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How to turn  
wooden  
threads



### Makers of the future

Fine  
craft at  
Bucks College



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## On the cover

Earlier this year, Ben Russell took some time away from his workshop to take part in a carving competition in northern Italy. Over five days, 25 entrants each shaped a block of timber on a theme relating to three impressive Dolomite mountain peaks called 'Le Tre Cime di Laveredo'. The results are a stunning collection of work, carved using a mix of hand tools, chainsaws and grinders. If this inspires you to have a go at chainsaw carving yourself, next month Ben explains the equipment and techniques you need to do just that.



## Inverted sanding

When I have a small piece of work that needs a sanding, such as a quadrant, I use my orbital sander inverted in a bench vice. This provides a flat sanding bed on which to move the workpiece with complete control.

G. Roberts, Stourbridge

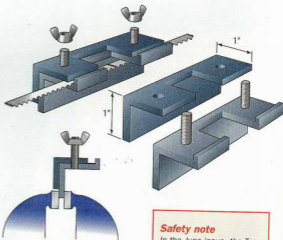


## Pipe store

Storage of electrical tools such as drills and screwdrivers can be overcome with the use of those odd bits of plastic drainage piping. I let them into a wooden base plate, cut out a piece for the handle, which creates a tidy place to keep them in the workshop, or to carry to the site of the work to be undertaken.

Alan Bourlet,  
Maidstone, Kent

## TIP of the Month



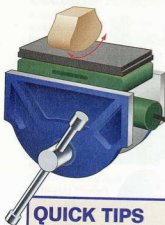
## Blade clamp

If you break a bandsaw blade that still has some useful life left in the teeth, this simple jig will hold the broken ends together while you braze them back together. You could use G clamps in place of the bolts and wing nuts.

J. Riley, Ruislip, Middlesex

### Safety note

In the June issue, the Top Tip suggested using cheap screwdriver shafts as extension driver bits. It should be noted however, that such shafts are not designed to withstand the high torques imposed by power drivers, and suggest they only be used for low torque applications at very slow speeds. Wearing safety goggles is also advisable.



## QUICK TIPS

### Double gauge

You can enhance the usefulness of your marking/cutting gauge by simply drilling a hole to house a pencil at the other end of the bar.



M. Metcalfe, Darlington

### Line plugs

If you don't have any wall plugs to hand, try using short lengths of hollow washing line. It works surprisingly well.

A. Hughes, Newport, S. Wales

### Glue scrub

When using glue it's important to remove any excess before it sets. One simple way to do this is to use a double-sided pan scourer. The foam will hold water for cleaning the joint and the green scourer will remove any semi-cured glue.

P. Julier, Enfield, Middlesex

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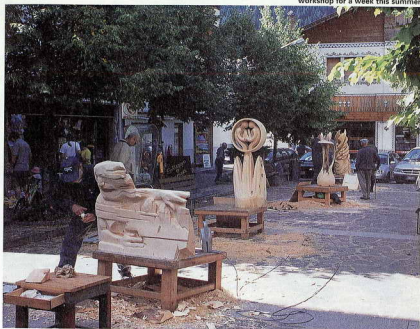


# The Italian Job



Given the chance to travel to Italy and

take part in a five-day carving competition, with full board provided, **Ben Russell** needed little persuasion...



The Hospital Piazza, my tree-lined workshop for a week this summer.

**E**arly this summer I got one of those emails that stuck-in-the-workshop woodworkers' dreams are made of. It came from a pleasant sounding woman called Tatiana, who wanted to know if I could come to

Italy to spend a week producing a large piece of sculpture in wood. This was to be a contest, the email said, for 25 sculptors, with two awards of 2000 euro: one each for the best abstract and best figurative pieces produced. It sounded good already, and it got better.

Tatiana explained apologetically that travel

costs would be my responsibility, but added that the organisers would provide full board in a hotel for the five days of the contest.

The venues for the event were to be Auronzo di Cadore and Misurina, two lakeside resorts in the Dolomite mountains, several miles apart, but under the same local administration. My atlas told me I'd be about as far north of Venice as I could get without finding I'd crossed into Austria. And this

would be, the email stated, the fifteenth year of the contest.

Now, I have to admit to being more than a little partial to things Italian. The food, the language, the aesthetic instinct, the sense of family and occasion — if Ryanair ever start direct flights to Italy from Cork, I'll go missing for most of the year. We all face difficult decisions in our lives and this was not going to be one of them!

**'Le Tre Cime di Laveredo', the three Dolomite slabs rising over 1,500 ft, were the theme for the contest.**



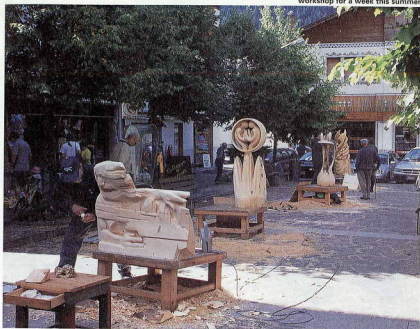
Auronzo di Cadore has an Alpine character, and boasts over 60 km of ski slopes. Summer tourists are mostly Italians escaping from the heat further south.

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## On our way

Several weeks later it's all happening. I'm on a plane heading to Venice/Treviso, getting to know the other Irish woodcarver who'll be accompanying me, Claidhbh O'Gibne ('Clive' to you and me). I'd seen Claidhbh's work before: mad Celtic interlacing, full of stylised animals and Irish mythology. I had a hunch it would turn heads in Italy, and later on I was to find that it did more than that.

For the contest, each sculptor was to be supplied with a 1.4m section of 'stone pine' trunk, about 45 to 50 cms in diameter. This is a big chunk of timber that would demand some determined woodcutting. Accordingly, amongst my baggage, in the hold below, was a box of woodcarving equipment that included: a Makita electric chainsaw, large and small TC tipped Arbotech cutters for Claidhbh's mini angle grinder, a mallet and a selection of Ashley Iles woodcarving chisels.

If that isn't problem enough with Ryanair's 15 kg baggage allowance, I've also brought chainsaw safety gear including protective bib and braces. These have mesh panels designed to tangle and halt the saw chain, should it make an unexpected dive for your legs.



The council workers replaced our cracked and knotty blocks.



Some sculptors sliced and re-glued their blocks. Gap filling polyurethane glues make it possible to get good bonds, with acceptable glue-lines, in far-from-perfect conditions.

## Heart of the Dolomites

The two hour train journey from Treviso to Calalzo, way up in the Dolomites, is a journey suffused with anticipation and the thrill of new experiences. The worries and responsibilities of the self-employed woodworker melted away at high altitude, somewhere over France.

The mountain scenery is breathtaking, and we were met by Tatiana, who kindly ferried us to our hotels. She reminded us that all participants would meet at a civic reception at 11 o'clock the following morning. I'd noticed this on the schedule, and had wondered how the organisers manage to start an event requiring heavy-duty chainsaw action with 'Drinks'!

We met, as instructed, for a genial gathering during which participants got to know each other, old friendships were reaffirmed, the rules for the contest explained and locations assigned.

Auronzo is a very linear community, stretching more than 4 miles along the lakeside, and sculptors are grouped in threes and fours in prominent public places. Tatiana, a graduate in modern languages, had kindly translated everything for us ahead of time, so we felt we pretty much knew the score. Claidhbh and I had been located in a cheery little square directly in front of Auronzo's hospital and, after my observations about alcohol and chainsaws, I

wasn't sure if that was a bad omen or a comfort!

## Work stations

The hospital square turns out to be a pretty little pedestrian way, fringed with shops, including a Gelateria — the classic Italian ice-cream and drinks bar, with shaded tables outside. Four of us would be working in a row, up the centre of the square, each provided with a large umbrella awning and a sturdy bench, about 40 cm high and 1m square. Sitting on the bench is a section of tree trunk, ready for us to carve, and nearby an electrical outlet for power tools.

First snag: our blocks are too small, and have large knots and ring-shakes. 'No problem', say the organisers:

Claidhbh (Clive) O'Gibne, also from Ireland, carved his 2000 euro prize-winning piece, 'The Three Celtic Spirits of Auronzo', largely by hand.



My neighbour, Massimo Pasini, did very intricate work with his chainsaw, with alarmingly little regard for safety precautions!



Massimo had prepared a half-size maquette during the week before the contest. I noticed also that he had made his own beautiful gouges.





It rained quite heavily on two days and large umbrellas kept us and the carvings dry. No one seemed too bothered about the electrical

'They can be changed'. A little later council workers set new blocks in place, and the work begins. To allow local residents to sleep, eat, and take a siesta in peace, the use of chainsaws is limited to certain hours. Claidhbh is hoping to manage the rough work with the Arbotech, to which, of course, the same restrictions will apply.

### Competitive spirit

Over the next five days our pieces take shape, and from talking to the other sculptors — in a utilitarian and improvised mix of languages — Claidhbh and I get an idea

One of my favourites: Gianpaulo Corna's 'The Valley Guards'.



of the nature of competitions like this.

First it comes as a shock to discover that there are several such competitions in Italy. Perhaps as many as 30 each year. Similar competitions exist for stone sculpture and for specialisations such as carnival mask carving. The 4000 euro prize fund in Auronzo is considered rather exceptional, with competitions more likely to offer a prize fund of 1000 euro or less.

And the approach to the work has, what seems to me, a distinctly Italian character. These are not the British or American chainsaw carving events, that you may have come across, where the focus is primarily on skilful and sometimes gimmicky use of the chainsaw. This is very much a sculpture event. If it takes a chainsaw to rough out the shape, so be it: all tools are legitimate in pursuit of the finished piece. Gouges, rasps, sanders and planers also feature. The aim is the creation of sculptural beauty, in the context of the theme. Many of the participants have an arts background and the work certainly reflects this.

### Each to his own

Usually I'm a great believer in preparation. In this case however, those who watched me



Winner of the 2000 euro award for best figurative sculpture, was Arianna Gasperlana, with her sculpture: '15 Years of Magical Metamorphosis'.



Carbognò's piece, 'Joy of Destiny', tells the story of divine intervention during a potentially fatal accident involving his son.



A beautiful piece, 'A Puff of Our History' by Claudio Bonechi

Highly commended, Marco de Lorenzo's 'Nights Under the Three Peaks - Music and Magic'.

make my last minute Plasticine model of my proposed piece, in the departure lounge at Stanstead airport may not think so! Massimo, working to one side of me, had spent five days designing and preparing a half-size version of the more complex part of his piece. Like Giancarlo, his immediate neighbour on the other side — who started by cutting his trunk in two,

squaring it up and gluing it together to make a rectangular slab — Massimo worked very methodically and with a clear vision of where he was going. My sketches and model had been very rudimentary and, like Claidhbh, I engaged in a good deal of improvisation as the carving progressed.

Claidhbh turned out to be a real crowd-puller. A veritable one-man street show. Whenever kids appeared, out came his juggling balls or his goatskin bodhran drum. He established quite a fan-club over the five days.

While Claidhbh and I worked our trunks as a single solid piece, several other sculptors cut theirs up into several smaller pieces, some gluing these back together to enlarge the scope of the carving block. While the wood had been seasoned to some extent, it was by no means dry. It occurred to me that developments in glues, particularly gap filling polyurethane glues, had made this possible. You can get good bonds, with acceptable glue-lines, under conditions that are far from perfect.

### Judgement day

As the week progressed, the pace of the work quickened



as we remembered that this wasn't just a pasta and wine fest, and that we ought to get our work finished. The sound of chainsaws was replaced by that of mallets and sanders, and on Friday afternoon the judges appeared. Tatiana translated my explanation for my piece, 'The Bulb that Grew the Three Peaks' and I could relax when the judges moved on to assess Massimo's work, knowing that any further finishing was now for my own satisfaction. I'd made it to the Dolomites, I'd completed my piece, I was a happy man.

That evening, all the sculptors, together with the organisers from the Council and tourist offices, sat down for a spectacular feast and any tensions from the week disappeared. There was a great sense of fraternity amongst the sculptors, and Claidhbh and I, as we had been throughout the week, were made to feel very welcome.



A very ingenious bit of re-gluing and carving, by Giandomenico Menia.

### And the winner is...

The following morning, pieces were being painted with liquid wax and other preparations, to limit the inevitable cracking as the timber dried. Some sculptors hollowed the underside of their pieces to reduce tensions.

The council workers arrived to take the pieces to the town hall, where the

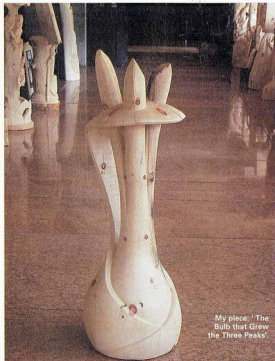


The judges circled on the evening before the presentation.

formal presentation of awards would take place. After a week of sustained effort, we waited on tenterhooks to see who would receive the sizeable awards. First, each competitor received a certificate and a souvenir rucksack, embroidered with an image of the three peaks, and then, out of the blue, Tatiana announced that Claidhbh had been awarded the prize for best abstract sculpture. With his scant grasp of Italian, Claidhbh recognised his own name but

missed the critical part of the announcement completely. He looked at me for an explanation. 'You've won', I shouted. And with a shell-shocked expression, that lasted for the rest of the day, he walked up to the podium to accept his cheque.

'Could we come back next year?', Tatiana asks afterwards. Well lets think about this: wonderful setting, fabulous food, great kindness and hospitality, lovely creative atmosphere, hmm...a tricky one. 'Couldn't miss it!' we both reply.



My piece: 'The Bulb that Grew the Three Peaks'.

Sitting beside his piece, Claidhbh is about to learn that he has won a 2000 euro award. All of us received a certificate and a commemorative rucksack.







# Choosing & using Handles, knobs and drawer pulls



Choosing the right fittings to finish off your project is crucial — **Mark Finney** explains the types available and adds some tips on aging brass

**A**ll woodworkers are keen to admire lovingly made joints and usually become highly animated by obscure details that the layman wouldn't even notice. However, for the prospective buyer of handcrafted furniture, two of the most important features which will sell a piece are often a silky smooth finish and a set of beautiful handles. Indeed, through the eyes of many, it may be the quality of the fittings that elevate a good piece to an excellent one.

There are literally thousands of handles sold by specialist suppliers nationwide, many of whom have excellent catalogues and websites. Even so, there are several factors that need to be taken into account before deciding which handles to choose.

## Types of material

There are lots of materials from which furniture fittings can be made and this will greatly affect the style and

appearance of a particular piece of furniture. Country-style handles are often made from iron, 'rusty steel' or possibly have a black lacquer effect. Fine furniture is usually fitted with polished or antiqued brass.

Sometimes handles aren't available ready 'antiqued' and you may need to tone down bright brass to make it look

more authentic. This is a simple enough process using a product called tourmaline brown (there's a black available too) which darkens brass on contact. Bear in mind that if the brass has a lacquered finish to prevent tarnishing, this will first require stripping using a conventional paint and varnish remover. A cold patination solution may also be required to remove grease or finger marks before treatment.

Tourmaline brown being used to antique bright brass.



## Old brass

There are two methods of aging brass. The first is to wipe the metal colour onto the surface and leave to react before washing down with clean water and dabbing dry with a piece of kitchen roll. Alternatively you can dilute the tourmaline in water and immerse the whole object for around a minute or two, checking the colour carefully. After treatment, the effect can be fixed using a product called jade oil, which is recommended for objects that are likely to be handled regularly.



