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The Woodworker

March 2014

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& Woodturner



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welcome

Although most of us (and I mean woodworkers here) enjoy a good read through the latest tool catalogue – and I personally find it very sad that there just aren't the hours in a day to read every one that's currently available in print – something closely related runs the



likes of Lee Valley, Axminster and the rest a very close second in our choice of fantasy reading. I'm talking about a good set of plans.

Embodying all that is hope and aspiration, while also remaining tantalisingly close and achievable, the printed plan can represent either a delightful version of our latest dream or the immediate future of a woodworking reality. Such is the power of the plan.

Protection money

Like the ideal partner, good plans are hard to come by, and even harder to come by 'on the cheap'. I should know; tracking them down remains one of my ongoing missions in life. A lot of creatives – and I'm including every reader here – have a tendency to protect their work from casual copying, especially if it's the sort of item that people will pay money for.

Worth the wait

I'd like to think we're all aware that sometimes only subtle differences

exist between the sort of design which looks cumbersome or ungainly, and a piece of work which seems lighter than air or is breathtakingly beautiful. If you've just drawn up a set of plans for the latter category, you may feel that the rest of the world can wait a bit longer before you share them.

Hope for the future

Fortunately not everyone is quite so ungenerous, but it does go some way to explaining the dearth of the 'ultimate plans book' or a similar collection of grade-A blueprints. While we do our best here at *The Woodworker* to serve up a tasty selection of projects for your enjoyment, top quality – and free – plans currently remain something of an optimistic ambition. You could even say they're a pipe dream...

Write on

Despite the extra work generated for yours truly, I welcome receiving your letters, emails and general communications on a wide variety of woodworking related subjects. So please continue to send them in, and if you could show a bit of patience that would be great; I will reply to everyone. However, a 24-hour turnaround is sadly not always possible!

Mark

You can contact Mark on mark.cass@mytimemedia.com



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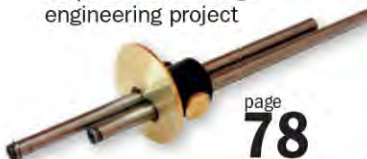
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March 2014

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Bench bonanza

Axminster has introduced new ranges of premium quality workbenches, made from European beech and finished with a lacquer. Diamond benches are available in two options. The D1 is supplied with one 360mm wooden vice and one 175mm quick-release carpenter's vice, while the D2 is fitted with two 360mm wooden vices. Both are equipped with 20mm bench dog holes and are supplied with dogs to fit.

Premium benches also come in two options, Premium AS and Premium Monster M. Both are

equipped with heavy-duty tops measuring 1910 x 615 x 850mm, with 20mm bench dog holes for side clamping and jointing; bench dogs are again supplied. Both benches also have a tool drawer and tool well.

All the benches are flat-packed but are relatively easy to assemble. Prices range from £474.95 to £909.95

■ **STOP PRESS:** We'll have one of these benches to give away in our May issue. Don't miss the chance to grab it! ■ www.axminster.co.uk

Einhell is 50

Einhell is celebrating its 50th Anniversary with the latest 2014 catalogue that has over 100 pages of products. Highlights include the Power X-Change

fast-charge lithium battery system. This future-proofed innovation is an area that Einhell will be developing in 2014 and beyond, enabling customers to save on a wide range of power

tools and garden equipment without needing to purchase expensive additional lithium batteries. The new catalogue also includes a detailed price list



of accessories and spares which are all available online. ■ **STOP PRESS:** We'll have nearly £500-worth of Einhell tools to give away in our April issue. Don't miss them! ■ www.einhell.co.uk

High-gloss solutions

Mirka is launching its new high-gloss solutions kit, offering a simple and cost-effective system that enables customers to finish a wide range of lacquered surfaces and solid materials.

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 - 20 Spindle moulding
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 - 20-21 Beginners routing
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MANUFACTURER: DeWalt

D&M PRICE: See website for latest prices

BRUSHLESS

NEW

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**4.0
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NEW BRUSHLESS COMBI DRILL & BRUSHLESS DRILL/DRIVER

MANUFACTURER: DeWalt

D&M PRICE: See website for latest prices

DeWALT

BRUSHLESS

DeWalt have added two new brushless drills to their cordless range with the DCD995M2 XRP 3-speed combi hammer drill/driver (right) and the DCD990M2 XRP 3-speed drill driver. Both feature 4.0Ah Li-ion battery technology, a tough all-metal transmission, an electronic clutch with 11-position adjustable torque control, an efficient intelligent trigger allowing control over all applications and a foot LED with delay feature for improved visibility and flashlight functionality. Both come complete with two batteries and a fast multi-charger in a T-STAK compatible kit box.



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You can write to us at, The Woodworker, MyTime Media Ltd, Hadlow House, 9 High Street, Green Street Green, Orpington, Kent, BR6 6BG or send an email to mark.cass@mytimemedia.com



DOUBLE GLAZING

Dear Mark

I'm writing in response to the archive piece in the January 2014 issue, entitled Household Repairs: Windows.

Back in the late 1950s I had finished my Carpentry and Joinery apprenticeship, done my National Service and returned to my old firm. One day I was asked to go to Belmont House near Faversham in Kent to renew some sash cords in the orangery windows.

When I arrived it turned out that there were six windows to tackle, and all were nearly 7ft wide and about 16ft tall, as you can see in the picture. As it looked like a daunting job, I reported back to the gov'nor for extra help. In the end it took six of us, with ladders, to replace each set of cords.

The windows were timber-framed, and inset with metal glazing bars and riveted-on wooden beads. When we got the lead weights out they were square in section and weighed over half a hundredweight each! The cords were actually twisted copper wires which had frayed over time and had to be replaced.

Yours faithfully

David Hammond, Birchington, Kent

I'm glad to hear that they didn't leave you to do it on your own, David! By the way, Belmont House is now in the care of a charity and is open to the public. Visit www.belmont-house.org for details.
Mark

THINK PINK

Dear Mark

I made this desk recently for my granddaughter. I had a lovely piece of timber for the top and intended to polish it, but a little arm came round my neck and a voice said: "Please can I have my desk pink?"

I held back the tears and replied: "Yes, of course you can!" So I made another one. Here it is.

Peter Berwick, Stockport, Lancs



Yes Peter, those little 'uns can be hard to say no to! In years to come her daughter will probably strip it and there your timber will be – revealed at last!

PEACE AND QUIET

Hi Mark

It's frequently mentioned in magazines: (a) that sharpening is boring; (b) that a chisel is described as 'sharp'; and (c) that a radio is essential in a workshop. I'm very happy to sharpen pencils, chisels and planes, and have all the kit needed to sharpen saws I enjoy making things better, and think of sharpening as time well spent. Who would use a blunt chisel?

Peace and quiet is to be savoured. I find a radio distracting. I like to concentrate on the task in hand, hearing the birds singing and squirrels running across the workshop roof. It must prove that we're all different.

Roger Boniface

Well Roger, I for one am glad we're all different, but I think we all share – if not actually fulfil – a desire for sharp tools!

SWITCHED ON

Hello Mark

This table lamp is a replica of one I made years ago at school, and from which my interest in woodwork stems. It was about the only lesson I really enjoyed.

What I remember most about making it was boring the hole for the flex from each end with a brace and bit, and a somewhat irate woodwork teacher doubting that the holes would meet in



the middle. In the end he inserted a red hot poker and I breathed a big sigh of relief to see the smoke coming out the other end!
John Mackay,
Cheshunt, Herts

This is a classic, John! It's good to hear that your making is still going strong. I hope that future generations continue to be inspired as you were.



BY MARK CASS

Donkey derby

This portable bookcase is (very) loosely based on the classic Isokon Penguin Donkey designed in 1939 by architect Egon Riss. It's become a modern furniture classic, and is still in production today

THE DONKEY LIVES ON

Only about a hundred of the original Donkey bookcases were made before the outbreak of war halted production and diverted valuable resources like plywood into more essential areas of manufacture. Several variations of the design have been created over the years, and a faithful reproduction of the original is still made today by Isokon Plus. You can see it and their other current products by visiting www.isokonplus.com

Although this particular version lacks the curves and beauty of Riss's original design, it's a lot more achievable for the home woodworker and can be constructed in a variety of ways to suit individual tastes and abilities. I've gone for a fat finger joint on the carcass sides; it's a strong but very simple joint and can be executed entirely on the bandsaw if so desired.

A sketchy start

So, as ever, the first step is to confirm the design with a simple sketch showing component parts and basic dimensions. This is vital for anyone who is looking to improve their woodworking and to reduce the number of errors per job; my ongoing target is 0.5!

You'll be surprised at just how helpful this basic exercise can be. I often find that the straightforward act of drawing out a job makes you consider more clearly your construction methods, the right materials, the ideal order of assembly and so on.

Mock up a model

I've also found, especially when you're making the first of anything, that it really pays to make a full size mock-up of the finished job. Feeling a bit over confident, I went ahead and cut my selected timber roughly to size, but it was only when I loosely assembled the parts, **photo 1**, that I realised they were too thick for the look I wanted. But my loss is the woodburner's gain, and so off I went again to the timber yard to get something more suitable.

A new beginning

Now that I had a better idea of the finished sizes, I was able to cut the new timber – some nominal 150 x 20mm PAR softwood that finishes up at 145 x 15mm – to length and make a start on jointing the two carcasses. These are meant to be suggestive of the panniers you might see strung over the back of a donkey or similar beast of burden (there are loads down my way!), and are the key feature of this particular piece of furniture.

Five-finger exercise

While through dovetail joints could be considered the preferred way to form the carcass corners, a finger joint is a simple alternative and combines strength with ease of manufacture. As all of the component parts are the same width and thickness, marking out is a fairly straightforward job. I always start by clearly marking each part in a way that excludes all possibility of any confusion; yes, it is possible!

DONKEY BOOKCASE CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Top/base	4	450	135	15
Side	4	235	135	15
Divider	2	205	129	15
Back (plywood)	2	438	223	6
Jointing board	1	450	120	15
Leg support	2	410	50	20
Infill triangle	2	230	120	15
Leg (dowel)	4	145	32 dia	



Next, it's time to set a gauge to just over the thickness of the timber, **photo 2**; this makes cleaning up the joint afterwards just that little bit easier. Gauge a line on every face of both ends of every part, **photo 3**. I made a trial run of the joint on a couple of pieces of scrap to check if it looked right. If you have the time I'd always recommend this course of action.

Divide and rule

A finger joint traditionally has an odd number of digits, partly for visual balance

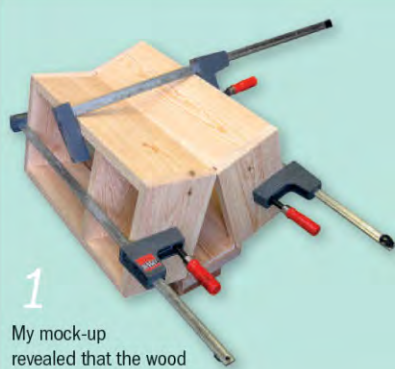
and also for conformity of grain direction top and bottom. I've gone for five to keep things simple. Dividing each board up into fifths is something we should all have learned at school, but for anyone who was bunking off that day, it's just a case of angling a ruler across the workpiece and marking off equal measurements, **photo 4**.

A while ago I converted an old marking gauge to a pencil gauge, and this is just the ticket for setting up and marking all the finger joints. Take care to check you've done them all – and it's best to do both

sides – as it's almost impossible to get the exact same setting on the gauge after you've changed it.

Making the cuts

Once you've got all the joints marked out, it pays to offer them up to each other just to be sure you've got it right, **photo 5**, especially the pencil hatching on the parts which are due to be cut out. Once you're satisfied, there's nothing to stop you pressing ahead, whether with hand or power tools. You'll need a coping saw if



1
My mock-up revealed that the wood I'd prepared looked too thick



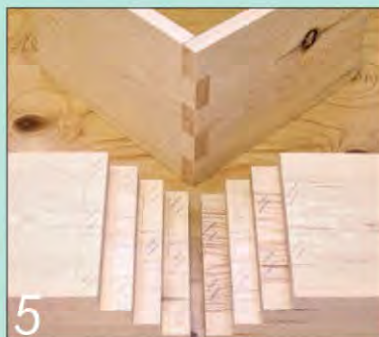
2
Set the gauge to just over the 15mm thickness of the timber



3
Strike a gauge line on each face at both ends of all the components



4 Divide the width by five by using a rigid ruler held at an angle across the face of the wood



5 A trial joint will help check the accuracy of your marking out, cutting and fitting



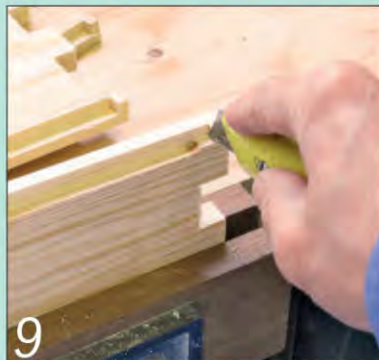
6 These fat finger joints can be formed with care using just the bandsaw



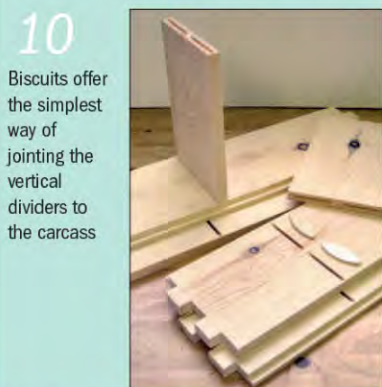
7 After cutting out, the parts can be offered up and test fitted prior to assembly



8 Cut the back rebates with the router. The rebate is stopped on the long sides.



9 Square the stopped ends of the rebate with a chisel or a sharp knife



10 Biscuits offer the simplest way of jointing the vertical dividers to the carcass



11 You can now glue and clamp up the two carcass assemblies, and check that they're both square

you're doing them by hand, and a suitable chisel to clean up the shoulders afterwards. Take your time to make your cuts as accurate as possible, and pay particular care if you're using the bandsaw, **photo 6**.

They should look something like this when they're all formed, **photo 7**. Check that they fit, but don't fully assemble them just yet.

Back to front

While it's certainly possible to just fix the backs onto the carcass, the job will look much better if they're rebated in. The easiest way is to use a bearing-guided rebate cutter in your favourite router. Depending on the arrangement of your finger joints, one pair of parts will have the rebates running straight through. The other pair will need to have them stopped, **photo 8**, and then squared off for neatness so the back will fit in, **photo 9**. I mostly used a sharp Stanley knife here, as the softwood end grain is fairly delicate and chopping it out with a chisel often ends in tears!

Tea and biscuits

It's time to take a break before starting the next part of the carcass preparation; the biscuit jointing. Of course there are other ways of fitting the vertical divider, but biscuits are a neat and easy option, **photo 10**.

After the biscuits comes the glue-up. As usual, assemble all your kit before starting so as to avoid a panic halfway through. As with gluing and assembling all rectangular joinery work, it's essential to check for squareness before the final cramping up, **photo 11**. You'll only make difficulties for yourself later if you skip this important step.

Vital support

The legs are just simple dowels, and do need extra support. This is provided by an additional rail which not only provides reinforcement but also a means of joining the two carcass sides. Because it really pays to form the leg holes on a drill press, you need to complete this operation fairly early in the proceedings while you still can. A Forstner bit sized to match the dowels is the preferred option, and I was lucky to have a 32mm one which matched them perfectly, **photo 12**.

If all has gone well, and depending on the finish you have chosen, it makes sense to get a couple of coats of varnish or paint on the insides and the backs while access is a bit easier, **photo 13**. While it's tempting to just race ahead, you'll get a better result if you can show a bit of patience. Once the finish is dry, fix the plywood back panels in place with suitably sized screws, **photo 14**.

Two into one

Right, that's the easy bit done; now it's time to consider joining the two halves of the carcass. You need to cut a joining board component the same length as the long internal measurement, and 120mm wide with a 15° bevel on each long edge. This should be biscuitted into the corresponding edges of the leg rails, **photo 15**.

At the top you need a similarly angled batten, **photo 16**. Together the joining board and batten will hold everything together, but it takes a fair bit of fiddling to get it right. It's a tricky job to glue and clamp up; I had to resort to screwing everything together to ensure it all stayed where I wanted it, **photo 17** – a definite challenge, and probably the least gratifying part of the whole project.

Four legs good

The legs can now be simply glued into their sockets. Just make sure that they're all the same length and that they all fit into the base so the unit stands level. I did consider leaving the ends of the donkey open so as to afford some limited storage for a folded up newspaper or magazine, but in the end I filled up the void with two triangles planed to fit and just glued in against a support block at the bottom (visible in **photo 16**) and the end of the batten at the top, **photo 18**.

An optional handle

All that remains now is to make a handle. This is an optional feature, but one which really makes sense on a practical level. It's possible to make a flat and wide one which would double as a micro table for teas and coffees, but I just went for a standard curved number in elm.

Don't be tempted simply to drive screws through the carcass into the handle from beneath. Remember, it will have to cope with the weight of your James Bond paperback collection too, and you don't want it falling apart the first time you try to lift it! I'd recommend that you employ some kind of mechanical fixing like the threaded nut shown in **photo 19**, which accepts the machine screw driven up into it from below.

In hindsight...

All in all I was quite pleased with this little bookcase. It captures the spirit of the original 'donkey' while managing to bring something new – if angular – to the party. Personally I think the legs would look better nearer the ends; that was my original intention, but I messed up the biscuiting and had to readjust things! The natural finish is fine, but a bright and cheerful paint job could really make this donkey bookcase sing... or bray!



12

Fix the leg support rails flush to the rear edge of each carcass



14

Cut the two plywood back panels to size and screw them into place



16

Near their top edges, add a slim batten with the same bevel angle



18

Add a triangular infill piece at each end to complete the assembly

13

It's a good idea to apply your chosen finish to the interior now



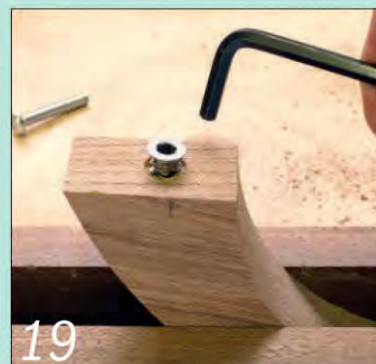
15

Fit a joining board with bevelled edges to link the two carcasses



17

Use biscuits and screws to fix the second carcass to the joining board



19

Screw a threaded nut into each end of the handle to take a machine screw



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BY KEITH SMITH

Swing into action

I have a large carpenter's bench in my workshop, but once I'm gluing something up on it, work often grinds to a halt for lack of working space. Been there? Well, here's a solution

This situation is hardly efficient, and I've wanted a larger assembly bench for some time. However, I didn't think I had the space to fit one. Then, with a particularly big job to complete, desperation drove inspiration. I hit upon the idea of making a torsion box which could be swung down from the wall when required, and easily pushed up out of the way when I needed the floor space.

