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The Woodworker & Woodturner

March 2012

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Kerry Donovan presents a toy chest for the living room

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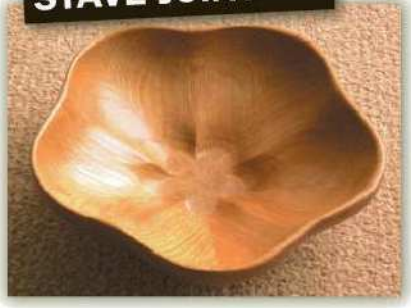

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welcome

We seem to have unearthed a rich seam of new talent with the turn of the year. Last month Ken Stratford and Roy Richardson made their editorial debuts within these pages with two projects that brought a breath of fresh air to the magazine. Now this month I'm pleased to introduce Kerry Donovan and Rod Tallack to the growing ranks of new *Woodworker* authors.

Kerry, who lives in Brittany, presents an ingenious toy chest with sliding leaves, made in French oak and chestnut, which does double duty as a living-room centrepiece when it's not concealing his granddaughter's soft toy menagerie. Rod has long retired from the woodworking industry, and now keeps himself occupied in Devon with making unusual pieces of woodturning. His article on stave jointing is a trigonometrical delight!

I have two small mistakes to own up to this month. On the cover of the February issue I unintentionally described Roger Berwick's sapele sideboards as being made of sycamore. So far only Roger has noticed! The other mistake appears in Routing basics 9, page 36, column 3, paragraph 2. It should say that when you're table routing the workpiece rotates *anti-clockwise* (not clockwise) round the cutter. Sorry, Roger and Ron…

Simple pleasures

Producing the magazine has its brighter moments too. Peter Dickings emailed me earlier this month about the December archive page *A bigger blast*, which featured a novel wooden toy from the early 1970s. He wrote: 'I loved Wobbling Willie in the Dec issue, and reckoned my grandson William would love it too. Into the shed for a few hours, and voilà: Wobbling Willie was ready for testing. The neighbours must have wondered what was the cause of the riotous laughter as Willie wobbled his way down his frame and hit the peg at the bottom. William (pictured here) loved it, as I knew he would. More of the same in future issues would be brilliant!'

We'll see what we can do…

Mike

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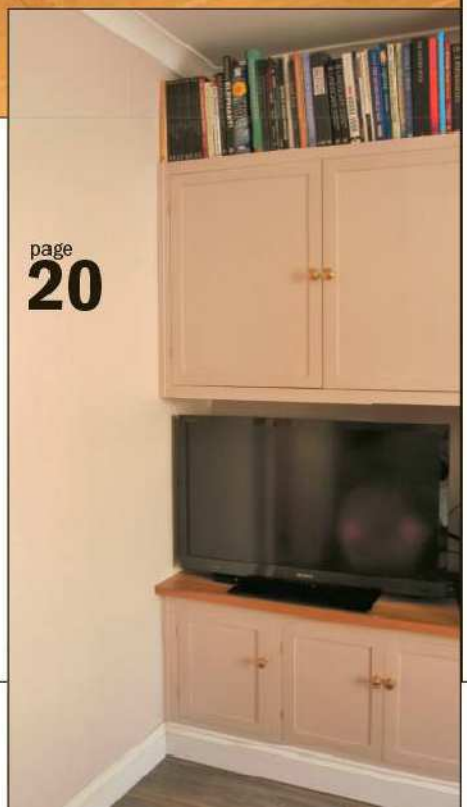
What's in store for you this month

WIN!
1 OF 5
PAIRS OF EINHELL POWER TOOLS
WORTH £160
SEE PAGE 37 FOR DETAILS

NEXT ISSUE
THE APRIL 2012 ISSUE IS OUT ON MARCH 9TH



REGULARS

PROJECTS

WORKSHOP

TURNING

ON TEST

The Woodworker & Woodturner

March 2012

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On the desk...

STAIRWAY TO HEAVEN

MANUFACTURER: Jeld-Wen
PRICE: On application

Jeld-Wen has revealed a comprehensive new stairs catalogue featuring a number of contemporary designs in materials including glass, nickel and white oak. The 60-page brochure contains all the company's popular stair styles from its Prestige, Contemporary and Traditional ranges.

New for 2012 is the Scala staircase, which comes with stylish brushed nickel spindles that complement its attractive white oak handrail and base rail. Also perfectly suited to contemporary homes is the real glass Radiance staircase, which has glass panels with matching white oak handrail and base rails.

Customers are guaranteed that their stairs will meet all relevant Building Regulations requirements.

NEW CATALOGUE

SUPPLIER: Brimarc
PRICE: free

BriMarc Tools & Machinery has just launched its new 2012 machinery catalogue. It's packed exclusively with quality brands including Jet, Lamello and Veritas. Among the new products you'll find the Excalibur EX-16 scrollsaw, and precision-ground accessory mounting jaws featuring the unique SafetyJaw with its rounded corners. Both Starter and Professional chuck packages are available from Axminster Chucks. Also new is Lamello's service offer, bringing a fully trained technician to your workshop or factory when you make an appointment. You'll find full details of all BriMarc stockists on the back.

Contact details of products and services mentioned in this edition of *ON THE DESK...*

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Jeld-Wen	0845 122 2890	www.jeld-wen.co.uk
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DIARY

JANUARY

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John Lloyd Courses
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Shropshire Association of Woodturners
22 Steve Healey: 3 mystery projects
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Southern Fellowship of Woodworkers
23 Mytchett Centre, Frimley
GU16 6AA
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MARCH

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Axminster EX13 5PH
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8-9 Woodcarving: Peter Berry
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ONE STEP AT A TIME

MANUFACTURER: Richard Burbidge
PRICE: from £1100

While we're on the subject of stairs, balustrade experts Richard Burbidge have unveiled two new product ranges called Immix and Elements in their contemporary stairparts collection. Both ranges are ideal for domestic refurbishment projects, thanks to their quick assembly and ease of fit.

Immix (left) is a mix of timber, glass and gunmetal connectors blended together to create a modern staircase solution. It's available in pre-finished white oak and walnut. The glass is 8mm thick and is housed within a simple channel, pre-cut into the rails for ease of installation.

Elements is a new range of pre-cut metal balusters which simply slot into pre-drilled timber hand and base rails. There are several designs available in black or primed ready for painting, and the timber used is white oak.

ONE-PUSH WONDER

SUPPLIER: IronmongeryDirect
PRICE: see website

IronmongeryDirect has extended its door furniture section to include a new range of Excel Architectural door levers. These high-quality handles for bathroom and WC doors are available in a variety of styles and finishes, and feature an unobtrusive push button which locks the lever. The door can be unlocked from the inside simply by depressing the lever – ideal for people who have difficulty operating a standard privacy lock – and can be opened in an emergency from the outside by inserting a pin into the hole on the external rose.

There's no need for extra modification to the door, as a separate turn-and-release is not required. These new levers answer the demand for high-quality designer door handles with outstanding functionality.

What's new from

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D&M TOOLS

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MANUFACTURER: DeWalt
D&M PRICE: £159.95

NEW

DEWALT

This twin pack from DeWalt is the latest addition to their 10.8V XR Li-ion Sub Compact range. It features the DCD710 compact cordless drill driver and the DCF815 compact cordless impact driver, complete with two 10.8V 1.5Ah Li-ion batteries and a 40-minute charger and packed in a rigid plastic case.

The DCD710 has a 10mm keyless chuck, a two-speed gearbox giving no-load speed ranges of 0-450rpm and 0-1500rpm, and 15+1-position torque control.

The DCD815 delivers a maximum torque of 107Nm, a no-load speed of 0-2450rpm and a 3400bpm impact rate. It has a three-LED 'halo' work light and features a 6.35mm drop-in hex retention, allowing 25mm bits to be inserted directly. The compact bodies are ideal for operation in confined spaces.

DCD785L1 18V XR LI-ION CORDLESS COMBI

MANUFACTURER: DeWalt
D&M PRICE: £154.95

DEWALT

NEW

DeWalt's best-selling 18V XR Li-ion compact hammer drill driver is now available with one 3.0Ah battery as an option at a very competitive price. This two-speed lightweight machine has an all-metal transmission for increased runtime and longer tool life. It features a 14-position torque control and has a 13mm single-sleeve keyless chuck with automatic spindle lock for quick and easy one-handed bit changes.

DW088K CROSS LINE LASER

MANUFACTURER: DeWalt
D&M PRICE: £179.95 (laser only)
£249.95 (with detector)

NEW

DEWALT

The DeWalt DW088K cross line laser is accurate to ±0.3mm/m in levelling applications. It's self-levelling at up to a 4° surface angle, and features automatic out-of-level indication. It works with the optional DE0892 detector at a distance of up to 50m. It comes complete with a wall bracket and a heavy-duty carry case.

GBH 18V-LICP SDS+ COMPACT HAMMER

MANUFACTURER: Bosch
D&M PRICE: £299.95
£169.95 (body only)

3 YEAR WARRANTY BOSCH

BOSCH

NEW

This new cordless SDS+ hammer drill is the most compact in its class, with an overall length of just 278mm including the SDS+ holder. Its pneumatic hammer mechanism is optimised for drilling holes of 4 to 8mm diameter in concrete. It has an impact rate of 0-4950 bpm and a no-load speed of 0-1050rpm. It's also suitable for modest screwdriving and drilling jobs in wood and metal, and comes complete with two 1.5Ah Li-ion batteries, a quick charger and an L-BOXX. It's also available as a body-only option.

RECORD POWER HAND CHISELS

MANUFACTURER:
Record Power
D&M PRICE:
See website

NEW

RECORD POWER ESTABLISHED 1909

Record Power have developed a range of premium-quality hand chisels to offer discerning cabinet makers and woodworkers a selection of essential tools that can take pride of place in any workshop. The blades are made of chrome manganese steel, which is prized for its high tensile strength and resistance to corrosion. The exclusively-shaped handles are of white hornbeam, renowned for its hardness and close grain. The chisels are available in bevel-edge, mortise or specialist versions, and are sold individually or in sets. See our website **www.dm-tools.co.uk** for details.

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BY KERRY DONOVAN

Vanishing point

My son and daughter-in-law recently asked me to make them a coffee table that could also be used to store children's toys. Their first daughter has just arrived, and they're aware that their living room will never be the same again unless they make plans now to keep her toy collection under control

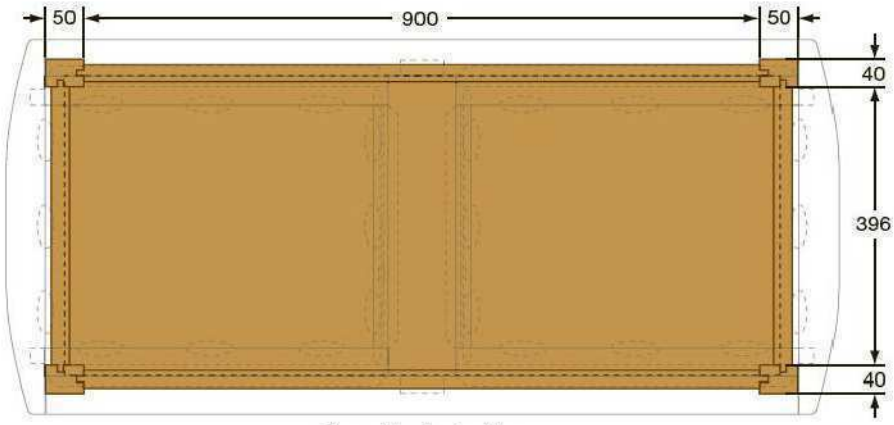
They provided me with an overall target size and the following brief. The table/box was to be child-friendly with no sharp edges, light in colour and 'chunky' (their word, not mine). As an afterthought, they added that they didn't want drawers or doors. That was it. However, I've made furniture for them in the past and know what they like, so the styling was left to me.

After a little thought and a search of the workshop to check out my stock of material, I emailed my son a very rough sketch for his approval. After a short discussion we decided not to go with my hinged opening top idea, to avoid using fittings or locking mechanisms, and opted for a table top with two sliding leaves – a design rather like an old-fashioned wooden pencil case.

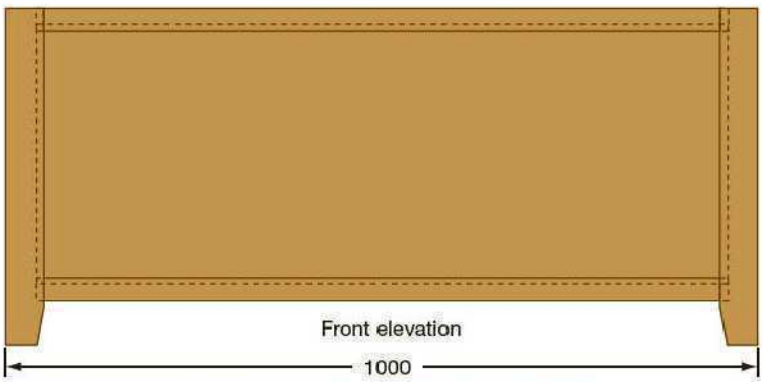
Choosing materials

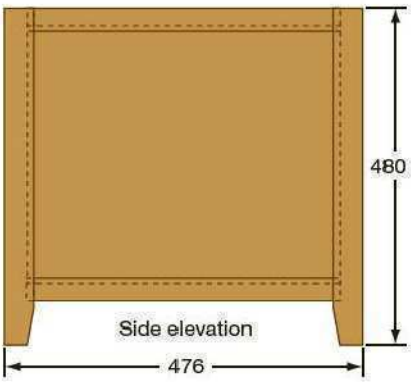
I live in Brittany, so the wood species I've chosen are of course French – oak for the chest framework and chestnut for the panels. I'm sure that English hardwood suppliers can offer something comparable. The two woods are both attractive and complimentary in colour, and they match furniture I've already made for 'the clients'.

Fig 1 *All measurements in millimetres*



Plan with ghosted top





Preparing the legs

I roughed out all the components for the carcase and planed them all round to the nominal sizes shown in the first cutting list (right). I then set the pins on my mortise gauge to 10mm and positioned the mortises in the centre of the face edge of the legs, **photo 1**. This would locate the rails in the middle of the edge of each leg. I then used the same setting for the gauge on the face side of the legs to offset the mortises towards the front and allow for 'handing' the legs, **photo 2**.

The legs will also have long grooves machined between the mortises to accept the panels. When marking the upper mortises I allowed for a 15mm haunch at the top and the 15mm groove at the bottom. I shaded the waste area of each mortise to reduce the chances of cutting errors, and then ran the gauge down each leg to mark the groove outlines. I then used my mortising machine to cut the mortises, **photo 3**. life's too short for hand mortising!

Preparing the rails

I've installed a movable stop on the fence of my radial arm saw, and this makes light work of cutting components such as the rails to the exact length. I then marked the tenons using the same setting on the mortise gauge.

My preferred method of cutting tenons is by saw-kerfing on my radial arm saw. I adjusted the depth of cut on each face of a spare rail a little at a time until the resulting tenon fitted the mortises exactly. This method ensured that the tenons were a good tight fit, and that they were centred in the rails.

I set the shoulders of the tenon to 25mm by clamping a square-edged waste block to the face of the cutting guide. I then checked the thickness and depth of the tenon before cutting all 16, **photo 4**. Finally, I cut the haunches on the upper rail tenons.

TOY CHEST BASE CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Leg	4	480	50	40
Long rail	4	920*	33	25
Short rail	4	416*	33	25
Side panel	1	890	367	20
End panel	2	416	367	20
Support beading	2	900	15	15
Base (mdf)	1	925	427	12

* An allowance has been made on the rails for 10mm tenons.

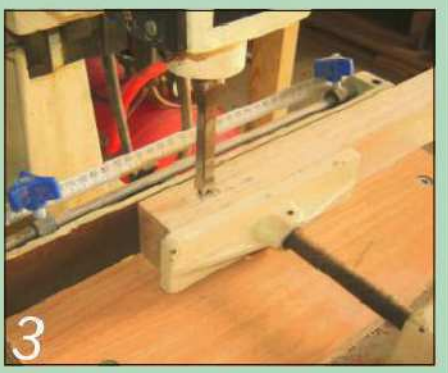
Cutting the grooves

With all the initial joints made. I moved on to cut the grooves that will retain the side and end panels and the mdf base. I chose to use my spindle moulder for this operation for its accuracy and ease of use… and also because I have one! You can of course use a router table instead.

Remember to stop the grooves at the

Mark the positions of the mortises and grooves on the face edge of the four legs

Use the same gauge setting to offset the markings on the face side of the legs



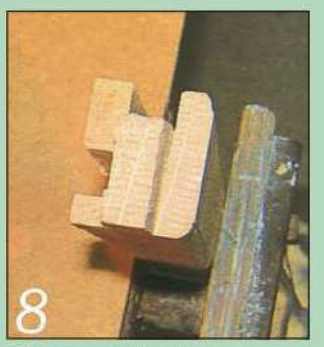
Cut all the mortises on a bench mortising machine if you have one, or by hand otherwise

Cut the tenons on the ends of the eight rails, and haunch the four top ones

Form the grooves on the inner faces of the legs, running them through the top mortises

Make up the chestnut panels to size and cut rebates all round them

When the glue has dried, remove all the panels from their cramps



Before assembling the carcase frames, profile the outer edges of the legs and rails

Dry-assemble each panel to check the fit; note the expansion gap all round

Assemble the carcase, cramp it up, check that it's square and set it aside to dry

Locate the long guide rails on the carcase and measure the distance between them

This shows all the components of the H-frame and the two sliding leaf frames

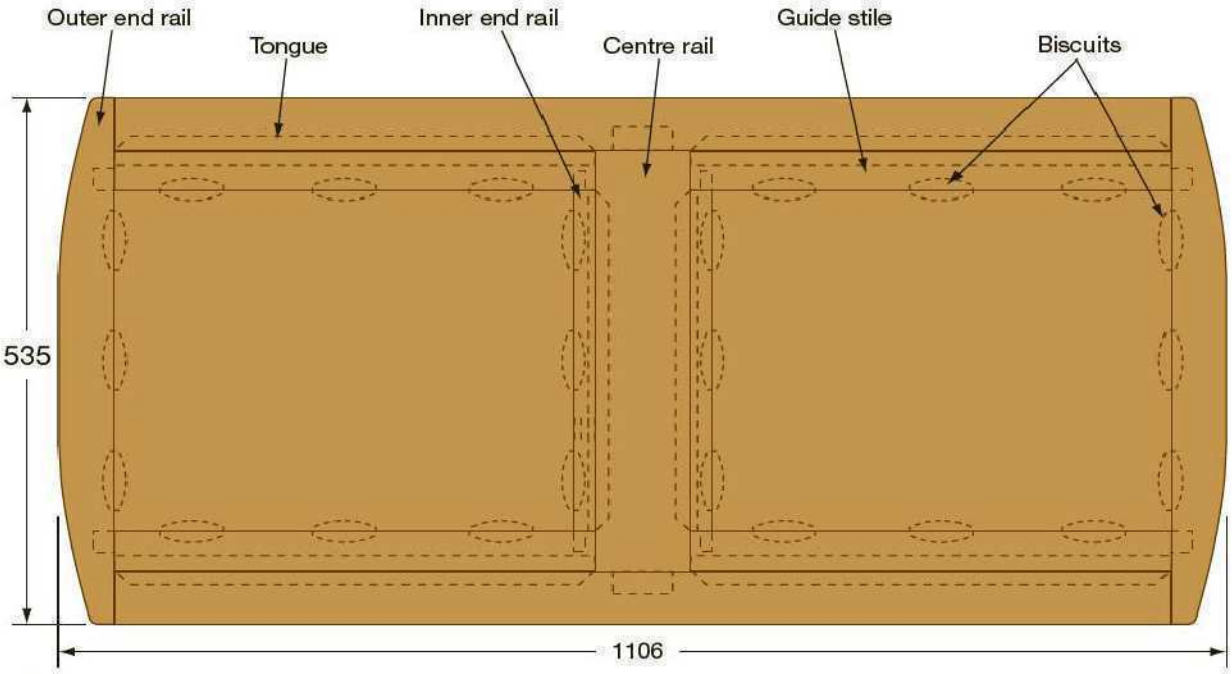


Fig 2 *All measurements in millimetres*

lower mortises, as otherwise they will show through at the bottom of each leg. The grooves at the upper mortises can run through, **photo 5**, as there is a full haunch on the upper tenons.

After the grooves have been machined, cut the legs to length but leave a 25mm horn on the top to protect the upper mortise joints during the test assemblies. At this stage I also cut grooves in the lower leg joint assembly by hand to receive the mdf base panel. I also remembered to cut four slots for size 20 biscuits in the top edge of each upper long rail; these would be used later to attach the top to the carcase.

At this stage I dry-assembled the carcase to test all the joints, and then took the opportunity to double-check the size of the openings for the panels before making them.

Preparing the panels

I made up the four panels to match the size of the openings, adding an extra 15mm all round for the depth of the grooves. I cut the rebates using a router with a straight cutter, **photo 6**, but I could have used the spindle moulder again. I worked from the back of each panel as I wanted the panels to fit flush with the front of the groove. I allowed 20mm for the length of the tongue to ease gluing, and to allow a little room for the panels to expand when the carcase is finally assembled. The gap won't show as it's on the inside of the box. They were now ready to be glued and cramped up, **photo 7**, ready for the final carcase assembly.

While the panels were in the panel press, I took the opportunity to profile the legs and rails using a router with a 12mm bearing-guided round-over cutter, **photo 8**.

Photo 9 shows a dry assembly of one end of the chest with its panel in place; you can see clearly how the grooves run between the leg mortises, and also the expansion gap on the chestnut panels.

Lastly, I cut the mdf base panel and nipped off the corners to allow it to fit in the access grooves I had cut into the legs.

First-stage finishing

At this stage of a project, I like to finish and polish all the panels before fitting them into their frames. It's far easier to do it at this stage, rather than trying to sand and polish a panel that's already in its frame.

I applied two coats of varnish to the panels as a grain filler, and rubbed down between coats with 240 grit paper. I finished off by applying two coats of a good furniture polish, and then buffed up to a soft shine. I then varnished the legs and rails, making sure not to foul any of the joint surfaces.

Carcase assembly

I glued up the carcase and left it to set overnight. I used sliding sticks to check for square before and after tightening the cramps, **photo 10**.

I tend to use webbing clamps for large carcases as you can obtain a uniform compression force all around... and they're relatively easy to fit single-handedly. I used clean rag pads to protect the areas where the webbing touched each leg.

That's the easy part of the project completed. Now it's time to begin constructing the top, the really technical part of this project. This consists of an H-shaped frame fixed to the top of the carcase and containing a sliding top leaf in each half of the H, as you can see in the main picture on **page 13**.

Marking up

After cutting all the parts and planing them to width and thickness, I marked the positions of the mortises at the centre of the long guide rails. The inner edge of these rails, the outer edges of the guide stiles and both edges of the centre rail will have grooves 10mm wide and 15mm deep

TOY CHEST TOP CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Long guide rail	2	1000	53	32
Fixed centre rail	1	474*	90	32
Outer end rail	2	585**	53	32
Guide stile	4	476*	40	32
Inner end rail	2	386*	20	32
Panel	2	436	347	20
Edge tongue	6	(to fit)	30	10

* An allowance has been included in these lengths for the tenons.

** 50mm has been added to this length to allow for the horns.


13

Here you can see how the various parts fit together around the centre rail


14

I made up the panels for the two sliding leaves using biscuit joints for strength


15

This shows all the components of one sliding leaf, ready for assembly


16

I made an mdf template to help me shape the two outer end rails

17

Cut the edge tongues to length and glue them into the grooves in each leaf


18

Fit the centre rail and glue the H-frame assembly to the top of the carcase


19

Then slide in the leaves as formers and cramp up the whole assembly


20

To complete the edge profiling, first shape the underside of the end rails

21

Then cramp the sliding leaves in the closed position and rout a profile all round the top


22

I decided that the two long guide rails needed some extra support...


23

...so I glued and pinned a moulding into the angle underneath them


24

The final job was to add a stop to the underside of each sliding leaf

machined in them later, so the mortises need to be marked and cut to allow for this.

I laid the long rails on the top of the carcase to check their alignment. I wanted to use the upper rails of the carcase to take some of the weight of the sliding panels, so I needed to overlap the long rails on the carcase top rail, **photo 11**.

I measured the gap between the long rails while they were in place on the top of the carcase. This gave me the distance between the tenon shoulders on the fixed centre rail. Then I marked out the tenons on each end of this rail, allowing for a tenon length of 25mm.

I used the same method to mark the mortises in the outer end rails; these will house the tenons cut on one end of the guide stiles. Each guide stile also has a small mortise in its inner edge to house the tenon on each end of the inner end rails.

The various components of the top frame are shown in an exploded array in **photo 12**, while **photo 13** is a close-up of the joint arrangements at the centre rail. Note that in these photos the mortises and tenons are all present, but the grooves have yet to be cut.

Cutting the grooves

Next, I cut all the grooves on the spindle moulder. Note that the inner end rails have a groove on their outer edge, but its depth needs to be reduced to 7.5mm as the pieces are thinner than the other leaf members and a 15mm deep groove would seriously weaken them.

