

Issue 321 • August 2017

Good

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step stool

ON TEST

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Aros Pro
cordless
sander



A RACE AGAINST TIME

LES THORNE'S STUNNING SKELETON CLOCK
IN ASH AND EBONY IS A REAL HEAD-TURNER



PLUS...

- Mike McCrory designs & makes a bespoke growth chart
- Peter Bishop looks at low impact methods of harvesting timber
- Andy King reports exclusively from Milwaukee's Berlin conference

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Welcome

Some of my favourite things from this issue

This past month has got me thinking about the things in our lives that we often take for granted, and how being thankful for them is so important. It's not until something happens that affects the way we go about our day-to-day lives that we are often forced to look at everything a little more deeply. For me, personally, this came about due to a back injury that caused me not only a great deal of pain and discomfort, but also meant that I had to adapt to new ways of doing things, and accept that my usual activities were no longer possible while I was 'out of action'. With those things that I had taken for granted removed and no longer readily available to me, I soon realised that I should be more mindful of just how lucky I am. Mobility, and being able to move without pain, is something I honestly didn't think twice about, but I now have a newfound respect and admiration for those who have to live with pain every day, and extend to them my utmost sympathy. Of course, this concept can be applied to any situation, and I'm sure many of you can relate to my little tale. The important thing is that I'm now fully recovered and can once again immerse myself in the magazine, but I'll definitely be more careful the next time I pick a sock up off the floor!

Giving back to you

The other thing that I've been pondering this month is how important it is for us to give back to you, the readers, and do as much as we possibly can to thank you for supporting the magazine. I know many of who have been subscribing or

buying *GW* religiously ever since it first started, but no matter whether you're a seasoned subscriber or just pick up the odd issue, we're eternally grateful that you've chosen us, and we'll always do the best we can to offer you a chance to win some great kit and prizes throughout the year. Thank you to all who entered our recent IRWIN and SENCOR competitions, and good luck to all who enter this month's Axminster giveaway. I always like to contact each of the winners personally, and love to hear how you're planning on using the new tool, etc. in future projects and just how grateful you are – it's hearing your positive feedback and kind words that really make my job all the more enjoyable. We've got some more great competitions planned over the coming months, so do stay tuned.

Joy through woodworking

Doing some online research lately, I also came across some wonderful summer woodworking projects – mainly those for the garden – including an elaborate swinging seat and some lovely modular furniture. Have many of you been inspired to get creative and make some new additions for your green spaces? It really doesn't matter what you make: it can be a simple project such as this month's step stool and toolbox in one, or something a little more involved, such as Mike McCrory's growth chart. The most important thing is that you enjoy what you do, and if your wooden creations bring joy to others along the way, then all the more reason to keep making!

Tegan

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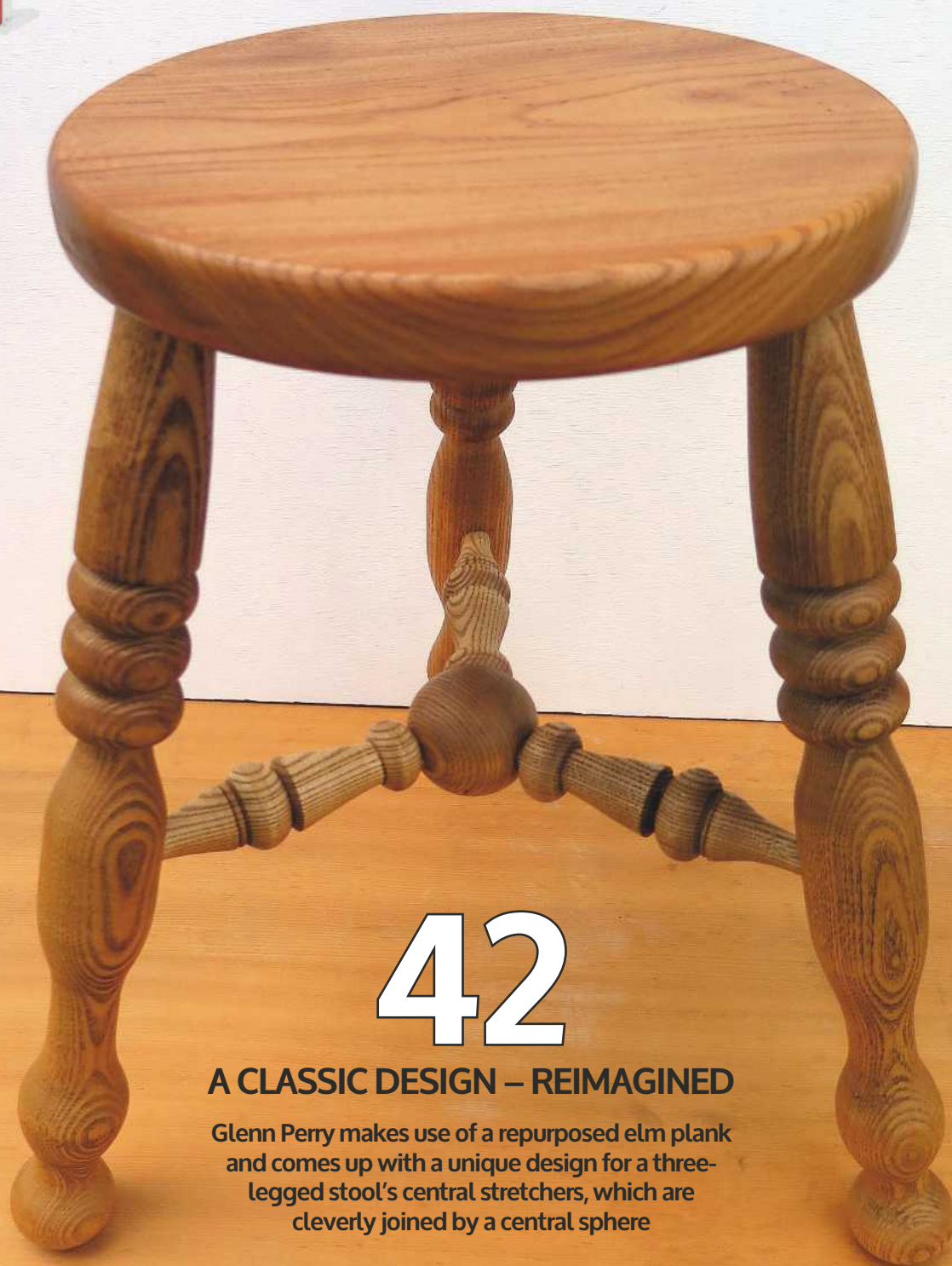
Dave Roberts
Consultant Editor

We endeavour to ensure all techniques shown in Good Woodworking are safe, but take no responsibility for readers' actions. Take care when woodworking and always use guards, goggles, masks, hold-down devices and ear protection, and above all, plenty of common sense. Do remember to enjoy yourself, though



WIN! An Axminster Hobby Series HBS200N bandsaw – worth over £185!