This design of workbench would be

equally useful in a part-time workshop (in a garage, for instance), as it takes up very little space once it's swung up out of the way.

A big egg box

A torsion box is basically a central lightweight core with a thin skin – plywood in this case – firmly fixed to both faces. This structure has an enormous resistance to flexing, especially with regard to its weight, because for the box to flex one ply face has



1 I laid one piece of 6mm plywood on the bench and loosely laid out the frame and the internal braces of the torsion box



2 The plywood has little compressive strength, so I fitted additional lengths of wood along the front and side edges to withstand clamp pressure



3 The legs are simple A frames, assembled with pocket-hole screws. Once clad with ply on each side they became very rigid



4 The heavy-duty steel hinges project above the workbench, but will be concealed by the sacrificial sheet of mdf



5 The finished bench provides a large, flat surface to work from, with ample space all round

to stretch while the other has to compress.

This bench was to go into a room 3.3m (about 11ft) square, I wanted to leave room to work round both ends so I chose to make the bench just over 2m (7ft) wide and 1m (3ft 3in) deep; at this size it's relatively easy to push up against the wall. If I had more space I'd have made it the full 2.4m (8ft) long. However, I think the 1m depth works well; to make it 1.2m (4ft) deep would increase the weight to be lifted, and could potentially put the catches beyond easy reach.

Choosing materials

For the top I bought two full sheets of 6mm 'best' ply, 12m of 75 x 50mm and 8m of 75 x 25 PSE (planed square edge) softwood. For the legs I selected one sheet of 6mm ply and 12m of 75 x 25mm PSE softwood. I also bought a full sheet of 6mm mdf to act as a sacrificial surface for the completed bench top. Finally, to mount the bench to the wall I bought 2.1m of 75 x 50mm and

2m of 75 x 25mm PSE softwood.

PSE softwood is described as nominally sized; it starts off as a sawn width and is planed smooth, which reduces its actual size by about 6mm in each dimension. The various lengths of softwood were unlikely to be a consistent width throughout, which is vital for the torsion box to work properly, so I ran all the softwood for the top through the thicknesser to ensure I would get a completely even surface for gluing when the frame was assembled.

Making the box

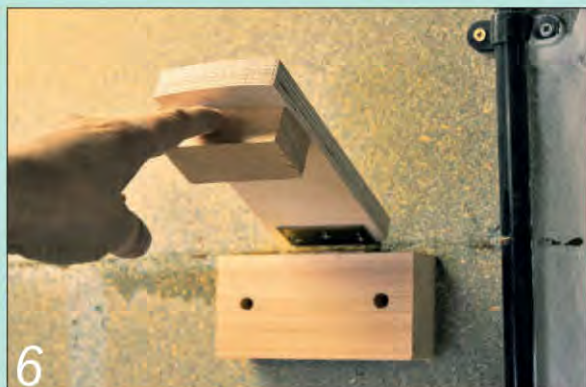
I started out by cutting two sheets of 6mm ply to size, 2.1m by 1m. I laid one of these on the bench so I could set out the internal frame more easily, **photo 1**. Normally the internal core of a torsion box can be extremely flimsy. However, I wanted to be able to clamp work down to the bench, particularly around its edge, so I chose to make the outer frame from 75 x 50mm

softwood and fit additional 75 x 50mm pieces inside the front and side edges, **photo 2**. These will provide a strong edge capable of withstanding cramps being applied to it.

The core is made from 75 x 25mm wood and the whole assembly is just screwed together, making absolutely sure the top and bottom edges are perfectly flush. I then pinned and glued the ply to both sides of the frame and ensured it was as flat as possible while the glue cured.

Copycat legs

The bench may have to take a considerable weight, but I wanted slim legs which could be easily folded away. I therefore decided to make the legs using the same sort of torsion box construction as the top. Firstly I made a pair of simple A frames which I assembled with pocket-hole screws, **photo 3**. I then glued 6mm ply to both faces of each frame, leaving the short legs



6 The larger central catch has a small overhang to minimise the chance of it being inadvertently knocked up when the bench is in the raised position



7 The smaller safety catch has a bigger overhang to make it easier to grab and push up when the bench is lowered



8 The bench takes up little space in the workshop once it's pushed up against the wall

9

The thin ply would not provide a durable surface to work from, so I pinned a sacrificial sheet of 6mm mdf to the top



10

To make the surface of the mdf a little more resistant to glue and other spills, I gave it two coats of clear acrylic varnish



protruding from the bottom to make it easier to swing the legs out from the wall.

Fitting the legs

I started by screwing a 2.1m length of 75 x 50mm softwood to the wall at a height of 920mm; this would allow me to hinge the top 60mm away from the wall. I needed this space as there were surface-mounted wall sockets behind the bench. I then fitted two vertical battens of 75 x 25mm softwood into which I could screw the hinges for the legs.

As these hinges don't take much loading, I used 75mm flush hinges for ease of fitting. If the floor had been uneven I would have fitted lift-off hinges so that I could lift the legs slightly as I swung them in and out.

Fitting the benchtop

To hinge the top I used three 100mm heavy-duty hinges. These had a large knuckle which projected above the top of the bench, **photo 4**, but this wouldn't be a

problem once the sacrificial mdf cover sheet was fitted.

I now checked to ensure that the top was evenly supported by the legs, **photo 5**, and found that with a lot of weight on the bench (me!) the legs flexed the relatively thin ply on the underside of the bench where it met the legs. So to give it some more support I glued some 75 x 25mm softwood along the top of the leg assemblies (visible in **photo 5**).

Holding the top up

To hold the bench up against the wall, I decided it would be best to fit two catches – a larger central catch, **photo 6**, and a smaller safety catch to the right-hand side of the bench, **photo 7**. Even though the bench is comparatively light, it could cause a serious injury if it were to drop down by accident (and it is far from inconceivable that a catch might be knocked up when swinging timber round the room). In practice I've found it easy enough to lift

both catches in order to lower the bench.

The catches are simply hinged off a bracket on the wall. Gravity holds them down, **photo 8**, preventing the bench from swinging forward.

The sacrificial top

To provide a thicker and disposable working surface, I finished the job by pinning a sheet of 6mm mdf onto the top of the bench. This needs to be reasonably firmly fixed in place, but not so securely that it can't be removed easily when it needs replacing. I used a nailgun with 16-gauge finish nails, **photo 9**. This surface has the added benefit that it projects above the hinges at the back of the bench.

Finally, to help the mdf surface resist the inevitable glue drips and spills, I gave it two coats of clear acrylic varnish, **photo 10**. The finished bench has turned out to be a real boon, and it's easily big enough to glue up a full-sized door, as the finished photo on page 19 shows.

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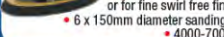
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BY IAN TAYLOR

Shaker flatpack

Have you ever been defeated by limited access for large pieces of furniture? I have. When my daughter moved to a new flat recently, we found that the sharp corners and narrow access on the stairs just wouldn't allow her to take the cherry double wardrobe I'd made for her. But it stimulated me to see whether I could make a knock-down wardrobe that actually looked like a proper piece of furniture, rather than a cheap chipboard box! Here it is

The idea was to use invisible screw inserts to hold together an oak frame-and-panel cabinet, with a removable cornice. Apart from the knock-down construction, I borrowed some of the design elements from several of the examples in Robert Meaders' *Illustrated Guide to Shaker Furniture*, but it isn't modelled exactly on any one piece.

The cabinet isn't tall – it stands just under 5½ feet high, so it's fine for hanging suits and shirts, but not long dresses or coats. The vertical posts are continued beyond the side panels to give short tapered legs.

There's a single drawer, under the hanging space. Since I focussed on making

just such a drawer in detail in the December 2007 issue of *The Woodworker*, I'm not going to deal with it again in this article, but the construction is totally traditional.

Topping the wardrobe off is a bold cornice, reflecting a style that you can see in some 19th century Shaker pieces.

The side panels

I started with the side panels. These are conventional frame and panel construction, with one long panel spanning the wardrobe space, and a shorter one over the space for the drawer. After all the joints were cut, I tapered the legs on the bandsaw, **photo 1**, and then cleaned them up with a plane.



1 Cut the taper on the legs with the bandsaw and clean them up with a plane



2 Gluing up each side frame took up the whole of my bench top



3 The convex cauls spread the clamping force along the whole length of the batten



SHAKER WARDROBE CUTTING LIST

All dimensions are in millimetres, and include allowances for tenons

Part	Qty	L	W	T	Part	Qty	L	W	T
SIDE PANELS					DOORS				
Stiles	4	1620	40	40	Stiles	4	1070	65	20
Wide (upper) rails	2	530	100	18	Top rails	2	160	65	20
Narrow (lower) rails	4	530	50	18	Bottom rails	2	160	75	20
Wide packing pieces	2	480	100	22	Panels	2	945	175	9
Narrow packing pieces	4	480	50	22	DRAWER				
Large panels	2	1085	495	9	Front	1	580	200	22
Small panels	2	215	495	9	Back	1	580	185	15
BOX FRAMES					Sides	2	450	200	15
Front/back rails	6	580	50	22	Base	1	565	450	10
Side rails	6	534	50	18	CORNICE*				
Plywood panels	3	536	508	9	Front section	1	772	80	17
Oak wardrobe base	1	536	508	9	Side sections	2	616	80	17
BACK PANEL					Front mounting batten	1	744	42	15
Stiles	2	1420	70	15	Side mounting battens	2	607	42	15
Main cross rails	4	460	70	15	Rear mounting batten	1	606	42	15
Upper dividers	2	560	50	15	Rear lip	1	734	25	15
Centre dividers	2	360	50	15	Plywood top panel	1	700	585	6
Lower dividers	2	220	50	15	* Parts are finished sizes: allow for cutting waste when gluing up				
Upper panels	3	575	135	8	You will also need: mounting battens (various), door and drawer handles, door hinges, magnetic door catches, hanging rail, wood finish				
Centre panels	3	375	135	8					
Lower panels	3	235	135	8					

I find it best to give the panels one coat of finish before the glue-up – this ensures that the finish goes right to the edges and guarantees that no unfinished bits will show if the panel moves in its grooves after assembly. Assembly was quite straightforward, although it took up my entire bench top, **photo 2**.

The box frames

The panels are joined by three rectangular box frames, positioned above and below the drawer space and at the top of the

cabinet. These frames align exactly with the lower pair of rails and the top of the side panels, and add considerably to the wardrobe's rigidity when it's assembled. They also give the impression of standard mortise-and-tenon joinery.

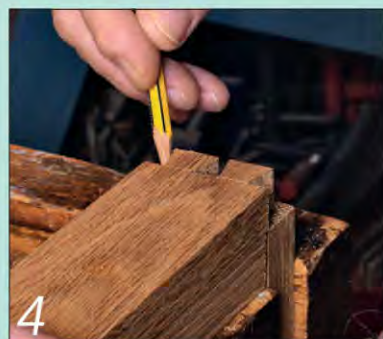
Since the cross rails on the side panels were narrower than the vertical posts, I needed to glue in packing pieces on the inside to give a flush surface to mate with each of the box frames. To aid the gluing, I used cauls – simple softwood battens planed to a slight convex profile along one

face. With the curve face down, clamps at both ends spread pressure across the whole length of the caul, **photo 3**.

Making the box frames

The rectangular box frames are simple assemblies, with the side rails blind-dovetailed into the ends of the front and back rails. Cut the tails in the box sides first and use these to mark up the recesses, **photo 4**, then cut them in the traditional way, **photo 5**.

The frames are 16mm shallower than the



4 Cut the tails in the back-to front frame components first and use them to mark up the recesses



5 Cut the dovetail recesses with hand tools in the traditional way



6 I used my Joint Genie for positioning the dowels accurately. Screw it to the cross rail

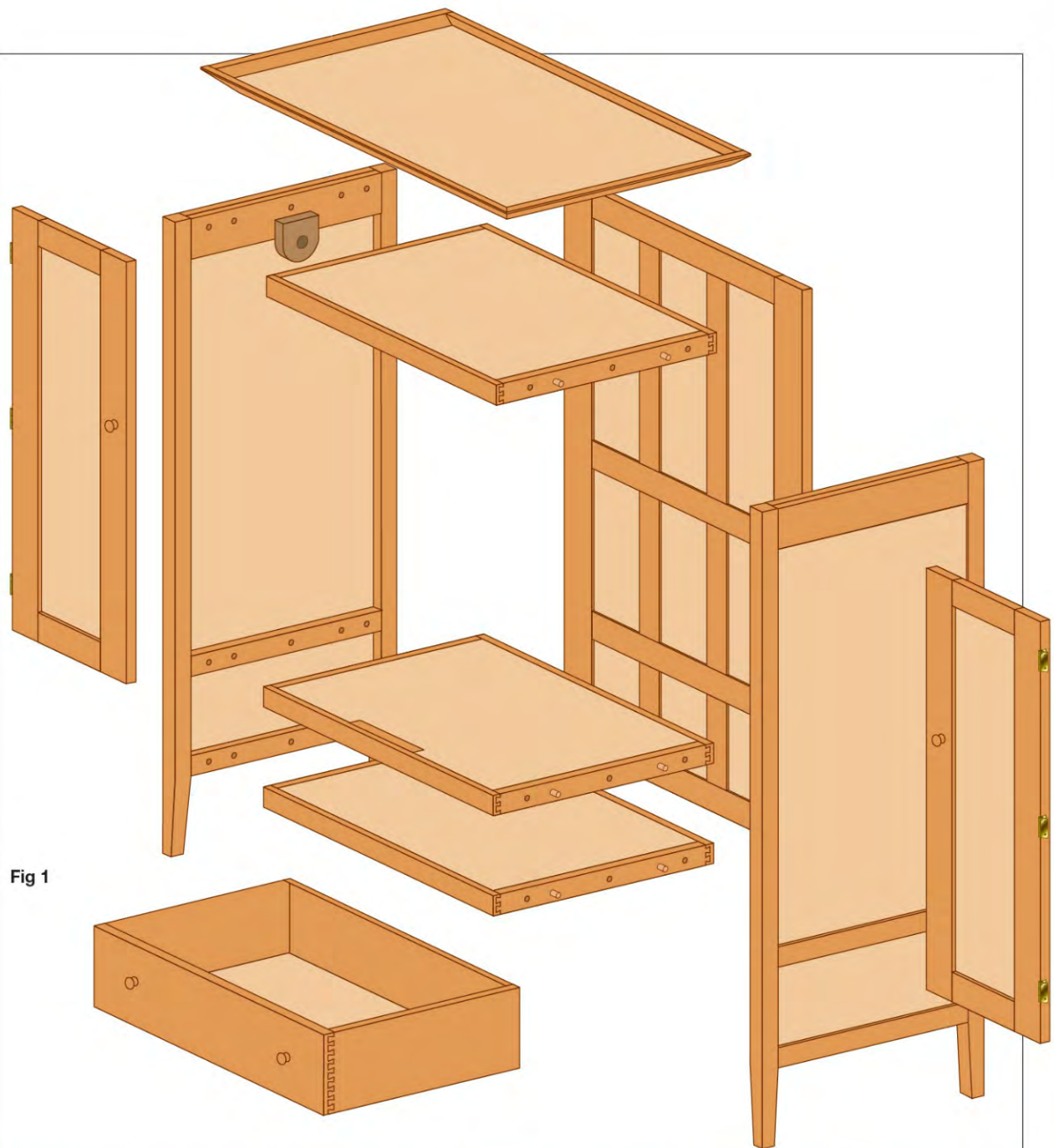


Fig 1



7 Drill holes for the locating dowels. The Joint Genie ensures they are perfectly aligned and vertical



8 Drill holes for the assembly bolts and inserts using a home-made jig with a 9mm clearance hole



9 Screw the threaded inserts deep into their clearance holes with an Allen key

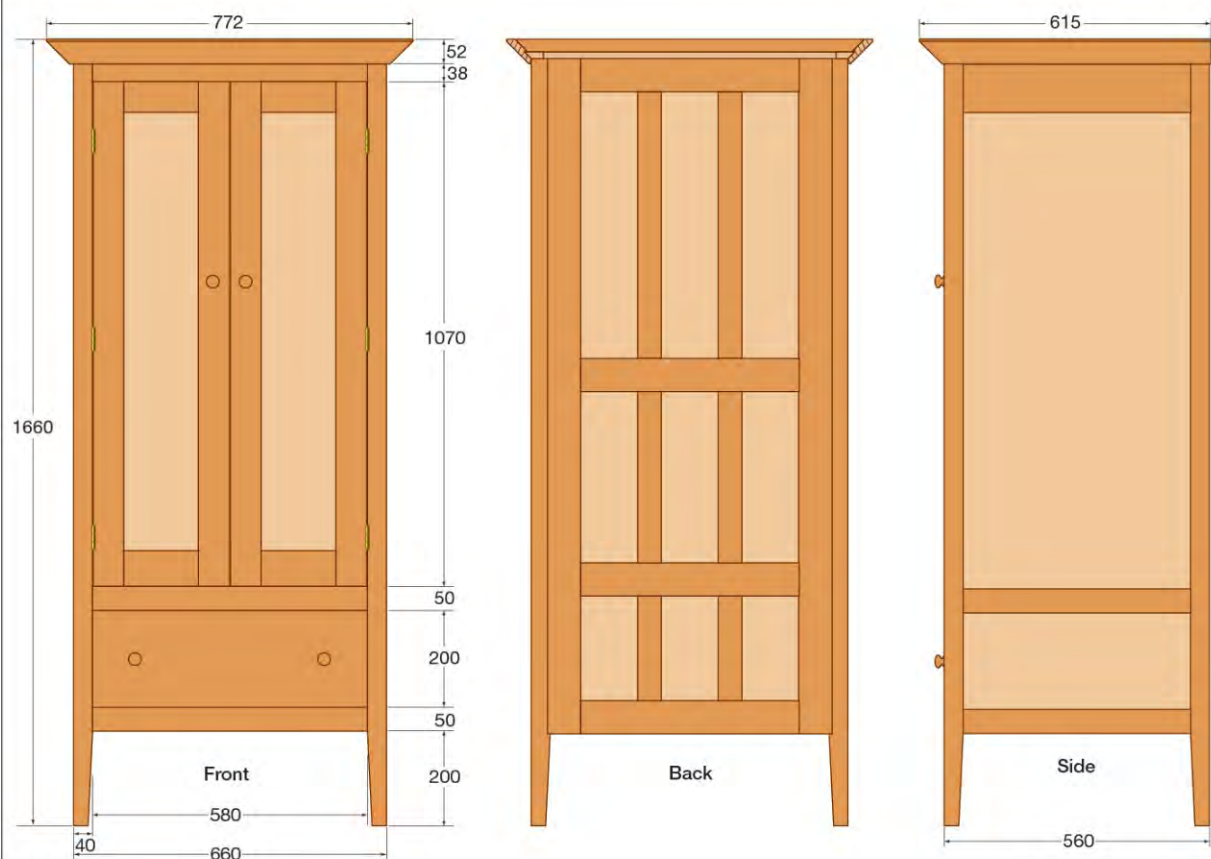


Fig 2

All measurements in millimetres

depth of the wardrobe side panels, to allow for the inset back panel. A matching 16mm deep rebate is routed on the inside edges of the back vertical rails.