I then dry-assembled the whole top assembly, positioned it on the carcase and marked the position of the biscuit slots on the underside of the long guide rails. If you look at **photo 11** again, you will see that the biscuit slots will project through the groove in the rail. This meant that the No 20 biscuits I planned to use would have to be cut down slightly in size to avoid this.

Preparing the top panels

I made up the chestnut top panels using biscuit joints for strength, **photo 14**.

When designing this piece, I had contemplated having the long grain of the panels running in the same direction as the long guide rails and the guide stiles, but decided against this layout because the panels could expand too much and impede the free movement of the leaves.

When cutting the panels to fit into the frames, it's important to allow a little room for movement along the width of the panel. I decided to leave a 1.5 mm expansion gap. I pre-sanded the top panels before cutting the slots for the biscuits that will attach them into their frames, **photo 15**.

Shaping the end rails

I made a template for this operation. I first marked one half of the curve I wanted using the edge of a bent steel rule on a piece of 9mm mdf cut to the size of the end rails, **photo 16**. When deciding on the shape of the curve, remember that the end rails will have two 25mm deep mortises to receive the tenons on the ends of the guide stiles. It's therefore a good idea to mark the mortise positions on the template so you don't risk exposing them when the ends are shaped. I cut the half-profile using my bandsaw and sanded the curve by hand, making sure I was happy with its shape before making the full-width template.

I then shaped each end rail by screwing the template to the underside, cutting away most of the waste on the bandsaw and using a router to trim it to the template. Then I routed a profile on the lower edges of the end rails and the long guide rails with a ⅜in bearing-guided cove cutter.

Assembling the leaves

I used webbing clamps again to assemble the two sliding leaves, which I placed face sides together to avoid bruising the top edges with the clamps. Once the leaves were fully dry, I glued the tongues into their grooves on three sides of each leaf, **photo 17**. I then tested the fit of the tongues in the grooves in the guide rails, and sanded them until they operated smoothly.

I then fitted the centre rail into its mortises in the long guide rails, glued the resulting H-shaped frame to the carcase, **photo 18**, and placed the leaves in position to act as formers to ensure that the frame remained in the correct position when it was under compression. I used a combination of Jet and webbing clamps to ensure an even pressure, **photo 19**, and set the whole assembly aside to dry.

Profiling the top

It was now time to complete the edge profiling. With the leaves in position I removed the lug profile under the outer end rails, **photo 20**. Then I cramped the leaves firmly together and profiled the top with a ½in bearing-guided round-over cutter, **photo 21**.

Extra support

As I was cleaning the top and making sure the leaves operated smoothly, I became aware that the long guide rails, which had been attached to the carcase with glue and cut-down biscuits, were going to take a considerable amount of strain the during the lifetime of the table. I wasn't happy about this and I felt I needed to add some extra support beneath their projecting edges, **photo 22**.

I made up a small moulding with a profile to match the underside of the top using a ¼in cove cutter. I attached it with glue and panel pins in the angle where the guide rails meet the top rails of the carcase, **photo 23**.

Finishing touches

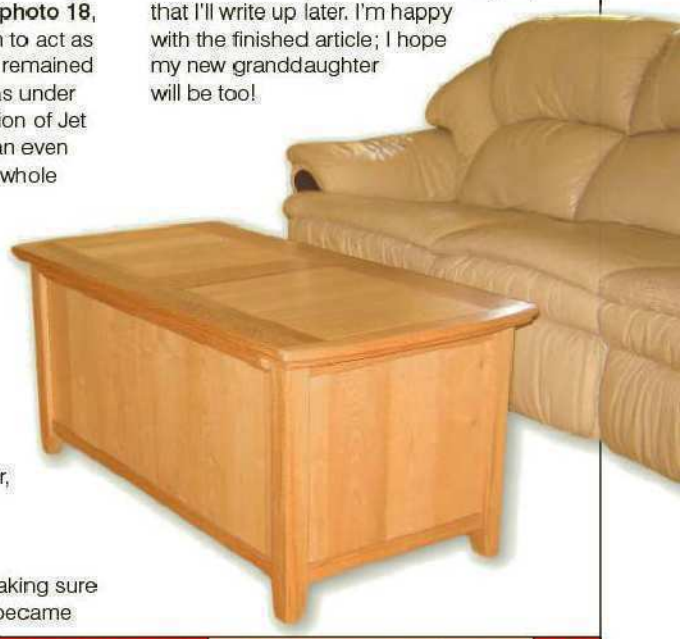
I cleaned up the top with my palm sander, working both across and with the grain, down to 180 grit abrasive. I then finished off carefully by hand, working with the grain only, using 240 grit abrasive.

I applied two coats of varnish to all the sliding surfaces to reduce the chance of future moisture effecting their operation, sanding between coats with 240 grit paper.

For the top I applied three coats of varnish, rubbed down between coats and, after the final one. I completed the job by applying three coats of polish, making sure to apply the wax to all the sliding surfaces as well for extra lubrication.

After polishing everything, I located the leaves, checked their smooth operation, and added a stop to the underside of each leaf, **photo 24**. I also stapled an off-cut of carpet to the mdf base panel to make the soft toys more comfortable!

As a final embellishment I added a little carved name plaque to one of the long carcase panels, but that is another project that I'll write up later. I'm happy with the finished article; I hope my new granddaughter will be too!



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BY BEN PLEWES

Made to measure

Victorian houses present many challenges. There's the ongoing maintenance, of course. Then there's the dilemma of whether to keep original features or replace them with modern alternatives. Last but not least, there's the age-old storage problem: where to put everything! Here's one solution...

With our seemingly limitless appetite for gadgets and gizmos, storage space always seems to be at a premium. Thankfully, Victorian houses can offer woodworkers lots of opportunities for creating built-in storage.

Most Victorian rooms have fireplaces with sizable chimney breasts and alcoves on either side. While most homes now have central heating systems, the old chimney breasts remain in place because of their structural nature. Adding built-in storage to these spaces has several advantages.

Because alcove storage essentially fills in existing gaps, it doesn't steal floor space or change a room's proportions; in fact it can improve them by creating cleaner lines. In particular, alcoves are the perfect place for housing televisions and other home entertainment equipment because they're in roughly the same focal point of the room as its original centrepiece, the fireplace.

Choosing materials

This project makes use of painted hardwood face frames applied to the front of the cabinets to give an up-market look and feel to the finished project. I've used melamine-faced chipboard (mfc) for the carcases because it's practical and easy to clean – it's the same stuff you'll find in most kitchen cabinets. The melamine face provides a water-resistant surface which makes the project that much quicker to complete because finishing is kept to a minimum. Mfc is also relatively cheap, which makes this kind of job that much more attractive.

Working out measurements

Measuring up for a project like this is quite easy, but it's worth bearing a few points in mind that can save you a whole lot of grief later on. Let's start from the bottom of the cabinet and work upwards.

1

A laser level is an ideal way of setting wall battens level in alcoves, especially if you're working single-handed

2

My Festool TS75 plunge saw is the ideal tool for cutting mfc to length...

3

...while my Festool Domino makes light work of creating loose tenon joints

■ If at all possible, run skirting board along the bottom of the base cabinet. This is one of the keys to making a built-in look as if it's always been there because it fits with the existing decor. If your existing skirting boards are in poor condition, now is a good time to consider replacing them all round the room.

■ Design your cabinets with a decent amount of clearance at the back. This allows room to run in power leads, connecting cables and TV aerial leads later. It also gives you freedom to set your cabinet in slightly from the face of the chimney breast, which can be a real boon when working with walls that are out of true. Don't forget to factor in the thickness of the face frame too.

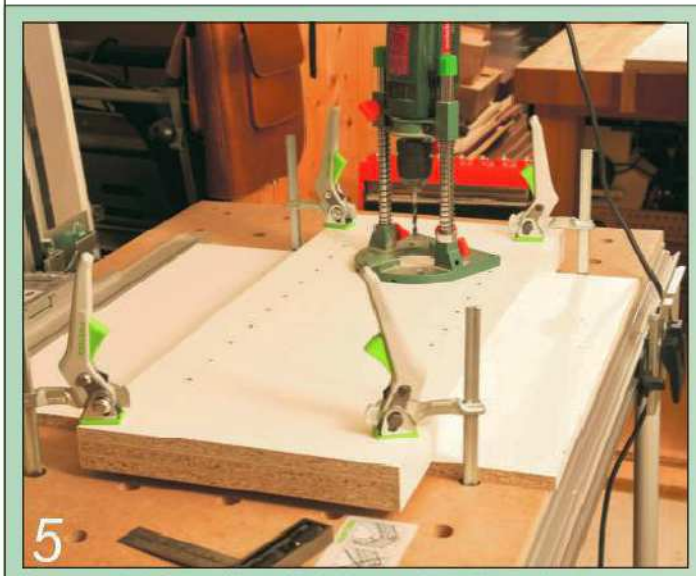
■ The top of the unit is quite likely to run into the ceiling coving every Victorian home seems to have. If this is the case, you've got an aesthetic choice to make. If you plan to build your cabinet all the way up to the ceiling, it's worth going the extra mile and running coving along the top edge for a professional built-in look. This needs to be planned for because a wider top rail will be needed when making the face frame to accommodate the coving. If you'd rather not cut into existing coving, another solution – which I've chosen here – creates a space on top of the cabinet for tall books that are difficult to house elsewhere. This approach is quicker, involves less hassle and still maximises storage space.

Marking out the walls

Bearing the above points in mind, the next step is to mark the walls where your cabinets will start and finish. If you're creating built-ins for two adjacent alcoves, a laser level will come in very handy, **photo 1**, but it's not essential. All this can be done equally well with a tape measure and spirit level.

When making your width measurements, leave enough wiggle room at either side of your cabinets so they can slide in and out easily during fitting. Any gaps can easily be covered with trim after fitting.

I used five evenly-spaced loose tenons in the end of this 300mm wide board

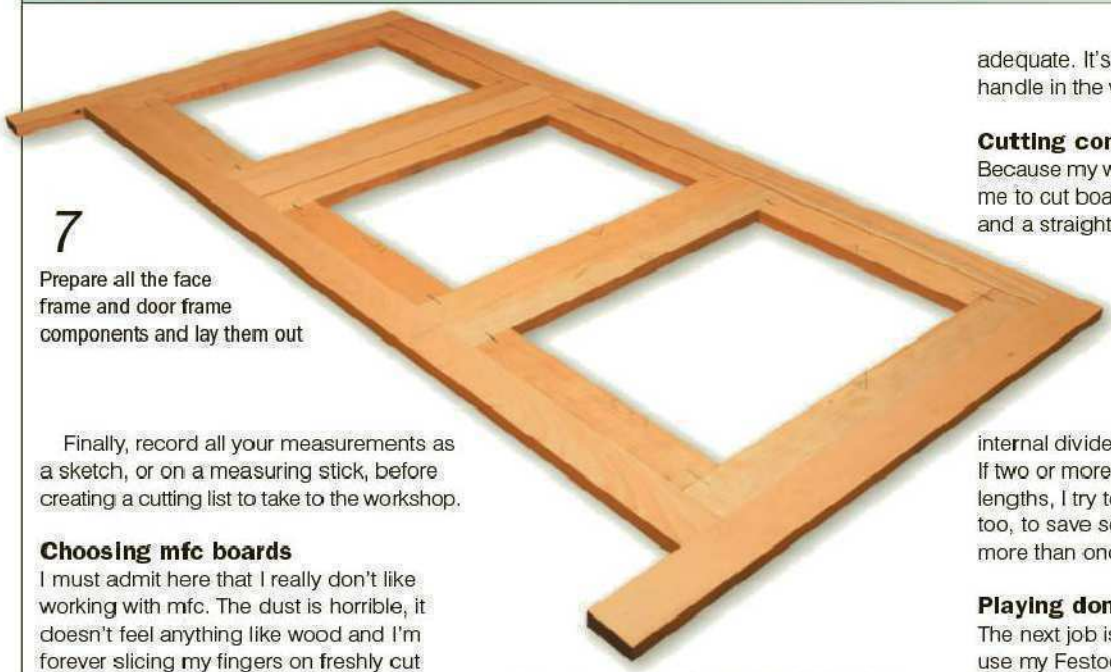


5

Use a pre-drilled template to drill holes for adjustable shelf supports

6

Apply glue to the remaining joints, assemble the carcase and cramp it up



7

Prepare all the face frame and door frame components and lay them out

Finally, record all your measurements as a sketch, or on a measuring stick, before creating a cutting list to take to the workshop.

Choosing mfc boards

I must admit here that I really don't like working with mfc. The dust is horrible, it doesn't feel anything like wood and I'm forever slicing my fingers on freshly cut edges which can be alarmingly sharp. Having said that, it's still probably the best material for this job.

I've developed my techniques for working with mfc around speed and quality of construction. Boards are available in a number of standard widths, so wherever possible I base my cabinet depth around one of these. This minimises the amount of ripping needed and therefore reduces the build time… and the dust cloud!

The cabinets' back panels can be inset into the rear of the cabinet or planted onto the back edges. For this project I planted them on to maximise cupboard depth. This also gave me a little extra flexibility when deciding which mfc board widths to buy.

Sourcing mfc boards

I've bought mfc from a variety of sources, but tend to come back to Wickes because they seem to offer a good balance of quality and price. I always buy in-store so I can avoid damaged boards there and then, instead of having to reject them off the back of a delivery truck and wait for replacements.

It's also worth noting that mfc is usually available in both 15mm and 18mm thicknesses. For the purposes of built-in cabinets I find the 15mm thickness perfectly adequate. It's also cheaper, and is easier to handle in the workshop than 18mm board.

Cutting components

Because my workshop is small, it's easier for me to cut board material with a plunge saw and a straightedge than to use a table saw. I have a Festool TS75 plunge saw with MFT table, **photo 2**, which features a cutting length stop for fast repeat cuts. Working on one carcase at a time, I cut the sides, tops, bottoms, internal dividers and backs in one session. If two or more cabinets share component lengths, I try to cut these at the same time too, to save setting up for different lengths more than once.

Playing dominoes

The next job is to joint the material. I like to use my Festool Domino fitted with a 4mm bit for this task, **photo 3**, but a biscuit jointer will do an equally good job. Where cabinets are to be wall-mounted and their bottom shelves will be load-bearing, I make sure that all joints are horizontal so that the shelf ends are jointed into the cabinet sides as if they were being jointed directly into the wall. This ensures that each joint has the maximum load-bearing potential.

This project features a cabinet depth of 300mm (without the planted-on back). I used five loose tenons per corner joint with an approximate spacing between each of 40mm, **photo 4**. Using this approach for corner jointing is very fast because joint

Rout a rebate in the meeting stiles of paired doors to keep dust out

spacing can be judged by eye, with a quick pencil mark on both components being enough to cut perfectly aligned loose tenons or biscuits. By the way, I don't attach the plant-on back at this stage; it's dealt with after the main glue-up.

Incorporating shelves

Featuring adjustable shelves in this type of built-in cabinet ensures maximum versatility, and doesn't add much time to the build. Whenever I include them, I start by making up a template with a shelf spacing that will work across the project as a whole. Allowing 50mm between shelf support holes works well in most cases, and gives plenty of options within a cabinet for customising the shelf gaps.

The template doesn't have to be elaborate; a simple piece of mfc, mdf or plywood, ideally the same length as the carcass sides, will suffice. Shelf support holes can then be marked out on the template and drilled in it. The template can be clamped onto each carcase side in turn, **photo 5**, and makes repeat drilling of shelf support holes very quick and easy.

Assembling the carcases

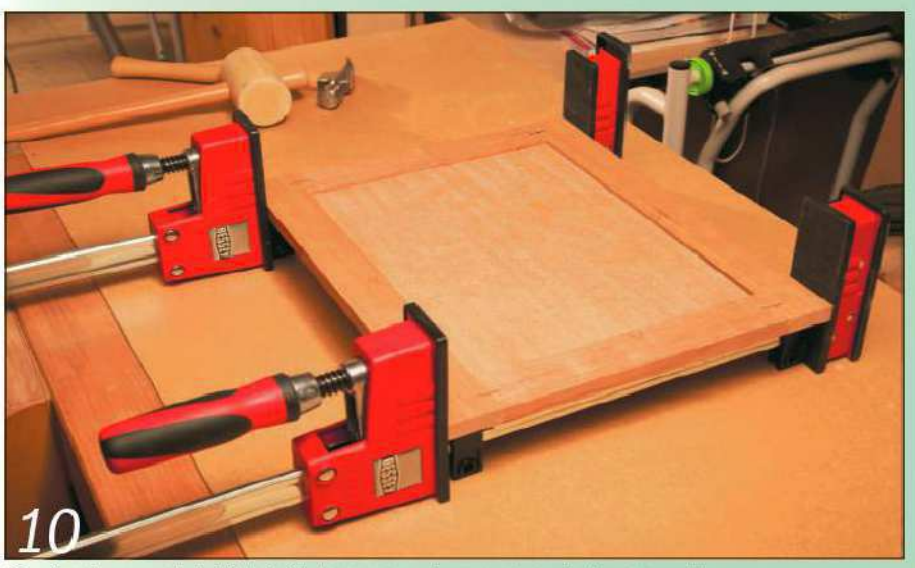
When all the joints are cut and any adjustable shelf holes have been drilled, it's time to glue up the carcases. I do this in two stages. First I glue in all the loose tenons on one component of each joint (usually the board ends), with the aid of a light hammer to drive them home. Doing this makes assembly easier, because one half of each joint is already dealt with when it comes to putting all the components together. Then all that's left to do is to apply glue to the remaining joints, assemble them and place the cramps as required, **photo 6**, before setting each assembly aside to dry for an hour or so.

Adding the back panels

Take care when removing the clamps. With no back panel in place at this stage, this type of cabinet is quite weak and needs to be handled with care to avoid racking. Manoeuvre the carcase into position on your bench so you have easy access to the back.

I prefer to use screws (3.5 x 40mm Reisser R2 cutter screws in this case) rather than pins

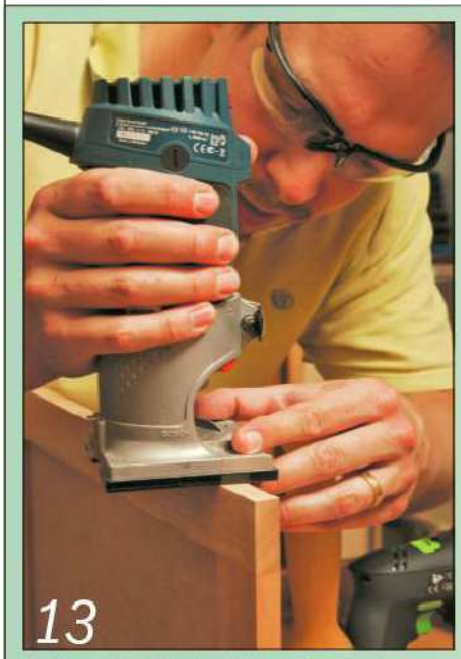
Cut the grooves in the door frame for the mdf panel and test its fit



Glue the door panels lightly into their grooves and cramp up each door assembly

As a general rule I allow 1mm of clearance all round cabinet doors. A card spacer does the trick

Trim any doors that are slightly over-size using a sharp hand plane



Mark out the hinge recesses and remove the waste with a palm router

Square up the rounded corners of the hinge recesses with a sharp chisel

Test-fit each hinge in its recess, then bore the pilot holes for the screws

Add the magnetic door catches to the face frame on small blocks, and fit the keepers to the doors

Drill clearance holes for the door handles and fit them in place

Unscrew each door and number it and its recess so you reassemble things in the right order

Remove the hinges and stick them in pairs to a numbered board

to attach the back. First I drill countersunk pilot holes through the back panel. I then drive the screws home to lock the back permanently in place; this dramatically improves the carcase's rigidity. I space the screws by eye and take care that no screws break through either face of the mfc. A carcase back can be fixed in place like this in just a few minutes, with no glue needed.

As a final touch, I turn the carcase over so its back is on the bench. I then apply a very thin bead of decorator's acrylic mastic down each joint line. Next, I run a wet finger over the mastic to smooth it into the corners. This fills any gaps and gives an almost faultless look to the cabinet's interior.

Making the face frames

Face frames give a high-quality look and feel to what is essentially a fairly cheap and quickly-made carcase, and they're quick and easy to make.

I used American cherry for the face frames and doors on this project. You can use any timber, but I find hardwood much better than softwood, even for painted projects like this. It tends to be less knotty and more dimensionally stable, both of which contribute to the quality of the finished piece. After planing enough material to size, I cut the pieces to length before mocking up each frame and door on the bench, **photo 7**.

You can joint the face frames in a number of ways. Traditional mortises and tenons work well. So do loose tenons, and this is the method I've used here. Pocket hole screws, dowels or halving joints are viable alternatives too.

Before gluing up the frames, I spent a little time with a fore and smoothing plane, removing any evidence of planer marks. Cleaning up in this way is much easier to do now rather than after assembly.

The next step is to glue and cramp up the frames and set them aside to dry, preferably overnight, because it's important that these joints are as rigid as possible before moving onto the next stage.

Making the doors

The doors in this unit are surprisingly easy to make. They're constructed in the same way as the face frames, but with the addition of a 6mm groove around their inside edges to take a solid mdf panel, and a rebate cut on the meeting stiles of paired doors, **photo 8**, to keep dust out when they're closed.

I like to keep the height and width of the door panels about 4mm smaller than the aperture size (including the grooves). This allows the joints to be pulled up tight during assembly. Because the panels are made from dimensionally stable mdf, they can be lightly glued in place. This has the added bonus of increasing the overall rigidity of the door.

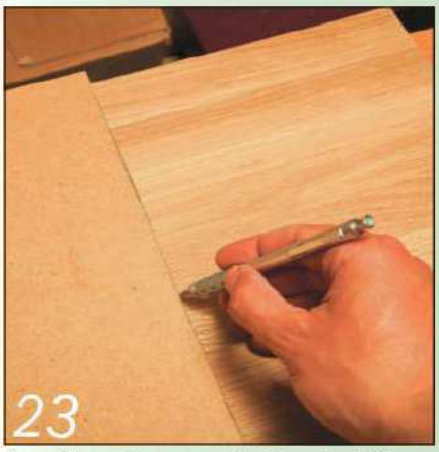
Cutting the rebates

A little working out is needed before cutting the rebates, because the doors will look their best if they appear to have stiles of equal width when they're assembled. The stile with the rebate on its rear face should be the same width as the hinge stile, while its neighbour – with the rebate cut into its front face – needs to be wider by the rebate's width. If you lay the door components out on the bench it looks much simpler, **photo 9**.

I used a spray system out in the garden to paint the face frames and doors

I drilled pocket holes in each carcase so I could attach the face frames

I laminated a number of oak offcuts together to make the TV shelf



An mdf template ensured that the oak shelf was marked out accurately to fit the alcove

I set the base cabinet on a levelling frame which I shimmed with offcuts before screwing it to the floorboards

If you're in any doubt, form the rebates on some offcuts first to test how they work together. Now assemble each door, cramp it up and set it aside to dry, **photo 10**.

Hanging the doors

As a general rule I leave a 1mm gap between door and face frame to allow for door clearance and paint thickness. I find that a takeaway menu card makes a useful spacer, **photo 11**. Any doors that are slightly over-size can be trimmed now with a hand plane, **photo 12**.

With both the face frame and the doors assembled, the next step is to fit the hinges. Butt hinges have a high quality feel, especially the solid brass drawn variety. After marking out all the hinge recesses, I used a palm router to remove the waste, **photo 13**, followed by a bevel-edge chisel and mallet to tidy up the edges, **photo 14**.

Now you can attach the hinges, **photo 15**. Hinge centring drill bits make short work of boring the hinge pilot holes, ensuring that each screw is centred precisely in its countersink. Drive a steel screw into each hole first to cut the thread in the wood; this reduces the risk of the soft brass screws shearing off as you insert them.

Preparing to paint

After fitting the doors and adding magnetic door catches (**photo 16**) and door handles (**photo 17**), I unscrewed each door and numbered it (and its recess in the face frame) with a number punch, **photo 18**. I also removed the hinges and temporarily fastened them to a numbered board with clear parcel tape, **photo 19**, to ensure that each one would go back where it started after painting.

Spraying the finish

I opted to give this unit a painted finish because it suits the room decor. To speed things up I used a HVLP (high-volume low-pressure) spray system. The downside with this approach, unless you're lucky enough to have access to a spray booth, is that you need the right weather conditions – you can't use a spray gun indoors! Fortunately I didn't have to wait too long, **photo 20**. Three or four coats can be added quickly with this system because each coat is relatively thin and dries quickly.

Fitting the face frames

With the paint dry, the next job was to fix the face frames in place. I used a Kreg pocket hole jig to drill a series of pocket holes around the outside of each carcase, **photo 21**, before laying them on the bench with their backs face down. Some careful alignment of the frames ensued before I could fix the face frames permanently in place with pocket hole screws.