Perfect for the small workshop or hobby user, this excellent bandsaw from Axminster could be yours! See page 41 for further details



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A CLASSIC DESIGN – REIMAGINED

Glenn Perry makes use of a repurposed elm plank and comes up with a unique design for a three-legged stool's central stretchers, which are cleverly joined by a central sphere

Good Woodworking

August 321

• TOOLS • PROJECTS • TECHNIQUES • ADVICE

PROJECTS

28 2 projects in 1

This simple project by Janice Anderssen uses basic materials to make a tool box that also doubles up as a handy step stool

50 Wine & dine

Peter Harrison's rustic wine rack, made using oak and yew, houses at least 12 bottles and is designed to be either placed inside a cupboard or used freestanding

62 A tall order

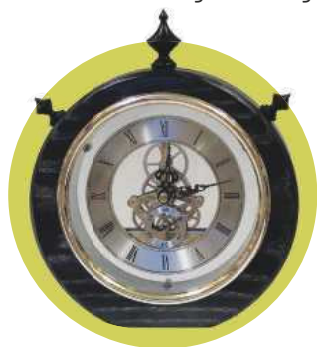
Mike McCrory's growth chart project is not only beautifully hand-crafted, but also visually appealing and entirely functional

72 All in one place

Phil Davy's handy sanding storage solution will ensure you never lose bits of abrasive again – just as long as you remember to put them back after you've finished!

80 A race against time

Les Thorne uses ash and ebony to make this wonderful skeleton clock with finials, which is then finished using ebonising lacquer and gilt cream to create a stunning contrasting effect



TECHNICAL



24 Hard Times

With work on The Old Vic's sash window looming on summer's horizon, Dave Roberts takes a timely lesson in compromise

38 Harvesting timber

Continuing his discussion on timber, Peter Bishop moves on to looking at the next phase in the process: harvesting timber ready for conversion

60 Woodworking adventures

David Moody shows that no matter what the budget or resources available to you, anyone can make their own tools and experience the joy and satisfaction that goes alongside this

PEOPLE & PLACES

32 Home truths

Edward Hopkins' blow-by-blow guide takes the fear out of framing

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In making and designing their 'Well Proven Chair', and consequently going on to introduce a range of stools, Marjan van Aubel and James Shaw have created a bio-resin foamwood – a new resistible and environmentally conscious material



58 The future of tool technology

Always keen to keep up with the latest tool developments, Andy King recently set off to Berlin, eager to find out what new offerings Milwaukee had up their sleeves...

90 Spontaneous eruption

Testing a hypothesis

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- 20 Stubai five-piece chip carving set

Phil Davy tests...

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<http://twitter.com/getwoodworking>

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Published by MyTimeMedia Ltd.
Suite 25, Eden House Enterprise Way,
Edenbridge, Kent TN8 6HF
UK and Overseas Tel: +44 (0) 1689 869 840

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print & digital media publishers



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Bosch updates worklight with connectivity module

Bosch has reinforced the labour-saving advantages of tool connectivity with the launch of its GLI 18 V-1900 C Professional floodlight. Thanks to Bosch connectivity, the strong performance and user-friendly features of the cordless LED worklight can be utilised and adjusted easily and remotely. The floodlight offers excellent illumination, with a brightness of 1,900 lumens and a dimmed mode of 1,000. Using an 18V 5.0Ah battery, runtime is eight hours in dimmed mode and four hours at full power.

A versatile joint allows angle adjustment up to 120°, with a choice of five different positions, and a thread is provided for attachment to a standard 16mm tripod. The robust frame, which also acts as a convenient carrying handle, is designed to withstand harsh conditions. Suited to both indoor and outdoor applications, the lighting unit's cover offers IP 54 resistance to water and dust. Priced at £109.33, see www.bosch-professional.com for more info.

Facebook quiz

Continuing on a light note, look out for the quiz that Bosch Professional has just launched on Facebook, giving you the chance to win a Bosch Professional connected combi drill. See the Bosch Professional Power Tools and Accessories Facebook page and select the 'connectivity quiz' at the bottom of the left-hand menu.

Bonus Bang offers

Between 1 July and 31 December 2017, you can claim a free gift via the Bosch Toolbox app when you buy one of a selected range of Bosch combi drills, drill drivers or angle grinders. For connected products, with the connectivity module already fitted, you can claim a Withings 'Activité Steel' activity tracker watch, worth over £135. For connection ready products, you can claim the GCY 30-4 Professional Connectivity Module for free. For further info on Bonus Bang offers, or to download the Bosch Toolbox app, see www.bosch-professional.co.uk/bonusbang, and for further info on Bosch connectivity, see www.bosch-professional.com/upgrade.

EWS 2017

The European Woodworking Show returns this year and is due to take place from 16-17 September, at the historic Cressing Temple Barns near Braintree in Essex.

Demonstrators and exhibitors really enjoy EWS and most take little persuading to return to the show to either demonstrate their skills or showcase their wares. The show's overseas contingent includes Chris Schwarz of Lost Art Press, Dave Jeske of Blue Spruce Toolworks, Ron Hock of Hock Tools, Thomas Lie-Nielsen of Lie-Nielsen Toolworks, Chris Vesper, Sadatsugu Watanabe, and Chris Vesper of Veritas tools.