Aligning the box frames

The box frames are joined to the side panels using special M6 bolts, mating with threaded inserts screwed into the packing pieces on the inside rails of the side panels.

The positioning of the frames needs to be spot-on and totally repeatable. So I used locating dowels to control their positions. To ensure accuracy, I clamped the frames in their desired positions and used my Joint Genie dowelling jig, **photo 6**, to drill 8mm dowel holes through the rails and into the spacer battens on the inside of the panel assemblies in a single operation, **photo 7**. Using the jig, screwed down on the inside

of the rails, ensures that the holes are accurately vertical and perfectly aligned. I glued the dowels only into the frames, leaving them protruding by about 20 mm on the outside.

Adding the inserts

With the dowels holding the frames in the correct positions, you can then drill the holes for the screws and inserts. This is a



I used three inserts for each cross rail. The fixings will be hidden from view in the finished cabinet



A 9mm plywood panel acts as a dust board and braces the box frames



Run the router and jig round the inside edges of the door to cut the stopped chamfers

similar job to the dowelling, but doesn't need quite the same degree of precision. I made up a simple jig – a 9mm clearance hole bored vertically through a block of timber, **photo 8**. The process is exactly the same as the dowelling.

Use this jig to drill simultaneously through the frame and into the side rails. With all the drilling done, the inserts can be screwed into the side rails. They are screwed in with an Allen key that locates into a hex-socket in the inside of the screw insert, **photo 9**. The cast inserts have an external thread that cuts into the bore of the 9mm clearance hole and locks the insert tight. I used 18 inserts in all – three for each cross rail, **photo 10**. They'll all be invisible when the wardrobe is assembled.

Plywood panels

Finally, to increase the rigidity of the box frames, I glued 9mm ply panels to battens glued and screwed to the insides of the frames, **photo 11**. Of course, you need to leave clearance so that you can still access the assembly bolts easily. These panels provide the top for the inside of the wardrobe space and a dust board under the drawer. There's also a further function, which we'll come to later!

Framing the doors

The doors are conventional frame-and-panel construction. The panels are individual 9mm boards, re-sawn from the same board to give a matching grain pattern. There's a slight chamfer on the inside edges of each panel to bring them down to 8mm and fit the groove in the inside of the frame.

The two meeting door stiles are cut from a wider board ripped down the middle, so that there is a tidy grain match when the doors are closed. Matching timber is also used for the outer stiles and the upper and



lower door rails.

I routed a stopped chamfer round the inside edges of the door panes, front and back, **photo 12**. I use a simple jig for this job, screwed to the base of the router. This acts as a fence and a stop, with the chamfer cut by a 45° bit.

After the router work, I cleaned up the stopped ends with a sharp chisel to remove the curved profile left by the router cutter, and glued and cramped each assembly and left it to dry, **photo 13**.

Designing the back panel

The back panel involved a fair bit of work, but I felt it was a bit of a let-down just to screw in a simple plywood sheet. I opted for another frame-and-panel construction, this time involving nine separate panels.

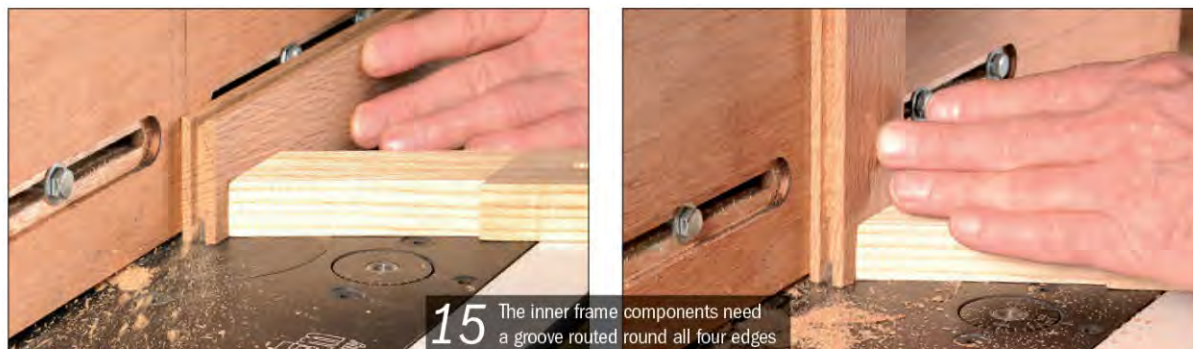
The second-from-bottom cross rail aligns with the bottom of the wardrobe space, so that only six of the panels are visible from the inside of the wardrobe. Since the rebate for the back is only 16mm deep the frame components were narrow, at 15mm. With a



Gluing up the doors is a more manageable operation than assembling the side panels



Trim the back panel frame components to length on the mitre saw for accurate results



15 The inner frame components need a groove routed round all four edges

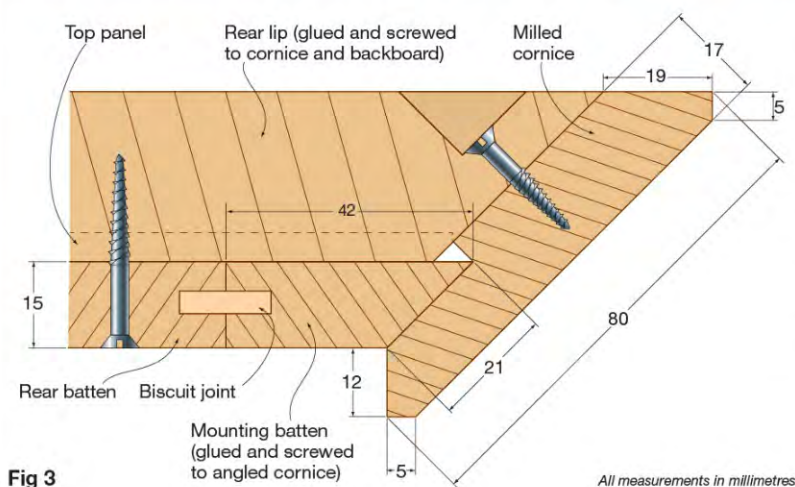


Fig 3

All measurements in millimetres

panel groove of 6mm, the construction doesn't really lend itself to mortise and tenon joints. However, it's very easy to use loose tenons in the routed grooves to get a strong and very neat job.

Preparing the frame members

I started by cutting all the components accurately to length. This was a good job for my mitre saw, **photo 14**, using the 90°

setting. By using a length stop, the dimensions of the matching pieces can be precisely matched before the grooves are cut on the router table.

The perimeter rails need a groove on their inner edges only, but all the internal frame components need a groove round their complete perimeter, ie on both edges and ends, **photo 15**. Make sure you mark the inside or outside faces of each component

and rout consistently off the same face. This ensures that any slight off-centre positioning of the router cutter doesn't give a mismatch in the alignment of the grooves. The loose tenons are cut to give a tight fit in the grooves, **photo 16**.

Assembling the back panel

Gluing up this panel was a rather tricky, and I found it easiest to tackle it in two stages. First, I glued up the central column of panels, **photo 17**. Although I used horizontal clamps in this step to ensure I could check for overall squareness, there was no glue applied to the outside joints. Once the glue was set on the first stage I slipped in the remaining panels and glued on the outside vertical rails, **photo 18**.

Looking at it on the bench, you might wonder why it needed two steps. However, handling all the panels, making sure they are in place and that the glue-up is square is a pressurised job, while the glue is setting quickly. So unless you have a spare pair of hands to help, you'll get better control and results by doing it in stages.

Preparing the cornice

Making and fitting the cornice was probably the most awkward part of this project. Since



16

The frame components ready for assembly, using loose tenons throughout



17

The first stage is to glue up the central column of three panels and their frame members



18

When the central column is set, add the six outer panels and frame members and clamp them up

it flares out at 45°, cutting the front mitres and gluing up the assembly is not straightforward. The stock needs to be milled first of all, to give the profiles shown in **fig 3**. Most of this can be done with a simple 45° chamfer bit, but you'll need a standard flat bit to rout the rebate to take the mounting batten. This is glued and screwed in place. I used a standard mitre saw to cut the mitres, with a packing piece under the mounting batten and the moulding upside down, **photo 19**.

The front mitres and the rear batten are joined with biscuit joints cut into the mating faces of the mounting batten. The rear batten has a vertical rear lip glued on first. This is mitred at the ends and screwed to the inside of the angled cornice (see **fig 3** again).

Assembling the cornice

Gluing up the assembly is quite tricky. You need a suitable framework to hold the cornice clear of the workbench and a way of clamping everything up tight and in the right place. A dry run is essential!

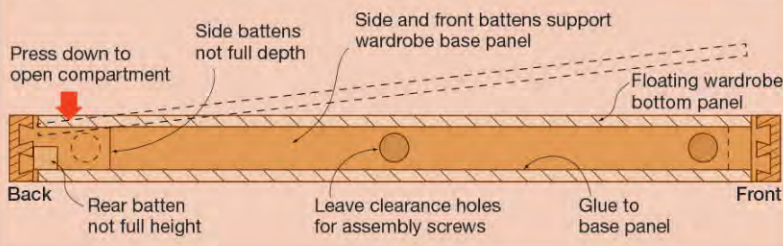
After a few false starts, I settled on using the cabinet itself as the assembly stand; surprisingly, it was just the right size and needed no extra work! I screwed the front and side mounting battens to the upper rails of the cabinet to hold the cornice solidly while the glue dried, using a makeshift clamp made from an old bicycle inner tube, stretched round the top of the cornice to hold the joints tight, **photo 20**. It all worked surprisingly well.

If you have any gaps at the mitres after you've cleaned it all up, they can be filled easily when you apply the finish. Sanding the wet varnish on the cornice with 180 grit abrasive paper creates a slurry that fills any gaps and dries to match the finished colour.

Finally I glued a 6mm ply panel to the topside of the mounting battens to give a

THE SECRET COMPARTMENT

An oak panel fitted into the inside of the middle frame gives a neat floor for the wardrobe compartment. If you make the side and front battens holding the glued-in bracing ply bottom panel in this frame thicker than the rear batten, and stop them short of the rear of the frame, you can lift up the panel by pressing down at the back. You have in effect created a narrow secret compartment where you could hide away all sorts of things – jewellery, important papers and the like.



flat top for the cornice, and to strengthen the assembly. The undersides of the side and front edges were chamfered so that the panel butts flush up to the angle of the cornice, **photo 21**. The finished cornice sub-assembly is simply screwed to the top rails of the wardrobe's side panels to fix it securely in position.

Attention to detail

The doors were fitted with turned walnut handles, to match those on the drawer. I used a pair of magnetic catches at the top and bottom to hold the doors closed and act as positional stops.

I made up brackets for the hanging rail out of utile to contrast with the oak interior. They're just simple semicircular blocks with 30mm holes in them to take the rail. These are screwed to the deeper upper cross-rails in the side panels, below the position of the upper box frame.

Finishing touches

I finished the pieces of the cabinet separately. I used a clear matt water-based lacquer for the inside, since it gives odourless protection and doesn't darken

the colour. The outsides were finished with three coats of my favourite home-made finish – equal proportions of boiled linseed oil, polyurethane varnish and white spirit, which is essentially a home-made Danish Oil. Wipe off any surplus thoroughly after each coat. Do this after 30 minutes and then again after further intervals of 30 minutes, till there's no surplus left.

And that's it. The assembled piece looks nothing like shop-bought knock-down furniture. It's sturdy and solid, but one person can move it single-handed, even if it's to the sixth floor of a block of flats. And my daughter has a wardrobe again...

FURTHER INFORMATION Knock-down fittings

The assembly fittings I can use are available from Screwfix. The M6 nickel-plated bolts are 35mm long and cost £2.35 for 50. The threaded insert nuts are 20mm long and cost £3.59 for 50.

- Screwfix
- 0500 414141
- www.screwfix.com



19 You'll need a packing piece to raise the cornice clear of the bed of the mitre saw



20 I improvised a band clamp with an old bicycle inner tube when gluing up the cornice



21 A plywood panel gives a neat flat top and strengthens the cornice sub-assembly

Nic Westermann



Mark Raby



Mick Hanbury



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Basa 4.0	Professional	375mm / 250mm	-22.5° to +45°	2.04 / 2.04	£1,125.00	£1,350.00
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BY PETROS KRONIS

Two into one

Save space in the bedroom by building this pneumatic masterpiece – twin bunk beds that convert to a platform bed with room for working and lounging areas underneath



The problem with conventional bunk beds is that they don't give you enough headroom underneath. The design of this convertible bunk bed incorporates pneumatic technology to solve this problem without sacrificing compactness.

Another feature is the simplicity of construction. It's almost entirely built using 92 x 21mm pine strip wood. What inspired me to design and build it in this way, apart from the need to save space in the bedroom, was a special offer in the local DIY shop for bundles of this timber sold at a knock-down price!

The design

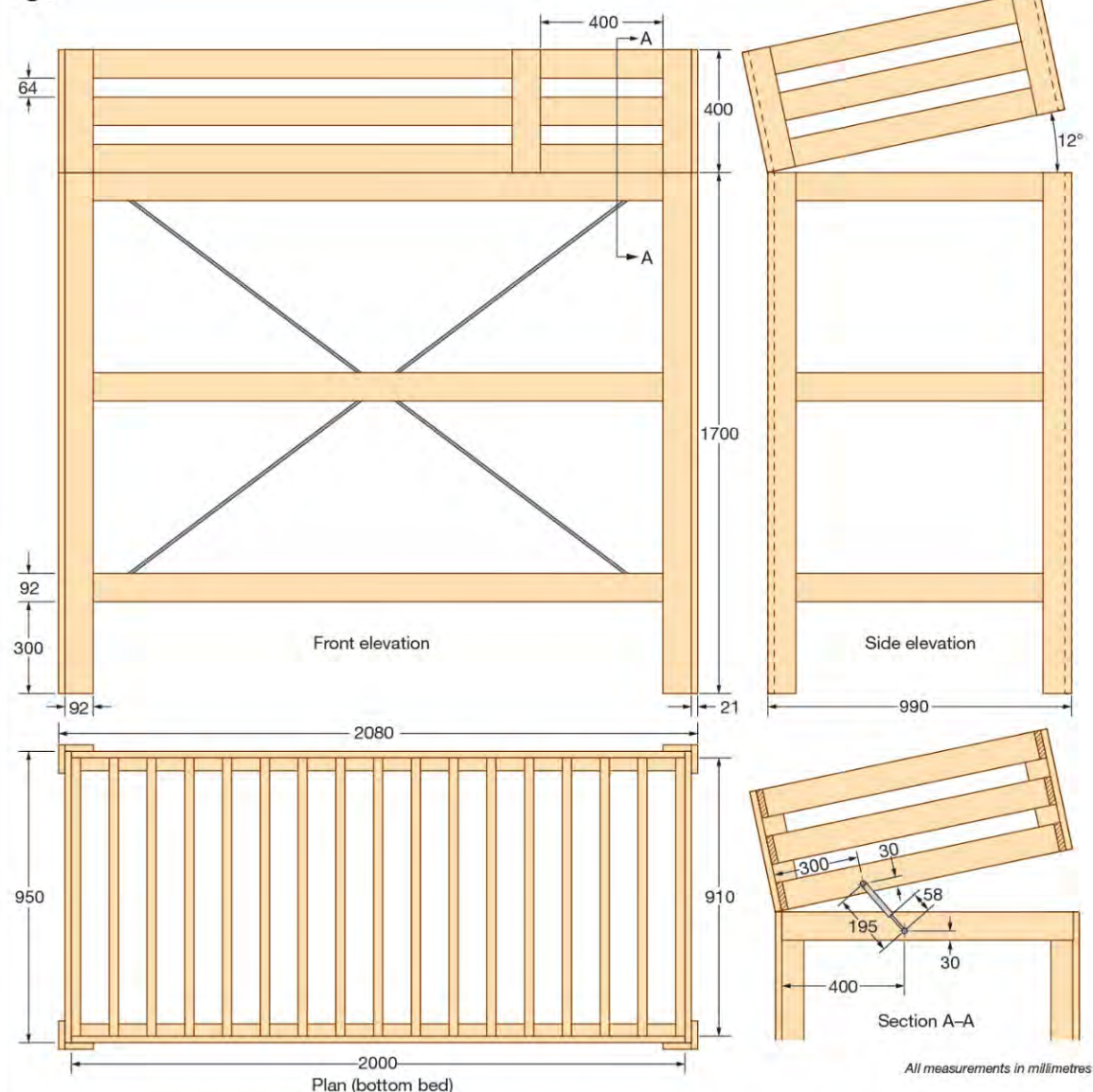
Fig 1 overleaf shows the design and general dimensions of the bunk bed, in elevation

and plan views. The top bunk is hinged at the back edge, and the front tilts up and is supported in the raised position by means of two gas spring struts. This gives the platform-bed configuration, with increased headroom under the front edge of the bed. A useful rule of thumb here is to provide enough head clearance for the user when he or she is standing in the space with one arm extended sideways and the fingertips touching the back wall.