Making up the shelf

In keeping with the rest of this project, I made the solid timber TV shelf from oak offcuts to keep the cost down. I had lots of odd square material hanging around the workshop that was too small for table or chair legs but ideal for this project.

I laminated the pieces together to make a wide board, **photo 22**, and planed it flat. I then used an mdf template to establish the precise size and shape of the alcove before marking out the oak panel, **photo 23**, ready for cutting with a jigsaw. I applied a layer of Chestnut's hard-wearing melamine lacquer, then rubbed it back with fine abrasive paper before finishing it with Woodwax 22.

Installing the cabinets

I made up a levelling frame for the base cabinet which I screwed directly to the floor, **photo 24**. The cabinet was placed directly on top and fixed with L-shaped brackets.

To fit the top cabinet, I screwed side and rear hardwood battens to the wall and slid the cabinet into position on top of them. More metal brackets were then positioned out of sight to secure the top of the cabinet to the wall at both sides and back.

To finish the project and make it look as though it had been there for years, I added skirting board to the base and scribed in some painted trim to hide any gaps between the cabinets and the walls.

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Clarke CCS-2	1300w	60/45mm	185/20	£64.99	£77.99
Makita 5704RK	1200w	66/46mm	190/30	£94.98	£113.98
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Clarke CON1020	1020w	3mm	£36.99	£44.39
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Ryobi ERT1400RV	1400	0-55	£87.99	£105.59
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Bosch PST700 *	500w	70/4mm	£44.99	£53.99
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Pembroke‡	22,191	£429.98	£515.98
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BY GORDON WARR

A winning round

There's always room in the home for a small table, and this one takes up the minimum of space as it's designed to fold down for easy storage. It's the sort of project that would make an ideal present, and as a bonus it uses very little wood

ROUND TABLE CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Legs	4	425	30	20
Rails	3	350	20	16
Top rail	1	350	30	16
Top centre	1	410	70	16
Top leaves	2	410	155	16

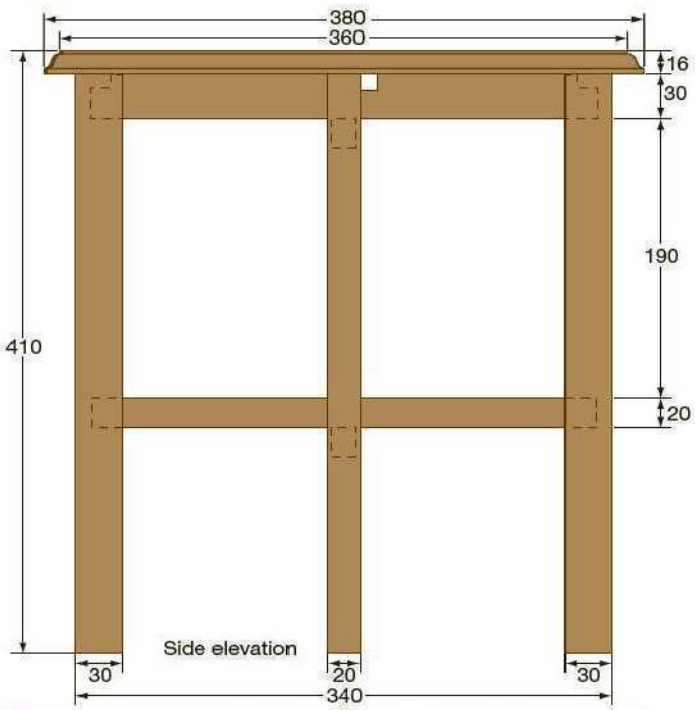
An allowance has been added to the lengths for cutting joints; widths and thicknesses are net. You will also need two lengths of piano hinge about 280 mm long.

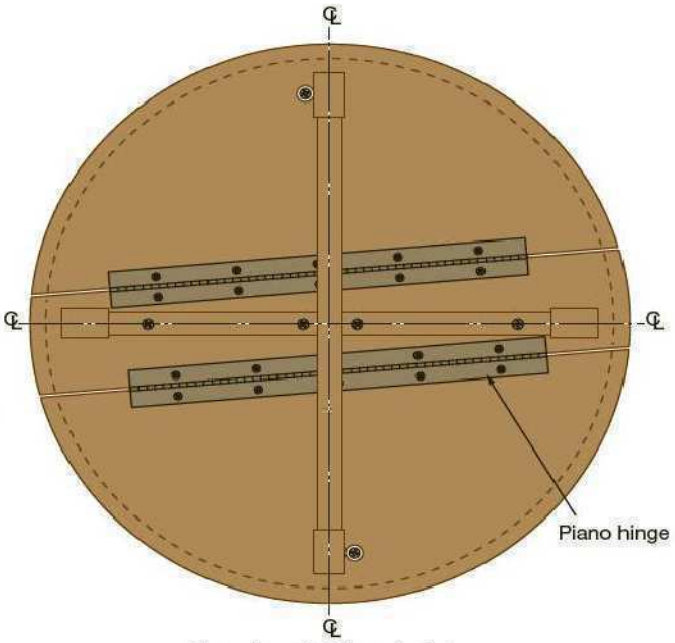
Start by preparing your material to width and thickness, allowing extra on the lengths for cutting the joints. In the case of the leaves for the top, it is also best to add a little to the width at this stage. If you're using any machine or power tool to cut the tenons, it is very important to ensure that the thicknesses of similar parts are exactly the same.

Preparing the Joints

An important aspect of marking out is to mark all similar components at the same

Fig 1 *All measurements in millimetres*





Plan view of table underside

Mark out all similar components together to ensure their accuracy

Use a mortise gauge to mark out all the mortises and tenons

time, **photo 1**, as far as this is possible. Not only is this quicker; more importantly, it's more accurate. Gauging for the joints has to be carried out piece by piece, **photo 2**. The tenons are all 8mm thick, and the mortises are the stopped variety.

The tenons can be cut by hand, on a bandsaw or by router. For smallish projects like this, I usually use a router in conjunction with a home-made jig. It's essential to use a router fitted with a fine-height adjuster to guarantee the required accuracy.

Of course, a mortising machine provides the quickest way of forming the mortises, but you can cut them just as satisfactorily by hand. However, apart from speed of working, one of the other great advantages of using a machine is that ongoing accuracy can be

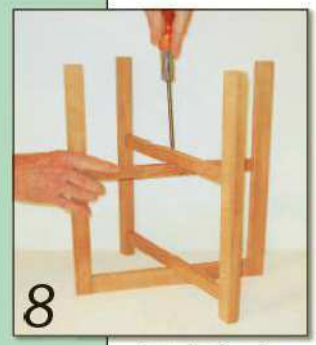
3
I cut the tenons on my router, but cut the haunches by hand

4
Glue up and assemble the rails and legs to make the first frame

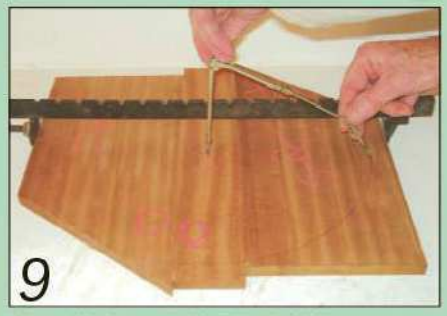
5
Trim the horns after assembly; I've removed the saw guard for clarity here

6
Assemble the second set of legs and rails around the first frame as shown

7
The project has changed into something resembling a Chinese puzzle...



8
...but aligning the frames and screwing the rails together makes everything clear



9
Cramp the top parts together lightly and mark the circle shape

10
Attach the two piano hinges and remove the waste on the bandsaw

maintained. Note that the joints on the upper cross rail are the haunched type, the traditional variation for a joint in such a position. The haunches on the wide top rail can be easily cut by hand, **photo 3**.

Interlocking frames

The way the leg frames for this table go together is somewhat non-standard, and the waste at the top ends of the first frame's legs is best removed before the second frame is assembled around it. Also at this stage you'll need to bore various screw holes in the rails; the screws will attach one frame to the top, and also provide the folding action. **Fig 1** gives all the details.

Assemble the first leg frame, **photo 4**. This is a straightforward process of gluing, cramping and checking that the assembly is square and free of twist. Now you can trim off the excess wood from the tops of the legs, **photo 5**. Note that in this photo the saw guard has been removed so you can see the cutting action.

You will realise from the photographs that the second leg frame has to be assembled so it interlocks with the first, **photo 6**. The end result looks rather like a Chinese puzzle, **photo 7**, but the way the frames work is revealed as soon as the screws are inserted in the rails to allow them to pivot, **photo 8**.

Preparing the top

It's time to tackle the top next. Plane the three pieces required to thickness, then lay them out together and screw the hinges in place. I used piano hinge, which can be cut to any length required using a hacksaw. Note that when screwing the hinges in place, they have to be positioned so that the tops of the moving legs will clear them; see **fig 1** again.

Now you can mark the circular shape on the assembly, **photo 9**. If you don't have compasses of the required size, improvise with a strip of wood with a pin inserted through it 170mm from one end. Tap the pin into the centre of the middle piece and hold a pencil against the end of the strip as you rotate it to draw an accurate circle.

Cutting the circle

A bandsaw is the easy way of removing the waste from the top, **photo 10**, but a jig saw

will work just as well. If you have a router, this is the best way of trimming the sawn edges, **photo 11**, but it must be used with a trammel bar. Because of the hinges on the underside which would foul the router, the trimming must be carried out from the upper surface. This in turn means that a piece of scrap must be temporarily secured to the centre of the top with double-sided tape to locate the pin of the trammel.

On the original, I moulded the edge of the top, although this is not an essential feature. You can leave it plain, or simply chamfer it. This can be carried out either by using the router in the hand-held mode, or on a router table. I used my router table, **photo 12**, and then sanded the edge by hand, **photo 13**.

Now you can add the legs to the top. When positioning these on the underside of the top centre piece, **fig 1**, arrange them so that they're symmetrical. Make sure your screws won't penetrate the top before you drive them in, **photo 14**. You can counter-bore the holes in the leg frame's top rail if you don't have screws of the right length.

Applying the finish

Finishing is always best if carried out with the project dismantled as far as this is possible. With this table, that means removing the legs, but the top can be left with the piano hinges attached.

I applied a mahogany oil stain first of all. This darkens the wood to some extent, but more importantly, if there are any variations in the shades of the various pieces used, it brings them to a uniform colour.

The actual finish you use is always a matter of choice. One of my favourites for small projects like this is pre-catalysed lacquer, which is cellulose-based. It's tough and hard wearing, and resistant to heat and moisture. I dilute it 1:10 with cellulose thinners, and apply it with a polisher's mop. I normally put on two or three coats, flatting down between coats. After the final application, I use some 0000-grade steel wool dipped in a soft wax, **photo 15**. The wax acts as a lubricating agent so the steel wool doesn't leave scratches. Finally, I burnish the wood with a soft cloth to give a mellow sheen.

The last job is to reassemble the legs to the top, and add small shelf studs to act as stops for the pivoting leg frame, **photo 16**.

FURTHER INFORMATION

Craftlac melamine lacquer is available from

- Craft Supplies
- 01433 622550
- www.craft-supplies.co.uk

Trim the edges of the circle precisely to size using a router fitted with trammel bar

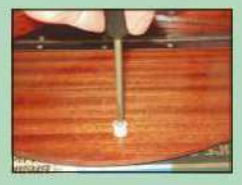
I moulded the edge on the router table, but you can also do it freehand

Smooth the finished edge with fine abrasive paper wrapped round a curved former

Drive in the four screws that attach the leg assembly to the top

After applying the lacquer, treat the final coat with steel wool and wax

16 Add two shelf support studs to act as stops for the pivoting leg frame



BY IAN WILKIE

Hanging committee

It's always pleasing to tackle a project with someone else, and in this case my wife's needlework and my woodwork came together particularly well to create some simple display solutions for her embroideries and tapestries

My wife asked me recently to make a simple frame for three of her small embroideries, each one measuring 165mm square, and also a top and bottom holder that would turn a narrow tapestry into an attractive wall hanging.

Framing an embroidery can present a few difficulties, and if the piece is particularly treasured or has taken many hours to complete, I think it's a task best left to the professional framer, who will have all the necessary equipment and experience. However, I decided to take up the challenge!

Planning the display

Because an embroidery or tapestry is textured, it needs a deeper frame than you might use for a print, and it's often necessary to introduce a slip between the cloth and the glass so the stitches aren't flattened. We decided that the small embroideries would be best displayed in one frame, mounted vertically, as each was exactly the same size and they had a common theme. I used two 900mm lengths of pine to make the frame, and painted it with a sample pot of flat acrylic paint.

Her tapestry wall hanging was rather more interesting from the woodwork point of view. I fretted a top and bottom hanger in oak, and then turned a more traditional design with finials. My wife was very pleased with the results… thank goodness!

MAKING THE FRAME

Each embroidery was first stretched and pressed to get it as flat as possible. Then the stiff canvas was laced across the back of a square of thin plywood to keep it straight, **photo 1**. The embroideries were then laid out on a piece of 3mm thick mdf which was to form the back of the frame, so the required size could be marked using a T-square, **photo 2**.

The back was cut out on a scrollsaw, **photo 3**. Many people fight shy of cutting straight lines with a scrollsaw because of course it has no fence. However, with practice this is easily done and the edge can be quickly trued up with a Permagrit sander if necessary.

Forming the rebates

The frame rebate was cut deep enough to take the 2mm acrylic glazing I proposed to use, plus the embroidery laced on its plywood stretcher and the mdf back panel. **Photo 4** shows the first cut being made using a Proxxon table saw. Then the wood was repositioned for the second cut to give sufficient width to overlap the edges of the embroideries slightly. Note that the guard is designed to protect the user's fingers from the blade, but I always use a push stick for added safety.

When fitted with the TCT blade that comes with the dado head accessory, the Proxxon saw makes quick work of both rebating and grooving. The result was a very smooth cut, **photo 5**, and only light sanding was necessary.

Making the mitres

The mitres for the corners were cut on the Proman saw, **photo 6**; the finer the blade the better if you want a really clean cut. The mitres were then glued with PVA and the frame cramped up, **photo 7**. Care must be taken to ensure that the adhesive doesn't spread onto the front surface of the wood, where it will cause hard-to-remove staining.

The Woodpecker box cramps I used are very easy to set up and give an excellent grip. Four is a bit of a luxury, but I'm glad I bought them! They're available from www.rutlands.co.uk at £28.95 each.

Finishing touches

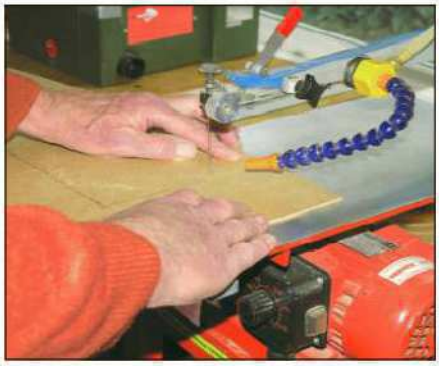
While the frame corners were setting, I added the two cross bars to separate the embroideries, **photo 8**. These were simply butt-jointed and glued to the inner edges of the frame.

I then reinforced the mitres by drilling a fine hole across the joint, **photo 9**, and inserting a short bamboo dowel (cut from a kebab stick) with a little glue on the end.

(continued overleaf)

1 Press each embroidery and lace it flat to a piece of thin plywood

2 Lay the embroideries out on an mdf panel and mark the size required

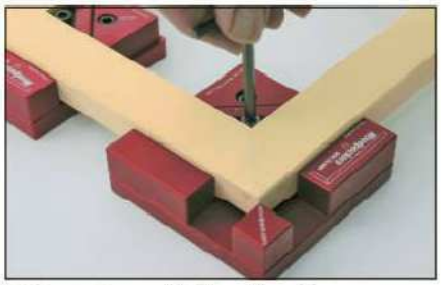


3 I decided to cut the back panel on my scrollsaw, but any saw will do

4 I cut the rebate in the frame timber on my Proxxon table saw

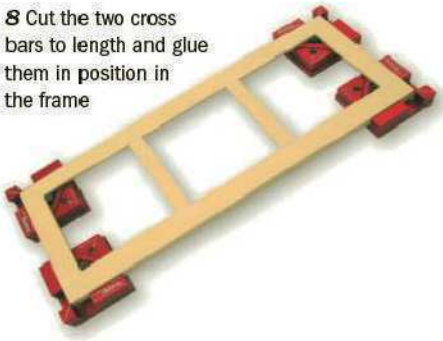
5 Its dado head accessory and TCT saw blade gave a very fine finish to the frame sections

6 I cut the corner mitres on my Proman saw, which has a very fine blade

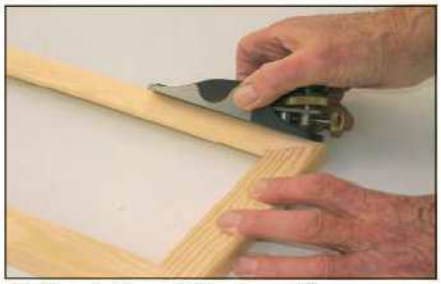


7 Glue and assemble the mitres. Corner cramps help to keep everything square

8 Cut the two cross bars to length and glue them in position in the frame



9 Reinforce the mitre joints by inserting a short length of glued bamboo dowel



10 Chamfer the outside edges of the frame with a small apron plane

Finally the outside front edges of the frame were chamfered with an apron plane, **photo 10**. The frame was then painted with several coats of acrylic paint.

Glazing and framing

I had decided to use acrylic sheet for the glazing, and cut a piece to fit. The three embroideries were attached to the mdf back panel with double-sided tape; then the back was secured in the frame with fine panel pins. Finally I screwed on the hanging plates and the job was done!

MAKING THE FRETTED WALL HANGERS

I had some oak salvaged from an old door which I put to good use to make the ornate hangers for the top and bottom of the tapestry. First the old paint was removed with a proprietary gel stripper. Then, after making absolutely sure that there were no hidden nails or metal pieces, I put the wood through the thicknesser to produce a plank 8mm thick ready for fretsawing.

Creating the design

Having chosen a suitable design and reproduced it to the size I wanted with my computer and printer, I stuck a copy onto the wood with Copydex adhesive. It helps to colour the segments that are going to be removed for clarity, **photo 1**. I then drilled the entry holes within the waste areas ready for the scrollsaw blade, **photo 2**, using a bench drill with a 1.5mm drill bit.

Preparing to saw

It was now time for some fretsawing, using my favourite Olson PGT blades, **photo 3**. I always use a lubricant stick, **photo 4**, to coat the blade and aid smooth cutting.

It's important to be relaxed and comfortable when fretsawing, and I prefer to sit at my scrollsaw which is mounted on a stand. A good light and a magnifying lens are also a great help, **photo 5**. I wear a disposable mask to protect against the fine dust produced. A scrollsaw can be connected to a dust extractor, but it's a noisy option that I find takes away some of the pleasure of some peaceful fretsawing.

Cutting things fine

I always cut out the internal areas first so there's plenty of wood to hold on to and manoeuvre. You'll notice that I've drilled the entry hole for the blade in the centre in this instance, **photo 6**, and will work outwards from there, **photo 7**. Sometimes it's best to just nibble little bits away. If the entry hole is drilled in a corner, the edges will be rounded and won't look crisp.

Once all the internal cuts had been completed, I cut around the outside edge of the design, **photo 8**. The blower should be positioned so it keeps the work surface free of wood dust and lets you see the cutting line clearly.

Finishing touches

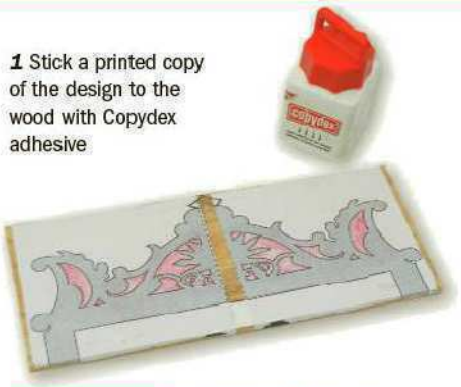
The bottom hanger was a simpler design to draw and cut out. Both pieces were then sanded to remove any whiskers and the edges were gently chamfered. The plan was to slide a 3mm bamboo knitting needle through a seam sewn in the back of the top and bottom of the tapestry to allow it to hang. I therefore drilled matching holes right through the sides of the wooden hangers and fed the needles in, **photo 9**, ready to receive the tapestry. Bamboo is very strong, and the knitting needles have an accurate diameter along their length.

MAKING THE TURNED WALL HANGERS

This alternative hanger with finials was turned from a very old piece of mahogany reclaimed from a table leg. First the blank was mounted between centres and turned to a diameter of 40mm.

Four blanks were then measured off, each one 42mm long, and a 10mm long spigot was turned to a diameter of 25mm between each of the blanks. Check the diameter, **photo 1**, and the length of each

1 Mount the blank between centres and turn it to a diameter of 40mm



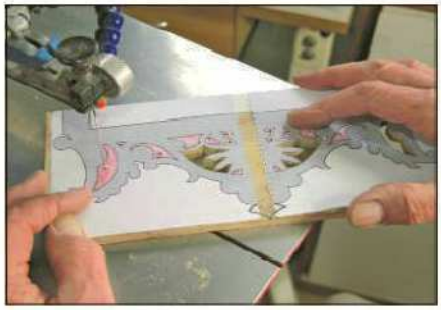
1 Stick a printed copy of the design to the wood with Copydex adhesive

2 Drill the entry holes for the scrollsaw blade within the waste areas

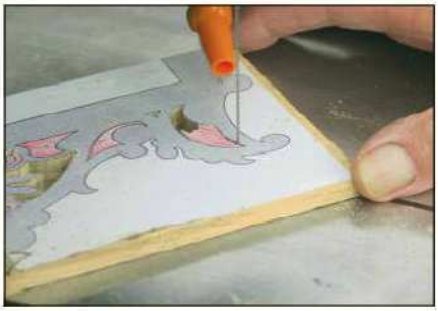
3 The blade I chose for this job was a 12tpi No 7 Olson PGT blade

4 I use this lubricant stick to coat the blade and aid smooth cutting

5 Good light, a magnifying lens and a face mask are fretsawing essentials



6 Cut out the internal areas first. I drilled the entry hole in the centre this time...



7 ...and worked my way out towards the sharp internal angles

8 Then cut round the outside edge, using the blower to keep the cutting line clear

9 Sand the two hangers and drill holes to take the bamboo knitting needles

section, **photo 2**. When you're happy with the measurements, remove the wood from the lathe and then separate the sections with a fine-toothed saw.

Each blank was held in the chuck jaws by its spigot and turned to shape, **photo 3**. A small profile jig made sure that all the finials were turned to the same dimensions.

Each finial was then remounted on the lathe and friction polish was applied; the inside edges were buffed up to match. All that remained was to drill 6mm holes to take the bamboo rod, trim this to the right length and insert it in the finials, ready to receive the tapestry.

2 Create four sections each 42mm long, with a 10mm spigot in between

3 Hold each blank securely in the chuck jaws by its spigot and turn it to shape

4 Glue the finials to the ends of two bamboo rods, ready for the tapestry to be fitted

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This drill features a keyless chuck, a two-speed gearbox offering speed ranges of 0-350 and 0-1200rpm and an 18-step torque selector for effortless screwdriving. It has an ergonomically designed soft handle grip, so it's extremely comfortable to hold and use, and there's a handy LED worklight mounted above the trigger so you'll never be working in the dark again. Its 10.8V lithium-ion battery is rated at 1.5Ah, can be fully recharged in three hours and is interchangeable with the batteries used in the Multimaxx. It's packed with its charger and adaptor in a sturdy carrying case.

EINHELL RT-MG 10.8LI CORDLESS MULTIMAXX

This sleek-looking power tool is one of the new generation of multi-tools designed to tackle a range of different workshop and DIY jobs using just one power source. It has a variable no-load speed of 5,000-17,000 oscillations per minute, and can be used to drive a plunge-cut saw blade for wood, a versatile scraper blade, a triangular sanding head or a tungsten carbide-tipped cutting disc. It takes just seconds to change the accessory using the Allen key supplied with the tool. The sturdy carry case contains one of each accessory plus six delta sanding sheets and, best of all, a second battery and a charger so you'll never run out of power.

For more technical information about these tools, or to request the new 2012 Einhell catalogue, please call 0151 649 1206 or visit www.einhell-uk.co.uk

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BY ALAN HOLTHAM

A level playing field

You may think that a horizontal router table performs exactly the same functions as a vertical one, but in fact working with a router in this orientation has a number of significant advantages. Let me explain...

SAFETY FIRST

There is one very important safety aspect to consider when using the horizontal router table. On a normal table, you always feed the work from right to left to ensure that you're working against the direction of the cutter rotation. With the horizontal table, it is essential that you feed from left to right to maintain the correct work and cutter orientation. The set-up is similar to a planer, where the timber is fed over a cutterblock which is revolving towards you.

For a start, it's always difficult to balance a wide workpiece on edge and feed it through a standard vertical router table, as even the tiniest bit of wobble is magnified at the cutting edge. With a horizontal setup, the whole width of the board is supported and there's no chance of any movement spoiling the cut.