Suppliers usually require several measurements to ensure that the sizes are correct. The height of the back plate and distance between centres are typical.

And did you know that you can have your own handles made? Many suppliers, furnished with a single original, are able to copy this and so make up a full set, often at a very reasonable cost.

### Modern styles

Not all designs rely on the influence of the past and many contemporary handles

are manufactured using unusual materials such as stainless steel, polished metals, ceramics and special finishes including satin nickel, or satin chrome. There are also specific designer styles too which are often based on a regional fashion or an ideology; Art Nouveau, American mission, Continental and Aztec styles are all good examples.

### Basic types

Within these many and varied styles are several fundamental types. One of the most basic of these is the simple plate handle where the handle is secured using a pair of bolts fastened through a decorative back plate. Although this back plate may be plain, it can also be engraved, embossed or even fretted. A typical description might therefore be, 'fretted and engraved plate handle'. Similarly, there are distinct types of plate handle where the back plate or handle shape provide the name; these include oval handles

Fitting a drop handle using a bolt and nut fixing.



Some drop handles and knobs may have an extension arm at the back to hold a door closed. These are known as cupboard turns.



Some handles such as this military chest handle are face fitting.



To cut a bolt to length, fit the handle and mark on the length. Remove and screw the nut back onto the bolt before placing in a vice. After sawing to length, file the ragged edge and remove the nut to recut the thread.

and ring handles. Handles which have two separate back plates are known as cabinet handles and the shape relates to its description, e.g., swan neck.

Finally there's the drop handle where either a ring or 'teardrop' projects down below the back plate.

### Pulls & knobs

Drawer pulls consist of a decorative plate which is pressed and face fixed to create a grip. Knobs are generally secured using a screw thread or from behind with a bolt and nut. They may be solid or hollow spun with the solid versions being much higher in price.

Some drop handles and knobs have an extension arm at the back to hold a door closed but are otherwise a standard pattern. These are known as cupboard turns.

### Sizes and fixing

When buying handles, measurements may be critical so it's important to understand

some of the descriptions that suppliers use. Generally you'll need to give the length and width of the back plate as well as the distance between the centres for the bolts. Simple knobs usually require no more than a diameter, whilst for drop handles, you'll require the size of the back plate and the length of the drop.

The fixing method may also affect appearance and suitability of a particular pattern. There are four main types. These are screw fixing, face fixing (as in the case of a military chest handle), bolt and nut fixing (where the bolt is secured from the back with a nut), and a rear fixing (where a screw is fitted from behind).

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# Sit & store



You can build this handsome storage bench with step-by-step guidance from **Dave Mackenzie**

**C**utting down on clutter is a constant headache in the average home, so it's a benefit if you can build storage space into your furniture. This bench is one solution — an occasional seat with two drawers that's both useful and looks good, for use in the living room or at the foot of a bed.

To augment its traditional look it's made in oak throughout, but any good-quality hardwood would be

fine. I've used mortice and tenons for most of the joints on the carcass and dovetails for the drawers.

## Side frames

The most interesting and demanding part of the construction is making the side frames which, with their curved rails and turned legs, give the bench much of its visual appeal.

However, the curved top end of the legs poses a problem for turning the

bottom ends. One way to deal with this is to retain some of the waste wood on the curved end to allow it to be mounted on the lathe. Once the turning has been done, the waste can then be removed. To ensure all the legs were the same size and shape I marked them out using a full-sized card template.

Use the gridded drawing to transfer the shape to your leg blank, then cut the shapes with a bandsaw or jigsaw to within about 1mm of the line.

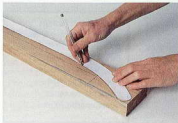
Find the centres of the two rectangular ends and mount one leg on the lathe. You'll be working on the foot end of the leg so stay well clear of the curved end.

## Turned foot

Start up the lathe at a medium speed. The leg is out of balance due to the curve shape sticking out at one end, so if it starts to vibrate, reduce the speed.

Start by marking the position of the shoulder then,

The legs should be marked out using a full-size card template.



Cutting the shoulder at the top of the foot using a skew chisel on edge.



Turning the foot to a smooth cylinder using a large roughing-out gouge.





Finish the foot with medium and then fine grade paper.



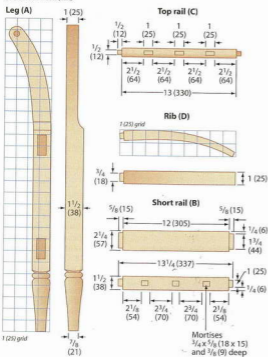
Remove the leg from the lathe then cut off the waste on the bandsaw.



Rout out the mortices with a 1/2" (12mm) flat cutter.

## Leg frame details

Dimensions in inches (mm)



diameter with callipers. Finish the job with medium and then fine-grade abrasive paper, then measure to find the position of the toe end of the leg and cut it from the lathe with a parting tool. Remove the leg from the lathe, cut off the excess and smooth all the curves up to the template lines.

Test the leg/rail joints and adjust if necessary.

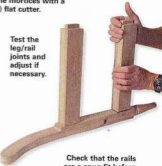
Check that the rails are a snug fit before the assembly stage.

## Thick to thinner

Next, reduce the top half of each leg in thickness by 1/2" (12mm). Make a line with a marking gauge to indicate its position and cut along the line. Where this thinner part rejoins the main thickness of the leg there's a small concave curve which I cut with the bandsaw then smoothed with a rotary rasp in a power drill.

## Making the sides

With all four legs completed, you can move on to make the side frames. First, draw lines on the legs to indicate the position of the mortises for

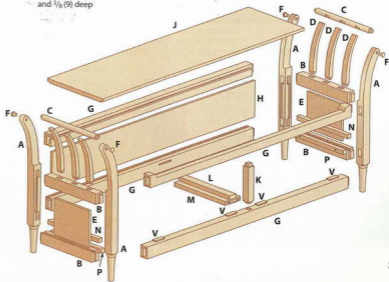


the long (G) and the short (B) rails. Set a mortise gauge and scribe the lines for the joints, then rout out the waste with a 1/2" (12mm) flat cutter to a depth

using a medium skew chisel, make a small 'V' cut, gradually enlarging it from each side until the shoulder is the right size.

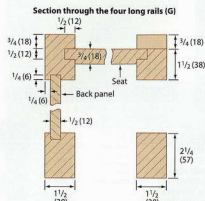
Now, turn a smooth cylinder between the shoulder and the foot end using a large roughing-out gouge. On this, mark the position of the bead below the shoulder and shape it with a small gouge or a skew chisel.

Finally, taper the foot between the bead and the end of the leg with a gouge or a skew chisel. As work on the taper proceeds, check its



## Long rail details

Dimensions in inches (mm)



## Top front rail ends



## Central upright (K)



## CUTTING LIST

All parts are oak except the drawer base, which is plywood.

Item	Qty	Millimetres	Inches
Legs (A)	4	673 x 102 x 38	26 $\frac{1}{2}$ x 4 x 1 $\frac{1}{2}$
Short rails (B)	4	337 x 57 x 38	13 $\frac{1}{4}$ x 2 $\frac{1}{4}$ x 1 $\frac{1}{2}$
Arm rests (C)	2	356 x 25 x 25	14 x 1 x 1
Ribs (D)	6	229 x 51 x 25	9 x 2 x 1
Side panels (E)	2	318 x 179 x 12	12 $\frac{1}{2}$ x 7 x $\frac{1}{2}$
Buttons for legs (F)	4	21 x 18 x 18	$\frac{1}{4}$ x $\frac{1}{4}$ x $\frac{1}{4}$
Long rails (G)	4	1226 x 57 x 38	48 $\frac{1}{4}$ x 2 $\frac{1}{4}$ x 1 $\frac{1}{2}$
Back panel (H)	1	1207 x 178 x 12	47 $\frac{1}{2}$ x 7 x $\frac{1}{2}$
Seat (J)	1	1194 x 330 x 18	47 x 13 x $\frac{1}{4}$
Central upright (K)	1	191 x 38 x 38	7 $\frac{1}{2}$ x 1 $\frac{1}{2}$ x 1 $\frac{1}{2}$
Central drawer lay (L)	1	305 x 38 x 18	12 x 1 $\frac{1}{2}$ x $\frac{1}{4}$
Central drawer support (M)	1	305 x 89 x 18	12 x 3 $\frac{1}{2}$ x $\frac{1}{4}$
Side drawer lay (N)	2	305 x 25 x 18	12 x 1 x $\frac{1}{4}$
Side drawer support (P)	2	305 x 25 x 18	12 x 1 x $\frac{1}{4}$
Drawer front (Q)	2	575 x 162 x 18	22 $\frac{1}{2}$ x 6 $\frac{1}{2}$ x $\frac{1}{4}$
Drawer sides (R)	4	330 x 152 x 12	13 x 6 x $\frac{1}{2}$
Drawer backs (S)	2	575 x 152 x 12	22 $\frac{1}{2}$ x 6 x $\frac{1}{2}$
Drawer bases (T)	2	562 x 318 x 6	22 $\frac{1}{2}$ x 12 $\frac{1}{2}$ x $\frac{1}{4}$
Drawer pulls (U)	2	35 x 25 x 25	1 $\frac{1}{4}$ x 1 x 1
Drawer stops (V)	4	76 x 18 x 6	3 x $\frac{1}{4}$ x $\frac{1}{4}$

There's no allowance for waste on the sizes given for the turned parts.

of  $\frac{3}{4}$ " (15mm), before final paring with a chisel.

Cut the short rails (B) to length and section, and mark and cut the tenons at each

end. I used a bandsaw and chisel. Test these joints and adjust if necessary.

The curved ribs (D) are cut from a 1" thick oak plank,

and their shape marked on using a template and cut out with a bandsaw before using a drum sander to get a smooth finish. Small tenons

need to be cut on the thick end only, and then used to set the mortise gauge for scribing the mortises on the top edge of the top short rails. Cut these mortises and check the rails for a snug fit.

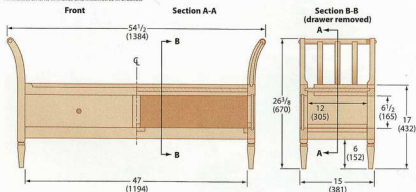


## Arm rest

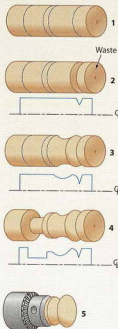
The top ends of the curved rails are housed in a cylindrical arm rest (C). First, with the arm rest as a square section blank, cut the mortises and fit the rails. The arm rest can then be turned to a cylinder, but to avoid ripping out the sides of the mortises during the turning, make small cuts that only remove small amounts of wood. I also found that using the skew chisel with a planing cut gave a better result than using a gouge, but you'll need to do some work with the gouge to remove the corners of the square section first. The ends of the cylinder are reduced with a parting tool, to a diameter of  $\frac{1}{2}$ " (12mm), to fit into holes drilled in the tops of the legs.

To cut the holes at the tops of the legs for the arms, use a drill press to make a small

All measurements in inches and millimetres in brackets







## Turning the drawer pulls

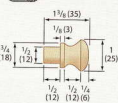
**1** Mount a square-section piece between centres and with a large roughing out gouge turn it to a smooth 1" (25mm) diameter cylinder. Mark on the position of the main features. I used a long enough piece of wood to make all four drawer pulls, then split them up afterwards for final trimming in the drill chuck.

**2** Make a deep 'V' cut where the top of the dome will be.

**3** Round the top of the dome with the skew and cut the coping with a 1/8" (6mm) gouge.

**4** Use the heel of a skew chisel to reduce the diameter at the base of the coping, then reduce the shaft to 1/2" (12mm) diameter with a parting tool.

**5** Finally, separate the pulls with a parting tool and fit each into a 'Jacobs' chuck on the lathe and smooth the head of the dome with a small gouge. Drill 1/2" (12mm) holes in the drawer front and glue in the pulls.



pilot hole. Next, use a 1/2" drill bit, drilling from both sides of the leg to avoid ripping out the grain when the drill exits.

## Panel grooves

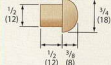
The next stage is to cut the grooves for the side and back panels. I find it helps to avoid mistakes if the sides are initially assembled without

glue and the positions of the grooves marked. When this is done the pieces can be taken apart and the grooves made with a router fitted with a 1/2" (12mm) flat cutter.

I made the panels themselves from several narrow 1/2" thick oak planks biscuit jointed together. Note that the direction of the grain in the panels runs horizontally to match the grain direction of the drawer fronts.

## Turning the leg caps

The caps (E), which go at the top of the legs to fill the arm rest fixing holes, are turned in a much the same way as the drawer pulls, and when completed can be glued into the holes at the tops of the legs.



Carry out a dry assembly, and mark out the position for the back panel grooves.



## Side frame assembly

Apply glue to all joints. For each side frame, fit the ribs into mortises in the short rail and the arm rest, then fit this assembly into one of the legs. Insert the panel, fit the lower short rail and finally put the other leg in place and clamp the whole framework until dry.

## Making the carcass

Cut all four long rails (G) to length. These are basically all the same with tenons on the ends, except the top/front rail has the front cut away. All the rails have various grooves and joints cut in them to house the panels and the central upright (K). Use a small template to mark the curved ends on the front/top rail (see drawing).

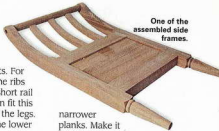
Set up your mortice gauge and cut tenons on the ends of the rails to match the leg mortises. Test the fit of the tenons and whilst assembled mark the position for the back panel (H) grooves, the position of the rebates for the seat (J) and the mortices to house the central upright (K).

Take apart and cut the grooves for the back panel and the seat. Note that the housing for the seat in the top front rail starts off as a groove but becomes a rebate for most of its length except the ends. This occurs when the shaped top is cut on the rail.

Next, cut the shape in the top edge of the top/front rail. I did this with a bandsaw then smoothed the ends with a file and abrasive paper. Follow this by making the central upright (K).

## The seat

To get the width required for the seat (J), you'll probably need to edge joint a couple of



One of the assembled side frames.

narrower planks. Make it slightly oversize then trim it to after it's been glued up. So that the seat fits into the grooves in the rails, the edge needs to be relieved by 1/4" (6mm).

## Runners & guides

Now you can make the drawer runners (P and M) and guides (N and L). The runners (P) are fixed to the inside of the sides with a couple of screws, while the guides (N) are simply glued to the top of the side frame rails. The central guide (L) is glued onto the central drawer runner (M) but before this is done the central support has biscuit joints made to fix it to the long rails.

## Assembly

Glue the front upright (K) into the two long front rails. Lay one side on the bench and glue this assembly into it. Pull the joint up with a sash clamp, then slide the seat (J) into the slots at the ends of the top front rail. The seat is glued into the slots and rebates at the front but allowed to move freely in the groove in the top back rail, so that it can shrink or expand.

Fit the remaining long rails and slide the back panel into place from the top. Finally, glue on the other side. Once dry, clean up the joints with a sander.

Fit four drawer stops (V) with glue and panel pins onto the back top edge of the lower front rail. These are set 1/4"

Cut the top front rail to shape and smooth the ends with a file and abrasive paper.



(18mm) back from the front edge, which corresponds to the width of the drawer front.