The unit converts to twin bunks by lowering the top bunk and latching it on the lower structure, bolting on the bottom bunk side rail and fixing the lower bunk base in position.

A folding table is incorporated in the design, which in the platform-bed configuration functions as a study table and

Fig 1



in the bunk-bed configuration as a bed headboard. Because the top bed tilts up, and access is from the front of the bed, the ladder isn't incorporated into the structure, but is made as a separate component.

Safety considerations

The design of a bunk bed raises serious safety considerations. I have thoroughly researched these, and my bed is made to the guidelines described in the British and European standard BS EN747-1. Further information can be found online.

When designing a unit such as this, special attention must be paid to structural adequacy. The main parts of the bunk bed are the posts and the beams. When a post is loaded axially, as in this case, the main concern is buckling, especially when the posts are tall and slender. The strip wood is rectangular, so two lengths need to be connected at right angles to form an L-shape if they're to behave as a solid member. These joints are reinforced by means of metal angle brackets at the bottom and mid height of the lower structure. **photo 1**, and at

the bottom corners of the top bunk, **photo 2.**

On the folding table end of the bed, the brackets are placed just above the middle tie members so they don't interfere with the table's folding mechanism.

Putting it all together

The assembly of the bed is mainly done with connection bolts. The only members that are glued and screwed are the L-posts and the stiffening members.

When all eight L-posts (top and bottom) have been constructed, the top bunk end

frames can be assembled on a flat bench or on the floor, **photo 3**. The two diagonals are measured to make sure they are equal, ensuring the frame is square; then each assembly is cramped securely. The holes for the top and bottom end frames are made with a 6.5mm drill bit, ready for the 6mm diameter connection bolts.

Repeat the same procedure for the side frames, **photo 4**. Drill the holes as before, and remember to mark which beam connects to which post (and its position on the post); similar members aren't interchangeable.

Preventing racking

Bolted rectangular frames with single-bolt joints tend to be unstable when sideways forces are applied to them, resulting in the frames deforming into parallelogram shapes. To ensure complete stability in this critical longitudinal direction, I added two cross braces to the back frame. These are simple flat aluminium strips attached with connection bolts, and are clearly visible in the main photo on page 35, and also in **photos 5** and **10**.

The tilting mechanism

This consists of two hinges at the back of the bed, two pneumatic gas spring struts on the inside of the side frames, two latches and two guides. **Photo 5** shows the hinge detail at the back of the bed and **photo 6** the rest of the tilting systems, while **fig 1** opposite gives the relevant dimensions.

Notice that the hinges have been placed next to the L-posts to avoid interference with the post connection bolts. For this purpose two pieces of strip wood 92mm square are glued at the back of the tie beams to bring the hinge axis to the correct position. The hinges are connected to the beams using 4mm connection bolts.

Latches and guides

The latches are used to keep the top bunk locked down when the unit is in bunk-bed configuration. The guides are metal flats bent outwards at the top and screwed on the inside and outside of the side frame's top beam. Their purpose is to guide the two mating members into the correct position as the top bunk is pulled down.

At the rear corners, the structure is stiffened using metal shelving brackets which serve to keep the side frame at right angles to the back frame and also to reduce lateral deflections of the end frames.

Strut matters

The position of the gas spring struts must be carefully chosen to give the correct tilting

CONVERTIBLE BUNK BED CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Bottom frame L- post	8	1700	92	21
Top frame L-post	8	400	92	21
Top frame ladder post	1	400	92	21
End frame beam	12	952	92	21
Side frame beam	8	2000	92	21
Bed support rail	4	2000	38	38
Stiffener	4	952	92	21
Top bunk front beam	2	1530	92	21
Hinge fixing pad	2	92	92	21
Folding table	1	910	600	18
Rear brace (aluminium strip)	2	2071	20	3
Ladder stile	2	1827	54	33
Ladder rung	6	310	30 dia	

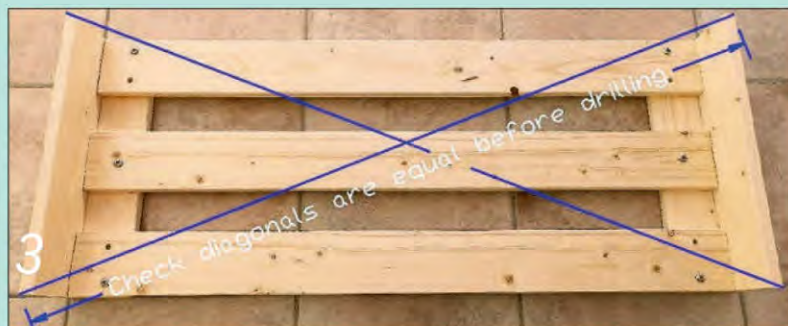
You will also need a range of hardware, including two gas struts, two steel latches, 12 65 x 65mm steel angle brackets, two 200 x 200mm shelf brackets, two folding table brackets, and M4 and M6 connection bolts in a range of lengths.



Two metal angle brackets are used to reinforce each of the four lower L-posts...



...and one is also used in each corner of the top bunk L-posts



Make up the two top bunk end frames and check them for square by measuring the diagonals



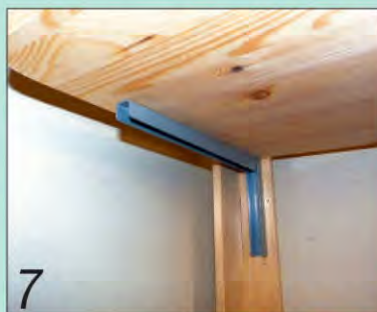
Repeat the same assembly procedure for the full-height frames



The top bunk hinges are fitted on spacer pads next to the L-posts



The gas piston, the latch and the guide peg are fixed to the side rail; see fig 1 for their positions



Folding brackets allow the work table to drop down as a bedhead in bunk-bed configuration



Removing the lower bunk and setting up the work station takes just minutes to organise



The ladder consists of dowel rungs set into the stiles, and has ladder hooks at the top



Fold down the table, add the front rail and drop in the slats to set up the lower bunk

angle. The important variables in the strut specification are the length, the piston stroke and the rated force.

Gas struts are available with similar sizes but different force capability, achieved by varying the pressure of the gas in the cylinder. The force selected will depend on the weight of the mattress to be used. Mine (bought on the internet – see Further information below for contact details) were 195mm long overall, and delivered a lifting force of 320N (newtons).

The further to the back of the unit the gas strut is placed, the higher the bed will tilt and the bigger will be the force needed to raise it. Bear in mind that the bigger the tilt angle, the more room is required between the back of the bed and the wall.

The folding table

The table is cut from 18mm thick solid pine board and is mounted on folding table brackets fitted centrally on each corner post at the required height, **photo 7**.

Take into account the fact that the front edge of the table needs to be raised slightly before it can be folded down. Open up the brackets, place the table top centrally on them, adjust them so they're square and screw them to the table top from underneath. **Photo 8** shows the table in position for use as a work station.

The ladder and bed bases

The ladder is a simple construction using 30mm hardwood dowels set into solid wood stiles measuring 54 x 33mm. The rungs are cut to a length of 310mm and fit in 5mm deep recesses drilled in the stiles as shown in **photo 9**. The top and bottom of the stiles are trimmed at an angle of 80°. Finally, a ladder hook is attached to the top of each stile.

The bed bases are a standard 2m x 900mm size. These are readily available and can be fixed in place with ease, **photo 10**. Screw the end and the middle supports to the side rails. The remaining strips of wood are held together with fabric strips (visible in **photo 6**).

FURTHER INFORMATION

Stripwood £7.98 for 2.4m

■ B&Q

www.diy.com

Gas spring struts £16.35

■ Amazon (search for Gas piston)

www.amazon.co.uk

Corner and table brackets

■ Element-System

www.element-system.com

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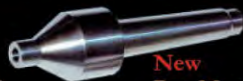
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BY GORDON WARR

Through a glass darkly

This table has a light and delicate look to it, with the combination of beech and the smoked glass providing a subtle contrast of colour and materials. It's very straightforward to make

Of course, other timber species could be used, and most glass merchants can offer glass in clear, bronze and smoked varieties. The glass needs to be 6mm thick, and must be safety glass; more about this later.

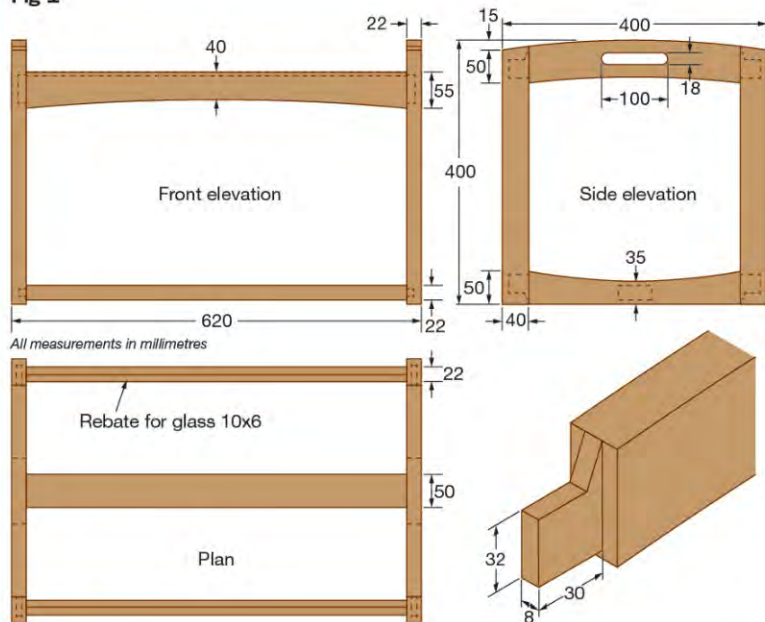
I was prompted to use beech for the framework because I had some in stock. Preparing material to size is always the starting point of a project, commencing with planing the face sides and edges. While the legs were planed to width, I left the six pieces which were to have their edges curved wider than finally needed. This is a useful dodge, as it makes forming the curved edges a little easier. The last stage of the planing is to reduce them to thickness. This always needs carrying out

with care when joints are cut by machine or power tool, as tenons in particular are often formed by working from both sides, and therefore any variation in thickness is reflected in the thickness of the tenons.

Allowing for horns

What applies to the thickness of the material also applies to its length where tenons are to be formed at the ends. Therefore the next step is to trim these seven pieces to length, that is, four to one size for the end frames, and three to the same length for the long rails. The ends become the datum surfaces when the tenons are formed. However, the legs are best cut overlong, and this excess is not removed until later. In any case, it would be almost impossible to trim the

Fig 1



GLASS-TOPPED TABLE CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Leg	4	430	40	27
Top side rail	2	650	55*	22
Top end rail	2	410	65*	22
Bottom centre rail	1	650	50	22
Bottom end rail	2	410	50*	22

Widths and thicknesses are net.

An allowance for joints has been added to the lengths.

* Prepare these parts wider than the quoted width to allow for cutting curves.



Mark out the joint positions with the legs held together in a vice

upper ends to their final length, as these have to be slightly curved to match the profile of the top rails. This excess length is known as a joggle or horn, and I'm a great believer in retaining these until later.

Multiple marking

I strongly recommend that you follow the professional way of marking out similar components at the same time, while all are held together in the vice or clamp, **photo 1**. This is not only quicker but much more accurate, as you know they'll all be the same. Remember, though, that in this case the legs are marked in mirror-image pairs; this is where the face marks prove to be invaluable. Initially, the marking out is carried out in pencil on the edges of the parts, and then squared around the piece individually as required.

Cutting to length

Now the rails can be cut to the exact length as marked out. Here a table saw is invaluable, but there's nothing wrong with a tenon saw and a shooting board. All the tenons are 8mm thick, and can now be marked with the mortise gauge. The gauge will need to be re-set for the long rails, though the joint thickness is the same. It may be that not all parts of the joints need to be gauged; this will depend on how they are to be cut. One of the advantages of using power tools or machines is that only a sample joint needs to be fully marked; the remainder will then be formed to identical dimensions.

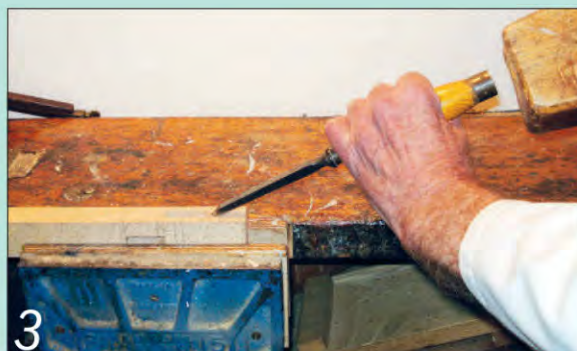
Mortises and tenons

The mortises in the legs were quickly formed on my bench mortiser, **photo 2**. This is an unusual machine as the wood remains stationary on the table, and it's the head that is moved laterally by lever along the extent of the mortise. I'm not aware of any other current mortiser which operates in this way, but I have had it for a few years now! When the mortises were all cut, I used a sharp chisel to cut the haunches inside them, **photo 3**.

For the tenons, I used my shop-made router tenoning jig, **photo 4**. This simple jig determines both the length and the thickness of the tenons, with edge shoulders and haunches being formed later. I decided to use sloping haunches on the end rails as these would not therefore be seen on completion. These were cut by a combination of bandsawing and tenon sawing. Another worthwhile dodge with tenons is to form tiny chamfers around their ends; these allow for much easier entry into their mortises.



Use a bench mortiser (if you have one) to cut all the mortises



Form the sloping haunches within each one by hand chiselling



I cut the tenons on the rail ends using a shop-made jig and router



The bandsaw is the ideal machine for cutting the curves on the rails



Drill out the handle holes and cut out the waste using a jigsaw



Then use a router and a template to trim the handle holes neatly

I always cut the mortises before the tenons. It's difficult to alter the width of a mortise once it's cut, but comparatively easy to re-size a tenon if the joint doesn't fit well.

Marking curves

I use an adjustable tourniquet bow to mark the curved components. To start with I made just a sample end and side rail with the curves I wanted; the various dimensions are given in **fig 1**. Either a bandsaw or a jigsaw can be used to remove the waste, **photo 5**, followed by a spokeshave (or,

better still, a compass plane) to trim down to the line. If a disc sander is available, this provides an ideal way of trimming convex edges. I then used these sample rails to mark the remainder of the components.

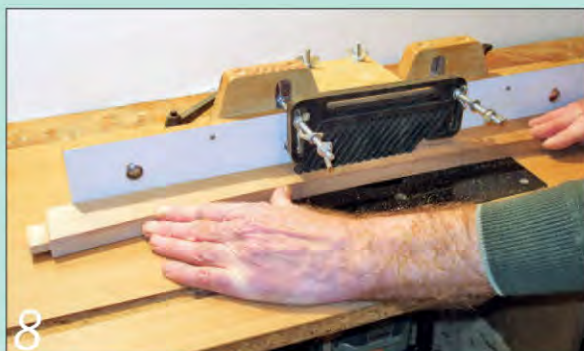
Routing the handles

I made a template out of plywood so I could trim the handle holes using a router. After using this template to mark the top rails, the bulk of the waste can be removed by boring and jigsawing, **photo 6**. Double-sided tape provides an excellent way of securing the

template to the wood; then the router trims the inner surfaces to an exact profile, **photo 7**. With the template removed, a rounding-over bit in the router completes these cutouts, although some final smoothing with abrasive paper will also be needed.

Final preparations

The glass top sits in rebates cut with a router in the long side rails, **photo 8**. With all the parts cut and fitted, and the curved edges completed, the job reaches the first stage of cleaning up. With any frame or box



8 Form the rebates in the two upper long rails on the router table

9

Glue and cramp up the two end frames and set them aside



10

Complete the assembly by fitting the long rails between the end frames



11

Rub down the final coat with 0000-gauge steel wool dipped in wax



type construction, inner surfaces must be cleaned up before assembly. I brought a variety of power sanders into use at this stage, including a large foam filled drum sander mounted in my bench drill. This proved to be ideal for the curved edges.

Starting the assembly

I began this stage by assembling the end frames, **photo 9**, cramping them together, checking for square and removing any excess adhesive while it was still wet. Once dry, the horns can be sawn off, and the top edges of the frames levelled and smoothed for which a belt sander is ideal. It's worth checking with frames of this type that they are in fact identical by placing one on top of the other.

The three long rails are cleaned up next, and the second stage of the assembly completed, **photo 10**. Again check for squareness from corner to corner, and also that the legs are at right angles to the side rails. When the joints have dried, give the whole piece a final sanding and lightly round over all the edges.

Applying the finish

My favourite finish for smallish projects like this one is pre-catalysed lacquer. It's a cellulose-based finish that dries fairly quickly and offers a high resistance to wear and any liquid spillages. I dilute it with around 10 per cent of cellulose thinners, and apply it with a soft brush. I usually give between two and four coats, flattening down between coats. The final coat I flat down with 0000-gauge steel wool dipped in a wax polish, **photo 11**, before burnishing the surface with a soft cloth.

Ordering the glass

The final job is to measure up and order your choice of glass panel for the top from your local glass merchant. The panel must be of toughened glass for safety reasons, so has to be ordered and made to the precise size you want. Measure the length and width directly from your table frame, and subtract 1mm from each measurement so it can be lifted in and out easily. When you place your order, ask for the edges to be ground and polished so they're safe to handle. When it's ready, simply place it carefully in its rebates, **photo 12**, polish off any finger marks and you're done!



12

Place the toughened glass panel into its rebates to finish the job

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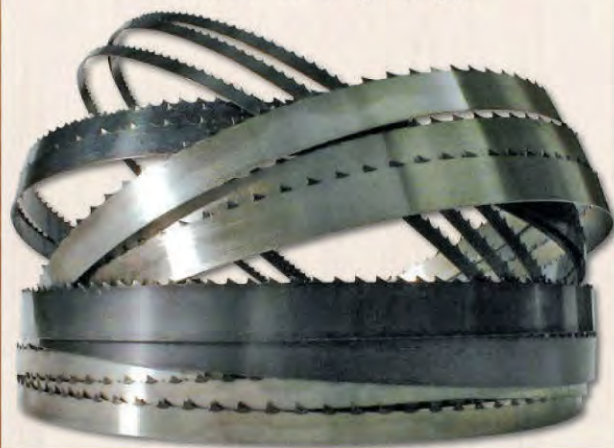
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BY MICHAEL FORSTER



RAISING MY GAME 1: Straight and narrow

Timber preparation matters. Do it well and you've a decent chance of getting excellent results with your woodwork. Do it badly, and you may as well not bother...