Firm favourites will be returning, including turners Joey Richardson and Mark Hancock; pyrographer extraordinaire Bob Neill; timber hewer Steve Woodley; woodcarvers Peter Berry, Tim Atkins and Dave Johnson; marionette maker Lenka Pavlickova; scrollsaw expert Fiona Kingdon; Japanese joint maker Brian Walsh; plus furniture makers David Charlesworth, Dylan Pym, David Barron and Treeincarnated.

Willy Rackham, The International Boat Building College, Willow Sculpture by Louise, blacksmith Nic Westerman, knife maker Ord Knives, and Dave Wilkins stick maker, add variety to the show and every effort will be made to make EWS 2017 as diverse and as interesting as possible. The British Woodcarvers' Association (BWA) will also be hosting their extremely popular public vote competition.

There will also be many familiar tool suppliers in attendance including Turners Retreat, Trend Tools & Machinery, Lie-Nielsen Toolworks, Gransfors Bruks axes, Pfeil, Auriou and Flexcut carving tools, Classic Hand Tools, Lincolnshire Woodcraft, Chestnut Products, David Barron Furniture, and a host of other retailers. For full details and advance tickets, see www.ews2017.com.



Trend T35 M-Class dust extractor

Equally at home in the workshop or the jobsite, the new Trend T35A (dust class M) dust extractor offers ultimate performance and protection from fine dust generated by power tools, including MDF dust.

The T35 is dust class category M rated to EN60335-2-69, for dust with workplace limit values $\geq 0.1 \text{ mg/m}^3$. Designed for professional use, the extractor offers industry-rated protection to home woodworkers as well as the trade and has a durable, impact resistant tank with a 27l dry pick up capacity as well as a 16l wet pick up facility.

The auto shaker facility keeps the HEPA 0.3 micron cartridge filter free of excessive dust build-up and the extractor also has a blockage warning light to ensure maximum performance at all times.

An auto-start socket allows power tools to control the extractor with an eight second run-on to clear any residual dust once the tool is switched off. A maximum of 2,200W can be plugged into the auto-start socket (1,000W on the 115V model).

Alongside the extraction capabilities the T35 also features an extra-long 7m power cable and a 5m 39mm diameter hose. It can also be used as a blower and comes supplied with a complete set of floor cleaning tools, crevice tool and round brush, making the T35 a top class all-rounder for micro fine dust, liquids and general clean up tasks.

The T35 M-Class dust extractor is available in two versions: the 230V is rated at 1,400W and is priced at £418.80 inc VAT, and the 115V version is rated at 800W and priced at £454.80 inc VAT. Both are available from all Trend Routing Centres and stockists across the UK; see www.trend-uk.com to find out more.



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A new set of accessories for BESSEY toggle clamps



BESSEY's self-adjusting toggle clamps are flexible and up to five times faster to operate when compared to conventional models, and the manufacturer has now found a way to bring these benefits to the multifunction table. Thanks to a special adaptor, it is now possible to use BESSEY toggle clamps on multifunction tables with 20mm hole diameters, such as the Festool MFT and also the Sortimo WorkMo.

The new toggle clamp adaptor STC-SET-T20 can be used together with the larger versions of BESSEY toggle clamps that have horizontal baseplates and a borehole in the centre of the base. These include the horizontal toggle clamps STC-HH50 and STC-HH70, the vertical toggle clamp STC-VH50 and the push/pull clamp STC-IHH25.

The three-part accessory can be assembled in a few simple steps: first, the clamp lever is opened to 45° in order to insert the screw through the lever mechanism and the baseplate. The Allen key is then positioned and the locking post is threaded in from below; hand tighten and then complete tightening using the Allen key. With this adaptor, the clamp can be used on multifunction tables with a 20mm hole diameter and a surface thickness between 19mm (minimum) and 25mm (maximum). Finally, the toggle clamp is secured from below using the locking knob to firmly attach it to the table.

With this clever accessory you are now able to take advantage of the numerous benefits of BESSEY toggle clamps on multifunction tables. For example, you now have the ability to clamp different workpiece thicknesses without adjusting the clamping screw manually and with practically the same clamping force. What's more, you can do this up to five times faster when compared to using conventional clamps. This time saving is made possible by the infinitely variable clamping width of up to 35mm on horizontal and vertical clamps and up to 13mm on a push/pull clamp. But that's not all: the clamping force of BESSEY toggle clamps can be adjusted to a maximum force of 2500N without the use of tools to suit the workpiece at hand. When the clamp is used in conjunction with a flexible pressure plate with a removable protective cap, fragile materials such as veneered or lacquered surfaces can be clamped in a gentle manner.

The toggle clamp adaptor STC-SET-T20 costs around £10.56. All BESSEY toggle clamps that are suitable for use on multifunction tables can also be purchased together with an adaptor as a set. The horizontal clamp set STC-HH50-T20 and the vertical clamp set STC-VH50-T20 cost £35.92, the horizontal clamp set STC-HH70-T20 costs £36.66, and the push/pull clamp set STC-IHH25-T20 costs £37.28 (all prices are RRP and inc VAT).

Shrewsbury Cathedral improvement scheme is testament to local company's skills

A major £1.5 million scheme to provide a café, shop, heritage centre and improved accommodation for priests at Shrewsbury's Roman Catholic Cathedral has been completed by a local company with specialist skills.

Shrewsbury-based Morris Property, supported by its Morris Joinery team, carried out the demolition, rebuilding and refurbishment work over 11 months, carefully respecting its heritage.

Two adjacent Grade II listed houses in Belmont, dating from around 1800, were transformed to provide living quarters, offices and meeting rooms for the Catholic Diocese. The café, shop and heritage centre, open to the local community and visitors, were formed in a replacement basement extension.

Morris Property is a leading construction and development company with a 100 year heritage of creating new-build, contemporary developments and sensitively converting, restoring and refurbishing landmark buildings. Its joinery team of craftsmen offer a full range of domestic and commercial services. To find out more, see www.morrisproperty.co.uk.



Bespoke sculpture created for Leeds shopping centre



This ambitious sculpture, displayed in Leeds' Victoria Gate retail and leisure development, was made using 18,000 pieces of hand painted wood

Working to 360 individual drawings, with 18,000 pieces of hand painted wood made into almost 400 pods and making up more than 3.5 tons of oak, the ambitious sculpture shown here was recently uncovered in Leeds' £165m Victoria Gate retail and leisure development.