The other main advantages are that the cutter is a great deal easier to access for changing, and you don't get all that damaging swarf dropping into the motor casing, as you do with the router mounted vertically under a table.

Seriously useful

A horizontal router is ideal for a host of routing operations, in particular mortise-and-tenon work, edge grooving, cutting wide rebates and panel raising with a vertical bit. In fact since I built this table, I'm using it far more than my vertical table, even for standard moulding work.

I copied the basic design from an American routing book, making a few changes and improvements to suit my particular needs. It's a very simple project that is quick to make, but it's worth spending some time doing it properly as you'll be amazed how much you use it.

1 The ideal material for the router table is mdf, due to its stability

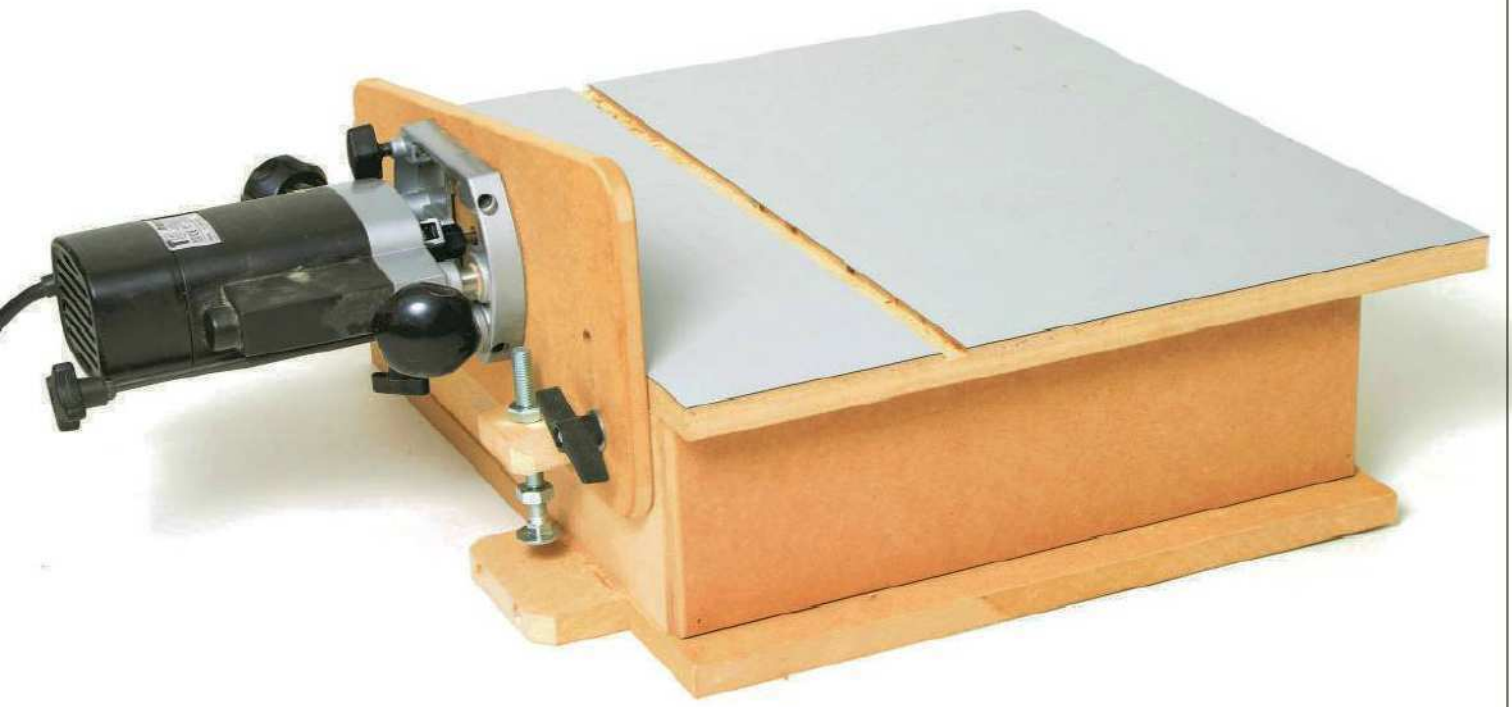
2 Use just one end of the cutter block when planing up the components

3 Biscuit joints are the ideal way of assembling the open box frame

7 Centre the work table on the sub-top and screw it into place

8 Brush contact adhesive onto the surface of the work table and the laminate

9 Stick the laminate in place and roll it to remove any air bubbles



Preparing the parts

You can make the table from whatever materials you have to hand; I used 18mm and 10mm mdf, **photo 1**, primarily for its stability, but plywood or well-seasoned hardwood would be fine.

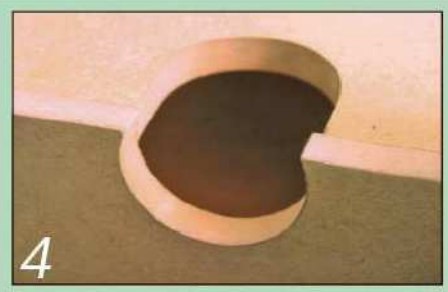
When you're planing up the edges of mdf boards, remember that it's a highly abrasive material and will very quickly dull your cutters. For this reason, I recommend using only the extreme end of the cutter block on your planer, **photo 2**; you can then avoid this blunted area for any other subsequent planing work.

ROUTER TABLE CUTTING LIST

All dimensions are in millimetres

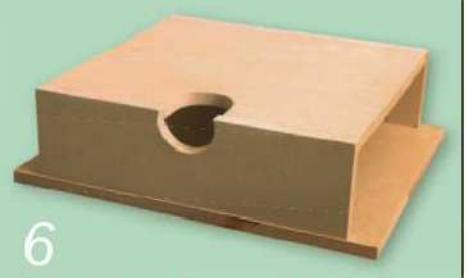
Part	Qty	L	W	T
Base	1	483	406	18
Side	2	406	127	18
Sub-top	1	406	370	18
Work table	1	483	406	18
End	2	394	127	9
Support boss	1	100	100	12
Router plate	1	406	203	12

You will also need an offcut of plastic laminate a little larger than the work table, contact adhesive, clear varnish, and two coach bolts and wing nuts.



Form a clearance hole for the cutter in one side and the sub-top

Glue and cramp up the box frame and check that it's square



Don't over-tighten the cramps in case you distort the sub-top; it muist be flat

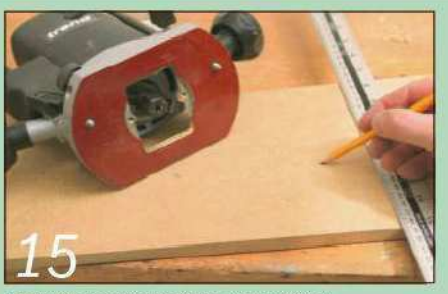
Use a bearing-guided cutter to trim the laminate all round...

...to leave a neatly finished work table, ready for the next stage

Cut the slot for the mitre guide with a single pass of the router

This will help to ensure that the mitre guide fits snugly in the slot

Fit a support boss for an extractor nozzle in the removable side panel



Mark the positions of the router fixing screws on the router plate

Cut the curved slot with the router, then reattach the router plate

Finally reattach the router to the plate and you're ready to start work

It's a good idea to cramp the router table to the workbench for extra stability

Assembling the basic box

The components are all jointed together with biscuits. You can either use a biscuit jointing cutter in the router or, if you have one, a proper biscuit jointer, **photo 3**.

All the pieces are straightforward shapes, but you'll need to form a cutter clearance hole in the sub-top and in one side before assembly, **photo 4**.

Glue and cramp up the main box section, **photo 5**, ensuring that the top surface isn't distorted in any way, as this will affect the basic accuracy of the finished table.

Adding the work table

The table consists of an open box frame, **photo 6**, onto which the work table is screwed, **photo 7**; hence the need for getting it all flat and level. Note that the table needs a small opening in one edge to accommodate the cutter; its exact size will be determined by the type of cutters you envisage using. Keep it as small as possible for maximum support; it can always be enlarged at a later date.

When you screw the table to the box frame, make sure the screw heads are well countersunk and that any burrs around the holes are sanded flat. You can leave the mdf surface just as it is if you like, although it's better finished with a coat of clear varnish. However, on any sliding surface like this, I prefer a laminate finish that gives a super smooth surface and allow the work to slide easily. It's not difficult to apply.

Fitting the laminate

Cover the surface of both the work table and the underside of the laminate with a coat of contact adhesive, **photo 8**, brushing it out as evenly as possible. Leave the two surfaces to dry thoroughly for about half an hour or so. Then stick the laminate in place and smooth it down with a hard roller, **photo 9**, to make sure there are no air bubbles trapped underneath it.

Trim off the excess laminate round the edges of the table using a bearing-guided cutter, **photo 10**. Then trim out the cutter clearance slot in the laminate to match the slot in the mdf work table, **photo 11**.

Cutting the mitre guide slot

The next stage is to rout a slot across the work table to accommodate a mitre guide. The dimensions of the slot need to be accurately sized to suit the bar of the mitre guide you intend using; borrow one off another machine if you don't have a spare.

Cut the slot in a single pass using a straight cutter, **photo 12**, keeping the guide fence pressed firmly against the side of the table to produce a perfectly straight groove. Notice that I'm using extended guide rods on the side fence to get the necessary reach. If you don't have these, you can achieve the same result by clamping a straightedge to the table and running the router base against it. Just make sure that the slot is perfectly parallel to table edge.

If your router fence has a fine adjuster, you can use this to adjust the width of the slot very slightly and make the mitre guide a snug sliding fit, **photo 13**. Apply a coat of cellulose sealer and then wax the cut surfaces to ensure that the guide slides smoothly and doesn't wear the sides of the slot.

Closing the box

The open sides of the box can be closed in now, but you should first drill a hole in one of the sides and fix on a support boss of 18mm mdf to take a dust extractor nozzle. Make this side removable by just screwing it in place, **photo 14**, so you can access the inside of the box if it ever becomes clogged up. The other side can have a permanently fixed cover. Take the removable panel off for now, as you'll need access to the interior later.

Mounting the router

The router is fixed to another piece of 10mm mdf which will act as a movable plate. This needs to be drilled accurately to take the fixing screws, a process made very much easier if you temporarily screw a couple of bolts with points ground on their ends through the router base, **photo 15**, and use these to mark out the hole centres on the mdf plate.

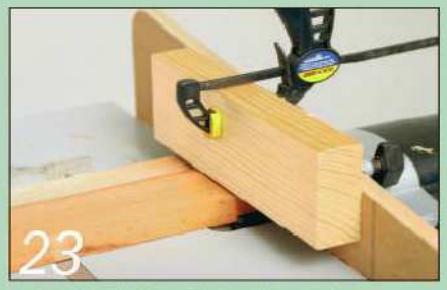
Drill slightly oversized holes at these points and countersink the heads of the fixing screws well below the surface of the plate. Then you can attach the router to the plate. Fit a straight cutter in the router and

Attach the router, fit a straight cutter and plunge a hole in the plate

Position the router plate on the end of the table and drill the pivot point

Drill a second hole for the locking bolt and mark the line of the curved slot (see text)

My first modification was to attach a simple fine-height adjuster to the router plate



I created a temporary guard by clamping a block of wood to the router plate

The extraction set-up worked well, with the table kept free of shavings

plunge it through the mdf plate to form the cutter opening in the centre, **photo 16**.

Mounting the plate

Tip the router table on its side, position the router plate so the cutter lines up with the aperture in the work table and drill the pivot point right through the router plate and the box side panel, **photo 17**.

Fix the router plate in place through this hole using a coach bolt and wing nut. Then drill another hole through the plate and the box side for the locking bolt at the other end of the plate.

Making the plate adjustable

To mark the position of the curved slot necessary for the up-and-down adjustment of the router plate, reach inside the table through the open end, poke a pencil up through this second drilled hole and pivot the motor plate from side to side, **photo 18**, so the pencil marks the required arc on the underside of the router plate.

Remove the plate, unscrew the router and use it to cut the curved slot in the plate by eye. Use a straight cutter a shade bigger than the diameter of the fixing bolt, and make the slot long enough to give you about 50mm of movement on the router plate. Reattach the plate to the side of the router table with the coach bolts and wing nuts, **photo 19**, fit the router to it and you're ready to start work, **photo 20**.

Although the table itself is fairly heavy and you can get away with using it freestanding, it's actually much safer and easier to use if it is held firmly in position. You can either cramp it to the workbench, **photo 21**, or screw a block to the underside which can then be gripped in the vice.

Late amendments

After just a little use I quickly realized that it wasn't that easy to set the height of the cutter precisely. So the first modification I made was to fit a simple fine-height adjuster using a bolt attached to the router plate, **photo 22**. In retrospect, it would have been much better if the bearing surface for this had been part of the original table base, so just extend the overall base dimensions accordingly to accommodate it if you are making your own table.

Router specification

As most of the work you do on this table will be relatively small in scale, it doesn't really matter what size of router you use. A relatively cheap one which you can attach permanently will be fine, but do pick one with a positive on/off switch that can be locked in the 'on' position. Many of the new routers have a 'dead man's handle' type of switch that you have to hold on during use.

Because there's likely to be a fair bit of extended overhang of the cutters, particularly for mortise-and-tenon work, it is also preferable to fit an 8mm collet where possible, as the bigger shanks of these cutters will go some way towards minimizing the inevitable vibration.

A simple cutter guard

There is so much work you can do with this simple horizontal table, tenoning being the obvious one. Haunched tenons are easy to cut as well. Just rotate the wood clockwise for each subsequent cut. Note that you'll need to use a scrap block at the back of the work for the first cut to minimise breakout.

I was slightly concerned by the safety aspects of the exposed cutter, but this is easily overcome by clamping a block to the router plate, **photo 23**. In due course I'll refine this temporary solution into a proper guard and also incorporate a hold-down mechanism as well. In the meantime, keep an eye on that cutter!

Final thoughts

The fine adjuster on the router plate allows you to set the depth of cut accurately, but it also helps to fit a fine height adjuster to the router itself to allow precise setting of the length of cut.

In use, I found that the extraction works superbly, with virtually no shavings ending up on the table surface. Everything was sucked into the table body, **photo 24**, and off to the extractor. I just wish all my other machines were this clean and efficient.

Gadgets: the end

BY KEITH SMITH

For the last eight issues I've been presenting a selection of gadgets, some of which I've bought and some I've made myself, and all of which I've found useful on a regular or occasional basis. Now, after one last rummage behind the extractor unit, I've found a final five for my farewell feature. I hope you find them as useful as the other forty...

Nominate your favourite

Do you have a gadget in your workshop you wouldn't be without? If you do, please drop us a line telling us why it's indispensable, and send us a photo, and we'll publish your nomination in a future issue of Gadgets. You can email your entry to mike.lawrence@myhobbystore.com, and send your photo as an attachment. Please make sure it's a high-resolution image so we can reproduce it at a reasonable size.

Turkeys welcome too

We'd also like to hear about any gadgets you've bought that turned out to be total turkeys. So don't be afraid to name and shame that gadget that really was a bit of a flop... or just a total rip-off!

PUSH PADS

Most of us will have a push stick or two around the workshop, and they're an excellent safety device which is particularly useful with a table saw. However for planers, spindle moulders and router tables a push stick isn't ideal because you need to keep pressure down on the workpiece as well as pushing it forward. This is where push pads come into their own, as you can easily press the workpiece down on the table and also keep it pressed hard up against the fence.

It's possible to buy plastic push pads, but I prefer to make my own. Some of the ones you can buy have an enclosed handle. In my opinion this isn't a good idea if you get kickback, since your hand would be trapped inside the handle and could be injured. It's better to make them with an open handle, similar to a plane's. It's easy enough to shape such a handle and to attach it to a board with dowels or brass screws which won't damage machinery.

For the friction material on the underside, I use non-slip router matting for some and a reasonably coarse abrasive paper for the others. The abrasive paper is more durable, as the router mat has a tendency to come unstuck at the leading edge.

COST: free if you use bits of scrap wood
RATING: more than invaluable
SUMMARY: make and use a push pad or two, and you'll almost certainly avoid an unexpected hand injury in future.

This is how the pad looked when I first made it...

...but then it got a bit too close to the table saw blade. I've added a small block at the back so I can push larger pieces across the planer

SLICK PLASTIC

I bought a length of this low-friction plastic when I was making a router table, and fixed it to the underside of the fences so they could slide easily over the laminate table top. It works very well; in fact, it's so slippery that I couldn't stick it to the underside of the fence and had to use countersunk screws to attach it. I've since discovered that you can also buy Slick tape, which is self-adhesive and 75mm wide, but is only 1mm thick compared with 3mm for the sheet. Knowing that earlier would have saved me having to use screws...

This total non-stickiness gave me the idea of cutting a thin strip off the sheet and using it to make a paint stirrer. I wrapped some rubber self-amalgamating tape round one end of the strip to give me some grip and it worked really well, so my next step was to make a smaller mixing stick for use with two-pack fillers. I don't like to use a wooden stick to mix these, as I think it absorbs some of the chemical out of the filler. These fillers really do stick, and in the past I've had quite a job keeping the mixing sticks clean; however, with the low-friction plastic they come off quite easily.

COST: £6.50 per 915 x 100mm sheet, £6.35 per 915mm x 75mm roll, both from Axminster
RATING: very useful
SUMMARY: this versatile material has many uses around the workshop for non-stick jigs, fences... and paint stirrers.

Slick plastic comes in 3mm thick sheets and as thinner self-adhesive tape

I wrapped self-amalgamating tape round one end of each strip to form a handle

DOVETAIL MARKER

A couple of years ago I went to the Getwoodworking Live show at London's Alexandra Palace and saw Rob Cosman demonstrating how to hand-cut dovetails. This inspired me to have a go myself. I usually use a Leigh jig to cut any dovetails I need, but since watching Rob I've found that for small jobs it's actually quicker to cut dovetails by hand than to set up the jig.

I soon realised that accurate marking out was absolutely vital for a perfect joint. However, I found it difficult to get the pencil mark along the face perfectly aligned with the angled mark on the end. Using a dovetail saddle marker solved this problem, with the added advantage that it was a lot quicker to use. These Veritas markers are made from anodised aluminium, so they should last a lifetime.

Rob Cosman also demonstrated how relatively difficult it was to start a standard saw off along a pencil line. He was promoting a very expensive saw which had finer teeth at the front to make this easier. When I got home, I took the set off the front teeth on one of my older tenon saws by rubbing a diamond stone along the side of the saw for the first 50mm. This works really well, and is worth trying if you have an old or cheap saw you're willing to butcher.

COST: £12.76 from Axminster, available in a 1:6 version for softwood and a 1:8 one for hardwood
RATING: brilliant for marking out dovetails
SUMMARY: these inexpensive markers make drawing accurate dovetails that bit easier and quicker.

Veritas dovetail saddle markers come in two different versions


The marker makes it easy to draw and align both pencil lines accurately

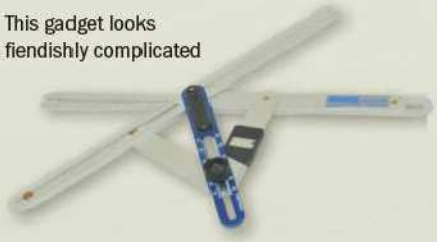
NOBEX MULTIFIX

Compound mitre saws are a common tool in the workshop and on site, but cutting the perfect mitred joint with one can be tricky as very few corners are exactly 90°. Even a small error in the cutting angle can result in a gaping joint, and this is especially so when fitting skirting boards as house walls are never square to each other. The Nobex Multifix is a clever gadget that splits the angle, internal or external, in half and allows the mitre saw to be set up very accurately.

It's a little bit fiddly to use, however. You set the two arms to the angle and then split the Multifix in two to get the half angle you need. However, it's still quicker and easier than drawing out the angle by hand, and I always use mine for this type of work.

It also comes in useful when mitring cornices, and for many furniture projects where you need to bisect an angle to get an accurate cutting line.

COST: £41.26 from Axminster, but currently Machine Mart has it at £35.98
RATING: very handy
SUMMARY: if you have a lot of skirting or cornice to fit, this gadget will soon pay for itself in the time saved and the improved quality of the finished job.


This gadget looks fiendishly complicated


Start by positioning the two arms against the walls and lock them in place


Then split it in half...

...and use this part to set the mitre saw's cutting angle

GUIDE-RAIL SAW

This is the final gadget of the series, and I've saved the best until last! Many of us have a circular saw and would hardly think of it as a gadget, but with the addition of a guide rail it becomes an altogether more versatile tool. In fact, apart from my cordless drill driver it's the one tool that I could least manage without. When I bought my Festool TS55, which is quite a long time ago, I think there were only two saws available with guide rails, but now most manufacturers have a model in their range and they are a little more affordable.

I bought mine primarily because I find it very difficult to cut full-sized sheets in the workshop, and this saw allows me to cut them accurately to size and with a very fine edge. However, since getting it I've found many more uses for it, such as cutting doors and worktops down to size, trimming edges and taking the waney edge off sawn boards. It also tackles a lot of fiddly jobs which require a degree of accuracy; one such job I did recently was cutting the panels out of a factory-made door so that I could glaze it. It's a winner!

COST: The Festool TS55 with one 1.4m guide rail is £470; Makita have a similar model for £335
RATING: brilliant!
SUMMARY: this is one tool that I would instantly replace if it ever packed up. I don't know how I could work efficiently without it.


The Festool TS55 is a good if unremarkable saw...


...but teamed with its guide rail it becomes immensely versatile


The rail's sacrificial plastic strip allows cross cuts to be made in veneered mdf with no splintering at all

BY ANDY STANDING

Jointing jigs

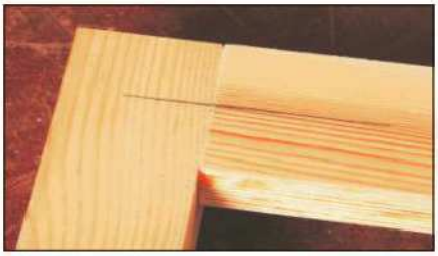
Having looked at jointing machines last month in my portable power tools series, I want to digress slightly and move on to jointing jigs. Some are designed for use with routers, which I'll deal with in a future article. The ones featured here all rely on power drills

THE BEADLOCK JIG

The Beadlock is a simple and highly effective jig. It uses a series of overlapping drill holes to create a mortise in both components. A ridged loose tenon is then used to connect the two parts together. It's available in two versions; one uses a 9.5mm diameter drill bit, and the other a 12.5mm bit for heavier constructions. Shims are provided to help you centralise the joint in the thickness of your timber, and for unusual jobs you can always make your own. The loose tenons are supplied in lengths which you cut to size to suit the job in hand. Router cutters are also available, allowing you to make your own tenons.

The system really is foolproof, and even inexperienced woodworkers should have no trouble producing perfect joints.

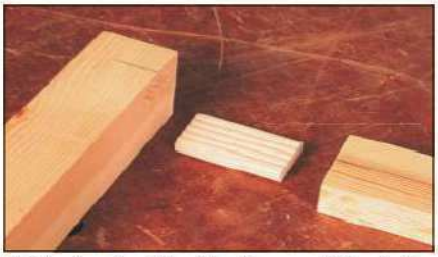
1 The system includes the jig, shims for centring the joint, two drill bits and two sizes of ridged loose tenon



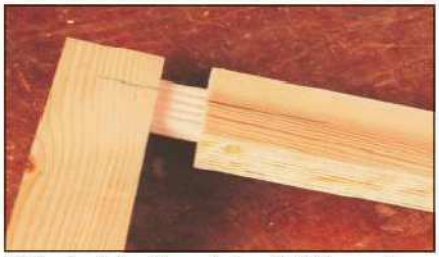
2 Begin by cutting your components exactly to length, and butt them up to each other. Mark the centre of the joint

3 Take one of the parts and locate the jig on it with the centre line set on the alignment marker of the jig

4 Clamp the jig and component in a bench vice and drill out the holes. Repeat the process for the other component



5 Cut a length of the ridged tenon a little shorter than the total mortise depth, and test its fit in each of the mortises



6 Trim the ridged tenon to length if it's over-long. Then apply glue sparingly and assemble the joint. Cramp it if necessary to pull it together

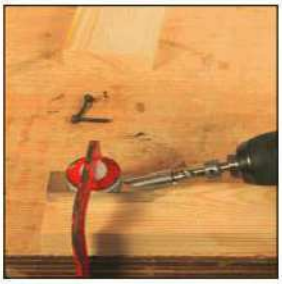
THE POCKET HOLE JIG

This is one of my favourite jigs, as it's extraordinarily versatile and enables projects to be assembled quickly and accurately. The pocket hole jig is a simple drilling jig that enables you to drill precisely angled holes. It uses a stepped drill bit, so effectively it counterbores the hole at the same time, recessing the screw head well below the surface. The joint is held together with a self-boring parallel-sided pocket hole screw which provides particularly good grip at the low drive-in angle.

In its simplest form the pocket hole jig is just a small metal block which can be clamped to the workpiece for use. There are more sophisticated versions with integrated clamps and alignment fences for more complex assemblies, though the single block can be used to make any kind of pocket hole joint.