## Marking the drawer joints

The drawers have lapped dovetails in the front and through dovetails at the back, and the bases are  $1/4$ " ply fitted into grooves.

Make a template for the tails using some thin card. I used a computer for this but it can be done just as easily with a pencil and ruler. The tails are positioned symmetrically with an equal distance between. Hold the template in place one of the sides (R) and draw around the tails with a pen. Do this on both ends of both of the sides.

The lengths of the tails and the pins then need to be gauged on the ends of the drawer sides and back with a cutting gauge to ensure that each tail and pin is exactly the same length. Mark the waste wood areas with some cross-hatching to avoid any mistakes when they're cut.

## Tail cutting

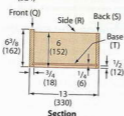
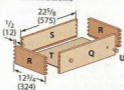
Use a tenon saw to make the cuts down the cheeks of the tails in the waste area, then remove most of the wood between the tails by chopping it out with a chisel. The first cuts shouldn't be on the scribed shoulder line but 1-2mm away; follow this up with cuts on the scribe line.



Join the front frame together before assembling to the side frames.

## Drawer construction

Dimensions in inches (mm)



Section

To make the chopping cuts, hold the chisel perpendicular to the face of the sides with the cutting edge inserted into the gauged line and the bevel facing the end of the board. Give the chisel a sharp knock with a mallet to chop half way through the wood, then turn the piece over and do the same on the other side. This will produce a neat accurate cut along the gauged line.

## Back pins

The pins on the drawer back (S) can now be marked using the tails as a template. Firstly, mark each pair of joints with identifying letters AA, BB etc., so that they can be matched up after the pins are cut.

With one of the drawer backs clamped vertically in the vice, align the tails of one of the sides onto it, and mark off the pin positions. Where these lines meet the edges, extend them along the inside

and the outside faces of the piece to the gauge line, and hatch in the waste wood areas. Cut out the waste using the same method as used for the tails, then test the fit of the joint.

## Lapped joints

On drawer front-to-side joints, it's usual to make the lap about one-third the thickness of the front; in this case it's  $1/4$ " (6mm) wide. This lap width should be marked with a gauge line, and the gauge then reset and used to gauge the side thickness on the back of the drawer front. After cutting the side dovetails and transferring their profile onto the ends of the drawer front, clamp the front onto the bench face down, and with a tenon saw held at an angle cut along the sides of the pins. You won't be able to cut down the sides of the pins completely just across the corners. Next, remove as much as the waste wood between the pins as possible with a router and a flat cutter, then cut out the rest of the waste with a chisel.

## Base groove

On the inside faces of all four pieces, use a router fitted with a  $1/4$ " (6mm) flat cutter to make the housing for the plywood base (T) to a depth of  $1/4$ " (6mm). Next, cut the plywood to size, apply glue to the joints, assemble and clamp the drawers together.

When the glue has set, plane the joints flush with the faces of the sides and back, and test to ensure each drawer fits into the carcass. I made the depths of the



To form the through dovetail joints, make a template for the tails using some thin card.

drawer fronts slightly larger than required and planed them to the correct width when the drawers were fitted into the carcass.

## Finishing

I finished the bench with Tung oil which gives a waterproof, stain-resistant finish with a suffused glow rather than a bright shine. However, before you decide to use it, try it on a piece of scrap oak to gauge the effect, as it will darken the wood slightly.

There are a number of ways to apply Tung oil but I tend to use a bristle paintbrush. First dilute the oil with white spirit about 1:1 and paint it on all over. Leave for an hour to two then with a plastic scouring pad rub the surplus oil into the grain. This has the effect of smoothing the raised pores in the wood. Follow this with a second application of the diluted oil and again after an hour or so buff off any surplus with a soft cloth. Leave for a couple of days and apply a coat of neat Tung oil.

After a short while buff off any surplus then leave for about a week. According to how high a degree of finishing you require you can continue to apply coats until you're satisfied with the results.



When the framework is dry, clean up all the joints.



Testing the drawer joints for fit.

# Record TSPP 250 Table saw

**W**e've all been waiting anxiously to see how the dramatic changes at Record Power and the management buy out would affect their schedule of new model releases. More particularly the fear was that with the closure of all in-house manufacturing they would just become another supplier offering re-badged machines, the same as all the others, just in a different colour.

Fortunately, it seems that the new management team have bucked this trend and are set on a course of offering a range of carefully selected, more upmarket machines that will be unique to the Record Power brand, rather than trying and compete with the heavily oversubscribed mass market.

## Flagship

The TSPP 250 is the first of this generation of new machines and it looks like being a real winner. The machine I had for testing was actually the pre-production prototype so there were a few minor problems that will be corrected on the first shipment that arrives in September.

For a long time the market has lacked a pro-quality saw bench with a cast-iron top at a sensible price. If you have several thousand pounds to spare the choice is quite good, but at a price below £800 there's very little in the way of

good-quality table saws, a machine that many would regard as the heart of the workshop. The TSPP has the added advantage of being a pull saw, in that as well as using it as a conventional saw bench you can also hold the wood still and pull the blade through it. This has several advantages, the main ones being that you get a more accurate cut, as well as being considerably safer for cross cutting.

## Big table

This is a big machine, and is supplied floor standing with cast-iron extension wings to either side. The overall table size is a massive 1180 x 800mm, so it's going to eat into the usable space in your workshop. The front rail and extension tables aren't easily removable so what you see is what you get.

The maximum depth of cut with a 254mm diameter blade is 80mm, the supplied blade being a 30 tooth TCT which is ideal for deep ripping but a little too coarse for cross cutting.

## Rip fence

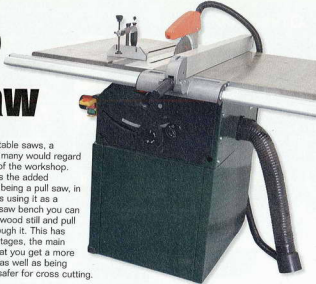
The rip fence is one of the best features, with a very smooth-operating and easily lockable yoke arrangement. So often these are either flimsy or tricky to adjust,

but this is simplicity itself and has the added bonus of rear locking as well for complete stability. There's no provision for fine adjustment, though I don't really see this as a problem as it's so easy to move anyway. A bolt on extrusion is supplied for narrow cuts against the fence but I was unable to try this.

## Blade controls

The blade controls are as you would expect, with full tilt to 45° and a separate rise-and-fall handwheel. Curiously this is graduated but has no reference pointer — perhaps the final version will.

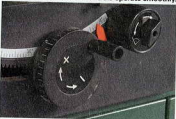
Situated just above these controls is the handle for the pull/push motion which has to be used in conjunction with the lockable mitre guide. The blade has a maximum travel of 220mm from front to



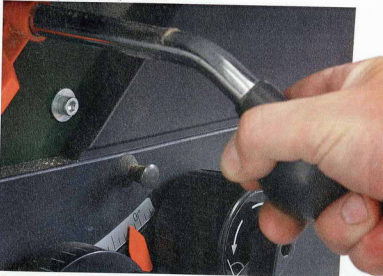
The easily adjustable rip fence locks up quickly.



The rise-and-fall and tilt controls operate smoothly.



The control handle for the push/pull function.

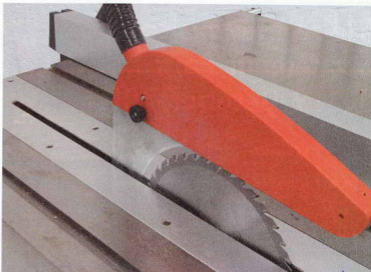




There's a rather cumbersome mitre fence.



Blade in the normal docked position.



Blade extended forward fully.

back; you just hold the wood in place and pull the blade through it. I did feel that this mitre guide was rather cumbersome, the locking knob seemed weak, and the screw adjusted hold down is a classic example of making a simple job complicated. A cam-action clamp would be much quicker and more effective.

### Other controls

The on/off control box is positioned to the left of the machine in not the most accessible place, but you have to draw the line somewhere between specification and cost and this is just about acceptable. However a foot kick switch would have been nice even if it

added a few pounds to the overall price.

The dust extraction arrangement is rather iffy with the pipe sometimes fouling when you tilt the saw head. Apparently this is the main area for change and I imagine it will be resolved by the time it's in production. However there must be some provision made to support the pipe off the crown guard — at the moment this just dangles free.

### Power & accuracy

At 2.1 kW the motor is plenty powerful enough for even deep ripping in hardwood and the drive is smooth and relatively quiet, all off course helped by the heavy cast top.



Deep ripping is no problem with plenty of motor power.

I was interested to see if the inherent weakness built in by allowing the saw head to slide would generate any inaccuracy in the cut, but everything seemed very rigid and firm even on the heaviest of cuts.

A sliding table will apparently be offered as an option towards the end of the year and this will be retro-fittable to existing machines.

Tested by  
Alan Holtham



The mitre guide with timber locked in position.



## VERDICT

At the price, the TSPP 250 is super value for money and although it's a really good saw now, the promised modifications will make it outstanding. Until I see them though I have to reserve judgement slightly, but if you're in the market for a good saw bench at a sensible price this will take some beating, so get in the queue!

Price: £799 including VAT

Contact: Record Power, tel: 0114 251 9115

**RATING** ★★★★★

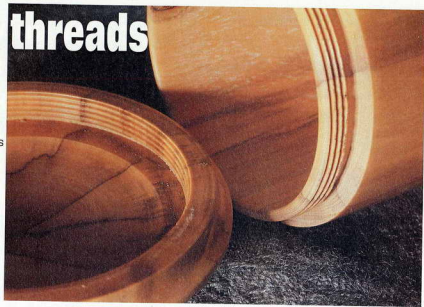
# Turning threads



Ever wondered how wooden threads are made? **Chris**

**Child** explains the secrets

A threaded joint adds a touch of refinement to a turned project and holds the separate components firmly together without the need for glue, enabling the work to be easily dismantled for storage. Threaded joints have been used on all kinds of wooden articles such as piano legs, spinning wheels, tapestry frames, chess pieces and tiny turned lockets. Nineteenth century tobacco and snuff boxes were nearly always made with a screw-on lid to prevent the contents spilling into the owner's pocket. Travellers could equip themselves with an ingenious travelling candlestick which had a screw-on cover which also doubled as a handle. And an entire industry developed to supply the medical profession with pill



boxes and special wooden containers with threaded lids for keeping glass medicine bottles safe while the doctor toured his rounds.

## Thread cutting tools

Thread 'chasing' tools are supplied in pairs — one for making the internal thread and the other for the external — and are sized according to the number of teeth per inch. For this boxwood project I

used a pair of chasers with twenty threads to the inch.

The choice of wood is important when it comes to cutting threads. The best results can be obtained only with close grained, well-seasoned timbers such as boxwood, lignum vitae and some of the finer-textured rosewoods. Coarse threads can be formed on softer more fibrous timbers, but it's much more difficult to obtain a clean, crumble-free thread.

## Thread chasing

I know from experience that it's only through practise that you acquire the dexterity necessary to chase threads with confidence. One of the problems of thread chasing is that you can only realistically learn on seasoned boxwood. If you try on low grade offcuts or less suitable wood it will only add to your difficulties. You can get some practise by making a length of thread on the outside of

- 1** Grip one end of the blank securely in a chuck.



- 2** Using a gouge, slice the end flat ready to start the chasing.



- 3** Form a small gap at the end of the thread section.



- 4** Start cutting the thread with the chaser held lightly between your fingers.



- 5** Lift the chaser out of the threads at the end of each pass.



- 6** Wax the threads to take off any sharp corners and lubricate them.







**7** When you're happy that the thread is completed, part off the lid.



**8** Practice chasing threads on the outside of the box.



**9** Cut a gap at the end of the thread section using a narrow parting tool.



**10** Set the tool rest at centre height, then push the chaser across to start the thread.



**11** Let the threads pull the chaser across once the threads are established.



**12** Ensure the threads have been cut to full depth before trying on the lid.

the project, where the trial threads will be removed in the course of turning the project. Once you've developed the necessary relaxed action and have succeeded in producing a few trial lengths of internal and external thread, you'll then be much better prepared to tackle the real thing.

### Internal thread

I always like to get the thread cutting done in the early stages, before I've invested a lot of time and trouble in the project. This means I have the full length and width of the wooden blank to work on, providing an extra bit of the cherry if I don't produce an internal thread at my first attempt.

You'll need to hold one end of your blank securely in a chuck so that you can work freely at the other end. Slice the free end smooth with a gouge and use a small round-nosed scraper followed by a square end scraper to the hollow out the lid and form a square-sided recess about 8mm deep. In the corner of the recess cut a 2mm gap using the side cutting parting tool. This is a vital space into which the thread chaser can work at the completion of its thread-cutting run. Without it, the front of the cutter would strike the roof of the lid and

mince up the threads.

Set the speed of the lathe to around 200 rpm and set the height of the tool rest so that, when the thread chaser is held horizontally, the teeth of the tool lie two or three millimetres above the lathe centre. Clean the top of the tool rest with some abrasive and apply a little oil or grease to lubricate the surface.

Thread chasers work better if they're well sharpened beforehand. To do this, lay the chaser flat on the oilstone and hone it until the top surface is bright all the way to the tips of the teeth. Make sure, especially with a new set, that the bottom corners of the chasing tool have been well rounded so that they don't bite into the top of the tool rest.

### Starting off

To start the thread, hold the chaser with two or three teeth lightly pressed against the end of the recess and feed the tool like a small snooker cue so that it brushes against the wall of the recess. At first you'll need to force the tool across but as soon as a thread begins to form, you'll feel a slight tug of the tool. At this stage be prepared to let it be drawn forward by the spiralling thread. As soon as you can see the thread forming, stop

the lathe and check that you've formed a single thread (one with a single start) and not a double or triple, which occurs when you feed the tool too quickly across. As the thread develops, you can stop pushing the chaser forwards altogether and concentrate the pressure sideways, so that the teeth of the chaser dig deeply into the threads.

I find that by removing the handles of my thread chaser and holding the shafts at the ends nearest the work I can maximize my sense of touch. I can then propel the chaser forward with my fingers, lifting it away at the end of the run and then placing in back at the start in a rhythmic elliptical movement.

Use some wire wool or abrasive nylon matting to rub some wax into the threads. This will take off any sharp corners and lubricate them. When you're happy that you have a length of fully-formed screw threads, part the lid off.

### External thread cutting

Cut a rebate on the corner of the body of the box, so that the projected section is 2mm wider than the diameter across the threaded recess in the lid. Cut an end space for the chaser to work into, using a narrow parting tool, then set the tool rest so that the thread cutter cuts at centre height.

The same principles that apply to cutting internal threads also apply to external threads, except that the tool



The side cutting parting tool and the set of thread chasers.



**13** Form the small moulding on the lid with a spindle gouge.



**14** Form the moulding at the base of the box with the parting tool.



**15** Smooth out the sides with the beading tool using the corner of the blade.



**16** Hollow the box with the corner of a square end scraper.



**17** Flatten off the bottom by scraping sideways with the corner of the scraper.



**18** Slice off the dovetail with the box held in a jam chuck.

isn't worked forwards but from right to left. Start the cut with a very gentle sideways pressure on the tool. Once you feel the first signs of a thread forming and the tool starts to feed itself, stop the lathe and check you have a single start thread.