The specially commissioned suspended ceiling was created by Leeds Building and construction firm, The Broadley Group, at the request of developer Hammerson.

This spectacular project is set to catch the eye of architectural award ceremonies and the Broadley Group has had up to 50 of its team working on the project for just four weeks from start to finish, a very tight schedule from design to drawing and fitting, which was achieved by transporting the pods from the firm's joinery workshop in Hunslet to Victoria Gate.

Chris Hiles, the group's Business Development Manager, said: "It is like nothing we have ever done before. At one point our premises looked like a huge Jenga factory with thousands of pieces of wood everywhere! We specialise in refurbishing properties but this was very bespoke, very unique, and different to what we had done before. It was challenging, but if that is what the client asks for, then we'll make it happen. It was a great team effort, and the end result looks outstanding."

To find out more about this fascinating project, see www.broadley.co.uk.

The Marquetry Society's 65th Annual International Marquetry Exhibition – winners announced

Members of Eccleshall-based Staffordshire Marquetry Group are putting their feet up after hosting the Marquetry Society's 65th Annual Exhibition at Gladstone Pottery Museum. The Exhibition, which featured over 200 exhibits from the UK and abroad, closed on Saturday 3 June following the Society's AGM and prize-giving ceremony.

The Staffordshire Group was particularly successful, winning four classes and taking numerous other awards to retain the Marquetry Society's inter-group challenge shield. There were awards for Elizabeth Head, Ron Butters, John Jeggo and Quentin Smith, but the stars of the show were Kerry Rath and Brian Freeman. Kerry won three classes, including the prestigious premier pictorial class, and Brian, the Group's Chairman, won the advanced miniature class and the Rosebowl for best picture in show, with his wonderful miniature picture titled 'Titania Sleeping in the Moonlight', which was adapted from a painting by John Simmons.

Group Secretary Quentin Smith, who has just completed six years as President of the Marquetry Society, said: "This was another solid performance from the Group. Our members are supremely skilled and regularly achieve top awards at national level. However, the main thing is that we enjoy making our marquetry in a friendly and supportive environment. We meet every Wednesday evening at the Methodist Church Hall in Stone Road, Eccleshall, and would be happy to welcome anyone who would like to know more about the art and craft of marquetry." Further details of the Group's activities can be found on their website – www.staffordshiremarquetry.org.uk.



Brian Freeman received the Ron Gibbons Trophy for best miniature in show and Rosebowl for best picture in show for 'Titania Sleeping in the Moonlight'



Kerry Rath received the Artistic Merit Award for her 'Bird Table'

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Dickies Workwear unveils new Pro Range: professional tradesmen & workers encouraged to #DressLikeAPro

Dickies has just launched its new Pro range, a new collection that combines practicality, innovation and safety with a modern, professional look – offering tradesmen a fresh new alternative to traditional workwear.

The Dickies Pro range has been created to meet increasing demand for smarter and more durable workwear that doesn't compromise on the comfort that tradesmen expect.

Designed using flexible materials such as Stretch Tencate® – plus Coolcore® to regulate moisture and Cordura® to offer extra defence against wear and tear on elbow panels and knees – the range also incorporates UV protection (UPF 45+) and is made using hypoallergenic fabric.

A high level of attention to detail has gone into the range and features include pockets created specifically to fit essential items such as a ruler, smartphone and kneepads, plus ergonomic side seams.

Available in five colour-ways, the smart two-tone collection includes trousers, jackets, T-shirts, caps and belts and can be worn as separates or as a coordinated outfit for a more professional finish.

The full Dickies workwear collection, including the Dickies Pro range, can be purchased online via www.dickiesstore.co.uk.



Hitachi launches new range of cordless nailers

For fast and efficient nail driving combined with easy maintenance, the new range of nailers from Hitachi features a unique air spring drive system that uses compressed air to drive each nail, causing less recoil, increased shooting speed, quicker response time between drives and better flush driving. Powered purely by the 18V battery, Hitachi's new cordless nailers keep that snappy, pneumatic and punchy feel thanks to their integral compressed air cylinder.

The NT1850DBSL/JM 18-gauge straight brad nailer, NT1865DBSL/JM 16-gauge straight finish nailer and the NT1865DBAL/JM 15-gauge angled finish nailer are all powered by super efficient brushless motors, and are supplied with two lightweight 3.0Ah Lithium-ion batteries for increased run time, less maintenance and greater durability.

The NT1850DBSL/JM brad nailer can drive up to 1,650 brads per charge while the NT1865DBSL/JM 18V straight finish nailer and NT1865DBAL/JM 18V angled finish nailer can drive up to 1,500 and 1,100 nails per charge respectively. A simple push button switches between sequential or bump fire mode.

All of these tougher, faster and more advanced nailers come with LED worklight, low battery indicator and a handy adjustable joist hook. A lock switch and a 30 minute automatic shutdown feature increase safety and promotes longer battery life. Adjustment of the drive depth and nose release, for quick and easy jam clearance, is simple and tool free.

With Hitachi's three-year warranty also available when registered online within four weeks of purchase, you can be assured of long service and peace of mind. To find out more about the new range, see www.hitachi-powertools.co.uk.



New from UJK Technology – digital height gauge



The UJK Technology digital height gauge is an indispensable measuring tool for the workshop in the accurate setting of cutting depths, especially router cutters and saw blades. The body is made of cast-iron and has machined feet that form a reference surface, and being highly stable, it can stand upright without additional support. A further advantage is that it is equally accurate both vertically and horizontally. The horseshoe-shaped body measures 54mm between the legs with an internal height of 80mm. The main feature is its highly accurate digital scale unit, with an LCD screen offering a reading in either metric or imperial.

The digital readout shows precisely how deep your saw blade or router cutter will cut, and you can zero the digital readout at any point, allowing relative adjustment. It is particularly handy to hold the bar in contact with the blade or cutter and gradually increase the cutter height until the display reaches the desired depth. Used horizontally, you can measure or adjust a router table fence relative to the cutter. Priced at £49.99, the digital height gauge will also measure a mortise to a depth of 99mm; see www.axminster.co.uk. Note: price includes VAT and may be subject to change without notice.