1 The jig can be a complex affair with clamps and fences (top) or a simple guide block (bottom)

2 Prepare the two components, ready to be butt-jointed together



3 Cramp the jig flush with the end of the workpiece and drill two screw holes

4 Align the two components and drive a screw in through each pocket hole

5 The pocket holes can be filled with specially shaped hardwood dowels

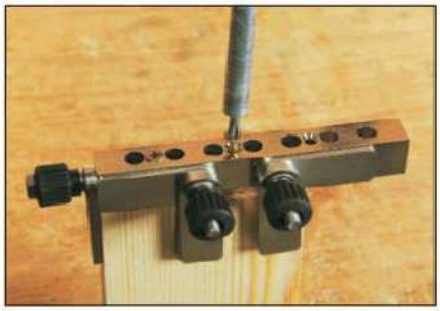
1 This dowel jig appears highly complex at first glance, but is very versatile

2 By contrast, this plastic jig couldn't be simpler in design or operation

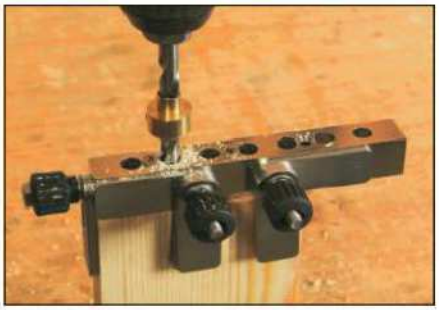
3 The Joint-Genie jig is extremely simple to use and is also highly accurate

4 Place the jig between the two components and turn the end stop to locate the jig flush with the edge of the tenon component

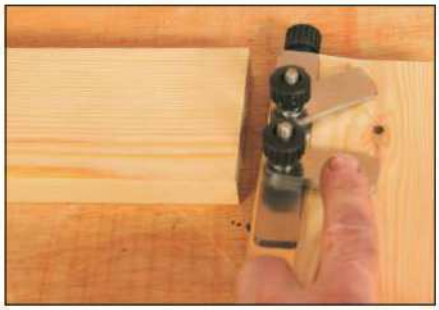
5 Clamp the workpiece vertically in the vice and use the spacer tabs to adjust the jig so it's in the centre of the workpiece



6 The jig can be screwed or clamped to the workpiece. If it's screwed, the screw holes will be hidden within the assembled joint



7 Set the depth stop on the drill bit and bore out the dowel holes in the end of the workpiece

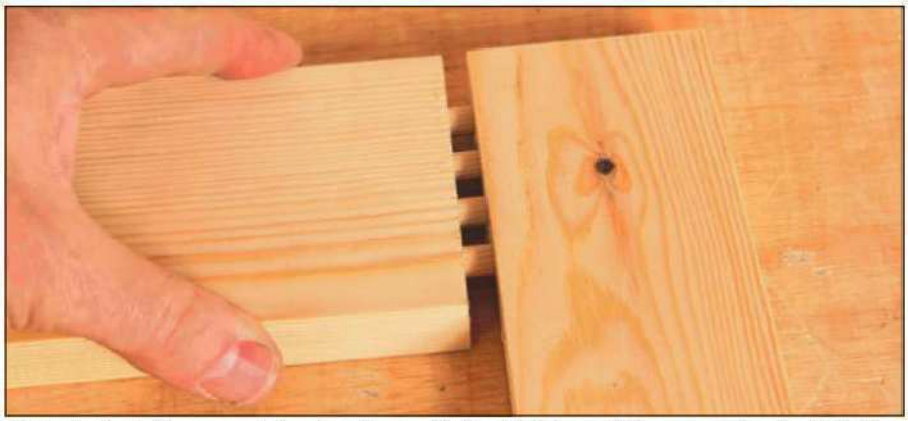


8 Place the components together again, with the jig still in position. Flip the end stop and the spacer tabs over onto the other component and screw the jig to it

9 Drill the dowel holes, remove the jig and glue the dowels into one component

DOWEL JIGS

There is a wide variety of dowelling jigs available, and most are fairly simple to use. However, dowels are unforgiving creatures, and any tiny inaccuracy in making the joint will stop it from fitting together properly. So you need a well-made and accurate jig. One of the best is the Joint-Genie, which is both simple to use and highly accurate. There are several versions available; I've been using the 8mm Professional model. This produces good strong joints quickly and with a minimum amount of setting up. The system is almost foolproof and there are no complicated instructions to follow.



10 Apply glue to the exposed dowels and assemble the joint. Cramp it if necessary to get a tight fit

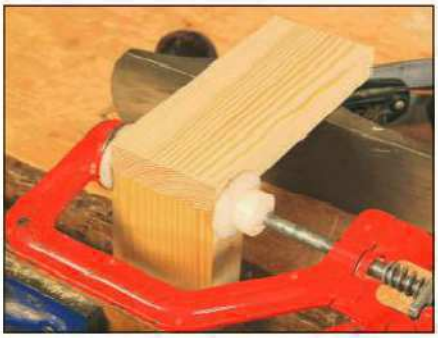
1 The stepped drill bit bores a hole to match the profile of the matching dowel

MILLER DOWELS

Miller dowels are a rather inspired variation on standard dowel jointing. Instead of the dowel being sandwiched within the joint, the Miller version is driven straight through the assembled joint in the manner of a wooden nail. The stepped design of the dowel causes it to pull the joint together when it's glued and inserted. A special stepped drill bit is used to bore the hole. It produces a remarkably strong joint and, by using contrasting dowels, it can also be made into a highly decorative one.

2 Three sizes of drill and dowel are available, in a choice of four woods

3 Prepare the parts to be joined and bring them together

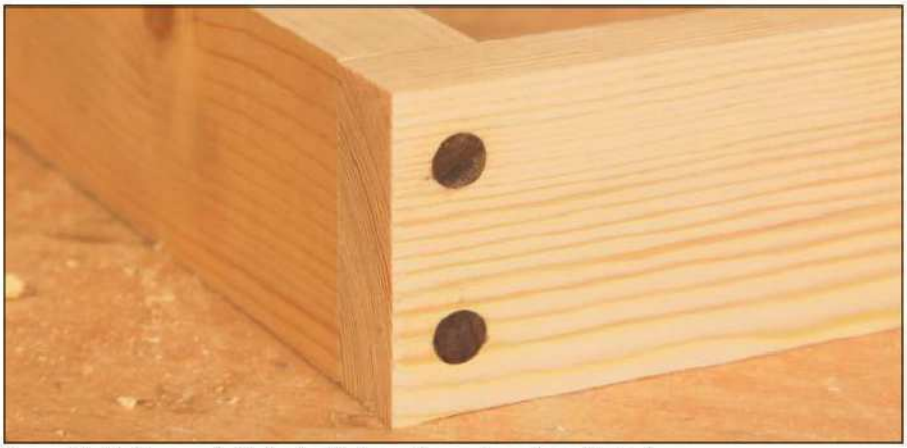


4 Use a cramp if necessary to hold the two components you want to join in position

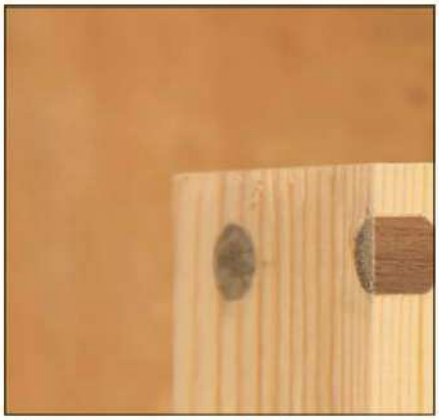
5 Drill the holes for the dowels through one component and on into the other

6 Apply glue to each dowel and tap it into place with a mallet

7 When the glue has set, trim the projecting dowels with a saw...



8 ...and finish them perfectly flush with the surface using a sharp block plane



9 A cross-section through the finished joint reveals the dowel's excellent fit

BY KEITH SMITH

Shop notes

I had hoped to be able to start this month's Shop notes with a finished picture of the kitchen we've been working on recently, but even the best-laid plans can go awry. So here's an update, plus a few thoughts on the subject of kitchen worktops

We've pretty much finished our part of the kitchen fitting, as you can see in the main picture above. The inset illustration, produced using our Kitchendraw software, shows how it should be looking by now, but we're still waiting for fitters to come and template the island unit for its stone worktop. This sort of delay waiting for other trades is inevitable, and is compounded on this job as it's a new build. This allows my clients to reclaim the VAT on the overall cost, so they're organising the other trades themselves. Ho hum!

Which worktop?

Kitchen worktops are now much more of a problem too. It used to be just a case of choosing the right laminate, but now there are so many choices it's difficult to pick the ideal material. As this particular kitchen seems to feature most of them, here's my take on the subject.

- Solid timber worktops are durable, easily repaired and soft and warm to work on. The downside is that they need regular maintenance, and oak in particular will go black if it's allowed to get soaking wet. In this kitchen we've fitted oak worktops to the tops of the tall units and to the L-shaped breakfast bar.
- Granite or marble are the materials of choice for the island unit in this kitchen. There's a misconception that these surfaces are literally bomb-proof. However, granite has a tendency to shed quartz crystals from its surface, leaving small craters behind. Both materials are also susceptible to staining, and once they're marked it's more or less impossible to get the stain out. Of course they're very hard and cold to work on; ideal for making pastry, but totally unforgiving if anything fragile drops on them.
- Stainless steel is an uncommon choice for a domestic kitchen, but we've been asked to fit one which we're having fabricated by a local specialist. Stainless steel is a durable and easy-to-clean surface, but it does mark terribly and for this reason I'd never recommend it for use in the home. However, despite our best advice the customer wants it and the customer is always right… so we're fitting it! It will be supported on a double layer of 18mm plywood in front of the main window.
- Resin composite is the worktop of choice in the utility room next door. The one we're using is solid resin rather than a resin layer over a chipboard core. This type of worktop will also mark and chip, but it has the advantage that it's entirely waterproof and can be shaped to fit without the need for any vulnerable lipping.
- Plastic laminate doesn't feature at all in this kitchen. It's out of fashion at the moment, especially for luxury kitchens, but in my opinion it's still one of the best and most practical worktop surfaces available.

Accidents will happen

For this kitchen we bought a length of oak worktop which we needed to cut to size on the table saw. While we were bringing it into the workshop, I managed to trap my hand between the worktop and the table of my disc sander. To say that it was excruciatingly painful doesn't do it justice! That was two

weeks ago, and my hand still hasn't recovered. This is particularly annoying as I'd trapped it in exactly the same way (although not as badly) a few weeks earlier, and had vowed there and then to move the sander… but I never got round to it.

The problem was that the machine was sitting on top of a recycled mortiser cabinet, and it was too big to fit next to the chop saw. I needed to make a new cabinet base for it, but simply hadn't had the time. After this latest incident I was determined to make that time, and to have what I call a Workshop Day.

Making it better

This a time to rearrange the workshop layout or make new stands or create some extra storage space… basically anything to make the shop safer and more efficient.

The first thing I did was to make a new cabinet for the disc sander. I used 18mm plywood for the carcase, added a 12mm ply back and fitted four castors (lockable ones at the front) to the base. I'm going to add drawers at some point, but that will have to wait for the moment.

Rafter storage

I also have a problem with short-term timber storage. When I buy long lengths of timber for a job, they inevitably end up on the floor as there's nowhere else to store them. This has been a real nuisance and a distinct safety hazard at times, but I couldn't think of an effective way to store them. Now, in desperation, I've made a rack that hangs from the ceiling joists. It's very effective, but it does obscure one of the light fittings…

My biggest fan

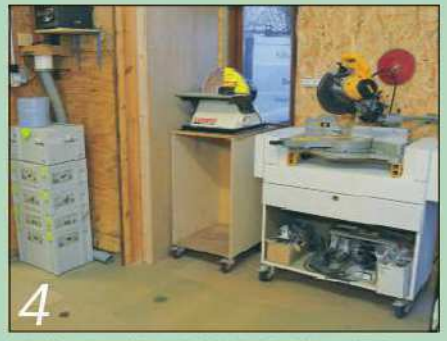
Finally, we're lucky that we have a small room in the workshop where my wife Judith does most of our finishing work. The trouble is that oil finishes smell pretty bad as they dry, and the odour (which I find it particularly nauseating) pervades the main workshop. To resolve the problem, I've fitted a small extractor fan in the wall. I chose a relatively small one; we didn't want to move a lot of air but simply wanted to create a negative pressure within the room which would keep the smell out of the main workshop. I then discovered that when it wasn't on it was acting like a turbine and allowing a lot of cold air to blow into the room, so I made a cowl to fit over it when it's not in use.

I can highly recommend treating yourself to a Workshop Day once in a while. Take a look around your own workshop and see what you could change for the better. You won't regret it!

Under the main window we've fitted two sheets of 18mm plywood which will form the support for the stainless steel worktop

Using solid timber for the cabinet end panels gives a striking effect. One even has some lead shot still embedded in it!

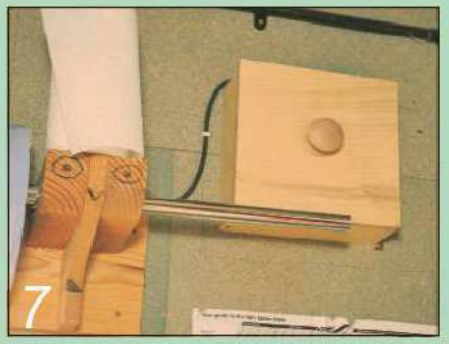
You may notice the odd knobs and bits of string on some of the units. We're waiting for the real knobs to be made for us



The disc sander used to live where the grey Systainer boxes are stacked. It now fits comfortably next to the mitre saw on its new, slimmer cabinet

This rack for short-term storage will hold longer lengths of timber which we used to stack on the floor. It's connected to the joists by pairs of 12mm thick plywood hangers

For our final Workshop Day job, we fitted an extractor fan in the finishing room to keep the smell of oil finishes out of the workshop



However, it did create quite a draught when it wasn't running, so we fit a sealed cowl over it when it's not in use

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BY PETER PARFITT

Building a cyclone kit

Cyclones for the small workshop have been available in the US for some time, but not in the UK. Cyclone Central is the first manufacturer to offer reasonably priced cyclone kits for the UK and European markets. Here's what's involved in putting one together

I've been using a 'dustbin lid' separator with my workshop extractor for several years, but it was pretty inefficient as I still had to empty the extractor and replace the filters regularly. I looked in envy at the US market, where cyclones are widely available for the hobby user or the small-to-medium workshop. I had even considered building a cyclone from scratch, as Keith Smith did in the magazine back in January 2009. Then, out of the blue, Cyclone Central contacted me and asked me to try out their new 100mm cyclone kit. How could I refuse?

Why use a cyclone?

Extractor filters and bags are expensive, and the fewer harmful particles getting through to the extractor the better. My Numatic NVD750 extractor is a lovely machine, but it has a very limited tank capacity. This makes it unsuitable for use with a planing machine, despite being perfect in every other way.

How it works

A cyclone fits between the dust-producing machine and the extractor, as you can see in the main photo. It sits on top of a 'drop box' where dust and shavings are gathered. As air is sucked into the cyclone, the debris, travelling at speed, hits the inside conical wall of the cyclone. Gravity makes the particles fall, but as the diameter of the cone reduces they speed up and everything remains forced against the inner surface of the cyclone – just like a fairground ride.

Meanwhile the air, free of debris, is sucked out of the central outlet pipe and into the extractor. The dust and shavings fall into the drop box; this greatly extends the life of the extractor filter and bag, which saves you money as well as the time you used to spend emptying it!

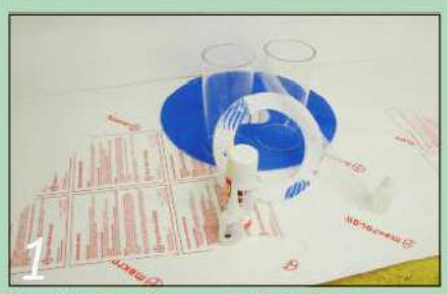
What's in the kit

The kit includes all of the components needed to build the cyclone, **photo 1**, plus two types of glue. The two-part adhesive is only for sticking the two opposing edges of the cyclone body together using the joining strip. The one-part adhesive is used for everything else. The cyclone parts have been accurately cut to size and shape on a CNC machine.

There were no written instructions with the kit, but they're available for download from the Cyclone Central website (see overleaf).

Assembling the main body

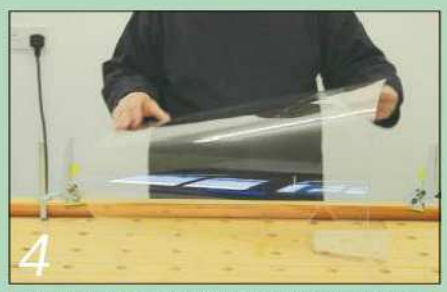
The first task is to glue the joining strip along one edge of the cyclone body,



The kit includes the cyclone body, the foot, the lid and two tubes of special adhesive

The joining strip supplied with the kit is first attached to one side of the cyclone body

I found it helped to trap one edge of the cyclone body under a broomstick...

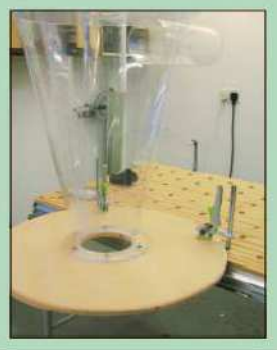


...and found that this 'third hand' made bringing the edges together a much simpler job

The top tube had to project through the lid by 40mm

The inverted cyclone is glued to the lid, and the foot and side tube are added

I cut out and grooved a circle of 19mm thick mdf to form the drop box lid...



...and fitted the cyclone to it with some 6mm nuts and bolts to complete the job

The finished cyclone and lid are fitted to the drop box, ready for testing

photo 2. I used the adhesive component of the two-part glue on the roughened side of the joining strip, and the activator on the surface of the cyclone body. When bringing the parts together the dwell time is a matter of a few seconds, so care was needed.

I inadvertently allowed some excess glue to flow onto the side of the joining strip where the second half of the cyclone body would be fitted in the next stage. I had to use a scraper to remove it so the two edges of the cyclone body would fit together flush.

It's important to practise positioning the other half of the cyclone body where it's to be glued. I found the process much easier by trapping the cyclone body, close to the edge with the joining strip attached, under a broom handle held down on the bench with clamps, **photo 3**. After a practice, I was confident enough to go ahead, **photo 4**, and wondered why I'd made so much fuss!

The lid and top tube

I then inserted one of the tubes through the cyclone lid. The top of the tube had to stick out 40mm above the lid, but the fact that it was a tight fit made it very easy to position. I glued the tube in place using the one-part adhesive, **photo 5**.

Next, with the lid supported upside down, I checked that the top edge of the cyclone body would fit into the groove on the underside of the lid. I then glued the two pieces together, **photo 6**, making sure that there were no gaps in the glue line. The one-part adhesive cures in about four minutes, and needs to be used in a well-ventilated area.

Joining the cyclone body to the foot was simple enough, **photo 6** again. I made sure that I ran a bead of glue along both the upper and lower edges of the joint, as this bears the weight of the cyclone and part of the weight of the attached hoses.

The side inlet tube

There's a pre-cut hole in the wall of the cyclone through which the side inlet tube is inserted. I had to check that the inner end was lined up with the centre of the tube that was already fitted to the top. Gluing had to be carried out in two stages, with the tube held carefully in place during the first stage; see **photo 6** again.

The drop box lid

Finally, I cut a circular lid from 19mm mdf to fit on my drop box. I made a hole slightly larger than the inside diameter of the cyclone base in the centre of the lid. Then I routed a channel in the mdf to take the rim of the dustbin that would be used as a drop box during testing, **photo 7**. The cyclone was connected to the lid with 6mm bolts, washers and lock nuts, **photo 8.**

It took me about two hours to get to this stage. I was now ready to mount it on my dustbin drop box, **photo 9**, connect up the hoses, and put the cyclone to the test. You can read my review on pages 72-73.

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BY COLIN SIMPSON

Starry night

This simple bowl is enhanced by its decorated rim. It's a great project to tackle as a way of improving your skills if you lack experience of off-centre turning. Best of all, you don't need an expensive multi-centred chuck. You don't even need a four-jaw scroll chuck, just a simple faceplate. A light coloured wood is best to accentuate the contrast between the rim and the bowl; I used ash

Decide which face of your blank is to be the top of your bowl, find its centre and screw your faceplate securely to it

Mount the blank on the lathe and true up the base, using a pull cut with a fingernail profile bowl gouge

This is a close-up shot of the pull cut, showing exactly where the shaving should come off the flute of the gouge

True up the edge of the blank with the same gouge, this time using a push cut

You can use the same bevel-supported push cut to start shaping the bottom of the bowl

Start to form a foot for the bowl using a parting tool. It's just under one third of the bowl's diameter and about 3mm deep

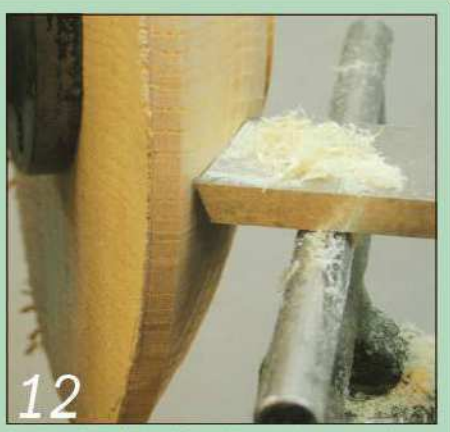
Cut away the waste near the foot with a pull cut. Then finish shaping the bottom of the bowl with a combination of both push and pull cuts

Give the underside of the foot a slightly concave profile so the finished piece will stand flat on the table or shelf surface

Take fine finishing cuts with the bowl gouge, keeping the handle down low and the cutting edge at about 45° to the surface of the wood

You should be aiming to get fine, spiral shavings like these as you make the finishing cuts

Alternatively you can use a square-edged scraper for your finishing cuts



You should still produce fine shavings, not dust, if your scraper's cutting edge is sharp enough

I prefer to power-sand my bowls, starting with 120 grit and working down to 600 grit. Work on the bottom quarter of the bowl, holding the sanding disc between 6 and 9 o'clock

Remove the bowl from the faceplate and attach an mdf disc about 50mm larger in diameter than the faceplate. True up its edge and then cut a recess in its face the same size as of the foot of the bowl

It's important that the foot of the bowl fits the recess tightly. Now cut a shallow taper on the rim of the mdf disc; it should look like this

Mount the bowl in the recess and apply hot-melt glue to the joint. The taper on the mdf disc allows better access for the glue gun

Let the glue cool, then true up the rim of the bowl with the bowl gouge. Make sure you leave a perfect finish on the rim

Scorch the rim evenly with a blowtorch. Make sure your dust extraction is switched off during this process; a hot ember sucked up the extractor's nozzle could prove disastrous!

Use a soft brass wire brush to remove any loose carbon residue from the scorched area. The brush will also pick out the softer, spring growth, enhancing the grain of the wood

With the lathe revolving very slowly, spray the rim of the bowl with ebonising lacquer and allow it to dry. Then remove the faceplate from the lathe and undo all but one of the fixing screws

Loosen the last screw and rotate the faceplate through about 15° (the same as moving it by one hour on a clock face). Tighten the loose screw and drive in the others

Remount the bowl on the lathe and reduce the speed. The whole piece is now considerably out of balance and must be turned much more slowly. Start the hollowing cuts near the centre...

...and work out towards the rim. When you're happy with the profile of the bowl and the width of the rim, power-sand it to a finish. Take great care not to damage the lacquered rim

I use a sharp countersink bit in a power drill to add the stars to the rim. The different sizes are made by drilling to different depths. Cover the whole rim randomly with the stars...

...until you end up with an effect like this. Brush off any wood dust and apply several coats of oil to finish the job

A couple of gentle taps from behind are normally enough to break the hot glue joint and release the bowl. If it's stubborn, remove the piece from the faceplate and microwave it for 30 seconds on low heat. This should soften the glue enough for you to remove the bowl from the mdf

Clean up and oil the underside of the bowl by hand. Then you can stand back and admire your latest masterpiece!

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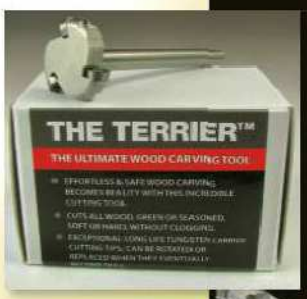
Having spent over twenty years using carving tools to create Bonsai, Graham Potter the owner of Kaizen Bonsai then spent two years researching and developing his own tools after experiences with other tools which were just ok, reasonable or even dangerous!

His idea was to make a tool that was versatile for working both large and small projects. The cut rate needed to be exceptional but with a very long cutting tip life and above all the tool needed to be safe.

And so Terrier™ and Little Terrier™ where born!