Over forty years ago I did a professional woodworking training course. Quite how I scraped through I don't know, and holding down a job in the real world was something else. I daresay I could possibly have found a place with that legendary company Bodgett and Fudge, but a satisfying woodworking career was a less realistic proposition.

Gappy joints, poorly-fitting doors in out-of-square cabinets, shoddy finishes – I took them all for granted in my work, and resigned myself to accepting that I just wasn't one of those specially gifted people whose work didn't have to be viewed through half-closed eyes. I thought they were the Special People and I was one of the Others. It was only after some fortunate, confidence-building chance encounters that I began to think it might not be that simple.

I don't for a moment entertain the idea that other readers are working at quite the level of mediocrity that I was then, but if the general feeling of 'Wish I could do better' is not entirely unfamiliar, then please read on...

Simple changes

Looking back, what I find most amazing is the simplicity of it all: the relatively few and relatively simple changes that set me on the road to better things and left me wishing I'd taken them on board years earlier. And that's what I'm going to try and share with anyone for whom it might be helpful.



Not that long ago, I thought this was the best work I was capable of...



...but this shows that a few small changes can make a huge difference



There's no reason why you can't prep by hand, given time and youthful vigour, but this piece of bubinga demands a lot of both!



Cutting can release internal stresses and allow timber to bow, so cut work oversize and leave it to settle before final dimensioning

The purpose of this article (and those to follow) is to signpost the journey, not to deal with each stage in depth. Once you know what you're looking for, there's a mass of information out there and you'll quickly find the stuff that's right for you – including of course in back issues of this worthy journal.

This month I'm going to look at what for most of us is the start of it all – timber preparation – and then I'll go on in later instalments to look at some basic improvements in terms of kit and skills that can pay huge dividends.

Buying off the peg

Here, then, is where it begins – with flat, true timber with square corners. It may well be that curves and angles also feature in your finished product, but they will be plotted from the known reference points of straight and square edges and it's impossible to overstate the importance of this. The most skilful marking and cutting will be wasted effort if the datum surfaces aren't true.

Like many hobby woodworkers of my generation, I didn't have the facilities for preparing timber at home so I ordered my stock in finished sizes. Most timber yards will gladly offer a machining service for a charge, and for many people that may remain the best option as the benefit of home mechanization might not justify the costs (although these might well be less



Buying timber ready-machined is an option. Always buy enough extra to allow for defects such as machine snipe to be cut out



Starting to use machines means learning about safety first, and making simple precautions such as using pushsticks second nature



A small bench-top bandsaw can do a remarkable amount of the donkey work in a small workshop

than they think). But I began to find it very restrictive and the outcomes unsatisfying.

Out of control

For me, the big drawback with ordering pre-machined timber was that it meant not being in control of this vital first stage of the work – and that set me up for problems further down the line. As we all know, timber moves, especially if taken from one environment to another – such as from the timber yard to the customer's workshop.

The act of preparation itself can also release stresses and unbalance moisture content, all of which meant that the timber carefully machined for me was quite likely to have changed shape before I got it all put together, usually to the detriment of the finished project. Were I doing the prep myself, there would be ways of mitigating this, and that would mean better outcomes.

The machine age

Of course, none of this meant that I absolutely had to have machines. It's perfectly possible to buy timber rough-sawn, then rip it and plane it entirely by hand at the start of every project. However, I decided it was time to drag myself into the real world and acquire a couple of basic machines. I didn't like them very much then and I don't now, but I've never regretted letting them into my life.

Safety first!

In a professional 'shop, no one without adequate training is allowed on a machine, but the hobbyist can now purchase frighteningly powerful kit with no questions asked and simply start using it. Anyone taking the step from hand tools to machines must at the very least read the safety instructions that come with them, and preferably take some training or read up further on the subject.

Informal tuition is often available from the



If you have a little more space, floor-standing machines are well worth the extra cost. Many can be put on wheels for better manoeuvrability

experts at woodworking shows, and of course a number of manufacturers and suppliers are only too happy to help a potential customer to learn with courses and workshops. So go study!

What machines for me?

I knew what I wanted: some kind of powered saw and a planer/thicknesser. These days there's a huge range of machines available for all sizes of workshops, from cheap and not-so-cheerful models to big, heavy bruisers bristling with bells, whistles and versatility. My advice would be to avoid both extremes. It's easy to end up either regretting the limitations of the machine you chose (and then having to buy twice), or wishing that you hadn't blown so much money and workshop space on something with features that you never use.

The very good advice I received – bearing those extremes in mind – was to go for the



The industrially rated Startrite bandsaw (left) surprisingly has a smaller footprint than the bench-top machine on the right



It can quickly reduce a huge 200 x 100mm hardwood plank to box-sized components



Initial planing involves two distinct functions: the first is overhand planing, using a fence to get a square edge...

biggest and best I could afford and accommodate comfortably, within the constraints of my finances and work area (remember that machines need working space around them). I found that many of the mid-range floor-standing units came with wheel kits, so they could be stored out of the way and wheeled out for use. Of course that's less than ideal, but it's a huge improvement on nothing!

Saw points

I'd heard a lot of experts say that the first machine to acquire is a table saw, but try as I might I couldn't find that advice particularly convincing. I knew I'd only have the room – and the finance – for one powered saw, and I wanted it to be as versatile as possible, which seemed (and with hindsight still does) to point to going for a bandsaw.

It can rip boards ready for the planer, or it can form curves and shapes as well as doing a very good job cutting tenons – something that can't usually be done safely



...and then thicknessing to get two parallel surfaces and consistent dimensions

on a table saw as the guard has to be removed. And of course, class-for-class, it can cut much deeper – important if you're resawing wide boards. I knew the bandsaw wouldn't give the same degree of precision as a table saw on straight ripping work, but as compromises go it wasn't a bad one.

Thick and thin

Once I'd sawn my stock to size I'd need to plane and thickness it – two distinct operations. The first is done on the overhand planer, where the timber can be run against a fence at a true 90° to get those vital datum surfaces from which all the marking out will be done.

For the next stage – thicknessing – I'd need a thicknesser which would use those datum surfaces as its reference to produce

parallel surfaces at the correct thickness. Because of my workshop size it made sense to combine these in one machine – a planer thicknesser – but when I moved to larger premises one of the first things I did was to buy a separate thicknesser. This now allows me to work more efficiently, as I don't need to dismantle anything between changing functions and can retain my settings on both machines. However, that wasn't an option at the time.

Life-changing?

Well, yes, that's what it was. The savings in timber merchants' machining fees would of course take time to show, but the other benefits were immediate. Two-stage timber preparation – not practical when buying finished sizes – meant I could let the timber settle between stages. I could also arrange the cutting angle to get the most stable grain orientation. And speaking of grain, it gave me the freedom to select the best part of the board for each particular panel – maybe there's a dramatic bit of grain that would be perfect for a box lid or a door panel, if only the piece weren't already sized for another component.

Prepping your own timber gives you that kind of control. And I just love the freedom to go and cut another piece if I suddenly find I need to, rather than struggle to work round a design issue or disguise a mistake.

Enough about me

What about you? Anyone in the position I was at this time has some decisions to make. Your workshop may well be a different size from the small garage I had then, so you



Dust extraction is essential. An ordinary vacuum cleaner will do for a benchtop bandsaw...



...while this drum-type extractor can be adapted for 32mm vacuum or 100mm extractor hoses

A SURFER'S GUIDE

These are just a few sites that I've found useful when looking for machinery. There are many more, of course, but these will get you off to a good start. If any of them are near you then it's worth taking the time to call in at their showrooms. A hands-on demonstration by an expert is invaluable, especially on an unfamiliar machine.

■ www.charnwood.net

Good, robust machines at sensible prices characterize this company. Their range of bench-top bandsaws is wide enough to accommodate most needs.

■ www.dm-tools.co.uk

On this site, if you click on either Bandsaws or Planer thicknessers you'll get a little preview of Alan Holtham's instructional DVDs, which might be very useful at this stage.

■ www.recordpower.co.uk

This site is also linked to its sister site Startrite. Most of the latter's machines are beyond the needs of a hobbyist, but you may find their bandsaws worth a look. As with Charnwood, the Record showroom is definitely worth a visit.

■ www.yandles.co.uk

An excellent company with good delivery and customer service, and stock to cover just about any woodworking needs.

may need to scale up or down accordingly, within whatever budget you have.

There are some relatively inexpensive bench-top machines that are small enough to tuck away in a corner and light enough to lift onto the bench when needed. Space prohibits my giving comprehensive advice on this, but firms like Charnwood and Record Power both do a good range of decent small bandsaws, while the Woodster planer/thicknesser was well reviewed in the November 2013 issue of the magazine.

Little and large

If space isn't at a premium – and your budget permits – then I think floor-standing versions of these machines are enormously better value for money, and you're less likely to grow out of them as your woodworking develops.

However, there are some pitfalls with small machines. Less mass tends to mean more vibration, which seriously reduces the pleasure of working with them. Some small bandsaws (not the above-mentioned, I

hasten to add) have aluminium frames which just don't have the rigidity of steel, and that affects blade tension. When choosing one, look at how easy the machines are to adjust and service – blade replacement, that sort of thing – and on bandsaws how fiddly the guides are to adjust. Oh, and if you get the choice, a cast-iron work table is a big improvement over an aluminium one. The important thing with machines, like any other kit, is to take a good look around before you buy.

The extraction question

The other thing I quickly realized when I got my first machines was that dust and chip extraction is not a luxury; it's essential, or your hobby can seriously damage your health... and your temper.

A small benchtop bandsaw can be hooked up to a vacuum cleaner – preferably a workshop-rated one, and definitely not the one that gets used in the house; you don't want the dust from mdf or tropical

hardwoods getting into that!

Planer thicknessers are a bit different and the chips they produce will quickly clog up a narrow vacuum tube, so most are fitted with 100mm wide extraction ports. Various manufacturers offer drum-type extractors that can be adapted for both outlets, and I've found those to be a good compromise.

What if it's not for you?

Even after reading all this, there will be woodworkers for whom the status quo is preferable – that for whatever reason, whether space, finance or simply the kind of work you do, it's just more appropriate to continue buying timber pre-machined. If that's the case for you, then there are still some ways of making the best of the situation.

Always buy timber that's longer than you need – for a number of reasons. Firstly, it allows for damage to the ends and corners during normal handling. Secondly, the very ends of timber, because of the exposed grain, can suffer disproportionately from changes in humidity, which is why timber merchants paint the ends as a precaution. Thirdly, machine snipe can reduce the thickness of the timber slightly but significantly for anything up to about 50mm (sometimes even more) from the end – the crucial part, right where you're likely to cut your joints.

Buying over-length may seem wasteful, but one way to manage this is of course to combine short lengths into fewer longer ones and then separate them at home – not a big ask with relatively small-section timber.

It's also worth buying more than just the exact cutting list requirements for a project. A few spare pieces may save a lot of hassle if you need to accommodate any changes of plan or simply to redress an error – and if as we hope they're not needed, then they can go into the timber rack for a later project.

And in the end...

Whichever way you get there, the important thing is to end up with those straight, true edges that will enable you to mark out the job accurately and with confidence.

It went seriously against the grain for me to go and buy machines, as I really do love hand work (not to mention detesting the noise and the dust raised by the average workshop banshee). However, it's impossible to overstate their proven value, as I'm always able to have well-prepared timber quickly to hand – whether I'm starting a furnishing project or just quickly cutting a new piece after drilling a hole in the wrong place in the original! Been there, done that! Why do I never learn?

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Although I don't consider myself an expert penmaker, I quite enjoy turning them occasionally as they make excellent gifts for family and friends. They're generally quite straightforward for even the most inexperienced turner to tackle



Penmanship



BY BOB CHAPMAN

You can make pens on very small lathes costing less than £200, and even on drill-powered lathes which can be bought for less than £50, although I don't recommend these as they're so limited in their usefulness.

Assuming that you have a basic turning toolkit, penmaking requires little further outlay on specialised equipment... although it has to be said that there's an abundance of such equipment available for the unwary.

In preparing this article I've tried to avoid the use of too many specialised bits and pieces. I don't deny that some of them are useful, but I think it's best to discover for yourself what you need before dashing off to buy a load of gizmos.

A kit of parts

There are many different pen kits available, costing from around £3 or so up to ten or fifteen times as much for the very best kits.

TURNING *Burr elm fountain pen*

1

Lay the pieces of the kit out in sequence to see what goes where



2

Make the two blanks a little overlong to allow for trimming later



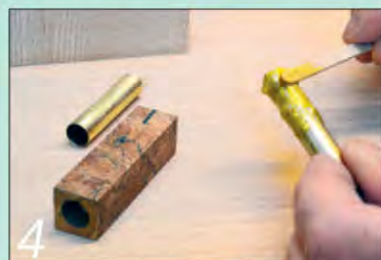
3

Drilling holes on the lathe is much more accurate than using a drill press



4

Abrade each tube and spread glue on it using a disposable spatula



5

Push each tube in so its end is just below the surface of the blank



6

I used a disc sander rather than a pen mill to trim the ends square



7

Rotate the blank regularly until an evenly bright circle of metal is exposed



8

Measure the diameters of the metal parts where the wood and metal will meet



The difference in price is usually reflected in the quality of the plating on the metal components. Kits are available for fountain pens, rollerballs, ballpoint pens and pencils in various twist or click mechanisms. The kit most favoured by beginners is the simple slimline pen or pencil which may cost as little as £2.50 each – or even less if bought in a pack of five or ten at a time. Buying in bulk is a worthwhile investment because, once you've caught the bug, you'll soon get through them!

Choosing materials

You can use any type of timber for the pen body but, naturally, it'll look better if the timber offers some visual excitement – perhaps a striking grain pattern, some spalting or a burr figure to add interest to the finished pen. In addition you could choose from a whole raft of pen blanks in acrylics and other materials such as alternative ivory or tortoiseshell.

In this article I'm going to use a small piece of burr elm for the pen body, and I've chosen a fountain pen kit which is a little more complex than the basic slimline kit but which gives me scope to show you some alternative techniques.

Checking out the parts

Unfortunately the cheaper pen kits rarely contain any instructions, so it's a good idea to start by laying the parts out and spending a few minutes figuring out how they go together, **photo 1**. All the kits I've used contain one or more brass tubes. These are the parts which end up encased in wood or some other material, and carrying out this process is the basis of all pen turning.

In this case the two tubes are different lengths, and by trying bits against each other and putting them together as far as I could, I finally decided that the longer of the two would form the body of the pen and the shorter tube would be the cap. If you're in doubt about how the bits go together, remember that there's a wealth of information on the internet and, no matter what kit you're using, someone somewhere will have described how it all works.

Preparing the blank

Select your blank and cut two lengths which match the lengths of the brass tubes. Allow 2-3mm excess for trimming to size later, **photo 2**. Mark the blank to show the matching ends. This is particularly important if there is a striking grain pattern along the blank.

Next, measure the outside diameter of the tubes (if there is more than one, don't assume they are the same diameter) and choose an

appropriate drill size to drill the hole in the blanks. Trial drilling in a piece of scrap showed that none of my metric drill bits was quite right. The 9.5mm bit was too small but 10mm was too big. Fortunately a search through my box of oddments unearthed a $\frac{3}{8}$ in bit which was perfect, **photo 3**.

Drill both blanks from the end which has to match the other piece, so that the holes are central and the grain will match when they're turned down, even if the drill wanders a little off centre towards the other end. The holes should be a reasonably close fit to the tube, but not tight.

Fitting the tubes

Abrade the tubes slightly with some coarse glasspaper and spread glue evenly over the outer surface. You can use cyanoacrylate glue (superglue) for this, but I prefer to use a two-part epoxy adhesive because it tends to stay where I put it, and doesn't glue my fingers together as I'm applying it, **photo 4**. The downside is that epoxy takes longer to set. Push the tubes into their respective blanks with a twisting motion to spread the glue, and make sure that the ends of the tube are slightly below the surface of the blank, **photo 5**. Leave until the glue is thoroughly cured.

Trimming the ends

The ends of the blanks now need trimming down to the ends of the tubes, making sure they remain square. There are specialised pen mills available; these have a shaft which goes down the tube and keeps the trimmer square to the tube, but you then need a different size mill for every different size of tube you might use. Different pen kits have different diameter tubes, so this could add up to quite an outlay if you want to try making a number of different pens.

Instead, I trimmed the blanks on a sanding disc, **photo 6**. This is cost-free but not foolproof. Care must be taken to get the end square to the tube. I make very light touches on the disc, turning the blank regularly until I see the bright surface of the end of the tube evenly exposed, **photo 7**. If you're careless and sand an angle on the end of the tube, there will be an unsightly gap when the pieces of the pen kit are finally assembled.

Getting ready to turn

Measure the diameter of the metal components that will butt up to the wooden parts of the pen, **photo 8**. This gives you the diameter to which the pen blank must be turned. Again, don't assume that they're all the same. Make sure you know what



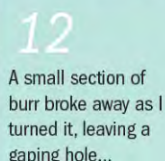
Pen mandrels are available with a variety of bushes to suit different pen kits



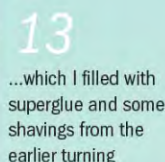
Fit the bushes, the blank and as many spacers as you need onto the mandrel



Run the lathe at high speed and turn the blank with a bowl gouge



A small section of burr broke away as I turned it, leaving a gaping hole...



...which I filled with superglue and some shavings from the earlier turning



When the glue has dried, turn the bump level with the rest of the blank and sand it smooth

TURNING *Burr elm fountain pen*



15
With the lathe off, apply the superglue quickly using some kitchen roll



16
Sand it, apply more glue, sand it again and then lubricate it with wax



17
Finish the process by polishing the surface with burnishing cream



18
The result is a smooth, glossy and hardwearing surface finish to the pen body

diameter each end of each blank must be.

A pen mandrel, **photo 9**, is one specialised piece of equipment I do think it's worth buying. Fitted with bushes of different sizes, it's used to hold the pen blanks while they're being turned. Many of the bushes are manufactured with the largest diameter corresponding to the diameter required for the pen.