NEWS IN BRIEF

The Stock Gaylard Oak Fair will once again be held on the August Bank Holiday Weekend. This is a special event for those interested in woodcraft, timber, conservation and the countryside and there is something that will appeal to all members of the family, including over 200 exhibitors, events in various arenas, as well as tree climbing and zip wires for the younger visitors to experience. Tickets are priced at £8.50 for adults and £3 for children, but you can save 10% on these prices by purchasing online in advance. To find out more, see the website: www.stockgaylard.com

Taking place from 19–28 August, Celebration of Craftsmanship & Design has become the largest selling exhibition of high quality bespoke furniture in the country and every year it draws visitors and exhibitors from around the world. Various competitions will be taking place across the 10 days, including The Alan Peters Award for Excellence, Best Use of British Timber Award, The WCFM Design Award and the free prize draw for visitors returns again this year along with a new craft&design Award. To see the full list of who will be exhibiting, see www.celebrationofcraftsmanship.com

On 19 August, Charnwood will be running a Woodworking Open Day at its premises in Leicestershire. Come along and enjoy a great range of offers across the full range of machinery and accessories, as well as guest demonstrators from Coombe Abbey Woodturning Club, Trent Valley Woodturning club, Robert Sorby turning tools and Chestnut finishing products. There will also be a free barbecue, so another good excuse to attend! Taking place from 10am-4pm, the event also benefits from free entry and parking; see www.chamwood.net/events-and-shows to find out more

New Clarke CBS190B 190mm bandsaw



This powerful Clarke bench-top bandsaw is an ideal woodworking machine for DIY and hobby workshop use. The CBS190B can make cuts up to 80mm deep and 190mm wide, and also included is a tilting table, mitre gauge and rip fence to provide the facility for straight, cross, rip, mitre and bevel cutting accurately in all types of wood, at a speed of up to 14.7m/sec. For the operator's safety, it is equipped with a dust extraction port that safely channels dust and wood chips away from the working area. Priced at £155.98, see www.machinemart.co.uk.

Carpentry students create wonderful rustic bench

Rugby College carpentry students have designed and created a new bench for historic Compton Verney. The project began in January 2017 when Compton Verney contacted the college with a request to design and build a



Rugby College carpentry students with the newly made bench

contemplation bench for their reflection area in the wooded grounds of the Georgian Mansion house, which is home to the award-winning gallery and museum. The bench looks out onto a new 'labyrinth' maze and is also near the base for Forest School sessions, where young people access outdoor learning and educational trips to the countryside.

The students visited the site, taking part in a Forest School session with Grounds Learning Programmer, Vix Powell. During this session they discovered some disused oak posts, which, after some careful cleaning and machining, were used to create the final bench.

Martin Williams from local company Timber Master supported the students to finalise designs, with Archie Pearcey's design being chosen due to his striking and sympathetic approach to the reclaimed materials. Fellow student Ethan Gwilym turned the design into a CAD technical drawing so the students could begin work on the bench in earnest.

With support of tutors the bench came together over several weeks, with students dedicating their free time to the project. It was installed in the park ready for the seasonal opening on Saturday 6 May.

Archie Pearcey, 18 from Rugby, is studying for a Level 3 in Carpentry and was the designer of the bench. He said: "I came up with the design after seeing the materials we had. We all took on different parts of the project, so I did the seating and backing area with some of the students, while others were in the machine workshop."

Vix Powell from Compton Verney, said: "We are absolutely delighted with the bench the students have created. The materials and design were all down to them, so I actually didn't see the bench until just before we installed it. It's fantastic and the colours fit in perfectly with the backdrop of the woods and the new labyrinth."

Royal Leamington Spa College offers carpentry and joinery courses and apprenticeships at a range of levels; see www.warwickshire.ac.uk/courses.

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Silky smooth turning

This trade-rated lathe would suit any professional or serious amateur turner and features an excellent variable-speed range as well as being very well made

Quickly following in the shadow of the Axminster Precision Pro lathe reviewed in GW314 is the AT1016VS. If you are hankering after a more traditional but equally action packed and well constructed small lathe, then this one really hits the spot.

'Trade' range

As part of the 'Trade' range it comes with a three-year warranty and can therefore be given a good workout in such an environment on a daily basis. It is also backed up with heavy, well machined castings and twin ball-bearing supports on the headstock for stable, accurate turnings. Capacities are decent for a small lathe allowing for bigger projects, including bowls up to 250mm diameter as well as the smaller trinkets and kits, which is where these smaller lathes often find their niche. But if you decide you need to turn something beyond the 400mm between centres capacity, there's an extension bed available as well as separate leg stands for the lathe and extension bed.



The switch box is hinged, which allows you to gain access to the bottom pulley for belt swaps

Belt positions

There are three belt positions that can be accessed through a drop down flap on the headstock with a locking handle through a lifting lever. Slackening the lock and lifting the handle releases the belt tension, which allows it to hop across to the next position. You do have to withdraw the powerbox for the variable-speed in order to gain easy access to the lower belt position, which sounds like a slight negative, but it's not a big issue as the box is hinged and held with a simple spring latch, so it's very quick to do. The only issue I have here is that the two wires that link the switch to the motor are clipped back, but there is enough slack on them within the pulley cavity to contact the belt and pulley, and I'd be concerned that they may snag or rub. I'd suggest using a piece of duct tape to secure it out of the way, which will ensure this doesn't cause a problem.

Variable-speed

With only three positions for the belt to contend with, and easy to change, I'd certainly make good use of them alongside the excellent variable-speed dial. There's also a great crossover of speeds within the three ratios, allowing you to continue at the end of one speed ratio without having to swap over to the next unnecessarily,



Variable-speed is very easy to control with this dial and digital readout

and the highest speed still starts as low as 660rpm to cover some more 'torquey' pieces as well as the fast end for other work, which you can access without altering the setup.