Their **Terrier™** and **Little Terrier™** ranges are receiving much acclaim the world over being CNC machined from 3032 high carbon stainless steel from a solid Billet with tips which are replaceable. They are created from polished Tungsten carbide which allows a much faster cutting rate, a shortened loading time and an enhanced lifetime of the tools themselves *(which are not to be confused with cheaper less effective imitations that are made in parts).*



Behind the cutting edge of both the **Terrier™** and **Little Terrier™** is a groove which serves to present it at a positive rake to the project making it a faster and cleaner cut. Conveniently, once the cutting face becomes dull, you simply loosen the retaining screw and rotate the tip to a sharper new section. It is reckoned by the manufacturer that the tip should last for a continuous 20 hour drilling session, so these pieces really are at the cutting edge!

The 27g **Terrier™** is the larger of the two Overall with a length of just 65mm and designed with a 1/4″(6.35mm) shaft primarily for the tools safety. This allows use in an array of die grinders and flexible shaft machines. It really does remove wood effortlessly and cleanly and its 25mm head removes wood effieciently at higher speeds A chip limiter prevents the tool from 'digging in' to the work.

Unlike some larger tools the **Terrier™** has a responsive cutting action that is very pressure sensitive. A light action by the user produces a fast delicate cut but with a little more pressure the tool bites harder without fear of it 'grabbing' or kicking back like some other tools.

For more confined areas the 15mm **Little Terrier™** which weighs just 23g just seems to get in anywhere with much greater control and is a solid and robust as its brother and delivers an equally clean job. It's not difficult to see why this tenacious, robust piece of kit which works well at both high and low speeds gets its name!

Both cutters work well at most speeds but the manufacturers recommend best results are achieved at between 1500 & 2000 rpm.

Economically priced at just £44.95 inc VAT and p&p, the Little Terrier™ is a great little investment which should, when used correctly last a good few years and its big brother the Terrier™ at just £54.95 inc VAT and p&p represents equally good value.

Replacement cutting tips and screws are available separately.

All can be purchased from:

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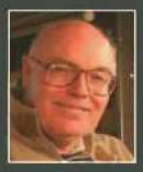
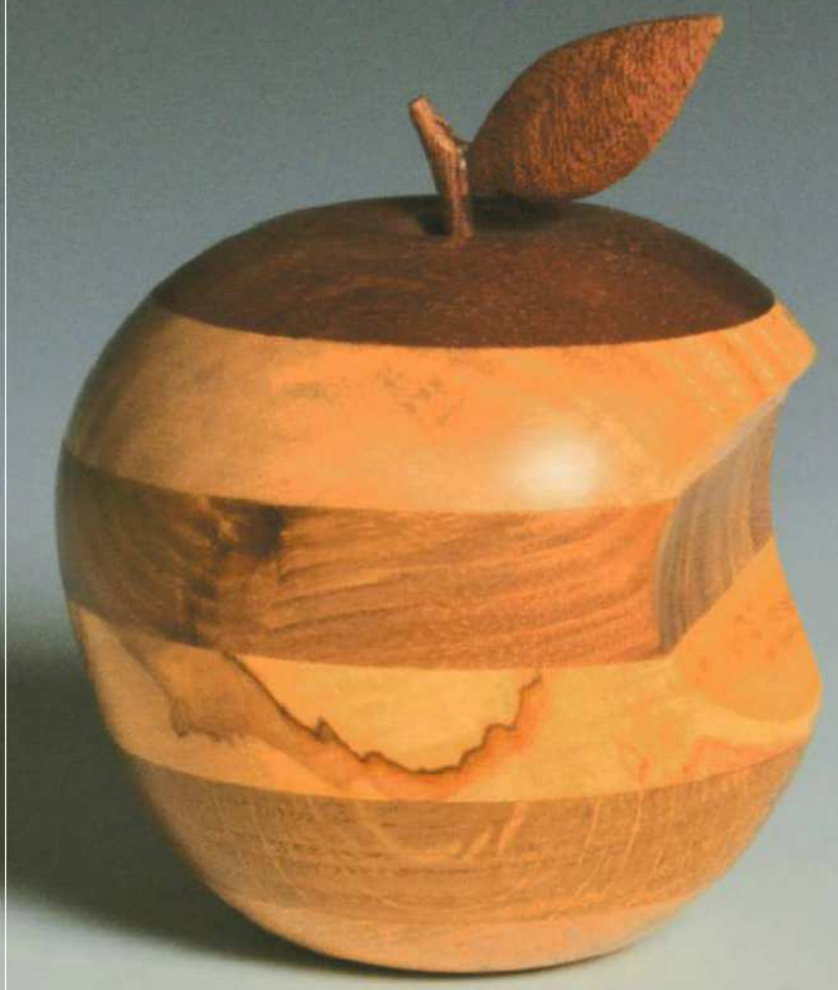


BY BOB CHAPMAN

Forbidden fruit

After I made the apple box which appeared in the January 2012 issue of *The Woodworker*, editor Mike Lawrence suggested I might try to translate the logo on his computer into a three-dimensional model. So I did...

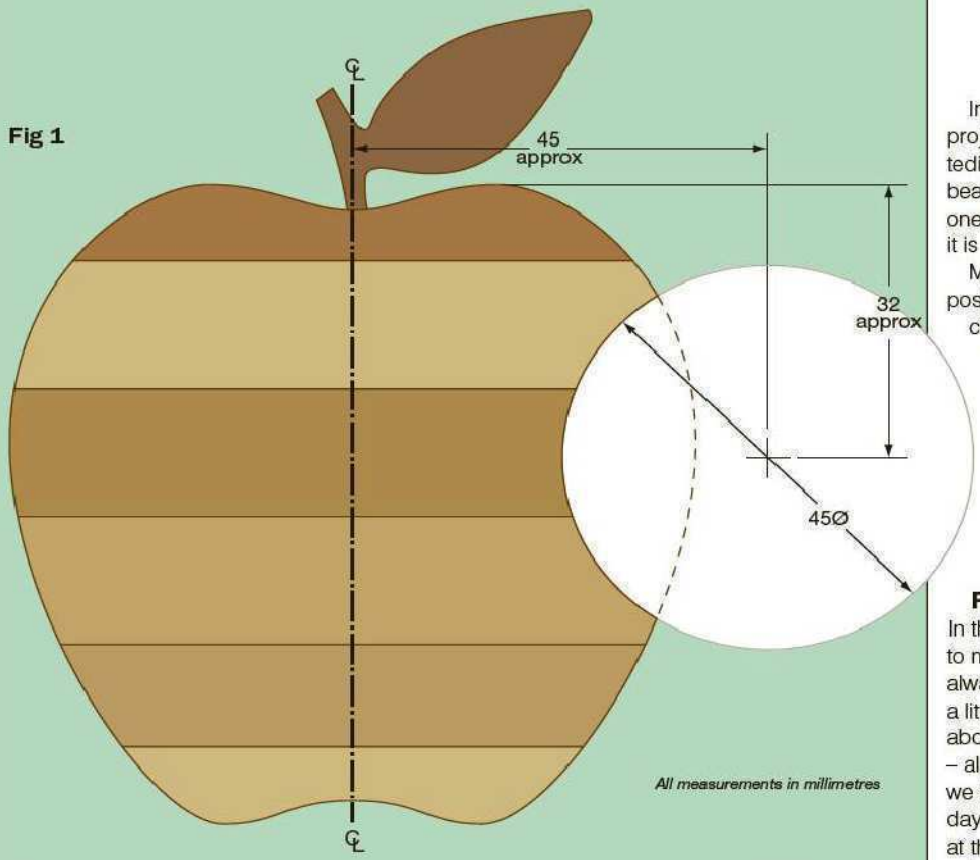


Mike had in mind the version featuring six coloured layers, and he suggested using a different timber for each one. The idea was to explore the problems involved in turning a small laminated blank and in creating an off-centre hole passing through its surface. It looked like an interesting challenge...

Measuring up

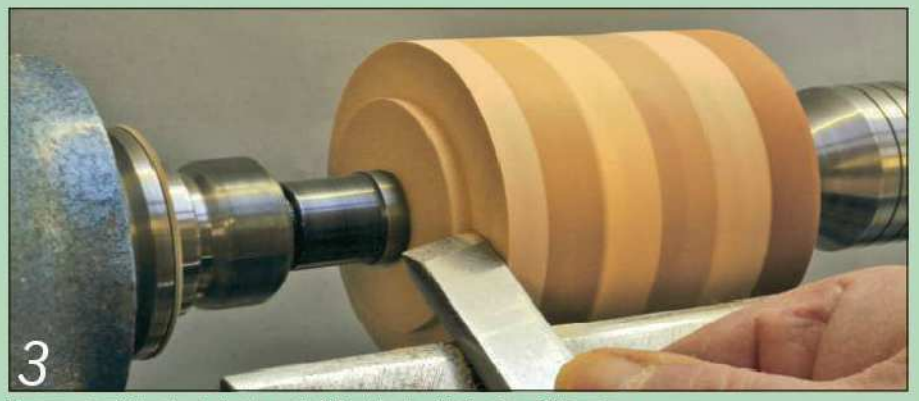
The first problem with a project of this nature is to work out the relative dimensions of the thing you're trying to make. I was pleased to find that the height and width of the logo were approximately equal. This meant I could stick to the dimensions I usually use when making examples of this particular fruit – approximately 75mm high and 75mm in diameter.

Fig 1



Glue the six slices together with PVA adhesive and clamp them together until it's set

Hold the block firmly while drilling the bite using a Forstner bit in a drill press



Form a dovetail spigot at one end of the blank with the toe of the skew

In fact all the dimensions given for this project are very approximate. To avoid tedium I won't go on repeating this, but bear it in mind if you have a go at making one. The bottom line is that if it looks right, it is right!

My next job was to work out the size and position of the 'bite', **fig 1**, which involved a certain amount of trial and error. Note that it's actually cylindrical rather than hemispherical. The leaf presented a special problem, because it floats above the logo. This is fine on paper, but my solid wooden leaf simply refused to float, and so I had to invent a stalk to support it. It's called artistic licence!

Preparing the slices

In theory you need six layers 12.5mm thick to make up a blank 75mm high. However, I always like to allow for wastage, so I added a little to this and cut a number of slices about 15mm thick from six different timbers – all taken from those smallish scraps that we keep because they'll come in handy one day. Can you identify them? The answer is at the foot of page 66.

I reckoned that, after planing the slices flat on both sides, I'd have reduced their thickness down to the right size. Well, it didn't work out quite like that, and most of the layers were still pretty close to 15mm thick when I'd finished. The exceptions to this were the top and bottom layers; their thicknesses were reduced during the turning and shaping process. Surprisingly, the overall height of the apple did finish up at about 75mm and, even more surprisingly, the top and bottom layers didn't look noticeably thinner than the others.

After planing them smooth, I glued the layers together with PVA adhesive and clamped them securely until the glue had set, **photo 1**. Assuming that this would make the blank more stable, I set the grain of each layer at 90° to its neighbours, rather like the layers in plywood.

Creating the bite

Drilling a hole through a shaped piece of wood is extremely difficult to do; instead the hole for the bite must be drilled while the blank still has flat sides. As you can see from **fig 1**, the bite is cylindrical and has a diameter of about 45mm – the ideal job for a Forstner sawtooth cutter in a drill press.

The centre of the hole is actually outside the block, but by holding it firmly it was possible to drill the bite without difficulty. In **photo 2** the clamp around the block isn't holding it together – the glue is set – but I

thought the blank might be difficult to hold and that the clamp would provide a better grip. In fact it proved unnecessary.

Turning the blank

I mounted the blank between centres and turned it to round with a spindle roughing gouge, before using a skew chisel to form a dovetail spigot on what will become the narrow end of the apple, **photo 3**.

The halfway point of the apple is obviously between the third and fourth layers, but the fattest part of an apple is a little above halfway and I marked this on the blank in pencil, **photo 4**. I then shaped the top of the apple with a 13mm bowl gouge, **photo 5**, before smoothing it to round with a 'scraper', **photo 6**. The tool in this case is actually a skew chisel. I often use one as a scraper; it does the job wonderfully well.

Shaping one end

Next, I drilled a 3mm hole in the end of the apple to the full depth of the bit, **photo 7.** The indentation left by the live centre makes a perfect lead-in for the bit. I used the skew as a scraper again here, its long point forming the deep recess where the stalk will enter the apple, **photo 8**. Then I used it to round over the edge of the recess, blending it into a smooth curve with the rest of the apple, **photo 9**. Finally I sanded this end of the apple with 120, 180, 240 and 400 grit papers before removing it from the chuck.

Turn and turn about

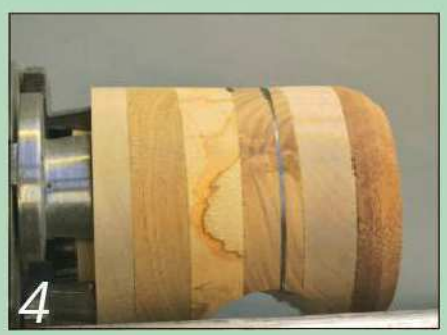
Holding the apple to finish the other end requires a simple home-made screw chuck, **photo 10**, and it's to accommodate this screw that I drilled such a deep hole in **photo 7**. The apple must be screwed up tight against the backing plate of the chuck to prevent it wobbling when the lathe is started, **photo 11**.

I used the bowl gouge and skew again to shape this end of the apple in the same way as the other end. The hole in this end is also drilled to the full depth of the drill bit so the apple can be reversed on the screw if you need to re-sand the 'fat end' later to blend the curves together better. The recess in this end doesn't need to be as deep as the one at the other end, **photo 12**.

Sanding with care

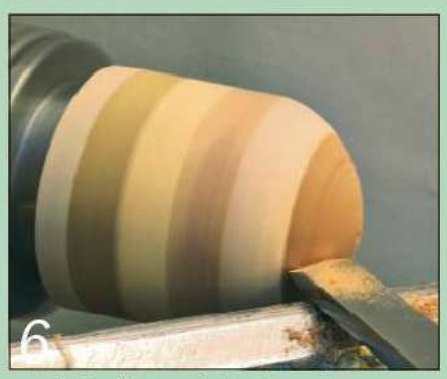
With the lathe off, sand the inside of the bite to a smooth surface and soften its edges slightly, working down through the grits from 120 to 400, **photo 13**.

When using several different species in the same piece, there's always the risk that dust from the darker woods will get stuck in



Mark the largest diameter of the apple at a point just above the centre line

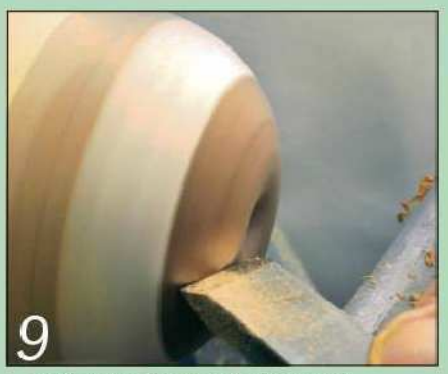
Remove the bulk of wood from the top of the blank with a bowl gouge...



...and refine the rounded surface using a skew chisel as a scraper

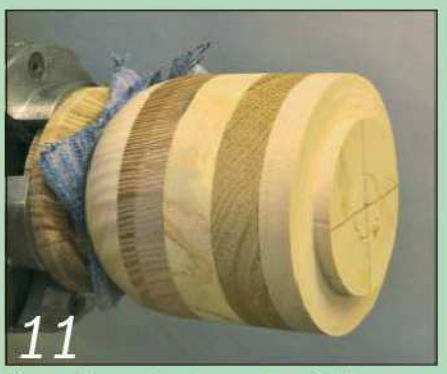
Drill a 3mm diameter hole deep enough to take the screw chuck

Form the recess where the stalk will go using the toe of the skew chisel...

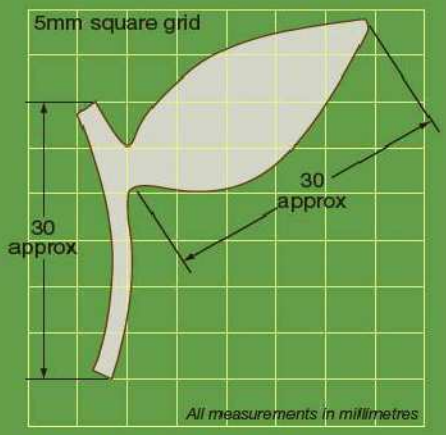


...and then use the same tool to round over the edges of the recess

Pad the screw chuck's backing plate with a clean rag to avoid bruising the wood



Reverse the apple and screw it on tightly so it fits against the backing plate



CREATING THE LEAF

I used the bandsaw to cut a mahogany slice about 3mm thick and sketched the shape of the leaf and its supporting stalk on it. To help get an appropriate size for the leaf, I propped the slice up behind the apple for comparison, **photo A**. I then cut out the leaf and the stalk carefully on the bandsaw, **photo B**. A scrollsaw would have been safer when working this close to the blade, but unfortunately I don't have one.

Once I'd cut the outline, I shaped the leaf with a craft knife and abrasive paper to round over the corners and thin it down towards the edges. There's very short grain where the leaf meets the stalk, and it's very easily broken at this point. A drop of superglue will repair the damage – well, it did in my case anyway! When you're happy with the shape, seal and wax the leaf and glue it in place, **photo C**. Stick a clove into the hole in the other end, and you're done.

A

Check the proportions of the leaf and stalk against the apple

B

Take great care if you're cutting out the leaf on a bandsaw

C

Shape the leaf and glue it into the top of the apple

12

Sand the whole surface smooth and blend the edges of the layers together

13

Stop the lathe and sand the bite, softening its edges slightly

14

Take care to get rid of the dust from the different timbers by blowing or brushing it away

15

Seal each slice of the apple in turn to avoid transferring its colour to its neighbours

the grain of the paler ones and vice-versa, making them all look a bit grubby. This cross-contamination can be difficult to correct at a later stage, so take time now to remove it. I use compressed air to blow the dust out of the grain, **photo 14**, but if you don't have a compressor then you can use a soft brush and work carefully over each layer in turn.

Sealing and polishing

I use cellulose sanding sealer, and I've found that the solvent in it can sometimes absorb the colour from dark woods. If this happens, the colour could be accidentally spread onto adjacent pale layers, and is impossible to remove without extensive re-sanding.

I now approach mixed timbers with caution, and I took great care in this instance to apply sealer carefully to each layer separately, **photo 15**, using a narrow brush and avoiding sideways movement from one layer to the next. Once the first coat has dried, a second coat of sealer can be added over the whole surface. Wipe off any excess sealer with a paper towel, and polish up the finished apple on a buffing wheel. All that remains now is to add the leaf (*see panel, left*).

* The six woods used are mahogany (top), sycamore, ash, horse chestnut, oak and holly

BY ROD TALLACK

A new dimension

This article is about an unusual technique called stave jointing, which can be used by anyone interested in making bowls or shallow platters with added interest and without the usual waste. It's related in a roundabout way to the use of shaped staves for making barrels: hence the name

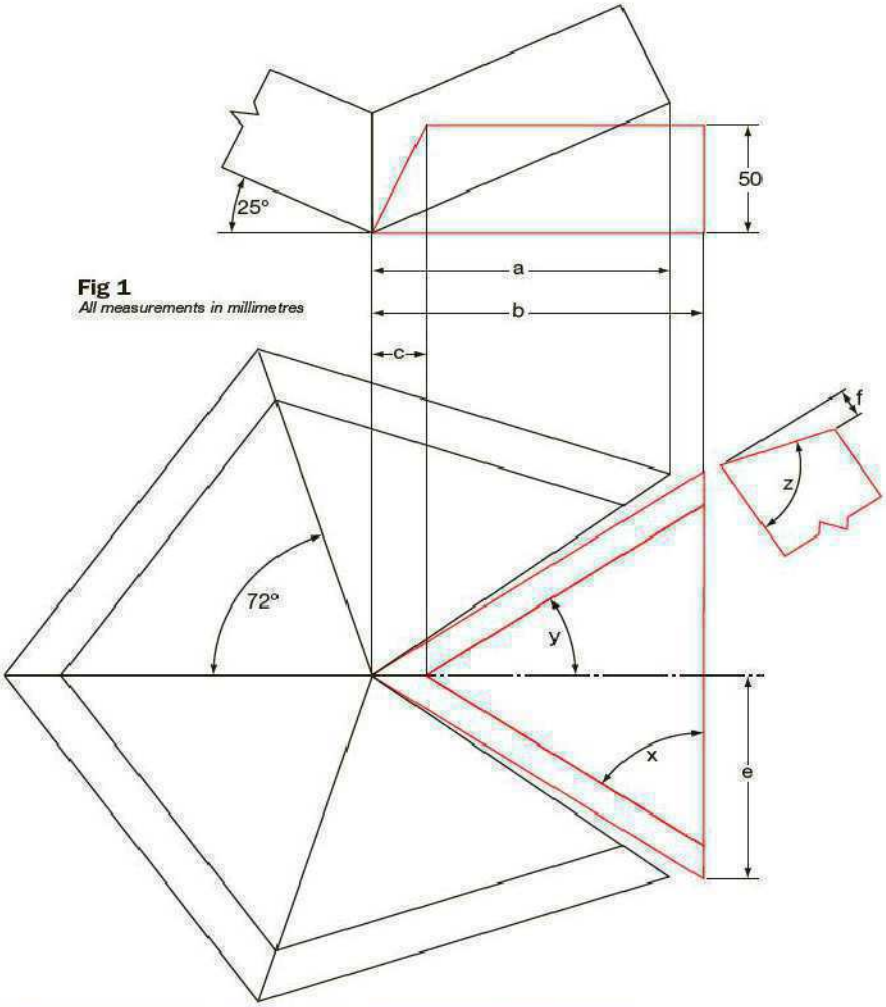


Fig 1
All measurements in millimetres

My interest in stave jointing started by chance, when my brother-in-law gave me three pieces of iroko measuring about 900 x 15 x 32mm which he found during a workshop clear-out.

To begin with I couldn't envisage an interesting project to attempt using this donation, even if the pieces were cut into short lengths and laminated together as a block. Then a thought occurred to me. Perhaps I could cut six lengths about 180mm long and taper each one from the 115mm down to 30mm. I could then calculate and cut the compound angles and glue them all together as a hexagonal pyramid which I could turn on the lathe.

First experiments

The end result of this first attempt is shown in **photos 1** and **2**. The vase stands 260mm high, with a maximum diameter of 150mm, and is made up from six lengths for the bowl, two pieces for the stem, and a single piece for the base.

Iroko is a rather featureless timber, so for my next endeavour I glued six thin pieces of beech between the pieces of iroko to make the bowl. The effect was quite good, but when I assembled it I found that I hadn't centred the beech segments correctly and the symmetry had been lost, **photo 3**, so the exercise was scrapped.

Try and try again

One learns by one's mistakes, and my next project was a great deal more successful, **photos 4** and **5**. The iroko is interleaved

1
My first attempt at stave jointing, viewed from the side...

2
...and from above. The stem is inset into the base of the bowl

3
My next attempt suffered from incorrectly centred segments, so I scrapped it!

4
Things definitely improved with practice, as this bowl proves

5
As the top view reveals, it's made from iroko interleaved with maple on a maple stem

I used elm and sapele to make up this unusual square bowl...

DOING THE TRIG

BASIC CONSTANTS

r = radius of circle = 160mm
t = thickness of material = 50mm
v = 180° ÷ 5 (no of polygon sides) = 36°
w = elevation angle of polygon = 25°

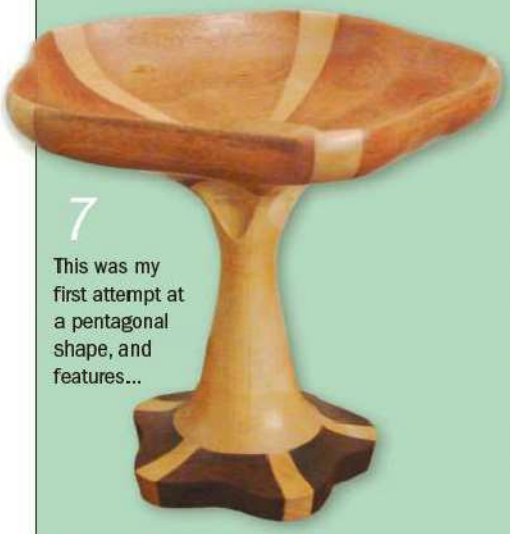
PENTAGON DIMENSIONS

Calculation	Result
a = r x cos v	160 x cos 36° = 129.44mm
b = a ÷ cos w	129.44 ÷ cos 25° = 142.82mm
c = t x tan w	50 x tan 25° = 23.32mm
e = r x sin v	160 x sin 36° = 94.05mm
f = c x sin y	23.32 x sin 33.37° = 12.83mm

PENTAGON ANGLES

Calculation	Result
$x = \tan^{-1}(b \div e)$	$\tan^{-1}(142.82 \div 94.05) = 56.63°$
y = 90° - x	90 - 56.63 = 33.37°
$z = \tan^{-1}(t \div f)$	$\tan^{-1}(50 \div 12.83) = 75.62°$

The stave cutting angle shown in **fig 1** is 56.63° and the edge mitre angle is 75.62°



This was my first attempt at a pentagonal shape, and features...