As the thread developed, I reduced the speed of the lathe to 120 rpm and pushed the chaser quite hard into the threads, while letting it be pulled freely along by the deepening screw. Check, using a strong light and a magnifying glass, that you've cut to the full depth of the thread chaser before trying on the lid. It's quite likely that

you'll need to make several more passes with the thread chaser to get the lid to screw completely home.

### Lid mouldings

With the lid screwed onto the body of the box, the dome of the lid can be formed using the small bowl gouge. The decorative mouldings on the rim of the lid are formed using a spindle gouge. Start off by using the gouge fairly flat and twist the point in the surface of the

work so that you form a shallow depression.

You'll notice that I use a small vertical tool post, made from a masonry nail fitted into a hole in the tool rest, to support the back of the gouge. This little device helps prevent the point of the tool from slipping backwards at the start of the cut and so

preserves the crisp edge detail of the mouldings.

### Box detail

Use a parting tool to cut into the side of the body of the box a little way up from the base so that a section for a plinth is formed. Form a small round

moulding on the top of the plinth with the parting tool, parting at different angles, then remove the waste with the roughing gouge and clean up any ripples by adopting a lateral cutting technique with the beading tool. Place the edge of the tool on the apex of the work so that it's only just lifting the fibres, and then slowly feed it sideways

using just the corner of the blade to cut. This will generate a flat, even surface right into the corners the mouldings.

### Hollowing the box

To hollow out the box, start off with a round-nosed scraper, and then use a square scraper to widen and finish off the cavity. I use a square-ended scraper which has had one side bevelled all the way along so that it doesn't bind on the concave wall of the box as it cuts.

Cut with the corner of the scraper so that a small amount of wood is removed at each pass, gradually opening the cavity to the required width. The full width of the scraper's blade must be prevented from biting into the floor of the box at all costs as this will cause a tremendous snatch and may dislodge the workpiece.

To flatten off the floor, the scraper is made to cut with the bevelled side of the tool, which has been sharpened for the purpose. Feed it laterally across the work face, cutting off no more than a millimetre at a time. After sanding and polishing, remove the box from the chuck jaws and jam it onto a mandrel so that the dovetail can be sliced off with a small bowl gouge.

The completed box and lid.



# Makers of the future



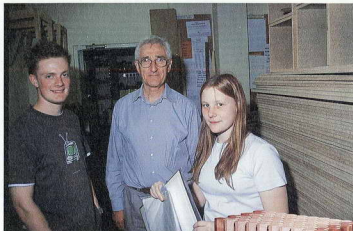
**Geoff West** found out about one of the few degree courses in Europe where both craft and design skills are valued equally

**B**uckinghamshire Chilterns University College's 3-year BA Hons Furniture Design and Craftsmanship course covers workshop skills: cabinet making, chair making, upholstery, wood machining, timber finishing, and metalworking (welding, brazing and wrought iron work), plus the preparation of designs: colour visuals, working drawings, specifications and estimated costs. Over 50% of marks are awarded for cabinet-making abilities. The Furniture Studies 2-year HND course includes the same subjects but has less emphasis on design. It's oversubscribed, currently with three applicants for every place, students coming from all corners of Britain and

abroad. Many ultimately set up their own furniture making companies, usually after gaining experience working with others.

"Our students tend to be those who are essentially doers, the kind of practically-minded people who enjoy fixing cars or tinkering with boats," explains design lecturer Phil Hussey. "You must love working with wood and be open to new ideas. Some people come to us saying 'I can make things, but I'm no designer', but I've invariably found that a practical ability spells a flair for design. We do prefer to take those with some woodwork knowledge, but sometimes accept people who have been working in a non-practical field."

Ruth Aplin with the laminated framework for a two-seater chair.



Course director Phil Hussey (centre), with students Claran Hammond (left) and Rhiannon Hankins (right).

## Student tales

Nicole van Drimmelen had a career in business until she opted to pursue her lifelong passion for arts and practical crafts. For her final exhibition piece she's making a pair of delicately exquisite sueded-lined boxes from yew, shaped like Chinese pagodas, with a marquetry design of trees. "I've discovered I've got a proclivity for marquetry, and hope to develop my own individual style," she enthuses. "My favourite timber is yew. I love the colours, the variety, every log is different, ranging from purples to browns. For me, it's frequently the grain of the wood that dictates the design. With marquetry, you can play around with the grain, it adds a glorious dimension to your work. I also adore the darker rich-coloured timbers, such as walnut and American redwoods."

Ruth Aplin enrolled soon after taking A levels. "Part of my school GCSE work involved making a wooden storage unit and I really enjoyed that," she explains. "It galvanised me into realising what I wanted to do with my life." Ruth's exhibition project is a large two-seater chair which can convert to a child's bed. Made from laminated sycamore veneer and bendy ply (made in the press shop), the curving shape accommodates two stainless



Table, with ends made of cherry, 'stalactites' from maple. The top undulates as the stalactites swing, each pulled back in line by magnets. By Robert French (1999).

steel poles, across which canvas is to be stretched to form the seat. Petite Ruth is actually smaller than her chair, but lack of muscle power has never held her back, as she explains: "I knew that lifting bulky timbers might be a problem when I started, but there's always someone around to lend a hand."

## Restorative enthusiasm

In addition to designer craftsmanship, Simon Hazel is keen on making reproduction items and is also enthusiastic about restoration. "Design of the thirties — art deco — was the inspiration for this sycamore



Paul O'Mahoney fitting a door on his oak drinks cabinet.



Laura Bregant with her 'ringbound' table.



Formers, for vacuum forming, carved to shape from assembled layers of chipboard, glued and bolted together.



One of two large press presses in the shop, where laminated timber is formed into shapes.

wall cabinet I'm making, which is based on the style of an old cinema in Lewisham," says Simon. "It's for my dad's collection of vintage dinky toys. It'll have a mirrored back and light-coloured shelves so as to show off the contours and colours of the cars. Sycamore's ideal because it varies both in colour and grain type, which could be curly or straight. An interior light will make it a real showpiece."

"No it's not a coffin, it's a drinks cabinet!" jokes Paul

O'Mahoney as he lovingly caresses the bevelled doors of the long sleek brown-oak box. It's a modernistic piece, just aching to be hung on the wall of a trendy living room. Paul's cabinet is a laminated construction, made from 2,

'Plywood man' table made from slices of birch ply assembled horizontally, to be topped by a glass surface.



3, 4 and 5mm alternating light- and brown-oak sheets, with shelves strategically positioned to accommodate bottles and glasses and incorporating a waist-level pull-out shelf for mixing drinks. Twenty-something Paul

did a national certificate in furniture and crafts after leaving school and started an arts foundation course before coming to High Wycombe. "I'd

enjoy making a whole set of furniture to match this piece, in fact I'd

like to furnish an entire room with everything in sympathy," he adds. "Eventually working in a co-operative furniture-making company would be ideal for me."

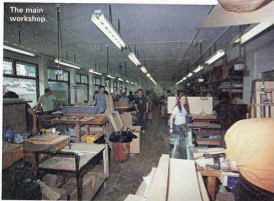
### Tools, timbers & techniques

Students buy their own set of hand-tools (planes, chisels, saws etc.), and the workshops have all necessary machines and equipment, which they're trained to use and maintain.



A student at work at his bench.

European or American hardwoods are the most popular: oak, cherry, ash, beech, sycamore and maple. Softwoods and chipboard are used to make mock-ups for projects, and also for creating formers for laminated work (see above left). Standard hand-skills of planing, cutting joints and so on are taught first, followed by techniques for laminating, steam bending and marquetry as well as wood finishing (oiling, waxing, French polishing and spray lacquers) and also metalwork skills. Practical work is augmented by lectures on technical



The main workshop.

subjects such as adhesive technology.

Laminating is done in the press workshop. The principle is first to make the shape you eventually want from layers of chipboard carved to shape usually on a spindle moulder (a revolving cutter on a table), then glued and bolted together. This 'male' former is then placed beneath the vacuum press, with a number of thin sheets of veneer or ply on top, the mating surfaces of these being coated with adhesive. An airtight rubber seal then descends, after which air is pumped out, allowing atmospheric pressure to force the sheets down over the former's shape. When the glue sets, the sheets have moved against each other to form the requisite, now-



Table, glass top, maple beneath, by Russell Thomas (1998).

permanent shape. The workshop also has a hydraulic flat press, which is used for gluing veneer to flat panels.

## Varied approach

Although someone once made a wooden bondage belt bed and another made a fully functional timber bath, waterproofed with tar and caulk, most people make contemporary stylish furniture. Two particularly imaginative table ideas by Fergus Channon are glass table-tops supported by crouching men: one made from horizontal layers of birch ply, another from vertical sections. One particularly imaginative piece is an oak table-top supported by a crouching figure made from sections of plywood.

"I'd advise amateurs to try and do the design as well as the making," concludes Phil. "If possible go on a course, as trial and error is a much slower teacher than a skilled craftsman. If you're unhappy with your joint-cutting skills, keep on practising. Buying a machine to do the job is pointless unless you're in business and need to save time. I still get tremendous pleasure out of crafting timber by hand, but my greatest reward is stimulating someone's creative abilities."

Collectors cabinet in Walnut by Adrian Jacobs.



Settee made from maple, cherry and walnut strips on a beech frame, by Simon Wilson (2003).

Chestnut table by Eliot Lee (1992)



Cecil Tate's adjustable recliner on a stand (1999).

Writing cabinet in oak by Jane Cleal (1987)



Table by Lisa Bregant.



round full circle and an ex-student asks us to 'Send them a good 'un', meaning can we recommend a promising graduate who might like to join their company. They know we will."

"What do I like about teaching?" says specialist crafts tutor Pete Legg. "I love hearing about ex-students running successful furniture businesses and making a name for themselves. And it's terrific when things come

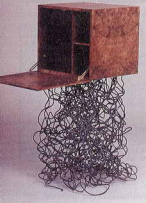
## CONTACT

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[www.bcuc.ac.uk/facultie/design/home/html](http://www.bcuc.ac.uk/facultie/design/home/html)



'Crouching man' table, Laminated birch ply by Fergus Channon v(2003).

Burr walnut cabinet with steel underframe, by Barry Griffiths (1997).



'Crouching man' table. Vertically cut, laminated birch ply. Fergus Channon (2003).



# Laminating curves



**Gordon Warr**

explains how to

make up curved components using laminating techniques in the construction of this unusual house number sign



**J**ust as you can tell a lot about a person from the type of car they drive or clothes they wear, I think the same applies to house signs. Some are decorative, and some are bland, while others are in need of a little care and attention, or are missing altogether! I'll leave you to decide what this design says about its maker — comments on a postcard please! It could be described simply as a house number, or more of a garden feature, or even an outdoor sculpture(!) and incorporates curved components made using two distinct techniques.

## Routed numbers

The numbers themselves are routed using a set of 6mm thick acrylic templates from Trend, in conjunction with a 13mm guide bush and an 8mm diameter plain cutter. The plain cutter makes a square-edged recess, but you could use other cutters to create a vee or a half-round cut. The numbers are approximately 57mm (2 1/4") high and a set of letter templates are also available.

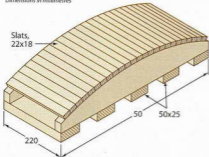
The first step is to prepare the setting out. Setting out was explained last month, and for this project all you need is a full-size front elevation.

## Timber choice

I used a combination of mahogany and ash, as mahogany has good resistance to weathering, and ash has excellent bending qualities. I was also anticipating that the curves of the main support could be achieved without any steaming or other preparation, and this proved to be the case, although straight grain is essential, as well as freedom from knots and other faults. These two species also provide good colour contrast adding to the visual appeal.

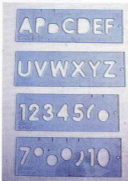
## Typical former for laminating plywood

Dimensions in millimetres



Typical formers used for laminating and bending.

Trend's lettering and numbering templates.



The templates are easy to use with a small router.



## Roof laminate

Start with the roof which is made from two pieces of 5mm thick exterior plywood glued together using a former to achieve the curve. I already had a couple of formers made for previous projects, and one of these happened to be ideal for the roof. The drawing shows a typical former for laminate work.

When bending plywood in this way, it helps to have the two pieces cut with the greater number of laminations running at right angles to the curvature, as thin wood is more flexible across the grain than along it. I cut them slightly oversize; in fact three were cut so that one could be used as an

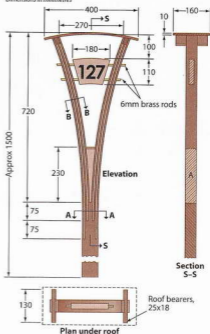
outer packing piece to spread the effect of the cramps.

Exterior waterproof adhesive is essential for this project, so spread this onto the mating surfaces of the ply then cover the whole sandwich with newspaper so that excess glue can be contained. It's also essential to add the G-cramps from the centre outwards (the more the better) then the whole assembly can be left overnight to dry.

With the cramps removed, one edge can be planed then the laminate sawn to width on the bandsaw; with the convex side downwards, this is almost as straightforward as normal ripping. The ends also need to be trued up on

## Laminated sign

Dimensions in millimetres



the bandsaw simply by using the cross-cut fence to support the workpiece. Finally, give it a thorough sanding, and round over all edges and corners.

## Number board

I cut the number board overlength so that it could be easily cramped down for routing, and before tackling the real thing, I practised cutting the numbers into a piece of MDF to work out the best spacing.

Once I was happy with the layout, I moved on to rout the numbers into the mahogany board, which took only a few minutes. Keep the mahogany rectangular at this stage which makes it easy to mark and drill the holes for the brass support rods.

## Laminating jig

To laminate the post, you'll need to make a jig from a piece of 18mm thick plywood covered with white paper which makes marking out easier and prevents adhesive spilling onto the ply. After marking the limits of the curve, screw a single block,

I practised the lettering on an MDF offcut before cutting the mahogany number board.



Boring holes for the brass rods.



Spreading waterproof adhesive onto a roof component.



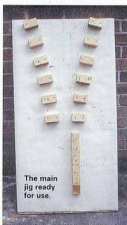
The plywood sandwich cramped to the former.

equal in thickness to the upright (ie: 45mm), to align with one side of the post will be.

Cut a strip of wood around 20mm x 10mm which will be bent to match the curves.



The jig for the upright partly prepared.



The main jig ready for use.

Cramp one end to the block, and bend the top end outwards to the limit of the curve already marked and cramp it in place.

Now you need to prepare a dozen blocks all around 90mm x 45mm x 35mm and bore a couple of screw holes in each. Lay six of these blocks evenly spaced up against the lath and screw to the plywood base. Repeat on the other side, using some 75mm wide packing (equal to the width of the post) to hold the lath in the right position.

## Cutting kerfs

Once you've made the laminating jig, you can start preparing the post. First cut and plane it to the cross

sectional size (see drawing to right), then mark on the lower extent of the laminate kerfs. These are staggered for two reasons: first to improve the visual impact, but more importantly, to spread the weakening effect that the cuts create.

I decided that the bandsaw was the best way to cut the kerfs, and fitted a 16mm wide blade for the purpose. Two cuts need to be made for each kerf which leaves a thin centre strip which needs to be removed; the outer two are 6mm wide, the centre one 9mm (see sectional drawing to right).

## Ash strips

The four ash strips which will be inserted into the kerfs need to be a little wider than the thickness of the mahogany to allow them to be easily tapped into place, and to simplify levelling off the assembly once glued up. The thickness of these strips is critical to ensure a snug fit in the cuts.