Loading up the mandrel

The appropriate bushes are pushed into the ends of the brass tube and then slid onto the mandrel. I've used all the other bushes as spacers to take up the excess length of the mandrel, but anything could be used for this – a series of small nuts, for example. The final knurled nut goes on the end, **photo 10**, and is tightened just enough to

stop the blank rotating.

It's possible to mount both blanks onto the mandrel side by side and work on them together. This is particularly convenient if they have to be turned to the same outside diameter, but that doesn't apply in this case and the second blank will be mounted and turned separately.

The turning begins

With such a small-diameter workpiece, the lathe can be run at high speed. I use a small bowl gouge to turn the blank, **photo 11**, but a roughing gouge or skew chisel might also do the trick.

The bushes act as a guide to the finished diameter, and the blank is turned down almost to this size, leaving a little extra for sanding. However, when I stopped the lathe

disaster had struck. A small section of the burr had broken out, **photo 12**, leaving a hole. This is always a possibility with burrs, where the twisted grain can create structural weaknesses that wouldn't exist in a piece of straight-grained timber.

Patch and match

My first thought was to scrap it and start again. This isn't as difficult as it sounds; you simply continue turning the wood away until you've exposed the brass tube, then clean it up and start again.

However, the beauty of burrs is that there's no pattern to them, and to effect a repair is fairly easy. I flooded the gap with superglue and then picked up some of the shavings from the lathe bed and pressed them into the hole, adding another drop of glue on top, **photo 13**. When the glue had set I turned the bump down level with the rest of the blank and sanded it smooth with 240-grit abrasive, **photo 14**. The repair is indistinguishable from the original burr.

The right finish

There are many ways of finishing a pen, and it would be quite easy to seal the wood and polish it with carnauba wax, but pens are handled more than most objects and ordinary wax finishes don't wear very well. A harder wearing surface, popular with many pen makers, is the superglue finish. Cyanoacrylate glue sets to form a hard transparent polymer, very much like a layer of plastic. Coating the pen blank in superglue produces a very hardwearing surface.

Building up the layers

With the lathe off, spread some superglue on some kitchen paper roll and rub it all over the blank, **photo 15**, rotating it by hand to get even coverage. Act quickly and decisively, or you'll simply glue the paper to the blank. When the glue is dry, sand it down carefully with 400 grit paper on a small block to level the surface. Then add a second coating of superglue in the same way as before.

I then rub this down with 1500 grit wet-and-dry (silicon carbide) paper, used dry. I know this is a big jump from 400 grit to 1500 grit, but it works. Apply another coating of superglue, followed by more sanding with 1500 grit paper, but this time lubricated with a little paste wax polish, **photo 16**. I used Briwax, but any other type would do just as well.

Wipe away the wax; then finish the job by burnishing the surface with burnishing cream, following the instructions on the container, **photo 17**. The result should be a

beautifully smooth, glossy, hardwearing surface finish, **photo 18**. If it isn't, add another coat of superglue and work on it as before until it is.

Coping without a mandrel

The second blank was to be turned to a different diameter and, although I could have mounted it on the mandrel, I wanted to illustrate an alternative method which could have been used for both tubes if you don't have one.

You need a cone drive in the headstock. This could be a 'dead' centre (one that doesn't have bearings) fitted directly in the headstock. I don't have one, so I held a separate cone in the chuck jaws to serve the same purpose. You could easily turn one from a suitable piece of scrap wood.

The pen blank is held between this and the tailstock centre, **photo 19**. Apply gentle pressure from the tailstock or you risk distorting the tube and splitting the blank. Turn it down to the required size; in this instance the two ends were different diameters, and regular checking was essential to get it right, **photo 20**.

A pen with a difference

This particular pen kit had a feature I'd not met before. The open end of the cap fitted over the tube rather than inside it, and this required cutting away a small section of wood. I carefully measured the overlap at 5mm, **photo 21**, and marked a line on the blank 4.5mm from the end. The difference was me playing safe. The exposed section of tube must all go inside the end section, and if it was too long I'd be left with a gap. To avoid this I deliberately made it slightly shorter than I thought it needed to be.

I used a skew chisel to cut in on the line, **photo 22**, and removed the section with a parting tool, **photo 23**. Cutting in with the skew prevents any breakout when using the parting tool. Removing the small end exposed the tube; the wood was then sanded and polished in exactly the same way as the first piece, **photo 24**.

All present and correct

The last step was to press the pieces together to complete the pen. You can buy a special pen press to do this (more expensive!), but I find a bench vice does the job quite adequately, **photo 25**. With all the pieces assembled, the pen was finished. It was to be my brother-in-law's birthday present!



19 Hold the second pen blank between a cone and a tailstock centre



20 Turn it down to size – in his case, to two different diameters



21 I measured the overlap required and reduced it by 0.5mm for safety



22 Use a sharp skew chisel to cut into the blank on the marked line



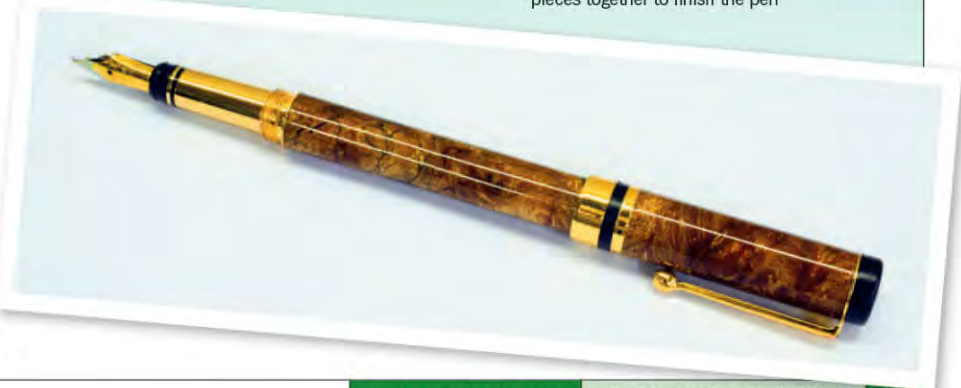
23 Then remove the end section next to the cone carefully using a parting tool



24 After exposing the brass tube, sand and polish the wood as you did before



25 A bench vice is ideal for pushing the pieces together to finish the pen



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BY PETER BISHOP

The first cut

Here's another great use of offcuts, with a stylish present as the end product! You do need a lathe to make it, but the rest of the work can be done by hand if power saws and sanders aren't available

I always end up with a stack of ripping strips standing against the wall by my power saws – a terrible waste even if they've been costed into a job. Getting creative can help use up some of them, and stops me from throwing them away. Any timber will do if it has reasonable strength. Those with a bit of character produce the best results if you can avoid digging the grain out when turning them.

Making a start

Sort out what you want to use. Saw it all to a generous 25mm or so square and cut off lengths of about 250mm. Smaller sections are fine if that's what you've got, and larger ones can always be turned down. Find the centre on each end of the first blank, **photo 1**, ready for turning.

Mount the blank on the lathe and turn it to a straight cylinder 25mm in diameter. I use a fairly large gouge for this, **photo 2**, but you'll need to go slowly and carefully if the grain is interlocked.

The right proportions

Once you have your cylinder, mark out the positions of the handle, the guard and blade, **photo 3**. The proportions are roughly half and half for blade and handle (the hilt, to give it its proper name). I keep mine fairly simple, **photo 4**, with a rounded bead to form the guard and a tapered handle rounded off at the top end. If you want to go really fancy, turn a pommel on the top of the handle. You'll probably need a bit more length on the blank if you decide to do this.

A smaller spindle gouge can shape the



1 Mark the blank's centre on each end, ready for mounting on the lathe



2 Turn it a straight cylinder with a gouge to about the finished size



3 Mark the position of the handle, guard and blade, with a bit to spare each end



4 A simple bead and a taper form the guard and handle of my knives



5 Once the blade is shaped, cut some shallow grooves in the handle with a skew chisel



6 Run the lathe and apply a length of wire to burn in some decoration



7 Cut off the waste and roughly shape the blade; I used my bandsaw



8 Your roughly tapered and shaped blade should now look something like this



9 Use a bobbin sander to clean up the shape round the base of the blade



10 The rest of the shaping can be done on a disc sander, then finished by hand

bead and put the taper on the handle. Finish the rough shaping by turning the profile of the blade in the round, and complete any further shaping on the handle.

Decorative detail

For decoration I like to burn some rings into the handle. Using a skew chisel I simply notch several shallow grooves in the surface, **photo 5**. Then take a length of reasonably strong wire, start the lathe up and press the taut wire into the grooves, **photo 6**. Friction soon creates heat and the burning starts. Stop and check before you go too far; this is best done in stages.

Once all this is done, finish off the profile with some fine abrasive paper, take the knife off the lathe and trim the waste from each end.

Shaping the blade

Trim the waste off the sides of the blade. I used my bandsaw, **photo 7**, but you can also do it with a hand saw. The central part of the blade needs to be about 6mm thick; it will be thinner on the edges. Examine how the grain runs before you make any cuts. Select the bit you'll leave on with care, making sure that the grain runs down the middle of the blade; try to avoid any cross grain at this stage. If you get it wrong the blade won't last too long.

Finishing touches

The knife should now be starting to look like the real thing, **photo 8**. At the top end of the blade, by the bead guard, round out and shape somewhere near the final shape and dimensions. A bobbin sander is great for this, **photo 9**. Move onto a disc sander and, rolling the blade, sand off the excess to form the final shape of the blade,



photo 10. Protect and grip the handle in a vice, and use a spokeshave if you don't have a disc sander. Final sanding and cleaning up can be done with an orbital sander or by hand.

Your knife should now be ready for finishing. I usually apply one coat of sealer, cut this back with 0000-gauge steel wool and then wax up the finished piece. Coloured waxes will help to bring out the grain and there you go: another great gift to pass on!



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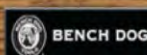
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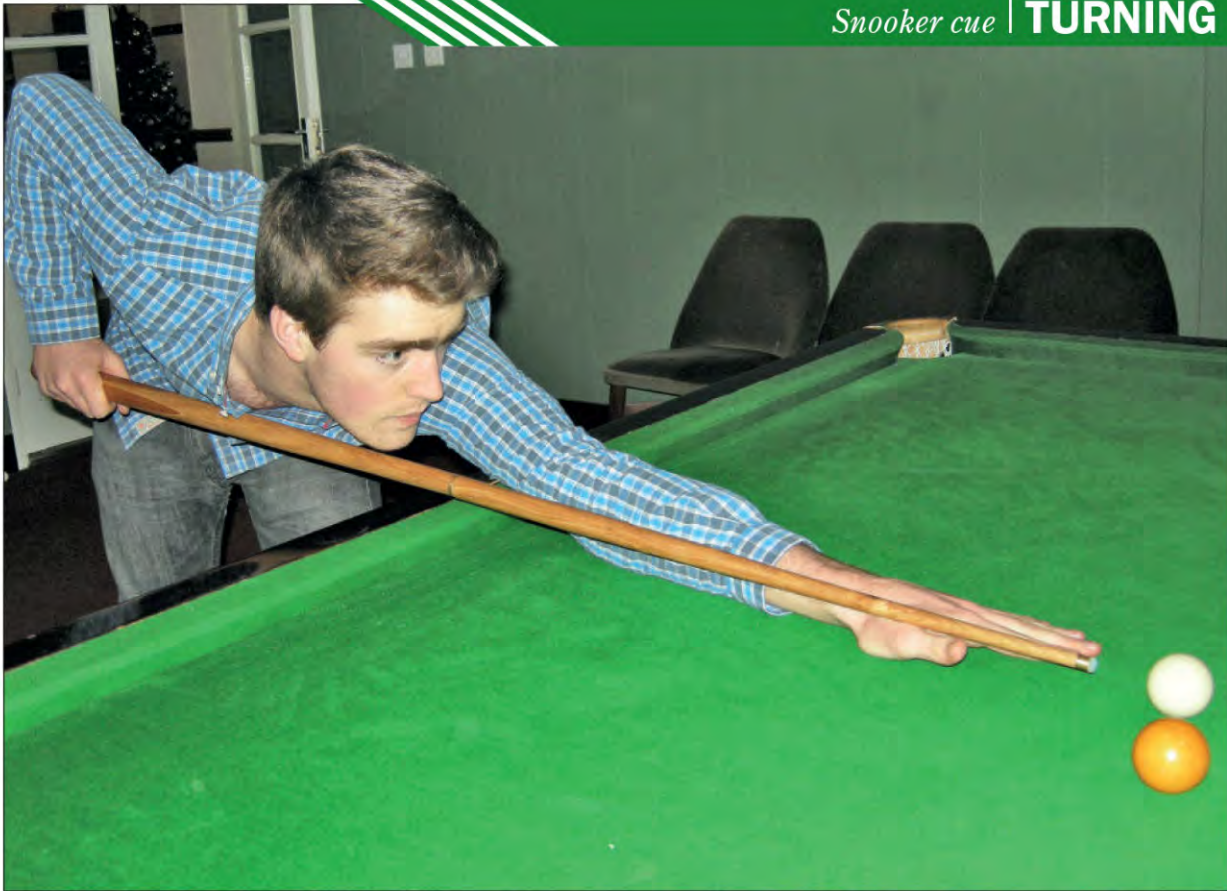
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BY COLIN SIMPSON

POT BLACK!

I had an interesting challenge recently. Some friends asked if I could help with their son Adam's university project. He's studying engineering at Exeter University and wanted to make a snooker cue. Engineering? I did wonder...

Initially I thought this would be quite a simple project, but after having given it some thought I realised there were several challenges to overcome. Not least of these was the fact that Adam had never turned anything before, so I had to come up with a simple way of turning a slight taper on two thin pieces of wood over a length of 29in (a full-size cue is a standard – and imperial – 58in long). Here's how we made it.

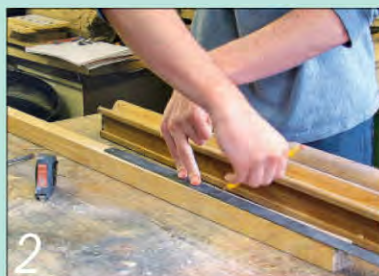
Square beginnings

Start by planing down two 30in long pieces of straight-grained ash using a planer thicknesser, **photo 1**. We made one piece 35mm square and the other 28mm. Make sure that their ends are cut square.

The thicker length will become the butt end of the cue, and will have decorative splices let into one end. To make room for these, measure and mark 10mm in from



1 Use a planer thicknesser to prepare the two sections of ash stock



2 Mark the tapers for the splices on the end of the larger blank

3

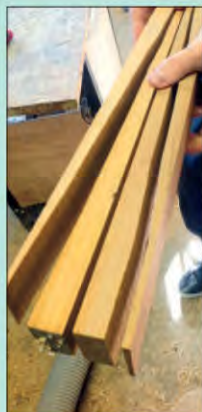
The marks are 10mm in from each edge and 405mm from the end



4 Cut the tapers on the bandsaw, working on the waste side of the lines

5

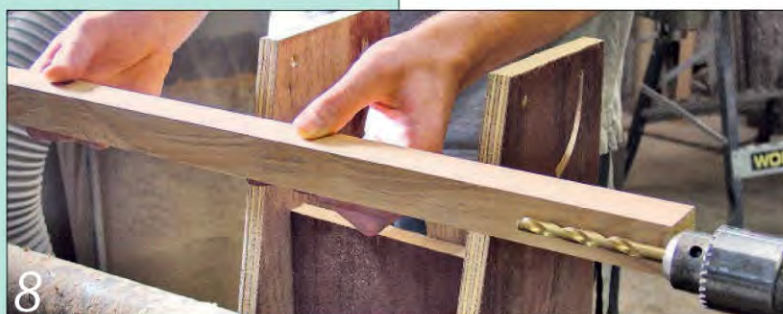
Prepare four splices in a contrasting wood, tapering from 12 to 3mm



6 Glue and cramp the first two splices to the tapered faces of the butt



7 Use a power planer to bring the stock back to 35mm square



8 My lathe wasn't long enough to use a Jacobs chuck and drill bit in the tailstock

opposite faces at one end of the blank. Now measure and mark a point 405mm from the end on two edges of the blank. This will be the length of the splice. Use a straight edge to join these marks, **photo 2**. The marking out should look like this, **photo 3**. Cut off these wedges using a bandsaw, **photo 4** and clean up the cut lines with a sharp plane.

Getting spliced

Select a contrasting colour wood – we used reclaimed mahogany – and cut four wedges on the bandsaw for the splices, each about 410mm long and tapering from 12mm at the thick end down to around 3mm, **photo 5**. Glue two of the splices to the tapered butt end, **photo 6**. When the glue has cured, clean up the splices using a power planer, **photo 7**, to bring the stock back to 35mm square. Now repeat steps 2 to 7 to fix the other two splices on the other two faces of the butt.

Planning to turn

It was now time to think about the turning. We started with the thinner blank, which would form the tip end of the cue. Of my three lathes, the Hegner VB36 has the longest distance between centres. It's great for the bowls, platters and vases I usually make, but isn't the best lathe for spindle work; however, it is capable of turning a spindle 29in long. This meant that we could make a standard snooker cue in two parts with a final length of approximately 58in.

Needing a hole

Before making the first cut, however, we had to drill a hole in one end of each of the two pieces to fix the brass joint (shown in **photo 22**). This hole needs to be 10mm in diameter and very accurately drilled. A simple way of doing this would be to use a twist drill in a Jacobs chuck in the tailstock, **photo 8**. The problem I had was that the VB's bed bars aren't long enough to accommodate the 29in blank plus the



length of the chuck and the drill bit.

The solution was to use my long-hole boring kit, **photo 9**, and to drill the hole with an auger inserted through the hollow tailstock, **photo 10**. Once the hole had been drilled to a depth of 50mm, we reversed the blank end to end on the lathe and mounted in the special four-prong drive that comes with the long hole boring kit – see **photo 9** again. The long shaft of this four-prong drive fits snugly in the hole that the auger bored, and ensures that the hole is perfectly in line with the axis of rotation of the lathe – an essential requirement unless you want a kink in the snooker cue at the joint.

Steady as she goes

In the 25 years I've been turning I've never needed a lathe steady – I don't normally do the type of work that requires one. However, turning a spindle 29in long to a taper of 10mm at one end would inevitably whip and flex away from the cutting tool, so I decided to make a lathe steady. **Photo 11** shows my first attempt, but I found that the wood rode up the wheels so I had to modify the design to provide support all the way round the spindle, **photo 12**.