...contrasting wood species in the body of the bowl as well as on the base

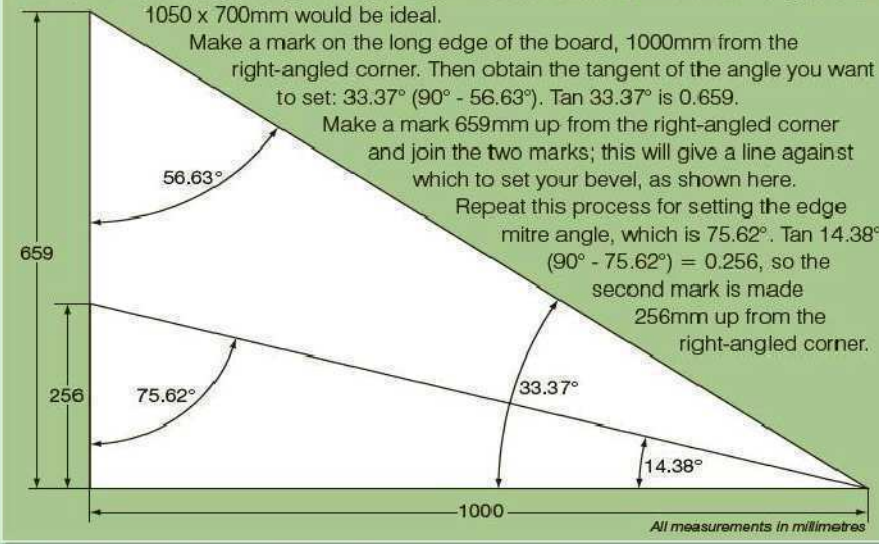
SETTING A SLIDING BEVEL

You obviously can't use a standard protractor to set a sliding bevel to an angle that has been calculated to two decimal places, but there is another way. You'll need a large flat surface with two straight edges at right angles to each other. A board measuring at least 1050 x 700mm would be ideal.

Make a mark on the long edge of the board, 1000mm from the right-angled corner. Then obtain the tangent of the angle you want to set: 33.37° (90° - 56.63°). Tan 33.37° is 0.659.

Make a mark 659mm up from the right-angled corner and join the two marks; this will give a line against which to set your bevel, as shown here.

Repeat this process for setting the edge mitre angle, which is 75.62°. Tan 14.38° (90° - 75.62°) = 0.256, so the second mark is made 256mm up from the right-angled corner.



with maple to make the bowl, which is on a maple stem and base.

A couple of other bowls followed. One is a combination of elm and sapele in a square shape, **photo 6**. The other combines sapele with maple, **photos 7** and **8**. I was rather pleased with them both!

Working it all out

I thought I ought to try writing down what I'd been doing so others could benefit from trying this unusual technique. Being quite long in the tooth, I first had to re-learn some simple projective geometry techniques (see **fig 1**), and also to refresh my memory with some basic O-level trigonometry.

I therefore decided that I'd photograph the next piece I made, and document it with all the relevant information the traditional bowl turner would need.

Doing the drawing

I decided to make a pentagon blank with the edges raised at 25° from the horizontal, thereby producing a pentagonal pyramid – see **fig 1** again.

I selected a radius of 160mm as a convenient size for my drawing board, and constructed the pentagon based on this. The radius dimension isn't important, as the object of the exercise is to determine the required angles at which to cut each segment. It's possible to take the two angles directly from the drawing, but in practice this is unlikely to be accurate enough. Hence the need for some basic trigonometry (and a helping hand from a calculator with the relevant functions).

Remember trigonometry?

In **fig 1** the black lines show a plan view of the assembled pentagon with the edges raised to 25°. The red lines show one element of the pentagon rotated down to the horizontal, and it's from this view the necessary cutting angles are obtained.

One problem with this task is cumulative error. There are five joints on this example, with ten cut faces, and any error with the angles will therefore be multiplied by ten. That's why the calculations in the **Doing the trig** panel above are to two decimal places.

Getting under way

Start by cutting three 150mm lengths of oak, then cut each in half to make six pieces measuring 150 x 110 x 50mm. Take five of the pieces, **photo 9**, and cut them on the diagonal, **photo 10**. Reverse one half of each pair, plane the edges and glue them together to form an equilateral triangle. After the glue has dried, plane the faces and

ends of each piece flat as these will be the register faces for the angle and mitre cuts.

You can now draw the final dimensions for this exercise on the bottom face of a piece, using the calculated angles from the red triangle in **fig 1**; these determine the final size of the triangles.

Cutting time

You can now set your saw to the required angles and cut the staves to size. See the panel on page 70 to find out how to set your sliding bevel accurately. In this example the table is set to 75.6° and the fence to 56.6° for the first cut, **photo 11**, with the base of the stave against the fence. The fence is then reset to 180 - (2 x 56.6) = 66.8° for the second cut, **photo 12**, using the first cut face as the register against the fence. If all the resulting sawn faces are really true, you can now glue the five triangular pieces together to make the pentagonal pyramid.

Photo 13 shows the underside of the assembled pyramid. Sacrificial softwood wedges have been glued to the inner faces, ready to take the faceplate for turning the bottom of the bowl.

Photo 14 shows the pentagon from above. As can be seen, this assembly has been carefully taken to a point. With previous exercises this wasn't so, which is why a separate base and stem were needed. Where the stem penetrated to the inside of the bowl it was made into a feature (see **photos 2**, **5** and **8** again).

Turning time

After mounting the blank on the lathe, make the first cuts to establish the size and outer profile of the bowl, **photo 15**, before starting to refine the shape of the exterior, **photo 16**. When the shape is completed and ready for finishing, re-mount the piece so you can turn the inside face. As can be seen in **photo 17** the wedges have been removed, and in **photo 18** some initial shaping cuts have been made.

When the turning is completed, give the bowl three coats of sanding sealer, rubbed down between coats, and then finish it with several of applications of a propriety wax.

Variations on a theme

This five-piece stave jointing example is not really suitable for traditional turning unless the segments are laid flatter – say at about 15°, say, rather than the 25° of this exercise. However, by increasing the number of segments to eight, the traditional turner would have plenty of thickness to work with... but the greater the accumulative error could be on the angles!

9 The starting point was a pile of five Japanese oak offcuts measuring 150 x 110 x 50mm...

10 ...which were cut in half along the diagonal and then glued together to form equilateral triangles

11 The base of the glued-up triangle acts as the register for the first cut

12 The second cut is made using the first cut as the register

13 Softwood wedges inside the pentagon will support the faceplate

14 The outside of the pentagon has been taken carefully to a point

15 Make the first shaping cuts to establish the overall size and the outer profile of the bowl

16 Then make further cuts to start refining the shape of the exterior

17 Remount the piece and remove the sacrificial wedges so you can turn the interior to shape

18 The internal shape is established slowly, working level by level. See page 69 for the finished bowl

On pages 53-54 I described the assembly of the new 100mm cyclone kit from Cyclone Central. *Once it was completed, I set it up in my workshop so I could see how it performed. Here's my report*

Cyclone Central 100mm cyclone kit

My old 'dustbin lid' separator has never been very satisfactory, despite the efficiency of my trusty Numatic NVD 750 extractor. I'd wished for a long time that an inexpensive cyclone for the small workshop market were available here in the UK. Now Cyclone Central is offering cyclone kits in various sizes.

The first test

In the initial tests I held my drop box lid on with an elastic bungee rope. Before doing any tests I thoroughly cleaned the extractor, dumping the contents on the workshop floor, and put in a brand new filter. The cyclone was connected up with standard 100mm extraction hose, secured with large clips.

I switched the extractor on and started by collecting the dust and shavings from the floor. There was a considerable improvement in the suction compared to my 'dustbin lid' separator. I continued testing the cyclone for a typical workshop day with jobs consisting mainly of sawing and planing, and had a bin full of debris at the end.

The drop box

I'd bought a large blue plastic disinfectant container from a local farmer for use as the drop box. The sides of the container were so thick that it would take my weight without bending. However, I decided to use an old dustbin instead, as it was easy to carry to the compost heap. Any airtight container can be used for the drop box, so long as it doesn't collapse when the vacuum is applied.

I had to modify the original mdf lid slightly in size to fit the dustbin. I then sealed it with polyurethane varnish before applying a coat of melamine paint. I did a further test and decided that the bungee rope wasn't required. It would be possible to put some foam draught excluder into the groove if the seal began to fail.

A pressure relief valve

I'd read accounts on the internet of home-made cyclones collapsing if the inlet gets blocked. In the Cyclone Central instructions they give advice about pressure relief valves.

I did some experiments and designed several variants of valve, all of which were made from bits lying around the workshop and took very little time to produce.

I started by cutting a 40mm diameter hole in the

I originally planned to fit the cyclone to this large blue disinfectant container...

...but ended up using an old dustbin as it proved easier to carry out when full

The completed lid is fitted with an improvised pressure relief valve

TESTED BY PETER PARFITT

drop box lid. Into this I inserted a 40mm plastic access plug used by plumbers. This made the hole tidier, and gave me the ability to close it off completely if my idea failed.

My first design used a pair of elastic bands to hold a flat disc in place on the inside of the drop box lid. I found that pressure would drop gradually as the vacuum increased, which was not ideal. I rejected using springs instead of the elastic, as they would behave no better.

The design that I favour uses a small magnet to hold a tin lid in place. When the vacuum increases above a certain level, the magnetic bond is broken and the lid falls to one side. This is a better method as there is no gradual drop in vacuum prior to the valve opening. The lid is retained by a spring on the underside of the drop box lid (it could be a piece of string) to stop it dropping into the shavings below.

I've now used the setup for several weeks and it works as it should. I can stress the system enough for the concertina hoses to shorten, but the tin lid remains in place. When I completely close off the inlet, the relief valve opens.

How effective is the cyclone?

I've now emptied the dustbin five times, but when I inspected the Numatic bin and filter there weren't enough chips in the bin to put on a dessert spoon. The filter is slightly discoloured, but remains perfectly serviceable.

I've noticed that, during the testing of my relief valve, some small amounts of chippings have got through. This occurs when the relief valve is open and part of the airflow comes through the drop box. Therefore, in normal operation the results should be even better.

Summing up

I've tested only the 100mm cyclone, but I have no doubt that the other sizes from Cyclone Central are up to the same high standard. I had contemplated making a cyclone from scratch, but the sourcing of suitable materials, the difficulty of making accurate cuts in plastic and the chance of failure were all too real. Also, I couldn't afford to waste a week or more doing a complete R&D effort for one workshop item.

If I hadn't been invited to do this test, I'd have made sure that one of these kits was on my birthday wish list. The clear step-by-step instructions made assembly straightforward. The cyclone performed exactly as expected, with almost nothing getting through to the extractor. With no obvious competitor on the UK market, this kit gets full marks from me for value for money.

SPECIFICATION

HEIGHT	600mm
INLET/OUTLET CONNECTIONS	100mm diameter
BUILD TIME	2 hours
TOOLS REQUIRED	none

VERDICT

I'm delighted that I now have an efficient cyclone which allows me to get the most out of my workshop extractor.

PROS
- Inexpensive
- Quick to assemble
- Tool-free assembly
- Efficient and robust

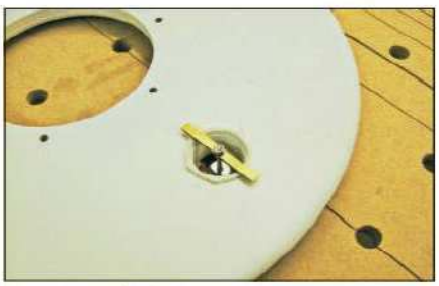
CONS
- Potentially tricky mating of cone edges

VALUE FOR MONEY ■■■■■
PERFORMANCE ■■■■■
EASE OF BUILD ■■■■■

FURTHER INFORMATION

- Cyclone Central
- info@cyclonecentral.co.uk
- www.cyclonecentral.co.uk

The first test involved sucking up the contents of my extractor from the workshop floor



The valve consists of a magnet suspended within the opening...

...which retains the tin lid closure on the underside of the valve

After testing, the extractor is empty and the filter barely discoloured

Mini bandsaws like this Jet JWBS-9 have often had a bit of a bad press, which is a shame because they can usually be tuned to produce good results. *If you're on a tight budget, they're an excellent introduction to the world of bandsawing*

Jet JWBS-9 bandsaw

£156

The JWBS-9 is a classically styled two-wheeled machine. The main frame is die-cast, but has plenty of ribbing to provide additional strength. The hinged front cover is plastic. A neat micro-switch on the door shuts off the power if it is opened, and this is actually a lot more positive than the interlocks I've seen on some much more expensive machines!

I was surprised at how quietly the induction motor ran. It drives the bottom wheel via a small pulley and a toothed belt. The motor hinges down to apply more tension to the belt if necessary.

Table and fence

The table is another aluminium casting. It felt rather rough and needed a good polish with some lubricating wax to make it smooth enough for work to slide easily across it. At 300mm square it's plenty big enough for the sort of work you'll be carrying out on it, and the rather crude tilting mechanism allows you to angle it to 45°.

The rip fence is as good as you get at this level and locks front and back, though precise positioning can be a little tricky if you want to move it just a fraction. A mitre guide is also provided, but there's so much play in the slide that it would be useless for anything other than approximate angles. However, this isn't the machine for that sort of job anyway.

One neat feature is the adjustable worklight mounted on the back of the machine, but sadly this illuminates only when you switch the machine on. It would have been far better fitted with an independent on/off switch.

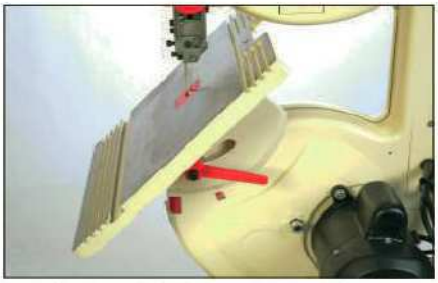
Controls and guides

The blade controls are all as you would expect, with a rather flimsy looking tension knob on the top which had me worrying about stripping the thread. However, a quick spray with silicone lubricant soon eased the situation.

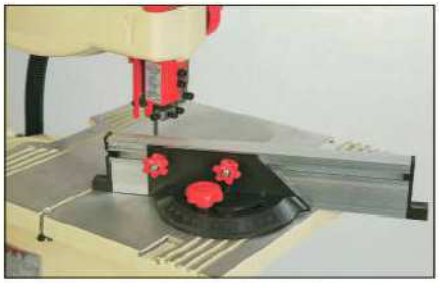
The tracking control on the back required similar treatment, and operated much more effectively once I'd worked out that you also need to slacken off the locking nut first!

The top guide is located behind an excellent guard system, but the actual guides themselves require some careful setting with their fiddly little Allen screws. There's a similar system below the table as

The flimsy-looking drive mechanism performed perfectly, even on deep cuts



A relatively crude tilting mechanism lets you angle the table at up to 45°



The fence is fine, but the mitre guide is only any use for setting approximate angles

The top guide is located behind an excellent guard, but needs some adjusting

TESTED BY ALAN HOLTHAM

well, but once set they seem to perform well. The rack-and-pinion rise-and-fall mechanism makes it quick and easy to adjust for depth of cut.

First the bad news...

The blade is the Achilles heel of all these budget machines. For years, manufacturers have been fitting really cheap and nasty blades, and there must be a lot of disappointed users out there whose machines are actually far better performers than their blades would suggest.

However, I'm pleased to see that the Jet now comes with a note that says the blade is fitted for 'transit purposes only' (whatever that means) and recommends that you fit a better-quality one. All we need to do now is get the suppliers to fit a decent one in the first place, and we've cracked it!

Changing the blade

The standard blade supplied on this machine laboured to cut even 20mm along the timber, and by then it was already about 3mm out of line: it was totally useless! Fortunately I'd also been supplied with some Axminster Axcalibur blades, so I fitted a ¼in x 10 tpi one in its place. By comparison the results were amazing. The machine whistled through the wood in seconds and kept perfectly true to the rip fence.

To test this further I tried a veneer cut in 75mm thick material, cutting right against the rip fence. This produced a wafer-thin and consistent veneer over the full length with ease. This was so much better than I'd have thought possible; it was hugely impressive for such a small machine.

Subsequent cuts were all as good, and I was having so much fun that I spent some time producing turning blanks – normally a job reserved for my Startrite 401!

Summing up

This is a super little machine for the occasional woodworker. The build quality is a bit flimsy in places, but at this price what do you expect? Dump the standard blade in favour of a decent one, and you'll transform it into a real little workhorse provided you don't need massive cutting capacity.

SPECIFICATION

MOTOR	350W
TABLE SIZE	300 x 300mm
TABLE TILT	0 to 45°
BLADE LENGTH	1510mm
BLADE WIDTHS	3 to 10mm
CUTTING SPEED	11m/sec
THROAT	230mm
MAX DEPTH OF CUT	80mm
DUST EXTRACT OUTLET	50mm
WEIGHT	17kg

ACCESSORIES SUPPLIED rip and mitre fences, work light, 6mm blade

VERDICT

This is very much a hobby-class bandsaw, but so long as you work within its limits you won't be disappointed.

PROS
- Cheap as chips!
- Surprisingly good performance...

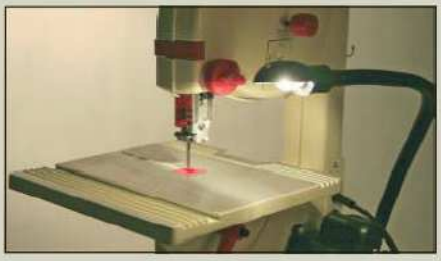
CONS
- ...so long as you change the blade!
- Needs some fiddly adjustments

VALUE FOR MONEY

PERFORMANCE

FURTHER INFORMATION

- Axminster Tool Centre
- 0800 371822
- www.axminster.co.uk



The useful 12V worklight is activated only when the machine is switched on

Replacing the supplied blade worked miracles; the original one made the cut alongside

The new blade produced a wafer-thin veneer with ease from 75mm thick material

It was even capable of cutting turning blanks – normally a job for a bigger machine

Not so long ago mitre saws – especially the sliding type – were quite hard to find. Now there's a wide choice, *with Axminster's catalogue listing several. It's an Axminster own-brand model and one of their stands (see overleaf) which have recently been under my magnifying glass*

Axminster AWSMS102 sliding mitre saw

£179.50

The saw's construction consists mostly of alloy castings and extrusions. A large knob at the front of the table enables it to be rotated as required, and a button to the rear of the fence secures it in place. There are stops at the main angles, and a protractor scale on the front of the base casting with an adjustable pointer on the edge of the turntable. The table and the base together provide 500mm of support for material being sawn, and there are outrigger supports which extend this to 1000mm. .

Fence features

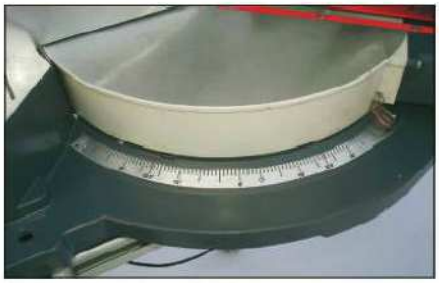
The fence is fixed, with the right-hand half having a length scale embossed in the face. While this is a useful feature, it is inevitably limited in length and therefore has restricted use. A work cramp is included; this will locate on either side of the fence, and is especially useful when bevel cuts are being made. Without a cramp, such cuts have a tendency to push the wood slightly to the left, resulting in a marginally inaccurate angle.

Safety first

The on-off switch is moulded directly into the handle, along with a safety button which has to be depressed to start the saw. Also in the handle is the switch for the laser – a useful bonus, but at its best when the ambient light is only moderate.. Before the head can be lowered, a simple clip has to be pressed to release the guard.

The right-hand half of the fence has a graduated scale

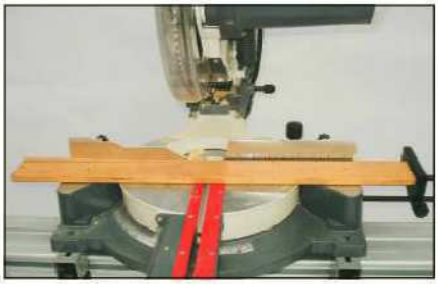
The tilt arrangement is located at the rear of the machine



The base is embossed with a clear protractor scale

Bevel cuts can be made only with the body tilted left

TESTED BY GORDON WARR



The outrigger support can be fitted with a useful length stop

There's a rotating plunger which is brought into use to lock the head in the lowered position – essential when the machine is being moved. To help with this, a carrying handle is built into the head.

Cutting joints

Also located in the head is a depth stop. This is normally set so that the teeth of the blade will just penetrate the material being cut, but the stop allows this be restricted so as to cut only part-way through. Thus the saw can be used for cutting joints such as tenons, half laps, trenches and rebates across the end of the wood. There is no scale to this; setting the stop has to be done by trial and error.

Cutting angles

The head tilts to the left for bevel sawing. A large ratchet locking handle holds it firmly in place at the required angle, with a protractor scale showing the chosen angle. There are adjustable stops at both limits of the tilt range, which ensure accurate setting at 90° and 45°. The whole of the head is mounted on two bars which provide the sliding action, and the movement is effortless.

A better blade

The blade provided as standard with this saw has 80 crosscut teeth, giving good results with wood and man-made boards. However, an even better blade is the 80-tooth negative-rake type, specially developed for crosscutting and giving exceptionally smooth surfaces. There is also far less chance of the blade snatching the wood, thus making the sawing action both easier and safer. Blades with negative rake aren't suitable for ripping, however.

Using the saw

When using a mitre saw, it's best to draw the head forward first and to carry out the cutting by slowly moving it back to the rear position. This reduces further any tendency of snatching, and allows for better control.

So with the negative-rake blade fitted to the saw, I carried out a series of tests, starting with square crosscutting on wood of various sections. Then I moved on to tackle some mitre sawing, both to left and right, followed by some bevel cutting. This can only take place with the head tilted to the left, and this is when the work clamp is especially useful. The results were all perfectly satisfactory.

Compound cuts combine a mitre and a bevel cut, but in practice these are rarely needed. Because the head will tilt only to the left, the range of possible compound cuts is somewhat restricted.

SPECIFICATION

MOTOR		1500W
BLADE DIAMETER		250mm
NO-LOAD SPEED		4500rpm
MAX MITRE RANGE		-45° to +45°
MAX BEVEL RANGE		0 to 45°
MAX CUTTING CAPACITY	at 90°	305 x 90mm
	at 45°	215 x 90mm
	at 45 x 45°	215 x 42mm
WEIGHT		18kg

VERDICT

This saw lives up to expectations, is easy to adjust and use, and produces results of high accuracy.

PROS
- Outrigger supports with end stops
- Adjustable depth stop
- Effortless sliding action

CONS
- A negative-rake blade improves performance

VALUE FOR MONEY ■■■■■
PERFORMANCE ■■■■■

FURTHER INFORMATION

- Axminster Tool Centre
- 0800 371822
- www.axminster.co.uk

Changing the blade is a rather fiddly process on this saw

The saw's crosscutting capacity is more than adequate

Cutting mitres to left or right is quite straightforward

TESTED BY
GORDON WARR

The mitre saw tested on page 76, and other similar saws in the Axminster range, are all designed to operate as bench-top machines. *However, using them on a stand adds considerably to their convenience and ease of use. Here's one option...*

Axminster deluxe mitre saw stand

This Axminster stand is made mostly of alloy extrusions, and is full of clever features. The legs fold away into the underside of the main rail, and when in this position (or lowered for use) they're retained by spring-loaded clips which provide a very positive locking action.

A roller is fitted at each end of this rail, incorporating a work stop which is pivoted so it can be selected instantly. There's a carrying handle located on the underside of the rail.

The stand has been designed to accommodate the vast majority of mitre saws currently on the market, and on the rare occasions when this is not the case, then a ply or mdf sub-base can be introduced to link them together.

The rollers are actually secured to the ends of the extension beams, which slide out to provide a work support span of approximately 3m. The rollers are adjustable for height so as to align with the bed of the saw, with the supporting beams being locked as required in any position. A simple tightening lever is rotated to achieve this.

Two cross members sit across the main rail and are locked by cam-action levers at the front. Their spacing is set to match the positions of the holes in the base of the saw, which is secured with the four bolts provided. The saw can then be moved laterally from one end of the rail to the other by releasing the locking levers, and can then be re-clamped or lifted completely clear of the stand. For most normal uses, the two cross members would be left secured to the saw, and the rollers retained in place. The stand can then be erected without the use of any tools or further adjustment.

Summing up

I found that this stand works extremely well. The design has been very well thought out and is full of innovative ideas. It's a first-class product, and Axminster rightly refer to it as their deluxe stand. It turns the mitre saw into a work station, and is just as suitable for use in the workshop as it is when working away from it.

SPECIFICATION

HEIGHT TO SUPPORT RAIL	810mm
FOOTPRINT	1300 x 750mm
MAX SUPPORTED LENGTH	2960mm
MAX WORK STOP LENGTH	1700mm
WEIGHT	14.2kg

VERDICT

This is a well designed stand that turns your saw into a versatile work station.