The next stage of gluing up is non-standard, so everything needs to be carefully prepared in advance, including the setting of the G-cramps. I inserted small spacers into the five cuts to partially spread them which allows easier application of the adhesive, then apply glue to the ash strips as well as the cuts before inserting them and tapping them completely in place.

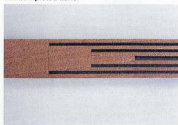
The roof removed from the former and awaiting trimming.



Bandsawing the kerfs for the ash inserts.



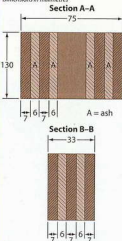
The completed kerfs.



The leg fanned out to make the gluing easier.



Dimensions in millimetres



## SUPPLIES

Brass and aluminium rods and tubing are available from B&Q and Hobby's (tel 020 8761 4247). Trend will send a copy of their catalogue to you free of charge by phoning (Freephone) 0800 487363.

## Cramping up

With the lower uncut end of the mahogany cramped to the large block on the jig, the cramps can then be added, working towards the upper end. Use cramping blocks on the inner surface to prevent the cramps from marking the wood as they're tightened. Once the glue has set and the work removed from the jig, some partial levelling off can be done using a jack plane.

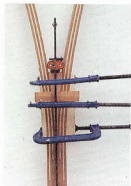
The next stage is to prepare the wedge-shaped block which fits in the centre cut. Achieving a good fit is probably the most difficult stage of the whole project, as constant trimming and checking is needed to get a



The laminate glued and cramped.



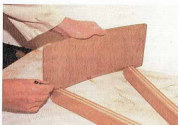
Initial levelling of surfaces using a jack plane.



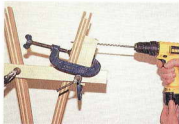
The centre block glued and cramped in place.



Sanding the sides smooth and level.



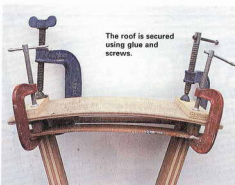
Using the roof to mark the tops of the upright.



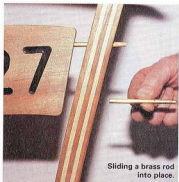
Boring holes in the upright for the brass rods. Note the block to guide the bit.



A roof bearer glued and cramped.



The roof is secured using glue and screws.



Sliding a brass rod into place.

really tight joint; I used a combination of a spokeshave and delicate use of a belt sander for this. Once the fit is acceptable, round over the upper end and glue and cramp it in place.

Now final levelling and cleaning up can be completed — a belt sander is a handy tool at this stage.

The inner surface of the centre cut still has a sawn finish, and the only way to clean this up is by thorough hand sanding.

### Rod holes

You should now be ready to mark out holes for the brass rods where they'll fit through each splay. I laid the assembly on the setting out board, then with careful use of a straight edge, marked off the centres.

The holes need to be bored so that those on one splay will line up with those on the other, and for this I prepared a block of scrap with

Painting the numbers.



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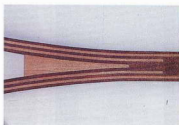




I applied two coats of clear wood preservative before oiling.



The completed project with the original setting out board.



A closer view of the laminated structure.

two holes bored in at the angle required. With this simple drilling jig cramped to each leg in turn, the holes can be bored very accurately.

### Roof joint

Mark the upper ends of the splay to length, again by direct transfer from the setting out board, then use the roof component to mark the angle on the ends. The curve on the splayed ends which matches the underside of the roof is so slight that you can assume it to be a

straight line, so cut it with a tenon saw.

A simple bridle joint secures the roof bearers to the splayed ends of the post and can be cut using a saw and chisel, while the bearers each have a shallow trench to match. The top of each bearer needs to be bevelled for a good fit under the roof, and a couple of holes bored in each. Once the bearers have been made, glue and clamp them to the splay ends, then fit the roof by gluing and screwing it down onto the bearers.

### Painted numbers

I could now shape and smooth the number block and, using a small artist's brush, paint the number recesses with three coats of black. Don't worry about a little paint finishing up on the surface of the wood, as it's easily sanded off leaving the edges of the recesses crisp and sharp.

I cut the brass rod to length, filed the ends then tapped them into place, relying on a reasonably tight fit in the holes to hold the rods in position.

### Finishing off

To protect the post from rot, apply a clear wood preservative, then standing the post in a container of it for several days. Paint on a couple of coats of teak oil which highlights the colour contrast between the woods and can be renewed quite frequently.

Set the post into an 18" deep hole, and after checking for plumb, bed it down in a mixture of gravel and soil.

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# Letters to the editor

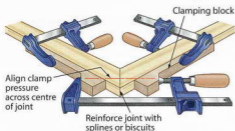
Send your correspondence to: Letters to the Editor, Practical Woodworking, Nexus House, Azalea Drive, Swanley, Kent, BR8 8HU. Alternatively, fax on 01923 286421, or email to [practicalwoodworking@getwoodworking.com](mailto:practicalwoodworking@getwoodworking.com)

## Mitre clamp

There are a number of methods and jigs for clamping mitre joints including using band cramps with corner blocks, but I thought you might be interested in a quick solution which I found in the American Popular

Woodworking's June issue. All you need for each joint is three light cramps and a couple of home-made cramping blocks. It may seem a little basic, but it works.

**H. W. Young,  
Bridlington, E. Yorks**

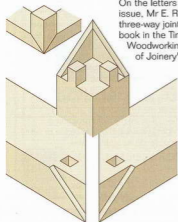


## Japanese joints

On the letters page in the January issue, Mr E. Riley was asking about three-way joints and it reminded me of book in the Time Life series 'The Art of Woodworking' called 'The Handbook of Joinery'. There's a section in it

on Japanese joints, one of which is shown here which is a rather elegant solution for a three-way joint. There are many other fascinating Japanese joints to admire or even try out, even if you don't have a Japanese saw or chisel set.

**M. Macpherson,  
Western Australia**



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## TV winners

Although I've been a hobby woodworker for about twenty years, I've never had any tuition, having gleaned what little I know from the pages of magazines and books, and although I consider myself to be reasonably competent, I don't claim any great level of expertise. When we first received Sky television I enjoyed watching 'The New Yankee Workshop', but bemoaned the lack of home-grown programmes. I thoroughly enjoyed 'John's Workshop', with John Revell and various visiting experts, and looked forward to 'Smith & Sweetman Workshop' with anticipation. I enjoyed the early broadcasts perhaps wishing that the camera would linger more on the workpiece and less on the presenters, but that's a minor matter. Then came the Chest of Drawers — a nice design, but everything I'd read and seen insisted that possible movement should be allowed for in cross-grained joints. We saw four drawer rails being securely glued in tight housings in each side panel, driven home with a hammer — no allowance for movement there! The writing slide got similar treatment, long-grained runners being glued and biscuitted across the end grain. Surely if there's any further drying of the wood, these components would split. The writing slide then seemed to be permanently fixed before any finish was applied, making it impossible to finish the rear part of the top face.

I, and I'm sure many like me, welcome British made programmes showing the making of good quality furniture, but they mustn't go the route of the house make-over programmes, showing shoddy work in the name of entertainment.

**James Brolly, Stretford, Manchester**

## STAR LETTER

## Inspired carving

In the September 2002 issue, Ben Russell featured a carving project entitled 'Celtic Clock' (p. 32-35). Although I didn't make the clock I was motivated by the Celtic motif inset at the bottom of the project. Here are some photos of a project I recently completed with a group of students in Saudi Arabia called 'The Adirondack Chair Project'. The chair has its



roots in the Adirondack forest of New York state, and Thomas Lee worked the first design in the early 1900s. It's still popular today as a garden or deck chair, and I was pleased to add some European charm with the Celtic inset. Thanks Ben for yet another inspiring article.

**Steve Smith,  
Saudi Arabia**



## Car jackpot

As Victor Meldrew would say - 'I don't believe it!' The car jack router table height adjuster featured as your Tip of the Month for July 2003 won £20 for a Readers Tip in 'The Router' of November 2000. In

the same magazine's April/May 2002 issue, it won Top Tip and won £75. Now it wins a Black & Decker Power tool for your Tip of the Month! Have I missed any other appearances of this most lucrative tip?

**Jim Rodgers,  
Edinburgh**

# Protecting your ticker

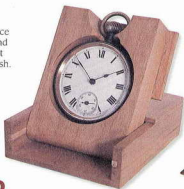


**David Bryant** shows how he reproduced three different Victorian case designs to protect and display a traditional pocket watch

**R**ecently I acquired a rather plain though interesting pocket watch, which I picked up for the princely sum of eight pounds at a clock fair. It's World War II of German origin, no saleable at the time because no one wanted to buy their products (hence no name on the dial), and hidden away has never been used. It has no jewels to speak of but it's a nice little watch, which would look good set in a small case. Some of you may also have a pocket watch with a mechanical movement, which

would benefit with something to display it, which is what I set out to do here.

In my files I have the measurements for three Victorian examples: a pendant watch stand in English walnut; a rather nice miniature oak longcase; and an attractive folding pocket watch box made of olive ash. They were made for the purpose of displaying the watch when not in use, so when retiring for the night, for example, the watch would be placed on its stand on a table beside the bedside.



## PENDANT WATCH STAND



**T**he pendant watch stand (above) consists of a simple arch mounted on two side pillars set into a circular base, and finished with a turned bone finial on

the top. All you need to make it are woodturning skills. The arrangement and dimensions of the stand are given in figs 1 and 2. The pillars (2) are straight forward spindle work, but need small gouges and chisels for the fine detail. I made the base (1) using a combination of faceplate turning and a four-jaw chuck.

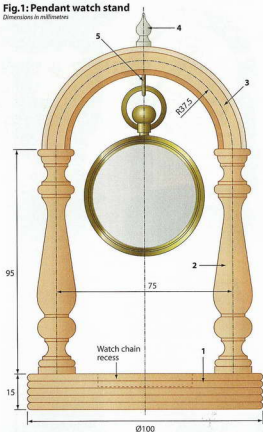
The first step was to stick the flatted side of a bandsawn disc onto a faceplate using double-sided tape, so that I could machine a groove for mounting it afterwards on the four-jaw chuck. The disc was then finished on the four-jaw chuck with a beaded perimeter and decorative grooving, together with a centre recess for storing the watch chain (photo 1).



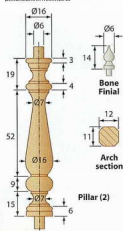
### PARTS LIST FOR PENDANT WATCH STAND

Item	Qty	Material	Dimensions
1 Base	1	Walnut	100sq x 20mm thick
2 Pillar	2	Walnut	22sq x 120mm long
3 Arch	1	Walnut	85sq x 16mm thick
4 Finial	1	Bone	Small piece to suit
5 Hook	1	Brass	Purchase to suit

**Fig. 1: Pendant watch stand**  
Dimensions in millimetres



**Fig. 2: Pendant stand details**  
Dimensions in millimetres



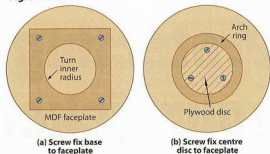
Machining the arch however required a little more thought. This was made in the form of a ring, which

was then split in half. There are probably more than a couple of ways of doing this, but the method I adopted was as shown in fig. 3, which is similar to how I make spinning wheel rims.

## Making the arch

**1** To make the arch, I fixed the walnut blank onto the faceplate, but because of the thin width of the arch I used screws on the outside rather than double-sided tape; when the centre part of the disc is machined away there's little adhesion left for the ring to stick to the faceplate. It might have worked but it didn't seem to me worth the risk, and with screws I knew I didn't have a problem. Sandwich a piece of MDF/plywood in between the faceplate and the walnut ring for attachment purposes (fig 3a).

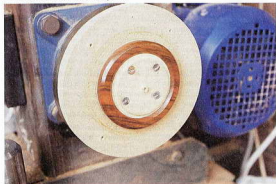
**Fig. 3: Pendant arch**



(a) Screw fix base to faceplate

(b) Screw fix centre disc to faceplate

**2** The turned arch/ring held by friction onto the plywood disc screwed to an MDF faceplate.



**3** Using a centre finder to locate the pillar positions.



**2** Machine the first side face and the centre bore.

**3** Screw a small plywood disc onto the faceplate (fig 3b) and machine this so that the partly machined ring is a jam fit over this. If you inadvertently turn it slightly undersize, pack it out with thin paper or card.

**4** Bandsaw off the outer part of the ring where you previously fixed it with screws to the faceplate. Invert the ring and fit it reversed tightly over the plywood disc so you

can finish machining the second side face and the outside diameter (photo 2). Remove the ring and carefully cut this into two. The other half can be used for another stand if you wish.

## Assembly

The assembly is straightforward with the pillars spigotted on either end to fit 6mm holes in the base and the ends of the arch. The finishing touch after polishing is to fix a brass hook to the arch, and machine a small bone finial to set into the crown. A centre finder was used to fix the hole positions for the two pillars (photo 3).



## MINIATURE LONGCASE CLOCK

### Dial plate recess

To turn the hood dial recess to fit the pocket watch. You need to set up the dial plate (3) on the lathe faceplate as in photo 4. The small clips allow you to centre it. The dial plate is recessed on the outside to suit the glass bezel and on the inside to fit the profile of the pocket watch case. Use a vernier to centre it up each time.

### Mouldings

The next stage is to make the mouldings (5) and (6) for the trunk, hood and ogee feet. These require special consideration because they're so small. They were machined on the router table for which a box of miniature cutters was needed; a friend of mine kindly loaned me a set.

A particular problem of cutting small mouldings on a router table is that being so tiny it isn't easy to pass the strip over the cutter without risk of injury to your fingers, even with a miniature push stick.

The best way is to stick the moulding strip onto a wider piece of waste timber using double-sided tape as in fig. 6, which makes the strip more handleable (photo 6).

You need to think carefully about the order of cutting the moulding profiles, i.e. which cutters first etc., so you can always maintain a firm edge to face up to the router table fence.

Finish the mouldings off by careful sanding. At this stage just fit and tape the trunk mouldings (5) to enable you to position the cut out for the false trunk door.

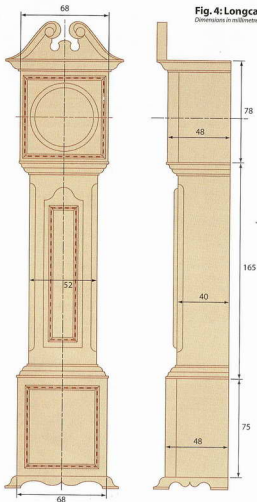


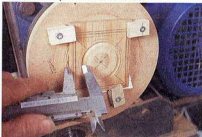
Fig. 4: Longcase  
Dimensions in millimetres

**T**he miniature longcase clock is more challenging. You know how it is when you're decorating the smallest room in the house it takes the longest time? So it was with making this; whereas the pendant stand only needs woodturning skill, to make the longcase a wider range of skills are needed including handwork, inlay and some simple carving. The arrangement and sections of the case are given in figs 4 and 5. Construction is as follows.

### Bodywork

Cut and shape the body of the longcase clock item (1) using handwork. Check the width of the cut out at the top so that your pocket watch will easily pass down with flexible packing behind (see later) and slip into the dial opening. Similarly, check the case width is slightly wider than the pocket watch else it won't fit in when the side pieces (3) are added. Prepare small timber pieces for the front and side panels (2) and (3) of the hood and base. The front panels require inlaying but for the moment tape these onto the body.