Additionally, with its digital readout, if you find a sweet spot for turning a particular species of timber, composite or plastic, you can easily log and replicate it every time, which is a nice improvement over a variable-speed model without this readout – such as on my own little Nova Comet, for example. The switch also has a reverse position, which is ideal for various sanding applications.

Tailstock

The tailstock has a No.2 Morse taper for centres and so forth, replicated at the headstock, with both hollowed out for easy ejection of drives using the knock out bar. The tailstock will also self-eject by winding the quill back in. A metric scale on the tailstock allows accurate blind drilling of holes as well, and with a very sweet action on the quill advance it makes it all the more easy to control.

The locking lever for the tailstock follows the tradition of many lathes by tucking it behind, which means you need to lean over to access it. This isn't a massive issue as you soon get used to it, but the end position on my own little Nova makes so much more sense for easy access purposes. Movement over the beds of both the tailstock and the banjo is very sweet and smooth and a regular coat of paste wax as part of a simple maintenance regime will ensure it stays the same.

Headstock

The headstock has an indexing feature with 24 positions, held securely with a tapered dowel that inserts through the casting. A neat little touch is the rare earth magnet on the rear of the dowel that secures it to the lathe body, so it's always to hand if you do any indexing work. There is also a set of graduations around the handwheel collar, read against a simple paint mark on the lathe body to show the index mark as you move it. There is a niggle on the test model here, though: the handwheel is very marginally out of whack so it runs ever so slightly offcentre and causes minor vibration at higher speeds. I took the handwheel off to check it wasn't the spindle and that solved it, running at any speed whisper-quiet and vibration-free, so it seems like a bit of an anomaly.



This switch also allows you to put the lathe into reverse for sanding



This simple two lever combination allows you to release the motor to make belt swaps



The indexing positions are replicated on the outer collar



The tailstock quill adjustment is very smooth

The headstock also has an M33 3.5mm thread for chucks and faceplates. Chucks are the be-all and end-all for many turners; I have certainly fallen under their spell since using one so it's well worth the investment of a good quality model to complement the excellent quality of this lathe. If you just want to get straight to work without investing in a chuck, however, then the lathe is supplied with a pronged drive and live centre plus a 75mm diameter faceplate.

My token efforts of woodturning certainly don't do the lathe justice for finesse or style but working on an easily adjustable, variable-speed machine with a digital readout such as this makes



Access to the top pulley is via this hinged flap on the casing

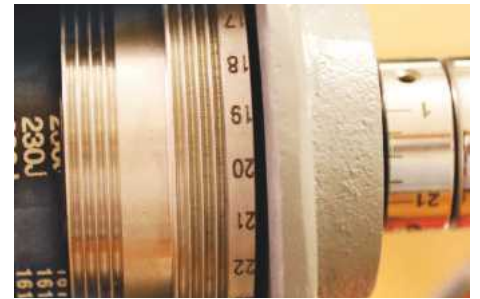


You lock the tailstock with this handle, which is positioned at the rear

it all the more easy. I noticed a couple of power drops when I was turning, but I had it plugged in through an extension lead. I switched to a direct connection and it seemed to solve the issue, so that's something to bear in mind.

Conclusion

I'm certainly very impressed by this lathe both in terms of its build quality and performance; the $\frac{3}{4}$ hp motor is a brushed type but purrs along beautifully with good power. It's got a price tag that matches its quality but you undoubtedly get what you pay for. It's a great investment if you are serious about your woodturning and



You can restrict the headstock in 24 indexing positions shown on the internal pulley



A neat magnetic tapered pin holds the indexes when needed



The banjo is held with a similar lever and holds firmly

want to expand your skills accordingly, but the handwheel needs to be checked to ensure it runs as silky smooth as it should. **GW**

Specification:

- ▶ **Motor:** 560W
- ▶ **Speeds:** 170-960, 300-1,660 & 660-3,600rpm
- ▶ **Headstock/tailstock tapers:** 2MT
- ▶ **Distance between centres:** 400mm
- ▶ **Max over bed:** 250mm diameter
- ▶ **Weight:** 38kg

- ▶ **Typical price:** £599.96
- ▶ **Web:** www.axminster.co.uk



Bowl turning with a chuck is very sweet



Pen turning type work is an ideal application for this lathe

THE GW VERDICT

- ▶ **PROS:**
Excellent variable-speed range; digital readout; high quality construction
- ▶ **CONS:**
Cables between switch and motor need securing; handwheel is very slightly out of true
- ▶ **RATING:** 4 out of 5



The perfect starter kit

This chuck kit from Axminster is ideal for those new to turning and contains everything required to get you up and running

As a good rule of thumb, it pays to buy well on accessories, so having never used an Axminster chuck, and seeing as one was sent with the AT1016VS lathe, this gave me a good opportunity to put it through its paces.

I will immediately admit that I'm no expert at this end of the woody market, so I've reviewed the chuck based on how it performs and judged it on how easy it is to alter, adjust or swap jaws, which are the factors that swing it for me.

The starter kit comes beautifully packaged with the chuck in its own robust cardboard box

(shown opposite), with an outer plastic storage case to retain both the chuck and accessories, so everything stays together when not in use.

The chuck is designed and made by Axminster themselves at their headquarters in Devon, and having their own in-house engineering shops eliminates the problems often associated with the quality control of some imported products.

The chuck is made from a single piece of stainless steel, which increases durability and also allows protection from any wet timber shavings, stains and so forth, with the four-jaw movement operated with a supplied chuck key.

The accessory mounting jaws have a ridge that locates into a corresponding groove into the interchangeable jaws, which allows for additional security with each jaw secured by two sets of screws.

I found that it was best to fit the jaws lightly at first then wind them in until they just touch each other in order to get them perfectly aligned before fully tightening off.

The supplied 'C' type jaws will grip internally into a recess or externally around the outside

of a blank as well as working with the additional accessories. The faceplate ring has a dovetailed inner rim and can be screwed to the blank and then retained by expanding the jaws. Alternatively, the screw chuck can be used; this has a 'T' shaped disc base that will then fit inside the jaws and is gripped by tightening the jaws inwards, so there's plenty of scope for holding work.

The collar of the chuck also has a couple of grub screws; these are used to secure it to the lathe drive for reverse work, which will prevent it from unscrewing under load. A large range of individual jaw sets are available for different applications and stock sizes as well, so the chuck can expand with you.