PROS
- Adjustable rollers
- Tool-free set-up
- Takes most mitre saws
- Easily folded for transport

CONS
- None

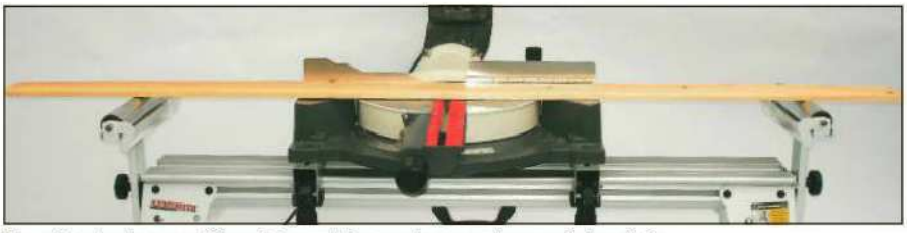
VALUE FOR MONEY ■■■■■
PERFORMANCE ■■■■■

FURTHER INFORMATION

- Axminster Tool Centre
- 0800 371822
- www.axminster.co.uk

The cross supports lock to the rails with good-sized cam-action levers

The two support rollers are readily adjustable for height



The extension beams slide out to provide a work support span of almost 3m

SDS+ hammer drills are usually rather bulky machines, but they justify their size by their ability to power through the hardest concrete without complaint. *This new Bosch model breaks the mould by being sleek and lightweight while still possessing impressive drilling performance*

TESTED BY
ANDY STANDING

Bosch GBH 18V-Li cordless SDS+ hammer drill

£250
(web price)

An SDS+ drill is a particularly useful tool if you do any sort of installation or fitting work. This type of drill is the only one that will reliably penetrate concrete or hard masonry. Though a combi drill can cope with most work, there are times when only an SDS drill will do. However, there's no point buying a huge machine if you need to drill only relatively small holes. This Bosch has a maximum drilling capacity of 12mm in concrete, and it's designed to produce optimum results at diameters between 4 and 8mm, which, of course, covers the most common wallplug sizes.

Simple features

The Bosch is a compact and elegant tool. The motor is mounted at an angle in the front part of the body and the slim battery slides onto the base. Those of you who like lots of switches and buttons to set will be disappointed, as there's only one switch apart from the trigger and rotation direction slider, and that's the hammer action selector which is mounted on the left-hand side of the tool. Just below the chuck is the now obligatory LED worklight. A standard SDS+ chuck is fitted which is fast and efficient to use. Unfortunately an accessory chuck is not included, though they are readily available.

Using the drill

This little drill is a pleasure to use. Its somewhat unusual shape gives it good balance, and the body is comfortable to grip with both hands if required. Its drilling performance is very impressive. While it's not the fastest SDS drill I've used, it certainly has the power to penetrate. With the addition of an accessory chuck, it could also be used for non-hammer drilling in timber and metal. I imagine it would also make a pretty useful screwdriver.

For such a compact tool, this Bosch drill certainly packs a punch. It's the ideal tool for fitting and installation work, where smaller diameter holes need to be drilled through concrete and masonry. It's extremely well-designed and fulfils its purpose perfectly.

The hammer selector switch is the only control you need

The obligatory LED worklight is actually a very useful extra

The battery charge indicator tells you when to switch batteries

This light and compact drill packs a really impressive punch

SPECIFICATION

BATTERY		18V 1.5Ah Li-ion
NO-LOAD SPEED		0 to 1050rpm variable
MAX DRILLING CAPACITY		
	wood	16mm
	concrete	12mm
	steel	8mm
WEIGHT		1.9kg
ACCESSORIES SUPPLIED		L-BOXX case, 2 batteries, fast charger

VERDICT

This is a cleverly designed tool for a very specific purpose, combining light weight with powerful performance.

PROS
- Comfortable to hold and use
- Compact and light
- Perfect for smallish holes

CONS
- Accessory chuck not included

VALUE FOR MONEY

PERFORMANCE

FURTHER INFORMATION

- Bosch
- 01895 838743
- www.boschpowertools.co.uk

The Proxxon DS460 fretsaw is an expensive piece of equipment, and the advertising material looks very promising. *I'm a regular fretsaw user, and I must have tested well over 50 saws over the years, so I was looking forward to adding this one to the list...*

Proxxon DS460 two-speed fretsaw

The DS460 is a parallel arm fretsaw with arms made from magnesium to reduce the weight and give low vibration and quiet running. The cast-iron body is powder-coated with Proxxon's distinctive livery.

The tiltable table can be slid back to reveal the lower blade clamp for access. It has a slot from the front end but no replaceable throat plate. The slots on the right-hand side are designed to hold the blade clamps when changing blades.

Clamping the blade

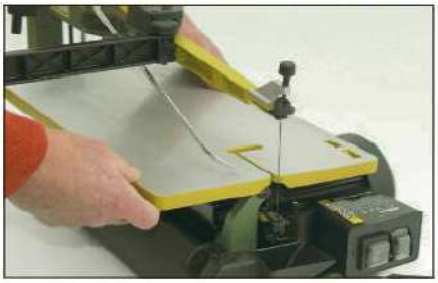
The blades are locked in position by means of a square-headed bolt for which a key is provided. Some blades are supplied; the instructions suggest that only Proxxon blades be used, but most makes of pin-ended and pinless blades will fit.

The machine has no hold-down device, but does have an adjustable plastic guard on the end of an arm which can be swung out of the way if not required. The blower keeps the cutting line clear, and there's a dust extraction point at the rear of the machine.

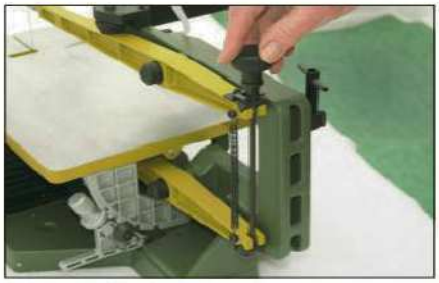
Using the saw

I put the machine through its paces by cutting 3mm mdf, 6mm plywood, 8mm hardwood and 25mm oak. External cutting went well, but when it came to releasing and reclamping the blade for internal cutting I was very disappointed and in the end extremely frustrated. I followed the instructions carefully, but in nearly every attempt the blade dropped down and the lower blade holder slipped out of position at the end of the lower arm. This made it virtually impossible to thread the blade through the hole in the

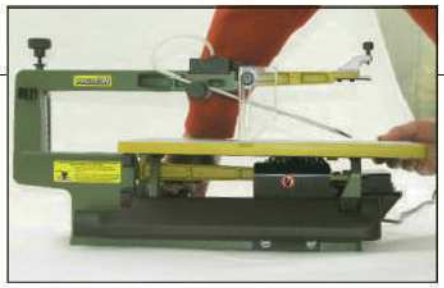
This knob secures the table angle, but worked loose on test



The table slides back for access to the lower blade clamp



This knob at the back of the top arm sets the blade tension



The knob that releases the sliding table is awkward to access

TESTED BY IAN WILKIE

The knob that secures the table angle needs a locking mechanism to stop it from moving while the saw is in use

workpiece to commence internal cutting. I tried repeatedly, but in the end I had to give up.

If a fretsaw is going to be of any use, the operator should be able to fret out any number of internal shapes, releasing the blade and threading it through repeatedly with the minimum of fuss and bother. This test revealed a glaring fault and a major design weakness. The lower blade clamp has too much play, and needs redesigning so it stays in position when the upper clamp is released.

More flaws

Most fretsawers sit down while they work. For this reason you need a quick-release tension lever positioned at the front of the top arm. On this Proxxon model you have to reach right to the back of the machine, which means standing up unless you have unusually long arms. On an intricate piece of work with possibly 50 or more internal cuts, you'd be bobbing up and down like a yoyo!

I can see why the designer felt that a sliding table was a good idea, but to release the table you have to reach nearly to the back of the machine to turn a knob, which I found an uncomfortable action. Furthermore, this knob needs some form of locking because it moved under test, with the result that the table was no longer accurate.

More grumbles

There are a few other design points which need addressing. The table is not as smooth as those found on other Proxxon machines, and the wood doesn't glide over the surface as well as I would expect.

The lack of a throat plate was surprising, and I would prefer to see one which could be removed or replaced with a very fine hole or slot to ensure that small pieces are not pulled down through the table.

The blower was somewhat feeble, with very small bellows. Its pipe should be adjustable so that the dust is directed away from the operator. Hold-down devices are usually included with a machine, whether or not you wish to use them; certainly they would be required in an educational establishment. However, I did like the plastic guard on the swing-away arm, and would have found that invaluable when teaching my young grandchildren to fretsaw.

Summing up

I have to say that I was very disappointed with this machine. I'm a big fan of Proxxon products, but I was left with the impression that this has been designed by someone who neither uses a fretsaw nor understands its function for carrying out intricate work.

SPECIFICATION

MOTOR		205W
TABLE SIZE		400 x 250mm
NO-LOAD SPEED		900 or 1400/min
TABLE TILT		-5° to +50°
THROAT		460mm
STROKE		18mm
MAX DEPTH OF CUT		
	at 90°	60mm
	at 45°	35mm
WEIGHT		20kg

VERDICT

I was very disappointed by this machine and can't recommend it, especially at this price.

PROS
- Smooth and vibration-free
- Swing arm with guard

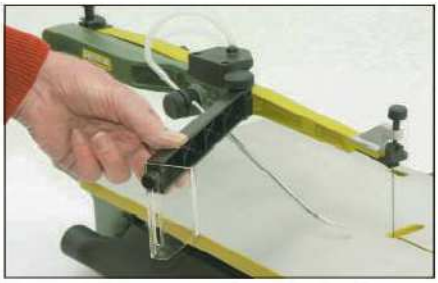
CONS
- Infuriating blade locking
- Awkwardly placed tension lever
- Angle setting knob moves in use

VALUE FOR MONEY ■■□□□

PERFORMANCE ■■□□□

FURTHER INFORMATION

- Axminster Tool Centre
- 0800 371822
- www.axminster.co.uk



The saw features a movable plastic guard and a dust blower

Reconnecting the blade for internal cutting was very difficult

The quick-release blade tension lever is a long reach away

The OF 2200 is the largest router produced by the German manufacturer Festool.
Their brand image is one of engineering excellence combined with attention to detail, and this quality is evident in their flagship router

Festool OF 2200 router

£708

Many Festool products have common features which allow accessories to be shared. The OF 2200 router can use the same guide rail system as their circular saws and can also be at the heart of a router table using the modular support units common to saws, jigsaws and belt sanders in the Festool range.

Open the box

The OF 2200 comes in a large Systainer case, Festool's tough tool container system. With the basic set you receive three collets, a 30mm guide bush, a chip deflector for improved dust collection, a spanner for cutter changes and a three-year guarantee. At the time of writing guide rods, a parallel side fence and a fence dust extraction hood are also included as part of a promotion.

There are several optional extras available, including collets in a variety of sizes, special-purpose base plates, guide and template systems as well as a wide range of cutters. The OF 2200 together with an accessory set is sold for £974.40, which provides the most popular extras at a discount.

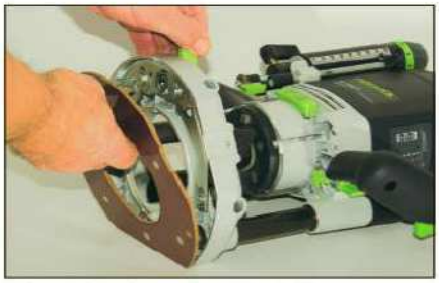
The accessory kit includes four additional guide rings, four bases, guide bars, a side fence and a guide rail fence adaptor. One of the baseplates, together with the guide rail fence adaptor, has been designed for use with Festool's popular guide rail system.

Using the router

The OF 2200 is a big router. However, when used correctly the full weight of the tool is borne by the workpiece, allowing the high mass

This accessory kit is well worth the cost, and comes in its own case

The clever ratchet system on the spindle lock makes cutter changes quick and simple



Releasing the base without having to use any tools is a real time-saving bonus

Production template copying is quick and easy to carry out

TESTED BY PETER PARFITT

to stabilise the cutting operation. The 30° offset soft-grip handles are comfortable to hold and ensure maximum control. The electronically controlled motor gives a smooth start and high torque, and there is a quick-acting electronic brake. This is the first router I've been able to use safely for freehand panel raising.

Simple operations

The first thing you'll appreciate when using this router is the effortless cutter change. There's a clever spindle lock on the front of the machine, with a built-in ratchet mechanism, which allows you to keep the spanner on the collet when tightening or loosening.

The next innovation is the tool-less base release which allows bases, guide rings and the chip deflector to be fitted quickly. There's no more reaching for the screwdriver to do any of these changes. I timed myself removing the chip deflector, changing cutters and collets, and fitting a 30mm guide bush. In 35 seconds I went from edge work to being ready to cut a kitchen worktop joint with a template.

Simple controls

The depth of cut setting is straightforward, and it has the added advantage of a micro adjuster that allows changes as small as 0.1mm to be made. Plunges are smooth and the plunge lock on the left handgrip is easy to operate. The on/off switch is on the right handgrip, and a nearby button releases a spring-loaded clear plastic chip guard. This closes off the central column area, making dust collection highly efficient yet allowing the operator to see the cutter in operation. I carried out a range of test cuts in oak, walnut and maple, and even the deepest were smoothly executed with perfect results.

Summing up

Over the years I've bought many routers and used even more. None of them was a complete disaster, but all had their idiosyncrasies. I'm now at a stage of life when I demand accuracy, speed and ease of set-up, total safety and near 100 per cent dust collection. Even the enthusiastic amateur must value his time and the joy that using quality tools can bring.

It's important to put the cost issue into perspective. The value of all my router cutters far exceeds the combined cost of my routers. So if you're going to invest in good-quality cutters, then it makes sense to maximise their value by getting a top-notch router. With this machine, Festool have thought of abolutely everything for both the busy professional and the enthusiastic amateur.

SPECIFICATION

MOTOR	2200W
NO-LOAD SPEED	10,000-22,000 rpm
COLLETS SUPPLIED	8mm, 12mm and ½in
ROUTING DEPTH RANGE	0-80mm
FINE DEPTH ADJUSTMENT RANGE	0-20mm
MAX CUTTER DIAMETER	89mm
WEIGHT	7.8kg

VERDICT

The OF 2200 is easy to set up, cutter changes take seconds and it's reliable, safe and accurate. The dust extraction is the best I've ever seen.

PROS
- Superb build quality
- Smooth start-up and running
- Integrates with Festool guide rails
- Three-year guarantee

CONS
- Expensive
- User manual could be improved

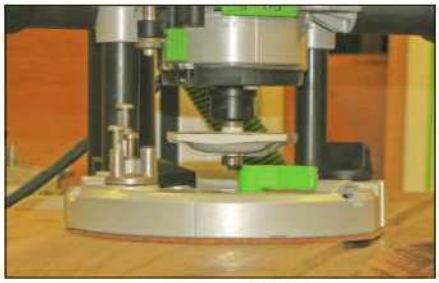
VALUE FOR MONEY ■■■■■
PERFORMANCE ■■■■■

FURTHER INFORMATION

- Festool UK
- 01284 760791
- www.festool.co.uk

The router can be used with the Festool guide rail system

The micro depth adjuster allows you to make changes as small as 0.1mm



Freehand panel raising with this huge cutter is both safe and accurate

The guide fence is solid and reliable, and has micro adjustment

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APRIL 2011

PROJECTS: Free-standing alcove dresser, Oak suite 5 – the chairside companion unit, Compact two-tone sideboard, Secondary glazing
FEATURES: Oak heating vents, Using low-angle planes, Matchmaking with furniture, Shop notes
TURNING: Off-centre turning – making a trivet, Cricket balls, Home-made sharpening jig
TESTS: SIP multi-function machine, Einhell cordless screwdriver, Proxxon table saw, SIP disc/belt sander, Mafell circular saw, Excalibur scrollsaw, Trend router cutter sets, Veritas plug cutting kit

MAY 2011

PROJECTS: Kitchen larder unit, Nest of oak tables, Inlaid pencil box, Glass-topped coffee table
FEATURES: Buying second-hand machinery, Making handscrews, Additions to the Trend Varijig range, Shop notes
TURNING: The eBay oboe, Three-pot desk tidy, Knobs and ring-pulls, Buffing your work
TESTS: SIP surface planer, Record bandsaw, Axminster planer knife setting jig, Einhell multi-tool, Excalibur scrollsaw, Kirjes sanding and polishing system, Axminster Universal router sub-base, SIP variable-speed midi lathe, Metabo sliding mitre saw

JUNE 2011

PROJECTS: Oak kitchen island unit, Two-drawer chest, Arts & Crafts hall table, Cricket bats
FEATURES: Textbook joints 1 – the mortise and tenon, Table-mounting routers, Copying dining chairs, Shop notes
TURNING: Off-centre turning, Traditional milking stool, Workbench tool stand
TESTS: SIP 12in and 14in bandsaws, Bosch cordless jigsaw, Festool eccentric sander, Triton router, Metabo drill/driver, Proxxon disc sander, Axminster table saw, Makita mitre saw, Dremel multi-tool and woodworking accessories, Kreg clamps

JULY 2011

PROJECTS: Reproduction Davenport desk part 1, Wall-to-wall storage units for a kitchen, Small oak sideboard
FEATURES: Routing basics 1 – choosing a tool, Textbook joints 2 – the halving joint, Sharpening bench tools, Shop notes
TURNING: Lidded cocobolo box, Turning tools 1 – using the bowl gouge, Turning wood and acrylic buttons
TESTS: SIP 10in bandsaw, Skil circular saw, Stanley toolchest, Metabo cordless jigsaw, Axminster scrollsaw, SIP bench mortiser, Triton dust collector, Kreg pocket-hole jig, DeWalt dual-base router

SUMMER 2011

PROJECTS: Davenport desk part 2, Drying rack, Gate-leg dining table, Shaker-style kitchen dresser
FEATURES: Routing basics 2 – choosing & using cutters, Textbook joints 3 – the housing joint, Gadgets for woodworkers, Shop notes
TURNING: Getting a grip – turning between centres, Suspended vessel, Turning tools 2 – the spindle gouge
TESTS: 4 small planer thicknessers compared, SIP lathe, Axminster bandsaw, Metabo Plus mitre saw, DeWalt router, Proxxon drill/grinder, Microplane rasps

AUGUST 2011

PROJECTS: Cutlery cabinet, Oak coffee table, Outdoor bench and table, Patio planter
FEATURES: Routing basics 3 – setting up your router, Textbook joints 4 – the dovetail, Drawing arcs and curves, More gadgets for woodworkers, Shop notes
TURNING: Getting a grip – faceplates and screwchucks, Beech bowl, Turning tools 3 – the skew chisel
TESTS: Four SIP dust collectors, Einhell table saws, Bosch cordless sabre saw and orbital sander, Metabo drill/driver, Kity spindle moulder, Proxxon carver, Foredom Flexi Drive

SEPTEMBER 2011

PROJECTS: Miniature chest of drawers, Bedside book cabinet, Occasional table
FEATURES: Routing basics 4 – cutting techniques, Textbook joints 5 – machine-cut dovetails, Tormek system upgrades, More gadgets for woodworkers, Shop notes
TURNING: Low-tech chucking, Ribbed bowls, Sharpening the five key turning tools
TESTS: SIP bench mortiser, Axminster bandsaw, Trend cutters, Metabo random orbit sander, Mafell planer, Startrite planer thicknesser, Woodster drill press, SIP scrollsaw, Trend Loc blocks

OCTOBER 2011

PROJECTS: Five-sided display cabinet, Desk caddy, Plant stands, Classical side table
FEATURES: Mobile work station, Routing basics 5 – home-made work aids, Portable power tools 1 – drills and drivers, More gadgets for woodworkers, Shop notes
TURNING: Three-tier egg tower, More low-tech chucking devices, Thin-walled vase, Using CBN grinding wheels
TESTS: Bosch mitre saw, Proxxon angle grinder, Kreg saw guide, SIP planer thicknesser, Einhell sliding mitre saw, Festool belt sander kit, Dakota magnifying glass

NOVEMBER 2011

PROJECTS: Sunroom dining suite in oak, Toy knights' castle part 1, Apple store
FEATURES: Working Wood with Paul Sellers, Routing basics 6 – guide bushes, Portable power tools 2 – circular saws, More gadgets, Shop notes
TURNING: Making cabriole legs on the lathe, Holding bowl blanks, Three-tier display dome stand
TESTS: Bosch random orbit sander, Radian router cutter, Bosch cordless drill/driver, Veritas plough plane, Woodster planer thicknesser, SIP mortiser, Makita cordless chainsaw, DeWalt belt sander

DECEMBER 2011

PROJECTS: Sycamore bedside cabinets, Knights' castle part 2, Slate-topped occasional table, Toy tank engine
FEATURES: Routing basics 7 – guide bush jigs and templates, Portable power tools 3 – sanders and planers, Gadgets for woodworkers, Shop notes, Children in the workshop
TURNING: Miniature yew vase, Five festive presents, Cabriole-leg stool
TESTS: Metabo Quick jigsaw, DeWalt sliding mitre saw, Quangsheng bench planes, Makita cordless planer, Colt drill and countersink set, Narex chisels, Makita router cutters

JANUARY 2012

PROJECTS: Twin pedestal desk 1, Library bookcase restoration, Round replacement window, Handicraft storage box
FEATURES: Routing basics 8 – choosing a router table, Children in the workshop, Gadgets for woodworkers, Shop notes, Workshop dust extraction
TURNING: Apple-shaped box, Set of napkin rings and stand, Satinwood hand mirror
TESTS: CamVac dry vacuum extractors, Festool Domino jointer, Einhell scrollsaw, Dremel multi-tool kit, Working Wood: The Artisan Course

FEBRUARY 2012

PROJECTS: Twin pedestal desk 2, Two sapele sideboards, Sequoia occasional table
FEATURES: Routing basics 9 – using a router table, Gadgets for woodworkers, A tale of two artisans, Portable power tools 4 – jointers, Shop notes, Buying raw materials
TURNING: Salt and pepper mills, Crown trinket boxes, Natural-edge bowls
TESTS: Narex mortise chisels, SIP 10in table saw, Axminster bench mortiser, DeWalt drill driver twin-pack, Quangsheng block plane, Dremel VersaTip, Veritas Poly-gauge, Bosch inspection camera

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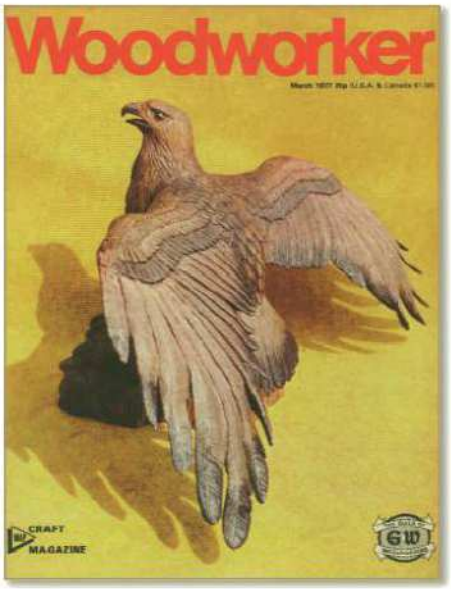
A bigger blast...

In this age of machine-dominated woodworking, it's easy to forget the place of the craftsman woodworker whose aim in life is to produce pieces reflecting his skill and patience rather than his expertise as a mere machinist...

The March 1977 issue of *The Woodworker* certainly aimed to catch the eye on the bookstalls. Its cover featured a stunning carved golden eagle on a rather bilious yellow cover (right) , but the magazine somewhat surprisingly didn't feature it within its pages. The contents list simply described it as an eagle owl (*oops!*)...

This was the 1000th issue of the magazine, and its major theme was a massive eight-page report on the first Craftsman Woodworker show that the magazine had organised at the new Wembley conference and exhibition centre in North London in January 1977. The report concentrated on publishing details and photographs of the various competition winners, including someone who may be rather familiar to *Woodworker* readers. He carried off the woodturning prize at the show for his entry, which consisted of a goblet, a lidded bowl and a candlestick, and he also collected the Gordon Stokes Special Woodturning Lathe as an additional prize. This 21-year-old forestry student at Aberdeen University is pictured in the magazine receiving his trophy wearing a very sharp pin-striped suit. Step forward Alan R Holtham of Sandbach in Cheshire, a master turner and a regular contributor to the magazine for many years. We haven't seen him in a suit since, mind you...

Elsewhere in the magazine, turning seemed to be the major theme of the issue. Nigel Voisey wrote at length about choosing the right lathe, and Norman Boodson presented part 3 of his series on making your own lathe. Former editor and master woodworker Charles Hayward described the making of a range of thumb planes, which craftsman of old used to enable curved mouldings and other shaped parts to be worked by hand. Next to this was a fascinating feature on the rustic art of rake making (*below*), which summed up the flavour of an issue dedicated very much to the artisan woodworker. The only concession to the power tool brigade was a detailed round-up of router cutters and their functions. It seemed rather out of place...



RAKE MAKING

by

JOHN HILL

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