- 4** The dial plate set up for turning the watch recess.  
The turn clips allow it to be centred.



### Trunk door

Make the false trunk door (4), rebating it where it's to fit the opening using the router table. Leave it square

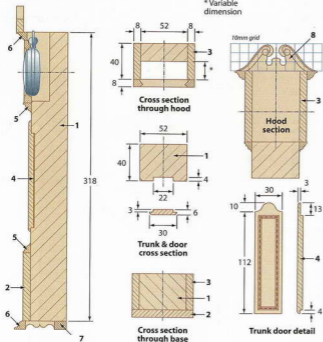
at the top for the moment or you'll make life difficult when you come to fit the inlay. Drill out the body using a saw tooth bit ready

- 5** Sticking the case mouldings to a strip of waste makes them easier to handle.

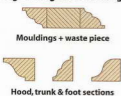


**Fig. 5: Longcase sections**

Dimensions in millimetres



**Fig. 6: Longcase mouldings**



(photo 7). After this, finish the ogee shape at the top of the false trunk door, round over the edges and check that it fits correctly. At this stage all the main parts of the case should be finished as in photo 8.

### Crest moulding/ogee feet

With the mouldings (6) previously made for the hood crest and ogee feet, you can cut and fit these. In addition, the ogee feet will require carving to create the undulating shape in the middle (photo 9) — a somewhat fiddly job due to

its size. A small fill-in foot piece (7) will also be needed at the back to make the case stand more firmly.

### Swan neck pediment

The last part to make is the swan neck pediment (8) which I've shown on a squared matrix to enable you to transfer the shape to the wood. I made the job simpler by pasting the pattern drawn on CAD directly to the wood. Carving isn't my best skill but after a bit of patient working the result was creditable (photo 10).

to take the trunk door (photo 6).

### Inlay

At this point you're ready to cut and fit the inlay on the dial plate base and trunk door; I used a scratch stock

**6** Drill out the a recessed area to fit the door, then clean up with chisels.



**7** I used a purpose-made scratch stock for cutting the inlay recesses in the dial plate base and trunk door.



**8** The main case parts.



**9** Base with ogee feet.



**10** The inlaid dial plate and swan neck pediment.

### Final assembly

The final stage is to glue all the bits of the case together stage by stage and stain and finish the clock to personal taste. I used Morrell's golden oak stain and a Danish oil to finish.

The last step is to fit the pocket watch in place, which is a little difficult, and local cut outs in the swan neck pediment and the body were made to make this easier. To hold the watch in place I'm currently using some seat wadding but a small piece of foam rubber may work better.

The top slot for sliding in the watch.



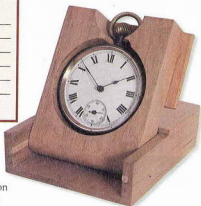
View of the base of the longcase.





## PARTS LIST FOR MINIATURE LONGCASE CLOCK

Item	Qty	Material	Dimensions
1 Body	1	Oak	52 x 40 x 318mm long
2 Dial plate/base panel	2	Oak	68 x 8 x 150mm long total Divide into two pieces
3 Side panels	4	Oak	40 x 8 x 320mm long total Divide into four pieces
4 Trunk door	1	Oak	30 x 6 x 105mm long
5 Trunk moulding	1	Oak	11 x 9.5 x 380mm long total
6 Crest/foot moulding	1	Oak	11 x 10 x 440mm long total
7 Foot piece	1	Oak	10sq x 60 long
8 Swan neck pediment	1	Oak	30 x 10 x 105mm long
9 Foam rubber stop	1	Foam rubber	Fit behind pocket watch in hood



## FOLDING POCKET WATCH BOX CASE

The last design, and possibly my favourite, is a rather delightful folding box case for a pocket watch. By comparison with the longcase, it's a very simple construction, and though somewhat fiddly to make due to the small parts, it's well worth the effort for

the end result. The making primarily depends on hand skills; no woodturning is involved.

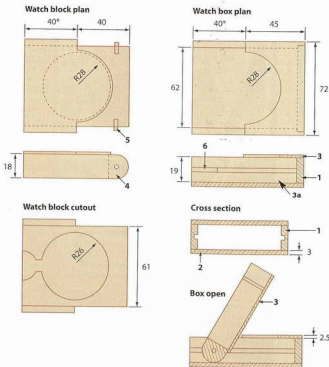
The design is really simple, consisting of a two-part case assembly. The watch fits into a block fitting within the outer case, which slides out and pivots back to rest at an

angle against shoulders on the top of the outer case. The original in olive ash looks really attractive, but not having any to hand I decided that the box would look quite nice in American cherry. Dimensions of the key parts are shown in fig. 7, though they may vary

slightly depending on the size of your pocket watch. The component parts are shown separately in photo 11. The step-by-step construction is as follows.

Fig. 7: Pocket watch box case

Dimensions in millimetres



11 The two part folding pocket watch box case.



**1** Prepare stock 19mm x 5mm for the sides and end (1). The width of 19mm needs to be sufficient for the pocket watch to be a clearance fit as it slides into the box in the closed position. Cut off the part needed for the end and rout a 3mm groove down the remaining length which is to form the two sides. This groove is to fit the two pins (5) in the sides of the watch block (4).

**2** Plane and bandsaw off thin squares of American cherry for the

case top (3) and base (3a). Work these two down to the thicknesses required, checking the pieces are stable aren't cupped. You may find it difficult to stop this but when glued to the other parts to form the box and watch block the problem should resolve itself.

**3** Split the case top (3), fret sawing it into two halves to the curved shape shown on the drawing. Marry the two parts together so they neatly fit against each other.

**4** Cut material for the watch block (4) 61mm x 18mm slightly longer than that finally needed so you can trim it back later to make a precise fit in the outer case. The block is a millimetre thinner than the case opening to make it a clearance fit as it slides into the box. Drill out the centre part with a large saw tooth drill bit — about 50mm (photo 12). Start to fit the pocket watch into this opening using a sanding drum to enlarge it as necessary. Form the neck section for the winding knob and ring at the top of the block.

**12** Drilling the recess for the pocket watch.



PARTS LIST FOR FOLDING POCKET WATCH BOX CASE			
Item	Qty	Material	Dimensions
1 Side/end	1	American cherry	19 x 5 x 250mm long Divide into three pieces
2 Case bottom	1	American cherry	90 x 73 x 3mm thick
3 Case top	1	American cherry	90 x 73 x 2.5mm thick
4 Watch block	1	American cherry	63 x 18 x 85mm long
5 Pin	1	Aluminium	3mm dia
6 Stop	2	American cherry	Make to suit case grooves

**5** Begin to fit and glue items (1) and (2) for the outer box together checking that the watch block (4) fits in neatly with a small clearance either side. The end (1) fits into rebates cut in the end of the two sides. With the watch block fitted in the box, start to position the two halves of the case top (3). The convex end glued to the watch block should just cover the circular opening extending by about 1.5mm. Glue the opposite end of the case top to the outer box ensuring that the two halves of the top fit neatly together.

**6** Fit two short 3mm diameter aluminium or brass pins into the rounded end of the watch block so the latter slides smoothly along the routed slots in the sides of the case.

Finally, fit a wood stop at the end of each case groove to set the watch block at an angle when in the open position — about 30° to the vertical is about right.

This is a nice little case to make up, but it does suffer from one deficiency in that the watch can drop out if you're unwary as you open it up. It may be worth

thinking about fitting some small stops or pins in such a way that this can't happen, which still allows you to remove the watch.

Workshop plans are available from David Bryant, 4 Grassfield Way, Knutsford, Cheshire, WA16 9AF @ £5.00 post paid.  
Tel/fax: 01565-65168,  
david@craftdesigns.co.uk,  
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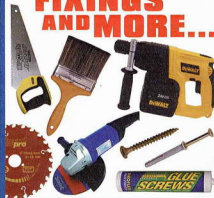
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# Finishing touches



Selling yourself and your work at a local or national show can be rewarding, but you need to balance cost against benefit, as

**Mark Finney** explains

**A**nyone who establishes a furniture workshop will at some point want to exhibit their wares. Whether this is at a local village hall or a prestigious designer event, a successful outcome is usually the result of hard work. Making up exhibition stock, setting up the show and keeping a cheerful smile can be very demanding. And you're witness to some very unusual comments too.

A few years ago I set up a stand to show a traditional range of oak furniture against a backdrop of photographs. Part of the display included a series of turned legs and columns which I'd split along the length so that the flat face could then be screwed onto one of the boards. Rather than waste the other half of each turning, I set up a similar display on a different part of the stand. One lady noticing that two halves were identical exclaimed in a loud voice, "Well you learn something

new every day!" Puzzled, I enquired as to what it was she'd learnt. "Well, I never knew that table legs were made in two halves and then glued together!" As the look on her face told me she was completely serious, I simply smiled as she wandered away from the stand.

## Keeping contact

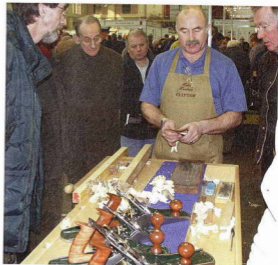
Even though there are lighter moments, exhibitions can sometimes be very busy. Make sure that you have a follow-up book ready to jot down names, addresses and other details. Don't forget to note down exactly what you talked about as that way, when you do get in touch, at least you'll sound as though you can remember what was needed even though most of the names and faces will become a blur after the first day.

It's also important to try and spot a potential customer from an interested woodworker. This takes a bit of practise and is a bit harder than it sounds but very important as it's very frustrating to see a well-heeled gent who'd tried to "have a word" slowly fading away into the crowd.

## Something to take away

Try to exhibit some of your best work. I once made the mistake of showing a cherry bookcase which was put together in a bit of a hurry and which had a patch of sapwood along one edge. Try as I might to explain that this was for display only and that each piece was made to order, the going was extremely tough.

And there are other factors too. Do you invest in a glossy brochure or just have a photocopy of the



furniture that you can make? Glossy photographs give the best impression of your work but they are expensive, whilst photocopies are cheap but might not present the image you need. It's wise to begin somewhere in the middle, say a folded leaflet, printed on good quality coloured paper so that customers can see you're not just handing out something knocked out the day before the show.

## Show business

And there are surprises too. I was once walking around an exhibition as a visitor when I noticed a leaflet that I recognised. It was one of my own with someone else's name on it! Oh well, they say imitation is the best form of flattery.

One spin off to attending a show is that you also get to meet other makers. This may result in the sharing of tips, the discovery of new techniques and contacts, and sometimes even making new friends. You also get to learn from other peoples mistakes.

And of course there's the inevitable funny story. I was



It's wise to show only your best work.

once demonstrating French polishing and as I stood to talk to someone else was asked, "How much is one of your wooden stools?" As I don't make stools I looked down and noticed a man pointing to the stool I'd been sitting on, complete with splashes of wood stain and old varnish. "£9.99 from B&Q" I replied, "but you'll have to assemble it yourself!"

Keep a note book ready for jotting down names, addresses and other details.



# Q&A

through plastic extraction pipes to various machines (say 5 in total) with a floor-standing chip collector?

**Tim Drake, by email**

The two products to which you refer are rather different items. The 'ceiling' type dust filters are intended primarily where there's a high concentration of dust; this is likely with turning work when this is the prime activity in a workshop.

Chippings collectors are excellent for collecting the debris from planing machines, saws, and indeed lathes. However, most are less satisfactory at filtering out and retaining fine dust. Indeed, they're likely to 'breathe' this out through the canvas bag fitted to most collectors at the top of the unit. It's possible with many makes (but as far as I know not necessarily all models) for an additional filter to be introduced within the unit to filter out the fine particles.

While a small fixed system could be

installed, these are normally linked to a stationary extraction unit. In the average garage, though, a trunking system would easily result in congestion. In an ideal situation, the extraction and collection unit should be separately housed outside the main workshop area, as there's always some leakage. In any case, I don't think that such a system could be installed within your budget.

I suggest that you study the Axminster Power Tools catalogue, checking on the specifications of the various models which they offer to solve dust problems. I also think it might be worthwhile contact 'Yorkclean', who specialise in small collection installations (contact Bill Blackwell on 01430 861460). They're based in Holme Upon Spalding Moor in Yorkshire.

Your needs will depend on the size of your garage, the machines you have installed, and the amount of time you spend in your workshop.

**Gordon Warr**

## Workshop extraction

I've recently set up a small workshop in my garage and I am concerned about health and safety with regard to dust. I only have a budget of around £200 and wonder whether you would recommend a ceiling dust filter (I was looking at the Axminster model) or a floor-based chip collector. I have a small industrial hoover which I attach to saw lathe etc.

How good are the ceiling dust filters and are they worth investing in? Could I set a small multiple collection system

## Cutting back the dirt

At a show recently, I noticed a stand selling fine steel wool to cut back polishes. Whenever I've used steel wool however, tiny particles have become lodged in the grain producing the appearance of dark flecks. Am I doing something wrong?

**D. Pearson, Redditch**

The method of cutting back a surface (known as denibbing) will depend both on the finish and the type of timber being denibbed. Where only a little polish has been applied, say a couple of coats of French polish or varnish onto an open textured wood, it is wiser to use a fine abrasive paper such as wet and dry paper or perhaps 400 grit lubrical paper rather than steel wool. The reason, as you have found out, is that any particles that become lodged in the wood are quite noticeable. Once several coats of polish have been applied however, and the surface is fully sealed, it's then perfectly safe to move

onto using steel wool as any small specks are easily wiped from the surface using a tack cloth.

Where the pores of the wood are very large, such as on elm or ash, or where a chemical reaction with steel may take place such as on oak producing hundreds of black spots, the use of steel wool should be restricted solely to when the surface is fully sealed. Where a surface isn't fully sealed, try using either of the abrasive papers mentioned above or a very fine scotchbrite pad as this won't break up during use.

**Mark Finney**



Fine steel wool can break up during use giving a grey tone to open textured woods that haven't been fully sealed.

## Two-part finish

I've made an electric guitar from mahogany and maple but I can't decide on the best type of finish to use. I don't have access to spray equipment and the guitar is to be used regularly. Can you advise?

**F. Simmons, Berwick**

You could varnish the guitar of course which will give some protection, but one particularly effective finish, especially when producing a gloss effect, is to use a two-part cold cure lacquer. This gives an extremely tough finish, which is suitable for regular use and, being relatively quick drying, will keep the finishing time to a minimum.

One type of two-part lacquer, known as plastic coating, is suitable for application by hand and consists of a resin and a hardener which need mixing in specific proportions before use. Once a coat has been applied by brush and has dried, cut back with 800 wet and dry paper to make sure that any unevenness in the polish is removed. Apply a second and possibly a third coat, repeating this process after each layer.

To create an even higher gloss mirror finish, a burnishing cream can be used once the lacquer has cured.

**Mark Finney**

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Tested

# Scheppach ts2000 circular saw

The ts2000 can be mounted on a folding stand.

The ts2000 is the smallest bench saw in Scheppach's range but embraces many features rarely seen on a machine of this size. The machine in its basic form can be regarded as a bench-top saw, measuring 720mm x 450mm x 300mm, so it's small and light enough to be regarded as a portable unit, which will fit into the boot of the average car. A stand is available which simply clips to the saw, and folds flat when not in use. Wheels are also available to make movement around the workshop easy.