One step at a time

First of all we turned the tip end down to 10mm in diameter, **photo 13**, so we could test-fit the brass ferrule, **photo 14**. We then tapered the cue in 100mm wide steps, starting at the tailstock end.

To help us do this accurately, we drew a full-sized taper for each part of the cue on a piece of mdf and divided it up into 100mm long sections, **photo 15**. We then used callipers to measure the diameter at each end of each section, and transferred this diameter to the stock.

Cutting in sections

We used a parting tool to cut a groove to the appropriate diameter at each end of the first section, **photo 16**, and created the taper between the two grooves using a



9 Using a long-hole boring kit is a good solution to the problem



10 Drill the hole using an auger threaded in through the hollow tailstock barrel



11 My first home-made lathe steady let the stock ride up the wheels



12 Version two of the steady supported the stock all the way round; much better!



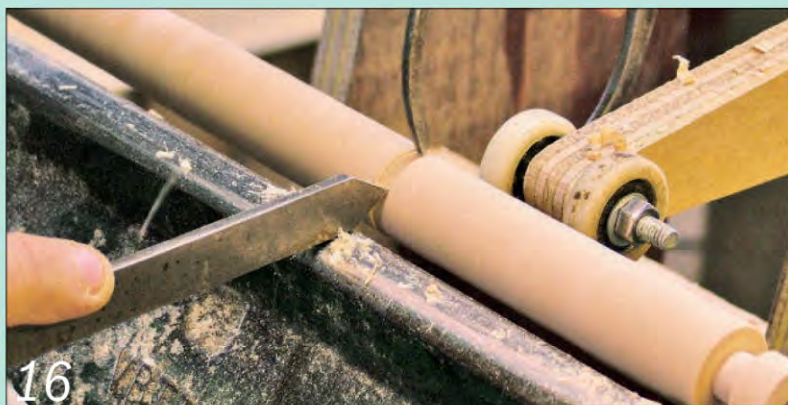
13 Turn the tip end down to a diameter of 10mm using a parting tool...



14 ...and test the fit of the brass ferrule. Sand the tip for a better fit



15 Use a scale drawing and callipers to set the correct diameter at 100mm intervals



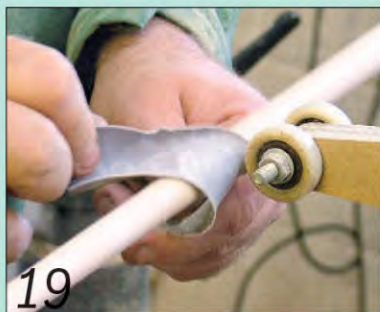
Use a parting tool to cut the grooves down to the correct diameter



Cut the taper on the first section with a spindle roughing gouge



You can use a skew chisel instead to achieve a better finish



Use fine abrasives to remove any small blemishes and tool marks



The final section involves turning the splices to the correct taper



At last you can see how the splices will look when they're finished



Glue in the two parts of the brass joint with epoxy resin adhesive

spindle roughing gouge, **photo 17**. If you're confident with a skew chisel, you'll achieve a better finish with this, **photo 18**.

Continue to work in this way – 100mm at a time – until you reach the headstock end. The brass joint we used was 22mm in diameter, and this method enabled a complete beginner to turn a gradual taper from 22mm down to 10mm over a 29in length. Brilliant!

Once the turning was complete, we sanded the section down to 240 grit, **photo 19**, and applied a coat or two of Danish oil. We were halfway there!

The same again

The butt end was turned in exactly the same way, with the hole for the brass joint drilled at the opposite end to the splices. This time the hole needed to be 12mm diameter. I don't have a 12mm auger, so we drilled a hole with the 10mm auger and carefully enlarged it by hand using a 10.5, 11, 11.5 and finally a 12mm twist drill.

Once drilled, the hole was supported by a standard 60° revolving centre in the tailstock. It is only when you start to turn the splices to a taper that you really see how they are going to come out, **photo 20**. A close-up of the splices when finished and oiled is shown in **photo 21**.

When you've finished both parts of the cue, glue in the brass joints. We used epoxy resin adhesive, **photo 22**. Finally glue on a tip with superglue, shape it to match the cue diameter using an emery board and you'll be ready to take on all comers!





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If you're familiar with the Kity 419 table saw, this model will be of interest as it's in the same style... but with an upgrade to the blade to increase it from 200 to 250mm, giving extra cutting capacity

Axminster TS-250M table saw

Cast iron is the choice for the table of this little saw, and it's a solidly constructed one. However, despite the decent mitre fence that comes with it, Axminster have missed a trick in not specifying a standard $\frac{3}{4}$ x $\frac{3}{4}$ in slot for this; instead it has the same 15mm wide T slot of the original Kity model. It would have opened up the saw to after-market mitre fences including Axminster's own UJK brand.

Extra extra

You can buy the saw as a small benchtop model for £319.94 or go for the bigger version complete with right-hand side table, left-hand sliding carriage and leg stand (and save yourself about £30). Alternatively you can retro-fit the additions as the need arises. The accessories bulk the unit up to 1440mm wide and 1220mm deep, but on its own the saw measures just 430mm wide and 635mm deep. Ripping without the side table is 160mm maximum, but increases to 760mm with the side table fitted, so this is a worthwhile extra to have.

Carriage return

The sliding carriage is also a useful asset on any saw, and although not overly big with a table size of 400mm wide and 250mm deep, there's decent support on the saw table itself allowing wider work to be cut safely. Travel on the carriage is around 650mm, and you can position its crosscut fence to the front or rear of the table to suit the work.

The carriage rail can also be moved backwards or forwards to gain maximum capacity or better working room, but altering this is quite convoluted as there are a series of small T-bolt fittings that hold it to the brackets from the underside. Small Bristol levers would have been easier to operate.

Fence foibles

The fence is also similar to the Kity 419 design, and the side table package comes with a longer fence for ripping sheets as well as the short one for timber. On the test model the fence was a little out of alignment with the main table. However, there is some movement in the running rail to swing this back and align it. The travel of the fence along the rail is not very fluid, and a fair few turns on the locking handle are

£514.96*
(see text)



Although the blade tilt scale reads to 50°, the maximum tilt is actually 45°



The crown guard is well made with a built-in handle, and is easy to adjust



It connects to the decent sized riving knife with a single Bristol lever



The sliding carriage fence can be quickly repositioned for angled cuts



Allowing for gullet clearance, the saw will easily cope with 75mm thick stock

needed to release it enough to move it, as well as to tighten it securely. That's quite frustrating when the fence is the one thing you alter frequently.

Cut throat

Where the saw does have fluidity is in the rise, fall and tilt of the blade, and with separate adjusters for both functions it's easy to set precise angles and heights. The fold-down handles on the winders, normally found only on more expensive machines, are a neat touch.

The throat plate itself has a 10mm wide aperture to the side. It has to allow for the tilt of the blade, but the gap does seem excessive and could allow debris to drop down inside the cabinet. The underside of the cabinet is open but the blade itself enclosed for safety, as well as to aid air flow for extraction, so debris could be difficult to clear if it lodges in the hoses.

Extraction itself seems pretty efficient, pulling the waste away well from the lower hose, and with the split fitting for the top hose, both extraction points are served from a single main hose.

Summing up

This is certainly a saw that offers excellent value for money, and after allowing 8-10mm for gullet projection it will easily cope with 75mm deep ripping at 90° as well as 50mm ripping at 45°, which is decent enough for many a small workshop.

Although it cuts to the maximum well and leaves a great finish from the supplied blade, remember that these are maxima. It's a good idea to limit it to around 50mm rips to ensure it operates well within its capabilities. **AK**

SPECIFICATION

MOTOR	1500W
BLADE DIAMETER	250mm
TABLE SIZE	635 x 430mm
MAX DEPTH OF CUT	at 90° 80mm
	at 45° 60mm
MAX RIPPING WIDTH	with fence 160mm
	with extension table 760mm
WEIGHT	80kg
ACCESSORIES	extension table £84.95
	sliding table kit £109.96
	leg stand £34.96

VERDICT

This is a gutsy little saw that performs well, although the fence could do with some work.

PROS

- Good cutting capacities
- Fluid blade adjusters
- Smooth carriage travel

CONS

- Fence sticky to adjust
- Sliding carriage awkward to reposition

VALUE FOR MONEY 

PERFORMANCE 

FURTHER INFORMATION

- Axminster Tool Centre
- 03332 406406
- www.axminster.co.uk



You can adjust the sliding carriage fence stop for squaring up the fence



You can swing the fence for angled cuts and reposition it for wider panels



The locking lever for the fence needs a lot of turns to adjust it

If you have a limited budget and a small workshop, a full-sized table saw might seem to be beyond your means. But don't despair; there are several table-top machines available that are ideal for tackling small-scale projects. Here's one of them... and it's a bargain!

Scheppach hs80 table saw

The hs80 is aimed at the amateur woodworker with limited facilities, and might be thought of as an entry-level machine with its price tag of under £100. Even so, it has an unusual feature that's not to be seen on other small table saws; a slide-out side extension which offers good support when tackling larger workpieces, and sheet material in particular.

Table and fence

The body is fabricated from sheet steel, with the table top powder-coated for durability. The table extension fits to the left-hand side of the body, where it slides in and out and can be locked in any position up to its maximum.

The fence locks onto the table at the front and rear, but has to be manually adjusted so as to be parallel with the blade. To help with this, there are scales close to both the front and rear edges. This fence can be used on its own, but an adjustable face can be

added and this would normally be used when ripping. This fence face is also used when cross cutting, by simply securing it to the mitre fence. This locates in a groove to the left of the blade.

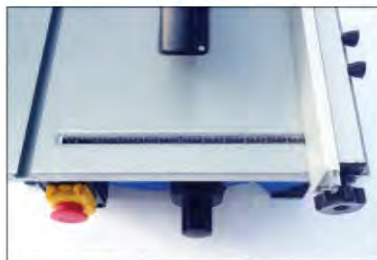
Simple controls

All the controls for the saw are positioned on the front of the body. One of the double knobs controls the depth of cut, while the other is used to adjust the angle of tilt of the blade. There is a protractor scale to aid this setting. The switch is the double press-button type, and has a cover which provides a large area to press to stop the machine in an emergency.

The motor is tucked away in the body of the machine, with the lower part of the blade being fully enclosed. Access to the blade is gained by removing the panel on the top surface which surrounds the blade. Following common practice, the riving knife also holds the crown guard in place; this has a dust outlet for connecting to a vacuum hose. A second dust outlet is provided at the rear of the body.



The side extension has adjustable feet that are used to get it level with the table



The rip fence locks at the front and rear; graduated scales aid the setting



The dual-purpose face can also be fitted to the cross-cut fence



Check the angle of the mitre fence when cutting at up to 45°



The fit of the cross-cut fence is also not ideal, but in practice it works well enough

Using the saw

The most frequent use of a table saw is for ripping. The rip fence has to be set for the required width at both the front and rear of the table, an unusual arrangement. Although the rip fence can be used in its basic form for sawing panel material, for most ripping cuts the facing to the fence can be adjusted to suit the user. Normally, the high side of the fence will face towards the blade, but for narrow cuts this position can be reversed so that the low edge tucks more readily under the guard.

Next, we cut smallish pieces of panel material when the extension proved its value, and also bevel cuts. Here test cuts should be made first and the tilt of the blade adjusted as necessary. Protractor scales can only be taken as an approximate guide.

Making cross-cuts

With the short part of the rip fence secured to the mitre fence, various cross-cuts were made. The fit of this fence in its slot is a little short of ideal, so its accuracy needs careful checking. Compound cuts can be made with the blade tilted and the mitre fence set to other than a right angle – a useful facility. Note that the blade, with its large teeth, is at its best when ripping, but doesn't give the smoothest and most accurate of cuts when cross-cutting.

Summing up

This little machine may have its limitations, but it also has a lot going for it, with the unique feature of the extending table top not seen on any other small saw being one major bonus. It offers very good value for money, and is particularly suitable for the person who spends only a limited amount of time in the workshop. **GW**

SPECIFICATION

MOTOR	1200W
BLADE DIAMETER	210mm
TABLE SIZE	525 x 400mm
MAX DEPTH OF CUT	at 90° 48mm
	at 45° 40mm
MAX RIPPING WIDTH	150mm
WEIGHT	16kg

VERDICT

This little saw packs a lot of features into a compact and inexpensive package.

PROS

- Slide-out extension
- Light and portable
- Bargain price

CONS

- Coarse blade supplied
- Rip fence needs careful setting
- Cross-cut fence not very accurate

VALUE FOR MONEY ■■■■■■

PERFORMANCE ■■■■■■

FURTHER INFORMATION

- NMA Agencies
- 01484 400488
- www.nmatools.co.uk



This is a typical ripping operation; note that the extract hose is not connected here



The side extension offers useful extra support for wider workpieces



When bevel ripping, you need to make test cuts first to check the accuracy of the angle

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Flat bits are a favourite weapon for fast drilling, but with the trade-off of little finesse in the finish they leave. It makes them more suitable for holes that aren't usually seen, or will be subject to more work

Bosch Selfcut Speed spade bit set

Bosch have redesigned the flat bit by introducing a couple of the more desirable elements found on a traditional auger bit to get a cleaner and faster cut. The triangular point has been replaced with a worm screw to give it a faster pull through the work. However, they still need a bit of a push in knotty, very hard or end-grained stock as the threads can get clogged.

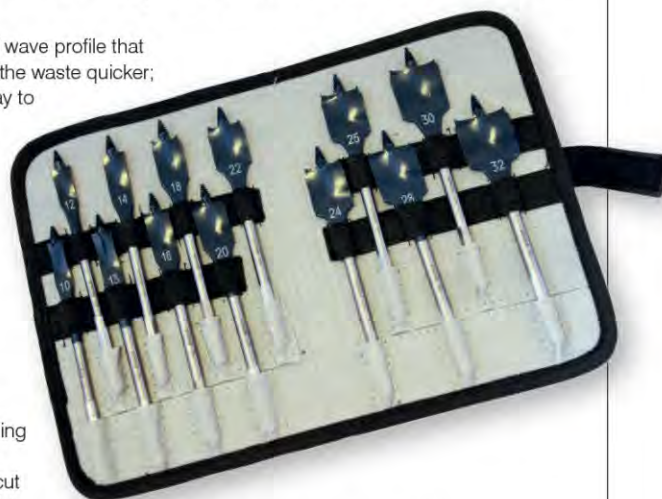
The second improvement is the spur on each side of the bit. This not only scores a scribe for a cleaner entrance hole; it gives a cleaner exit hole as well. The cleanliness of the hole is a valid claim with the entry point pretty clean, as is the wall of the resulting hole, but with the spurs set in from the overall diameter it does leave a slightly ragged start. To break through the exit hole the bit needs to be given an extra shove as the worm screw has no substance to bite into, so there is some breakout even with the spurs. Drilling from both sides is still the preferred option here.

The flat part of the blade isn't actually flat

either, having a twisted wave profile that apparently helps clear the waste quicker; but there's only one way to check the claims of speed and cleanliness of cut over standard bits and that's to try it in a simple head-to-head test.

Faster? Better?

A claim of up to a tenfold increase in drilling speed is a big one, and our results didn't confirm this. Drilling through some 100mm pine with a 20mm Selfcut bit and a standard flat bit resulted in the Bosch zipping through in an average of 5 seconds, while the flat bit was averaging just over 8 seconds. The latter also required more effort to keep the cut going.



Maintenance matters

Despite the profile being more complex than a standard flat bit, the cutting edges are flat so a suitable file will keep them in good order relatively easily. The standard 1/4in hex shank design lends itself well to the quick-release chuck systems on many drills. There's no indication on the packaging that these are designed for impact drivers as well as drills, so be sure it's only the drill you use them in. **AK**



The edges of the bits have a defined wave profile when viewed side on



The spurs are positioned slightly inboard of the overall bit diameter

The bits cut very quickly and without the need for a lot of pressure



The resulting holes are relatively clean but have minor tearing at the edge

SPECIFICATION

SET CONTAINS 13 bits, sizes 10 to 32mm

VERDICT

These are pricier than traditional flat bits, but are a better option than the standard types available.

PROS ■ Fast and relatively clean cut
■ Good size range

CONS ■ Quite expensive
■ More work to maintain

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

FURTHER INFORMATION

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

Veritas have had a couple of wheel gauges in their range for some time, but have now complemented them with a dual marking gauge. This is better known as a mortise gauge, but has a few differences from the traditional variety

Veritas dual marking gauge

£49.94

Standard gauges can take a little getting used to, especially in long grain situations where the pin has an inclination to follow the grain pattern if you let it. A wheel gauge works in a similar way, but the bevelled wheel tends to pull the gauge head into the work so it doesn't wander off line. This type is ideal for marking really fine lines, as the wheel severs the fibres rather than crushing them as a pin gauge does.

Versatile wheels

Many people assume that the wheels spin, but both are fixed. They can be retracted into the headstock for safe storage, or when a single cutter is needed for use as a marking gauge.

In mortise gauge mode the rods slide through the headstock, within which O-rings maintain a light but constant friction, and are locked in position with a thumbscrew. To gauge the width of a chisel prior to cutting a mortise, you set the cutters against the edges of the blade and lock the rods in place. You then use the gauge to mark the mortise and tenon components of your

work in the usual way. The thin, sharp profile of the wheels ensures crisp, clean cutting lines, both along and across the grain.

The rods are positioned off centre in the headstock. This prevents the tool from rolling about on the bench, and maximises the area of the brass face in contact with the work.

Using the gauge

There's a slight tendency for the tool to drag as the inboard wheel pulls the headstock against the edge of the work. You will maintain better control of the tool by pulling it towards you rather than pushing it away as you mark the lines.

A further addition, available as an accessory, is the shaft clamp (£8.04). This slips over the two rods and locks them together via a thumbscrew. Once you have set the gauge to a specific mortise size, you can then move both bars in unison by adjusting the position of the headstock for different offsets. This is certainly worth having if you do a lot of gauging that includes regular mortise and tenon work.

The gauge is easy to set, accurate in use and very versatile. Its price also compares favourably with that of other top-end mortise gauges. **AK**

SPECIFICATION

LENGTH	190mm
SETTING RANGE	0-145mm
HEADSTOCK	Aluminium with brass facing
CUTTERS	Hardened steel

VERDICT

This is more versatile than a standard mortise gauge. It works best with the optional shaft clamp.