In use

Working with the chuck on the lathe showed similarities to the one supplied with my Nova, with adjustments quick and easy to make.

The chuck key works correctly as well, turning clockwise to close the jaws, unlike the Nova, which runs the opposite way. Everything runs fluidly and smoothly as you tighten up to the work, with no sign of any runout once it's going, so I was certainly happy with it.

Conclusion

Although a pricier option than the Nova or similar types on the market, with the addition of a faceplate ring and screw chuck insert, this is a great place to start if you're a first time chuck user. **GW**

Specification:

- ▶ **Supplied 'C' jaw capacities:** 56mm outside diameter; 69mm internal diameter
- ▶ **Additional accessories supplied:** 100mm diameter ring plate; screw chuck

▶ **Typical price:** £179.95

▶ **Web:** www.axminster.co.uk



The chuck key allows for smooth adjustment of the jaws



A faceplate ring is supplied, which traps with the jaws



There is also a screw chuck that is secured with the chuck



The jaws are located on a raised ridge and are secured with two set screws



Each jaw must be matched to its correct position



Using a chuck is so much easier...



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THE GW VERDICT

- ▶ **PROS:**
Great starter kit; stainless steel construction; performs well in use
- ▶ **CONS:**
It's best to check the jaws for alignment before fully tightening
- ▶ **RATING:** 4 out of 5

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Plenty of power

This excellent piece of kit is not only compact, light in use and extremely powerful, but may also change the way you look at 18V tools

I've been a fan of 10.8V and 12V drills and impact drivers ever since I first used them as they are so compact but still benefit from having good power. I rarely even use an 18V option now unless I am doing some heavy-duty work that requires bigger holes or fixings to be used, but that could all change after picking up this incredible pair!

Increased capabilities

I've had a go at using this drill on the odd occasion when attending Milwaukee events, but I've only just managed to get a kit onto the test bench – it was well worth the wait!

Stepping up from the original 1.5 and 2Ah cloverleaf cluster battery, this particular set retains the same battery fitment that fits inside the handle but comes supplied with 4Ah batteries – there's a flat base to the battery for storing the extra cells, which allows for the increased run time. It also has the added advantage of acting as a stable base, so both tools can be stood up when in use, allowing for easy access.

The higher Amp Hour rating also increases the torque capabilities of the drill from 37Nm

with a 1.5Ah battery, up to 44Nm with a 3Ah or bigger battery, so you get more power under the bonnet with this setup.

Useful additions

There's no remaining battery power indicator on the batteries themselves, although both tools have identical bars of four LEDs on the bodies, which show how much power is left in the battery when the trigger is squeezed, which is always a useful addition to any tool.

Likewise, they share trigger-operated LED lights that work with a small tweak of the trigger without spinning the chuck or bit and stay illuminated for 10 seconds after, allowing you to set and check a fixing or easily manoeuvre it into position for gloomy areas.

But it's all about the power with these two, and as part of the 'FUEL' range, these feature brushless motors, which keeps maintenance to a minimum and increases the battery runtime and performance.

M12 CPD drill

The drill is pretty special in the performance area when compared to rival brands, so much so that Milwaukee have fitted a 13mm capacity all-metal single sleeve chuck where most manufacturers stick with a 10mm chuck to try and limit the diameter of drills being fitted.

Milwaukee still rate the drill to 25mm maximum diameter in timber, which is certainly good for a diminutive tool, and trying it out with

a 25mm auger on some oak doors to drill out for the latches it was more than man enough and had plenty of power to spare. But set to its fastest speed is where it really breaks barriers. Bigger diameters require lower speeds in order to reach the higher torque, but in the trade especially, faster is more important and that can lead to poor gear selection and tool overload.

Even with protective circuitry it won't do tools any favours, but Milwaukee has so much power that, as long as the chips are clearing the drill, it will drive a 19mm auger through pine on its fastest setting without flinching, losing power or tripping the overload protection.

I found that if the drill flutes get clogged and the drill gets bogged down, then the overload kicks in to protect it so it has a lot of power in reserve, backed up with essential protection as needed.

It's pretty nippy at its 1,700rpm top speed as well so if you do need to drill large holes quickly, the M12 CPD does the job admirably and is very impressive. Having used other models, I know I would need to drop down to the slower speed setting to achieve the same diameter hole.

There is also an 18-position torque collar behind the chuck, which allows for consistent controlled screwdriving if needed.

The additional bonus of the second collar behind the torque one allows you to switch between screwdriving, drilling and hammer mode, and means you don't have to adjust the torque setting when switching modes, as it automatically overrides this.

M12 CID impact driver

Moving over to the impact driver, I again found that it breaks the mould. Twin kits normally give you a straightforward, single-speed impact driver but Milwaukee have upped the ante by including the M12 CID: a two-speed machine that has a very responsive variable-speed trigger to back it up. The combination of speed and trigger control helps drive screws and other fixings efficiently to suit the work, and changing the gears also alters the maximum torque with a very impressive 135Nm in its highest gear – exceptional power for a tool in this voltage class and around 20Nm higher than most rival models. It is also powerful enough to drive 100 × 6mm screws directly into beech, which



Both tools have a set of LEDs, which indicate remaining battery power



Likewise, they both have a trigger-operated LED worklight



A top-mounted slider changes gears on the drill



The drill also has a torque collar for precision driving



There's also a second collar that overrides it for drilling functions



The impact driver has a toggle switch for changing speed and torque



Batteries slide into the handle, which makes the grip slightly large

is normally the realm of the 18V machines. Toggle the gears by pressing the top-mounted button and the maximum speed reduces from 2,650rpm to 1,200rpm, and the torque drops down to just 19Nm; this now allows greater control for adhering thinner gauge and smaller fixings where the higher speeds and torques can easily drive them too far or shear them.

Conclusion

Milwaukee have come up with a pretty special kit here: both tools are close to 18V performance but are packed into very compact and lighter bodies, with the only slight negative for me being the handles. These are a little on the large side, but they have to be in order to accommodate the battery design, although both have sculpted necks that makes them feel pretty comfortable in use. Either way, this shouldn't put anyone off trying out this kit; the tools could definitely be real game changers and may even end up replacing your 18V equivalents. **GW**



Running 100 x 6mm screws directly into beech...