The table top is made up from alloy extrusions and the centre section can be lifted clear (a single screw retains it) to give access to the motor arbor and the blade lock nut. There's the usual arrangement with an adjustable riving knife with the crown guard on top. This features a 50mm diameter dust outlet, while the main 100mm diameter dust outlet is at the back of the body. The top of the table benefits from having a groove on either side of the blade for the mitre fence.

The motor has overload protection to

prevent the damage of overheating, and the blade height and tilt is adjusted by a single handwheel, with a dial to indicate the chosen angle.

## Fences

The rip fence — which extends the full length of the table and locks in place with a ratchet lever at the front — features an adjustable 'L' section face which can be used either with the 60mm high side to support the wood, or the 10mm side. There's a magnifier on the scale to help with the precise setting of the fence, and a couple of clips on the top are for storing the push stick.

The mitre fence is a substantial affair and adjustable up to 60° to the left and right. A loose pin engages with the 90° setting, along with the 45° left and right ones. The face of the fence is 400mm in length and 50mm in height, and can be adjusted laterally, while the whole thing mounts on a T-section bar which locates positively in either of the slots with only a hint of slack. Maximum cross cutting capacity with this fence is about 230mm for square cuts.

## Extras that enhance

The key to this machine's flexibility is the assortment of table extensions available as extras.

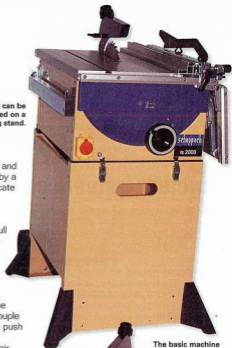
An extension table can be fitted onto the right-hand side, which adds a further 250mm to the ripping width capacity, and is designed to fold down when required. Additional 250mm wide extensions can be secured to this first one to further increase the support width.

The same system can be added to the left-hand side, and an extension can also be fitted at the back, adding around 575mm to the length of the table. Again with a width of 250mm, it simply clips in place, and can be positioned at any point along the back of the table.

## Sliding table

A 550mm wide sliding table is another extra, and is fitted onto a rail which locates onto the left-hand side of the main table, enabling the sliding table to be quickly added and removed. There's latitude for securing this in the forwards-backwards position, depending on the size of material being saw.

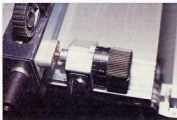
The quadrant which carries the fence is similar to that on the mitre fence, with the fence



The basic machine is compact.



The rip fence has micro adjustment.



There's a large panel for access to the riving knife and for changing blades.



The side extension tables in position.



itself being 950mm in length and extending to a massive 1560mm. Both the fence and its extension carry a scale, although this will always need reading relative to the adjustable lateral setting of

The sliding carriage fence has a telescopic extension.



The back extension table gives extra support when ripping.





## SPECIFICATIONS

Motor	1800 Watts
Blade speed	5120 rpm
Blade diameter	200mm
Teeth	24
Max cut depth	60mm @ 90° 48mm @ 45°
Table	610 x 480mm
Weight	33 kg

the fence in the quadrant support. A micro-adjustable stop is also fitted on the fence, and can be pivoted clear without altering its position.

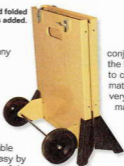
Maximum cross cutting capacity with the sliding carriage is more than 600mm — sufficient for kitchen worktop material for example.

With all the extensions in place as described, and the sliding carriage mounted to the side of the machine, it's possible to cut down a standard size

The fence quadrant - note the loose pin.



The stand folded with wheels added.



sheet of man-made board to any smaller size.

### In use

The benefit of the back extension table is realised when ripping long pieces as it keeps the work from tipping up at the front — a common problem with small table saws. Bevel sawing is made easy by virtue of the automatic reading of the angle the blade is set at.

The sliding table is very rigid, showing only the minimum of flex when heavily weighted down at its extreme left-hand limit, and the supporting rails to the carriage are fully adjustable for both height to ensure it runs level with the main table, and also to make certain that forwards-backwards movement is parallel with the blade.

The quality in terms of design and construction is impressive, and this in

Crosscutting with the fence extended.



conjunction with the ability for the basic unit to be extended to cope with large sheet material, makes the ts2000 a very capable and flexible machine.

Tested by  
Gordon Warr



## VERDICT

**Not the cheapest saw bench on the market, but one of the best.**

**Everything about it spells quality, and although it's small enough to be easily transported, with such a range of extension tables available it can cope with material that would otherwise be the preserve of much bigger machines.**

Price: Expect to pay around £600 including VAT for the basic machine.

Contact: NMA (Agencies) Ltd, Tel: 01484 400488

**RATING ★★★★★**

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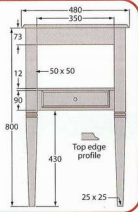
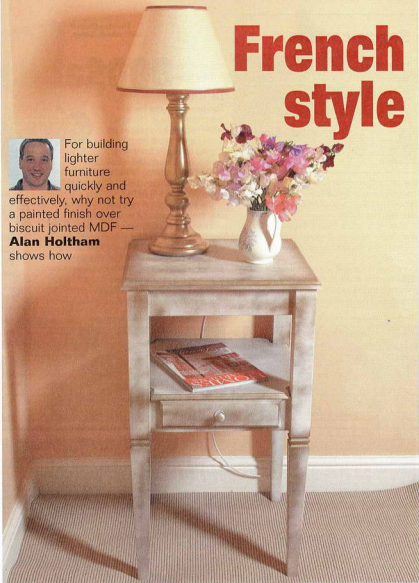
# French style

**T**his small lamp table was made for a client who wanted something with a French antique feel to it, and on account of the tight budget the most feasible solution was to use MDF with a suitable paint finish.

Because all the components are relatively small I was able to use up a lot of offcuts that had been accumulating over the months. Saving this is wise as they do come in handy for just this sort of smaller project. However, be aware of the health problems associated with machining MDF and take suitable precautions for the inevitable dust that's generated. At the very least, wear a face mask, but ideally use a vacuum extractor on power tools as well to collect the dust at source.



For building lighter furniture quickly and effectively, why not try a painted finish over biscuit jointed MDF — **Alan Holtham** shows how



There's a lot of router work involved in even a simple project like this, and a suitable router table makes the job much easier, particularly if it has a sliding table. However if you don't have this luxury you can use a hand-held router with wooden guide battens clamped to the work.

I was pleased with the result and fortunately the client was as well.

## Leg work

The first step is to make up the square legs using two pieces of 25mm MDF laminated together. It's easier to do this by making them up as one rather than

individually, so spread an even coat of PVA glue over both boards taking care to get right up to the edges, then clamp them together. Over the

years I've gathered a collection of old weights which are perfect for clamping jobs like this, as they spread the pressure evenly. Keep

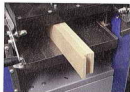
your eyes open for them in your local scrap yards as imperial weights are no longer used and are usually just thrown away.

**1** Spread a coat of PVA onto both surfaces, taking care to get right up to the edges.



**2** Old weights are ideal for clamping wide surfaces as they spread the pressure evenly.





**3** Thicken the drawer sides in one for maximum support.



**5** A sliding table makes short work of the drawer half lap joint.

## Drawer components

Whilst the laminated legs are curing (leave it at least overnight), you can prepare the pieces for the drawer from 10mm material. For accuracy, use a thicknesser to get them all to the same width, but a good tip with thin pieces is to thickness them all together to stop them leaning over as they pass under the knives.

Machine the 6mm groove for the drawer bottom first and then cut the rebate for the half lap joint at each end of the two shorter pieces. This is where the sliding carriage on the router table is so useful; you can set the fence as a stop and then cut each joint with perfect repeatability.

The half lap joint in conjunction with the inserted drawer bottom forms a very strong construction as MDF glues together very well — there are no end grain to deal with. Make a trial assembly of the drawer to check that it all fits together well; the bottom only has to be a fraction oversize to stop the joints closing properly. Then glue and clamp the whole assembly using a good-sized square to check for squareness, though it should be okay if you cut the bottom square in the first place.

The drawer front is added later and is simply a piece of 12mm MDF with a suitable moulding run around the edges. Don't overdo the moulding work on MDF as all



**4** Form the drawer bottom groove on the router table.



**6** Do a trial assembly of the drawer to check the fit.

these cut surfaces are difficult to seal properly when it comes to the finishing stage.

## Moulded detail

When the laminated board for the legs has cured, plane up one edge true and then rip off the four legs on the bandsaw. I actually cut out five to give me a spare to use for setting up the various

**7** Glue and clamp the drawer together checking squareness.



**10** Rip and plane the legs to a perfect square.



**13** Make up a simple tapering jig from 10mm MDF.



## CUTTING LIST

Item	Qty	L x W x T
Legs	4	800 x 50 x 50
Top rails	4	350 x 73 x 16
Bottom rails	4	350 x 90 x 16
Top	1	480 x 480 x 16
Shelf	1	435 x 435 x 12

## DRAWER

Front	1	300 x 75 x 12
Sides	2	380 x 68 x 10
Ends	2	280 x 68 x 10
Guides	2	380 x 25 x 35

tapering and moulding operations that come next. Plane and thickness all the legs to make sure they're perfectly square, then cut them to the final length using the first one as a template for the others.

The simple band of moulding round the middle of each leg is achieved with a cove cutter in the router, and once again the sliding table makes this a doddle, particularly if you set up a stop to help repeat the cut on four sides of four legs. Then

repeat the whole procedure with a second cut to get the desired effect.

## Tapering jig

I formed the tapers on the circular saw using a very simple home-made jig, which is simply a strip of MDF with two steps formed on one end with a series of short blocks; the height of each step has to be half the thickness of the required taper on the leg. In this case I used 12mm MDF for the whole thing which effectively tapered the leg

**8** Mould the edges of the planted-on drawer front.



**11** Set up a table stop to save marking out each cut...



**14** Position the fence to start the taper at the right place.



**9** True up the edges of the laminated leg blank.



**12** ... then use a cove bit to cut the leg moulding.



**15** Make the first cut with the leg on the first step.





**16** Make the opposite cuts on the second step.



**17** The finished tapered leg should be symmetrical.



**18** Radius all the edges with a 3mm radius bit.



**19** Cut the slots for the leg-to-rail biscuit joints.



**20** Thickness all the rails; note the two different widths.



**21** Crosscut them to length together for accuracy.



**22** Use a biscuit cutter in the router table to slot the ends.

down to a finished size of 25mm square.

To use the jig, place the leg on the first step and run the whole thing through the saw, having determined where you want the taper to start by adjusting the position of the rip fence. Then turn the leg 90° and make another cut, again on the first step. Now put the end of the leg onto the second step and cut the other two faces of the leg to produce an even taper. Smooth off the faces to remove any tool marks, then

use a 3mm diameter bearing-guided rounding over bit to radius all the corners of the leg.

### Biscuit joints

All the cross rails are jointed into the legs with biscuits, so the easiest way to cut these is again using the router with a biscuit jointing cutter. If you mark out the extent of each joint you can make the cut by eye, as nothing is critical provided you work from the face side of each piece at all times.

The rails must be thickened to get them the same width, but note that the bottom ones are wider to accommodate the drawer. Try cutting them to length together to get them spot on for size but always use the same one as the marking template to prevent errors from accumulating.

The corresponding biscuit joint in the end of the rails was cut on the router table, as I figured that this would give me a bit more support than trying to do it with the

router hand held. Use the same cutter, but be careful not to cut the slot too long and come out of the side of the rail. Finally, run the radius cutter round all the bottom edges of the rails.

### Assembly

Glue up two frames first, again making sure they're dead square. Take care because it's very easy to distort the rails by clamping too hard; just make sure the joints are pulled together — you don't have to wind the clamps up really tight.

One of the lower rails has to have the drawer aperture cut out, I did this with the bandsaw having first marked out the dimensions using the completed drawer as a template and allowing 1mm of clearance. You can now assemble the rest of the framework, being careful to orientate the rails correctly with the radiused edges at the bottom.

### Won't fit!

Having completed the whole assembly and allowed the glue to set, I then found it impossible to get the lower shelf into place! It very nearly went but not quite, so the

**23** Radius the bottom edges of all the rails using a guided rounding over cutter.



**25** Cut the drawer aperture out of one of the bottom rails.



**24** Glue up the two side frames making sure that they're dead square.



**26** Complete the frame assembly ensuring that the radiused edges on the rails are at the bottom.



**27** Fit the lower shelf in two halves rejoining them in situ.



only answer was to cut the shelf in half and reassemble it in situ. This actually worked very well and the joint was invisible.

### Finishing off

Before finally fitting the shelf, I ran the drawer front moulding around the edges, including the notches for the

#### 28 The routed detail on the lower shelf notch.



#### 29 Rout the drawer runners/guides.



legs, which save you having to be quite so accurate with the marking out and makes a feature of the shelf. Rout the edge of the top with the same cutter, then glue this onto the framework using one of the weights to clamp it in place.

The last job is to fit the drawer runners/guides which are formed from a single piece of rebated MDF, cut accurately to length so that they just glue in place between the front and back rails.

Now with the drawer slid into place you can fit the front so that it doesn't foul on the underside of the shelf. Again, glue and clamps is all that you need to fix it.

#### 30 Fit the drawer runners by gluing them into place.



#### 31 The completed table ready for sealing.

### Painted effect

Finishing MDF is always something of a problem, particularly where there's been a lot of moulding work. Everything looks fine until you start to put on any sort of paint which promptly sinks unevenly into the exposed edges. I first seal the whole job with a coat of cellulose sanding sealer, sometimes several coats to



#### 32 I finished it with spray paints for an aged effect.

get a really even coverage on the awkward areas. Once this has dried, which only takes a few minutes, you can flat down any areas of roughness and then carry on with the finish of your choice.

In this case I used cans of spray paint, starting off with a primer, then white and finally the highlights in gold to achieve an aged effect.

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Tested

# JCBD drill & jigsaw combi set

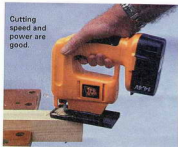


**J**CB power tools and small machines are fast establishing themselves as being a combination of good quality and reasonable prices and, like many manufacturers, offer several cordless power tools as well as power tool combination sets. I tried out the 14.4 volt drill driver and jigsaw combi set (JCBD-CHDJSK1).

## Cordless driver

The drill has a 10mm keyless chuck and variable speed from 0-650, and the collar rotates to give hammer action, normal drilling, plus three torque settings for screwdriving, as well as a reverse setting. Listed capacities are 10mm in steel, 13mm in aluminium, and 25mm in wood. Masonry capacity isn't mentioned, though the drill is equipped for this. Two screwdriver bits are included and clip neatly onto the top of the body, while the back of the handle has a soft-grip insert for comfort.

My tests included all the typical uses for a drill, with the maker's capacities being easily reached. I found that a little extra care was needed when driving in screws because of the limited choice of torque settings, but nevertheless the performance when driving 65mm long screws into softwood was good.



Cutting speed and power are good.