PROS

- Beautifully made
- Retractable cutting wheels
- Opposed cutting bevels for extra accuracy
- Can be used as a depth gauge

CONS

- Can be tricky to use on long grain

VALUE FOR MONEY



PERFORMANCE



FURTHER INFORMATION

- Brimarc
■ 03332 406967
■ www.brimarc.com



The gauge has a good range, suitable for joinery as well as smaller applications



The flush-fitting outer wheel can be used to gauge and transfer rebates



It's particularly well suited to gauging and transferring mortise widths



The shaft clamp slips over the two rods and locks them together via a thumbscrew

Multi-tools are the power-tool jack of all trades, allowing you to tackle a wide range of sawing, sanding and other jobs simply by using one tool and changing the attachment. Here's Bosch's latest version

Bosch GOP3000 SCE multi-tool

The Bosch GOP300 is a machine that removes the need for any tools to switch accessories. It's done via a large lever at the front, similar to the one on some jigsaws that releases the blade. This operates a centre split pin with a mushroomed head that retains the accessory. Pulling the lever compresses the pin to release the accessory, and it works well. The lever is a bit on the stiff side, but it may loosen up over time.

The retaining system is designed to take the majority of standard makes of multi-tool accessories on the market, so you aren't restricted to using Bosch ones, and there's also an adaptor washer to accommodate any that don't fit directly.

A sturdy body

The grip is very slim for a multi-tool – around 180mm in circumference – and this makes controlling it easy, especially on finer work such as blind cuts. The multi-speed dial allows the cut to be started on a lower setting to maintain control, before ramping the speed up once the cut is established.

There's certainly no lack of power in the unit once it's put to work. It features so-called Constant Electronics to maintain power under load and that seems to do the job,

making light work of gaining a clean edge in some skirting that had been ripped off a wall, or when cutting away a rotten door jamb to fit a scarfed piece.

Aside from its cutting abilities, the machine is also a remarkably good sander in its own right – very useful for getting into difficult-to-reach areas.

Multi-tasking

Finding a real niche where this (or any other) multi-tool fits is a tricky one. Working in situ is undoubtedly an area where it excels, and with the array of accessories available it can multi-task like no other power tool can, whether sanding, cutting or grinding.

While it's unlikely to be tool many people would use on a daily basis, it's undoubtedly a 'get out of jail' machine, achieving results that would be difficult if not impossible by other means. Bosch's take on it, with the easy swapping of accessories, makes it a tool that will be reached for on many an occasion once you realise its potential. **AK**



£250

SPECIFICATION

MOTOR	300W
OSCILLATION RATE	8000-20,000/min
OSCILLATION ANGLE	± 1.4°
WEIGHT	1.7kg
ACCESSORIES	L-BOXX, 48 attachments

VERDICT

This is a truly user-friendly model, with loads of power alongside the usual Bosch attention to build quality.

PROS ■ Powerful
■ Good size grip
■ Tool-free swaps for attachments

CONS ■ Operating lever quite stiff

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

FURTHER INFORMATION

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



Releasing a lever allows the split pin to open and secure the accessory



The accessories can be fitted at an angle to suit the work you're tackling



The easy-to-use slider on top of the tool operates the power supply



Cutting out a rotten door jamb ready for a scarf is a perfect application

A flush-cut saw can prove useful in the workshop or out on site for jobs such as trimming dovetails or cutting off plugs. A chisel used with the bevel down isn't always successful, whereas a flush saw will always do the job perfectly

Trend folding flush-cut saw

Trend have come up with a nifty little saw here, featuring a foldaway blade so the teeth are fully protected when it's in storage; such a delicate blade is very prone to accidental damage if you don't keep a guard on the teeth.

conventional saw

Even so there will of course come a time when the teeth will eventually lose their bite, but Trend have covered that particular base with a simple-to-replace blade.

Using the saw

Some flush-cut saws on the market have the teeth set on one side of the blade to allow them to cut without binding, but that limits them to cutting into the work from

one side... and invariably that means a right-handed approach.

Trend's version has a non-set blade so it can be used from any direction, so it's ideal for left- or right-hand use. With no set to damage the surface it runs against it does a fine job, cutting very sweetly.

When tried on a plug 35mm in diameter, it did bind slightly... but this is only to be expected as any saw without set will bind in a cut. It's better for the smaller plugs of around 13mm diameter used to cover screws and such like. However, attacking bigger stuff such as protruding dovetails from all sides of the work will alleviate the binding to an extent. **AK**

£18
(web price)



SPECIFICATION

BLADE LENGTH	120mm
BLADE THICKNESS	0.4mm
TEETH PER INCH	22tpi
WEIGHT	150g

ACCESSORIES Spare blade (£8.34)

VERDICT

Although it's a pricier option than a fixed blade type, its replaceable blade and folding handle make it very versatile.

PROS

- Folding handle with handy hanging hole
- Replaceable blade
- Left or right-handed use

CONS

- Can bind slightly in deeper cuts

**VALUE FOR MONEY
PERFORMANCE**

FURTHER INFORMATION

- Trend
 ■ 01923 249911
 ■ www.trend-uk.com



The saw is easy to strip down when the blade needs replacing



You can use the saw with the blade in the conventional straight position...



...or cranked back so the handle is held away from the cutting line



The blade folds into the handle for storage in much the same as a penknife

Spokeshaves are among the most tactile of hand tools, but they can be a little tricky to get to grips with at first, especially the round-soled ones. Here's a good example from Lee Valley Tools

Lee Valley cast round spokeshave

Lee Valley Tools have created a replica of an original Edward Preston spokeshave. The 1374 model was made with a curved sole, and LVT have adhered to that same design rather than altering it to a flat-soled version that's much easier to control. A flat version may well be in the pipeline...

A close look at the tool reveals a thing of beauty, made to very high standard indeed. The piecrust wave design within the body doesn't make it any better as a tool, but it certainly retains the look of the original Preston model.

There are differences from the original, of course, but they're only recognisable in the materials used. The body is made from cast stainless steel, so therefore it's not only durable but resistant to corrosion, and with a high polish to both the handles and the sole it's a great tool to hold.

Using the tool

If you've ever held or used a standard spokeshave, you need to be aware that this one is quite a bit smaller than most, so you may have to alter your grip slightly. It's still a very useful size though. The 35mm wide blade is great for board edges as well as working arrises and chamfers, but like other

round-soled shaves getting the sweet spot and controlling it is all in the wrist action, and that can be tricky for the novice.

There's no fine adjustment for the blade either, which makes altering the cut a bit more of a challenge. However, trial and

error will get you in the right area, and once there, the PM-V11 steel used for the blade is very durable and retains an edge for a long time.

Looking forward

Lee Valley's drive for authenticity does them proud with this spokeshave. It's a fabulous piece of kit, but its round sole isn't as handy as a flat one. That said, with practice you can work all profiles – flat, concave and convex – with it. However, for the novice spokeshaver a flat one is much easier to handle, so we hope LVT will retain the authentic look but introduce a flat-soled version to complement it soon. **AK**



SPECIFICATION

LENGTH	170mm
SOLE RADIUS	16mm
BLADE	2.4mm PM-V11 steel
BLADE WIDTH	35mm
BLADE BEVEL	30°

VERDICT

This fantastic high-class spokeshave is very basic in design terms, but once set it's a dream to use.

PROS ■ Superb build quality
■ Very durable blade

CONS ■ Currently available only in a round-sole profile

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

FURTHER INFORMATION

■ Axminster Tool Centre
■ 03332 406406
■ www.axminster.co.uk



Just four components make up this impressive little spokeshave



The PM-V11 blade slides into the body easily once it's been honed



You can use a spokeshave by pushing or pulling it, working with the grain



You can work flat as well as convex profiles once you have control of the tool

Cordless tools are very useful and convenient, but it makes sense to use tools that share the same batteries and chargers. The Triton 12V twinpack is a good solution, with a pair of sturdy tools, two batteries and a charger all neatly packaged in a soft storage case

£140
(*see text)

Triton T12TP 12V twin-pack



These Triton tools are both compact and lightweight, but still have considerable capabilities. They are ideal for more modest projects where the power and brute force of the heavier weight tools would be wasted. The pair look similar to other drill/drivers on the market, with the front end alloy casing screwed to the plastic back shell. You can buy them separately, or as a pair for just a few pounds more than each individual tool.

The impact driver

Taking a look at the impact driver first, it's a competent little tool featuring an all-metal gearbox and a Japanese Mabuchi motor. A spring chuck holds the bits, but you'll need a bit holder or longer bits to drive the screws as 25mm bits sit in a little too deep to allow them to work.

Forward and reverse functions are above the trigger. There's a variable speed trigger to aid screwdriving and it's pretty responsive, so you can run in smaller screws with decent control, and while the 90Nm torque doesn't break any records we had no problem driving 70 x 5mm screws directly into softwood.



The drill driver

For piloting work the drill driver comes into its own, and it has a neat removable chuck. This is again of decent quality, and has a pull collar to release it from the spindle. With the chuck off, there's a 1/4in magnetic hex chuck to take a screwdriver bit, so you can have a drill in the chuck and then slip it off and fit a bit to drive a screw. This also has the advantage of shortening the tool body, which may be



The drill has a removable chuck, which is unlocked by pulling on the rear sleeve



Removing it exposes a magnetic 1/4in hex adaptor for screwdriver bits



Both tools use identical 12-volt slot-in Li-ion batteries with Sanyo cells



Drill pilot holes using the drill chuck. Then remove it and fit a bit to drive screws home

useful when working in confined spaces. While this dual function is not up to the standard of the superb Metabo Quick drill that has an identical system for swapping the chuck on and off, it's a handy feature to have.

There's the usual rotating torque collar behind the chuck, with 17 settings available. Torque levels are maybe a little low, however – 22Nm in low gear, and a paltry 5Nm in the faster setting, which relegates the higher speed to small diameter drilling and some light screwdriving tasks. The lower speed performs better, but is still only capable of drilling a maximum diameter of 20mm in wood.

We tried to push it harder with a 25mm flat bit, and while it did manage to bore the hole, the strain increased as it cut deeper and the drill cut out and stopped for a few seconds to protect itself from overloading. It's handy to know that particular function is there when you push it too hard.

Batteries and charger

The batteries supplied are 1.5Ah Li-ion cloverleaf style packs, and an upgrade 3.0Ah version is available. The actual cells used in them are made by Samsung, so both tools have motors and gearboxes of equal high stature.

Charge time for the smaller batteries is an hour, so no records are being broken in this area, and if you rely on a pairing of drill and impact driver as the set with two batteries that's available, a spare battery is probably worth considering.

Summing up

So while the internal works are up to scratch, the crux of the matter is the price point against the established brands such as Bosch, DeWalt, Makita and Hitachi, who all have similar kits in this platform.

These are priced around the same as the Triton versions, and that may well be the area where these may struggle to gain a foothold, despite being reasonable performers (if slightly under-powered when compared to the big boys). However, they're well made, tough, compact and convenient to use. Their soft cases and fast charging are a bonus. **AK**

SPECIFICATION

T12DD DRILL/DRIVER (£130*)

BATTERY	12V 1.5Ah Li-ion
CHARGING TIME	1 hr
CHUCK	10mm
NO-LOAD SPEEDS	0-400 and 0-1300rpm
MAX DRILLING CAPACITY	wood 20mm metal 6mm
MAX TORQUE	low-speed 22Nm high-speed 5Nm
WEIGHT	1.18kg

T112ID IMPACT DRIVER (£134*)

BATTERY	12V 1.5Ah Li-ion
CHARGING TIME	1 hr
BIT HOLDER	1/4in hex
NO-LOAD SPEEDS	0-2000rpm
IMPACT RATE	3000bpm
MAX TORQUE	90Nm
WEIGHT	1.14kg
ACCESSORIES	2 batteries, charger, storage case

VERDICT

These are both competent performers, but established brands can be purchased for only a few pounds more.

PROS

- Good-quality motor, gears and battery cells
- Removable drill chuck
- Built-in worklight

CONS

- Relatively low power
- No drill or screwdriver bits supplied
- Expensive if bought as single tools

VALUE FOR MONEY

PERFORMANCE

FURTHER INFORMATION

- Triton Tools
- 0844 5760266
- www.tritontools.com



The impact driver's sleeve chuck is too deep for 25mm long bits...



...which means that a bit holder or longer bits are needed for driving screws



There's enough power to drive 70mm screws straight into softwood

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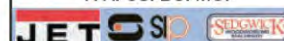
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What can I do to help you?

BY GRAHAM MENZIES

Come in, take a seat. Welcome to the bank.
Miss Jenks, a fresh coffee for this client of rank.
Your eye's drawn, I see, to my carpenter's plane.
It's a reminder of Father, and from whence I came.
I keep it on my desk – it helps me concentrate –
And of course it also acts as a brilliant paperweight!

*What can I do to help you,
To support your venture's success?
Like the plane of old, we'll smooth your path
And guide you through all business stress.
You know I'm right behind your growth.
We're the bank that likes to say Yes!*

Come in, sit down. I'll find another chair.
Can I get you a coffee? It's machine-made, I fear.
Business is good five years on, so you say.
That's marvellous; just what I wanted to hear.
The plane? I still have it, though no longer on view;
Our policy dictates old must give way to new.
And besides, it's deemed a dangerous weapon of late
Under the Health and Safety Act, sub-section 48.

*What can I do to help you?
Insurance, investments and tax?
We'll help you to sort the wood from the trees
(and all for really quite reasonable fees).
We're the bank that still likes to say Yes.*

Come in, wait there, let me just read the screen.
Welcome to the corporate management team.
Ten years of good trade looks impressive for sure,
Though growth at twelve per cent's well below par.
Funding expansion's a risk, I'm sure you can see.
We can only support you if the numbers agree.
Any tangible assets to back up a loan?
Just debtors and stock? You could mortgage your home.
Business goodwill sounds good, but of course what it lacks
Is we can't put a charge on it, to cover our backs.



*What can I do to help you?
I'm afraid that my hands are tied.
The numbers simply don't stack up, and so
Your loan application's denied.*

Thank you for holding. So how was your day?
Just a few questions first (which we record anyway).
Place of birth, date of birth, mother's maiden name
Secret word and account number, over again.
Now we're through security. You need a helping hand?
I'm not authorised to decide; I'm sure you understand.
Now your limit's been reached, foreclosure's for sure.
At this stage it's clear we can do nothing more.

*Is there anything else I can help with?
Your call is important to me
On our premium rate helpline numbers
Keeping talking is truly the key.*

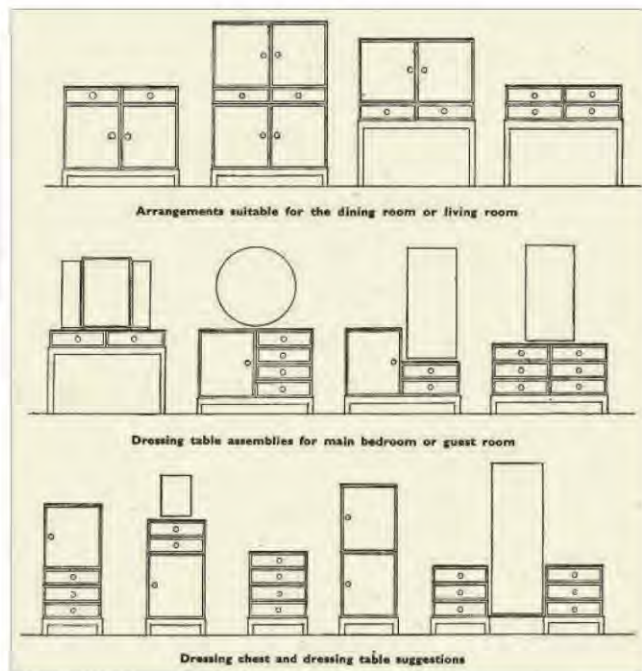
Come in, take a pew, well of course I do,
Of course I remember you well!
I watched your company's growth with pride,
And was saddened by its desperate fall.
I'd left the bank by then, you know,
And I took the chance to start again.
I retrained in joinery. Now every day
I take pride in working the traditional way.

*The banking certificate up on the wall
Reminds me of my past; that's all.
My first project was to make it a frame,
Using Father's old-fashioned carpenter's plane.
Certificate or frame? You can decide
In which of the two I take the most pride.*

INTERCHANGEABLE FURNITURE



FIG. 1. UNITS READY TO ASSEMBLE
Without staples or other drawer units may be used



Home assembly line

Standardisation: a profitable boon for the consumer, or a step towards the suppression of creative thought and free enterprise?

Obviously the 'one size fits all' philosophy doesn't suit everything, but there are enough consumer products out there for a degree of standardisation to make a big difference in our world (do I hear cordless power tool batteries, anyone?), both on a practical and an economical level. There may yet come a time when necessity outweighs the need for profit, but I think we may have to wait a little longer yet.

Nothing changes

Browsing through an old copy of *The Woodworker* from May 1947 earlier today, I couldn't help noticing an article on this theme and applauding the idea behind it. Not dissimilar in appearance from pretty much any furniture catalogue page today, this piece on 'Interchangeable Furniture' shows the obvious benefit of a standardised unit, and just some of the variety of items that could be created from a small list of

core units. I like the idea that, on a whim, a householder could radically redesign a couple of rooms with just a bit of humping and sorting. As a kid I'd often come home from school and think I was in the wrong house following one of my granny's cabinet, table, chairs and sofa re-shuffles. I guess it's only human to crave a bit of variety...

So why didn't we see the nationwide success of this particular scheme, I wonder? Probably because you had to make it yourself – and if you know of anyone who actually did make some of these units I'd love to hear – and many of us are aware just how easy it is to run out of steam on a marathon project like this would have been.

Squaring the cube

I do recall though, the 'cube' storage system which has been running in one form or another since the 1970s (or possibly earlier).

Based on a 340mm square, the leading brand was the Palaset from Finland, and it could be bought from adventurous design outlets like Habitat and Heals. It was easy for anyone to make a similar sized cube – offering drawers, cupboards and so on – and advertisements for similar systems could often be found at the back of magazines like *Private Eye* for many a year.

In answer to my own question then, it looks as if it is possible for standardised interchangeable furniture to succeed commercially in the world, and it's very likely that we've all seen some of it at one time or another. Can our past really lead our future?

Mark

More from *The Woodworker* archive next month...



Quality - Innovation - Performance
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MT55cc Precision Plunge Cut Saw

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