## Cutting edge

Like the drill, the handle on the jigsaw also has a soft-grip insert and it operates at a speed of 2800 strokes per minute, but doesn't have

pendulum action. The blade is held in place by a simple clamp arrangement tightened with the Allen key provided. A wood cutting blade is included, and there's a lidded space within the box for blade storage. The sole can be tilted to 45° left and right, but all angular settings have to be manually determined. Stated capacities are 50mm in wood, 6mm in steel, and 10mm in aluminium.

The jigsaw's performance cutting wood is at the upper end of the capacity range, and its speed and power are both good for a cordless tool in this price range. The blade grip is basic, but seems to hold the blade positively without any tendency to work loose.



Bevel sawing.



The tools and batteries fit snugly into a purpose-made carry case.

Tested by Gordon Warr



Boring 24mm holes.

## VERDICT

These tools look the part and perform well up to expectations. The convenience of having two tools sharing the power source and housed in one box is high, but only if both tools can be fully exploited. RRP: £99.99. Available from leading outlets.

Contact: JCB (Stockists information) 0845 6021381, [www.jcbworks.co.uk](http://www.jcbworks.co.uk)

RATING ★★★★★



This great toy train has working wheel pistons and a lidded carriage for storing toys. **Peter Hughes** shows you how to make it

pistons and a lidded carriage for storing toys. **Peter Hughes** shows you how to make it

**E**ven though passenger steam trains are museum pieces and seldom seen on the tracks, their popularity has never waned; the narrow gauge steam trains found near many British seaside holiday destinations are a testament to this, and enjoyed by children and adults alike. So it isn't surprising that the attraction of wooden trains persists, and the version outlined here will provide hours of happy playtime for both boys and girls.

### Timber

The chassis and cow catcher were made from  $\frac{1}{4}$ " thick dressed pine while the boiler and cabin are  $\frac{1}{4}$ " pine and the wheels are  $\frac{1}{2}$ ". Contrasting hardwoods were used for the pistons, piston rods, seat, boiler bars, chimney stack and wheel spokes.

### Wooden wheels

You'll need to buy ten plastic spoked wheels (4" diameter) for this project even though I only used the tyres from the



# Sit-on train



wheels. You could use the spoked wheels as they come, but you may have to do away with the pistons as the off-set piston rod connections may prove difficult onto the plastic. I find wooden wheels so much more attractive and the action element of the moving pistons adds greatly to the project.

The wheels are turned from  $\frac{1}{2}$ " pine in two halves (see **fig. 1**). There are two very good reasons for this construction. Firstly, there's very little stretch in the tyres and a one-piece wheel would have to have a very shallow tyre recess, which may result in a tyre being shed while cornering. Secondly, you can join the two halves together with the grain at right angles to each other, an arrangement that greatly increases the strength of the wheel. The dimensions given in **fig. 1** are to suit the particular tyres I bought. Bear in mind that the 4" tyres you buy may have a different profile and that you may have to adjust the dimensions accordingly.



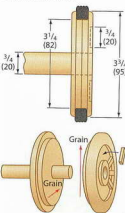
### Turning the wheels

I turned the half wheels in batches of six, mounted on a home-made jig as shown in **photo 1**. Of course, with this arrangement you can only shape the faces of the end wheels and you have to shuffle the wheels about in

order to shape them all in turn. The recesses in the outer faces are decorated with twelve hardwood spokes, in this case mahogany. This gives an attractive "steam train" look. **Photo 2** shows a completed wooden wheel and the original plastic wheels — the choice is yours.

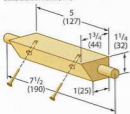
**Fig. 1: Wheels**

Dimensions in inches (mm)



**Fig. 2: Axles**

Dimensions in inches (mm)



The wheels are mounted on lengths of 20mm dowel which pass through a 21mm hole drilled in the axle blocks (see **fig. 2**). Set the completed wheel and axle block assemblies to one side until the construction of the cow catcher is complete.

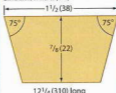
## Cow catcher

From  $\frac{3}{4}$ " pine, cut, glue and clamp the blocks shown in **fig. 3**. The drawing indicates the position of the chassis and front axle but at this stage the cow catcher isn't fixed to the chassis. The shaping process is easier if it isn't joined to the chassis. When the glue is thoroughly dry, a combination of bandsaw and sanding disc can be used to shape the catcher.

The wheels, and particularly the cow catcher, will sustain considerable impacts and abrasions from your average three-year-old engineer, so to help the train stand this abuse, the axles and the cow-catcher are glued and screwed into the positions shown in **fig. 4** and **photo 3**.

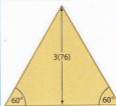
**Fig. 5: Boiler segments**

Dimensions in inches (mm)



**Fig. 6: End cap segments**

Dimensions in inches (mm)



**Fig. 7: End cap is glued to cylinder**



that will eventually form the front end of the boiler. The hexagon is firmly glued to the cylinder as shown in **fig. 7**. Since the whole assembly is to be turned on the lathe, it's essential that the glue be given sufficient time to cure properly.

The rear of the boiler is screwed to a faceplate on the lathe and the whole assembly is turned and made round (see **Photo 5**). It's at this stage that the smoke stack is fitted. The stack will be subjected to great stresses and is vulnerable to knocks, so it passes through both the top and the bottom of the boiler. The boiler, complete with chimney is simply mounted on two wooden blocks, the tops of which have been shaped to the same radius as the boiler. For extra strength, the boiler is bolted through the support blocks and on through the chassis (see **photo 6**).

## Cabin

The cabin is pieced together from pieces  $7/8$ " pine cut to the angles shown in **fig. 8**. The dimensions can be gleaned from the grid and are merely a guide. They can be varied at will, but make sure that the overall height of the cabin is between  $13^\circ$  and  $15^\circ$ , and that the base of the cabin is  $5$ " wide to match the width of the chassis (see **photos 7 & 8**). Set the completed cabin to one side until the pistons are fitted.

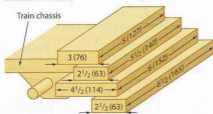
## Pistons & cylinders

I recommend hardwood for the cylinders and pistons. In this case, I chose mahogany



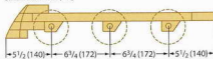
**Fig. 3: Cow catcher**

Dimensions in inches (mm)



**Fig. 4: Axle spacings**

Dimensions in inches (mm)



## Boiler

From  $\frac{1}{4}$ " pine, cut twelve pieces to the dimensions listed in **fig. 5**, then from  $\frac{1}{4}$ " pine cut six pieces to the dimensions shown in **fig. 6**. The twelve pieces are then glued and strapped together to form a cylinder (see **photo 4**) and the six triangles are glued together into a hexagon





and oak. The mahogany was turned to the dimensions shown in **fig. 9d** and the centre hole was drilled.

For reasons of strength, I chose to make the pistons in one piece, and the process is outlined in **figs 9a to 9c** and **photo 9**. While you're at the stage shown in **fig. 9b**, check that the piston has a snug but smoothly sliding fit into the cylinder. If not, you can always remount the piston onto the



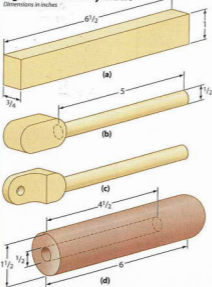
lathe and machine it further. Only when you're happy with the fit should you complete the final shaping of the piston end and complete the assembly (see **photo 10**).

To fit the cylinders and pistons, drill a hole on each side of the boiler so that a  $1/2$ " dowel will pass through the boiler and rotate freely. The position of the holes isn't critical, but they need to be below the mid line of the boiler and the clearance between the lower end of the cylinder and the front wheel is minimal. And of course, the two holes need to be exactly opposite each other (see **fig. 10**). The dowel is passed through the holes in the boiler and the cylinders are glued to the ends of the dowel. To keep the cylinders parallel to the boiler, two wooden spacers are threaded onto the dowel prior to gluing the pistons into position. (see **fig. 11**). The piston rods are fixed off-centre to the wheels with oak pins. Check that you have a smooth piston action when the wheels are turned (see **photo 11**). With the pistons running smoothly, the cabin section can be glued and screwed into position as shown in **photo 12**.

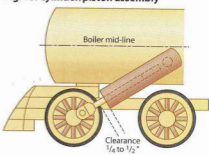
**Fig. 8: Cabin (end view)**



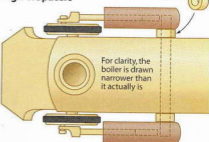
**Fig. 9: Pistons and cylinders**



**Fig. 10: Cylinder/piston assembly**



**Fig. 11: Spacers**





(see photo 13). The completed seat is glued and clamped onto the support blocks and two screws are driven from inside the cabin and into the back rest (see photo 14).

## Embellishments

The fixing of the seat completes the basic train but there are optional extras that add to its attraction and the play value. Inside the cabin are screw heads showing which can be concealed in a traditional way or they can be hidden by a fire door, pressure gauge and speed control.

Fig. 13 is an exploded illustration of the components I used and photo 15 shows the completed interior of the cabin.

The side bars are a simple turning project, again using a contrasting hardwood. It isn't inconceivable that a child will stand on the bars and therefore they must be very robust. The bars themselves are  $1/2$ " thick and the bar supports are turned in one piece with the securing studs also  $1/2$ " thick (see fig. 14 and photo 16).

The lantern could receive heavy blows and is secured both to the boiler of the train and to the smoke stack. Fig. 15 outlines the construction. The body of the lantern is turned in one piece and is glued into position on the boiler, while the lens of the lantern is also turned in one piece and passes through the body of the lantern and into the smoke stack.

## The truck

From  $3/4$ " pine, cut shapes to the dimensions shown in fig. 16. These three

Fig. 13: Cabin interior details

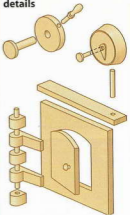


Fig. 14: Side bars

Dimensions in inches



Fig. 15: Lantern

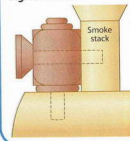
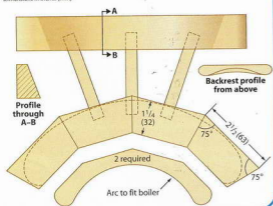


Fig. 12: Seat

Dimensions in inches (mm)



## Seat

Teak or mahogany provides an attractive contrast to the lighter coloured pine and you'll require four  $6 1/2$ " lengths cut to the trapezium profile shown in fig. 12. The four lengths are glued together and the contours of the seat rounded when the glue has set.

The back rest is cut from the same  $1 1/4$ " stock as the seat and is basically a bar of wood lightly contoured for

comfort and attached to the seat with three hardwood spindles. The seat sits on two blocks that have to fit accurately to the underside of the seat and to the curve of the boiler

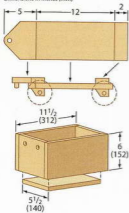


pieces form the chassis of the truck. The front piece with the coupling dowel will be subject to severe stresses and will need to be glued and screwed into position as shown in photo 17. These screw heads are hidden when the wheels are glued onto the base of the chassis. A simple butt jointed box

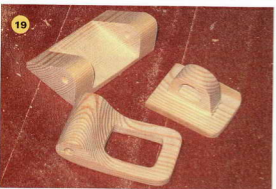
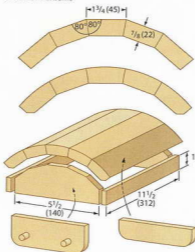




**Fig. 16: Truck**  
Dimensions in inches (mm)



**Fig. 17: Truck lid**  
Dimensions in inches (mm)



**photo 19. Fig. 18** outlines the process and gives the starting dimensions. Safety is paramount throughout any toy project and this hasp and "D" loop gives me the opportunity to stress the importance and the nature of thinking about safety. This locking mechanism is the part of the toy most likely to fail. To minimise the risk of the wood failing, the parts were bandsawn from a block of wood rather than made up from several pieces. To minimise the risk of the glue failing, the surface to be glued is made as large as possible. Despite these precautions, failure is still a possibility. This is the reason for not using screws. Failure of wood or glue is regrettable, but such failures are unforgivable if they expose the sharp end of a screw.

### Finishing

Time spent on the final sanding of the finished project is vital, both for the appearance and the safety of the toy. A thin coat of polyurethane varnish will seal the wood. This coat of

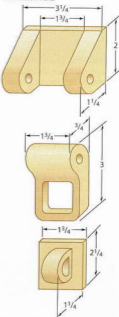
from  $1/2$ "\*, and to the dimensions shown in **fig. 16**, is made and glued and screwed onto the chassis.

The lid of the truck is a little more complicated and the construction is outlined in **fig. 17** and **photo 18**. The curved roof is constructed using the same method as for the boiler. With the benefit of hindsight, you'll find it easier to make the lid first and tailor the box to fit the lid rather than the other way round. To ensure that the lid sits squarely on the box and to enable the box to be "locked", two flange pieces are required. One has two  $1/2$ " dowel studs that fit into the holes at the front end of the box. The other is just a plain flange and both are illustrated in **fig. 17**.

### Locking mechanism

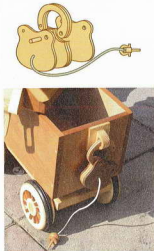
Some careful bandsawing, sanding and fretsawing are required to make the hasp and "D" loop as shown in

**Fig. 18: Truck catch**  
Dimensions in inches





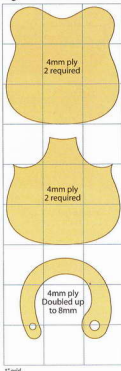
varnish will need to be rubbed down with abrasive paper before the application of a second coat. Depending on the porosity of the wood, you may need to repeat this process and apply a third coat.



## THE LOCK

The lock components are cut from good quality 4mm plywood. Fig. 19 shows the shapes required. The loop of the lock is made from two pieces of 4mm ply glued and clamped together. This is stronger than a similar piece cut from 8mm plywood. The locking pin is turned from hardwood and is securely fastened in place with 3mm nylon cord.

Fig. 19: Padlock



# Ryobi JS500 QEO jigsaw

**Tested**

On first inspection, this 480 Watt jigsaw looks very similar to others currently on offer in the semi-pro range, but in fact it does have a few features that set it apart.

It's supplied in a case with a vacuum attachment and a selection of blades, one of which is much longer than normal to facilitate the claimed depth of cut of 75mm in timber, and I was particularly keen to put this to the test.

## Notable features

Normal features are present, including variable speed from 0 to 3000 strokes per minute, and three-stage orbital action for faster and more efficient cutting in softer materials.

A quick-release lock allows blades to be installed quickly and easily without tools, and they can be stored in a handy drawer located under the body of the saw.

For completely dust-free cutting, a vacuum attachment is supplied which clips on the base after you've slid it forwards, and it connects to a standard dust extractor or vacuum. It saves all that blowing to try and keep the line visible!

To prevent the work splintering, jigsaws are usually fitted with a special anti-splinter shoe that slots into the baseplate. In the case of the Ryobi though, the whole base can be slid forwards to provide support around the blade — a much better idea to my mind, though it can't be used for angled cuts.

## In use

The saw did everything I expected of it without any fuss or bother, and I was particularly impressed with the 3" cut. The finish wasn't brilliant but I suspect this was down to the quality of the blade, as the machine is certainly up to it.



Tested by  
Alan Holtham



The easy change blade holder requires no tools.



## VERDICT

A very capable tool with a few innovative features that make it stand out from the crowd. Give it a serious look if you're in the market for a new jigsaw.

Price: £49.95

Contact: Ryobi, tel: 01491 848700

**RATING** ★★★★★