Drilling out oak with a 25mm auger was well within the drill's capabilities



On its fastest speed it runs a 19mm auger in pine without a problem



... is impressive to say the least!

Specification:

- ▶ **Drill model No:** M12 CPD
- ▶ **Speeds:** 0-450 & 0-1,700rpm
- ▶ **Chuck capacity:** 13mm
- ▶ **Max diameter wood:** 25mm
- ▶ **Max diameter steel:** 13mm
- ▶ **Max diameter masonry:** 13mm
- ▶ **Torque:** 37Nm (with 1.5Ah battery); 44Nm (with 3Ah battery)

- ▶ **Impact driver model No:** M12 CID
- ▶ **Speeds:** 0-1,200 & 0-2,650rpm
- ▶ **Torque 1st gear:** 19Nm
- ▶ **Torque 2nd gear:** 135Nm

- ▶ **Typical price:** £280
- ▶ **Web:** www.milwaukeetool.eu

THE GW VERDICT

- ▶ **PROS:**
Superb power; compact; two-speed impact driver; 13mm drill chuck
- ▶ **CONS:**
Quite a thick grip
- ▶ **RATING:** 4 out of 5



A carver's dream set

Perfect for the aspiring or advanced wood whittler, this set of high carbon steel chip carvers from Stubai represent great value for money

Any aspiring whittler would be content with this little set of chip carvers from Stubai. The high carbon steel blades extend back into the handles and are pinned through with two rivets for a solid, secure feel as you cut; the exception being the beech-handled detail knife that features a tang and ferrule construction. The other four knives are ash-handled and comprise a longer, sculpted handle bench knife, and three identical handled knives – a double edge, a stab, and a chip knife – so the set should satisfy most chip carving projects.

Sharpening up

Each blade is highly polished and pretty sharp straight out of the box, but I found they definitely benefited from a tickle with a fine slipstone, a leather strop and honing paste. Once I'd done this the blades were superb, leaving clean,

smooth cut facets with the edges holding up well, requiring only a cursory swipe on the strop every now and then to refresh the edge.

Getting a feel for the cut

I'm certainly no carver: long-term readers may remember the pig I carved back in issue 217 as an example of my prowess... But I like a challenge and it's always best to work your way up to bigger things, so a mouse seemed like a good starting point and once again, like my woodturning learning curve and my recent pyrography attempts, I found using the chip carvers to be quite therapeutic. However, having watched a whittler or two in action at various shows, the logic seems to be to defy the first rule of woodworking – to always cut away from yourself – so a lot of the knife cuts chip carvers take tend to be towards them, with the knife being used in the same way as

you would when peeling an apple, by pulling the blade towards your thumb. Some cuts will automatically protect you as the area you work on is backed up by part of the carving itself, but others are directly towards your flesh, so care is definitely needed. It certainly made me very aware of just how easy it would be to end up in A&E, but at the same time, I found I could soon get a feel for the cut as well as being able to judge when to stop applying pressure during the cut.

Safety first

For the novice as well as the pro there are also Kevlar gloves for chip carvers, so I think it would be prudent to invest in a pair just to be on the safe side! But that aside, I found these knives to be very nice to use, comfortable and controllable. I'm not going to say I knew which knife to use at any given time – I was experimenting as I was going – but you soon get a feel for what works best. As for my mouse, he isn't finished yet but I'll get there, or perhaps end up turning him into a flea if it all goes wrong!

Conclusion

At around a tenner a knife, this set represents great value and would be ideal for whiling away an hour or two whittling a few offcuts. **GW**

Specification:

► **Blades:** High carbon steel
► **Handles:** Ash and beech

► **Typical price:** £52

► **Web:** www.johnsonstools.co.uk

THE GW VERDICT

► **PROS:**
Good set for different applications; great quality; solid construction

► **CONS:**
Not razor-sharp out of the box

► **RATING:** 4.5 out of 5



The knives benefit from a hone prior to use, and a strop keeps them cutting well as you work



Some cuts are made by pulling towards bare flesh, so care is needed



When making other cuts, you are protected by the carving itself but awareness is prudent



Detail work is easy with the correct knife – you just need to experiment to know which one is best!

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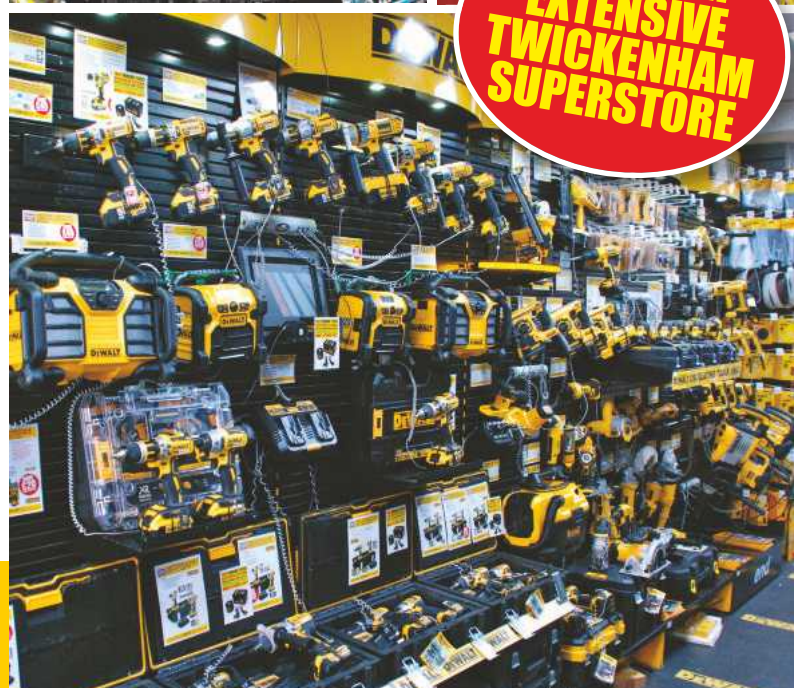
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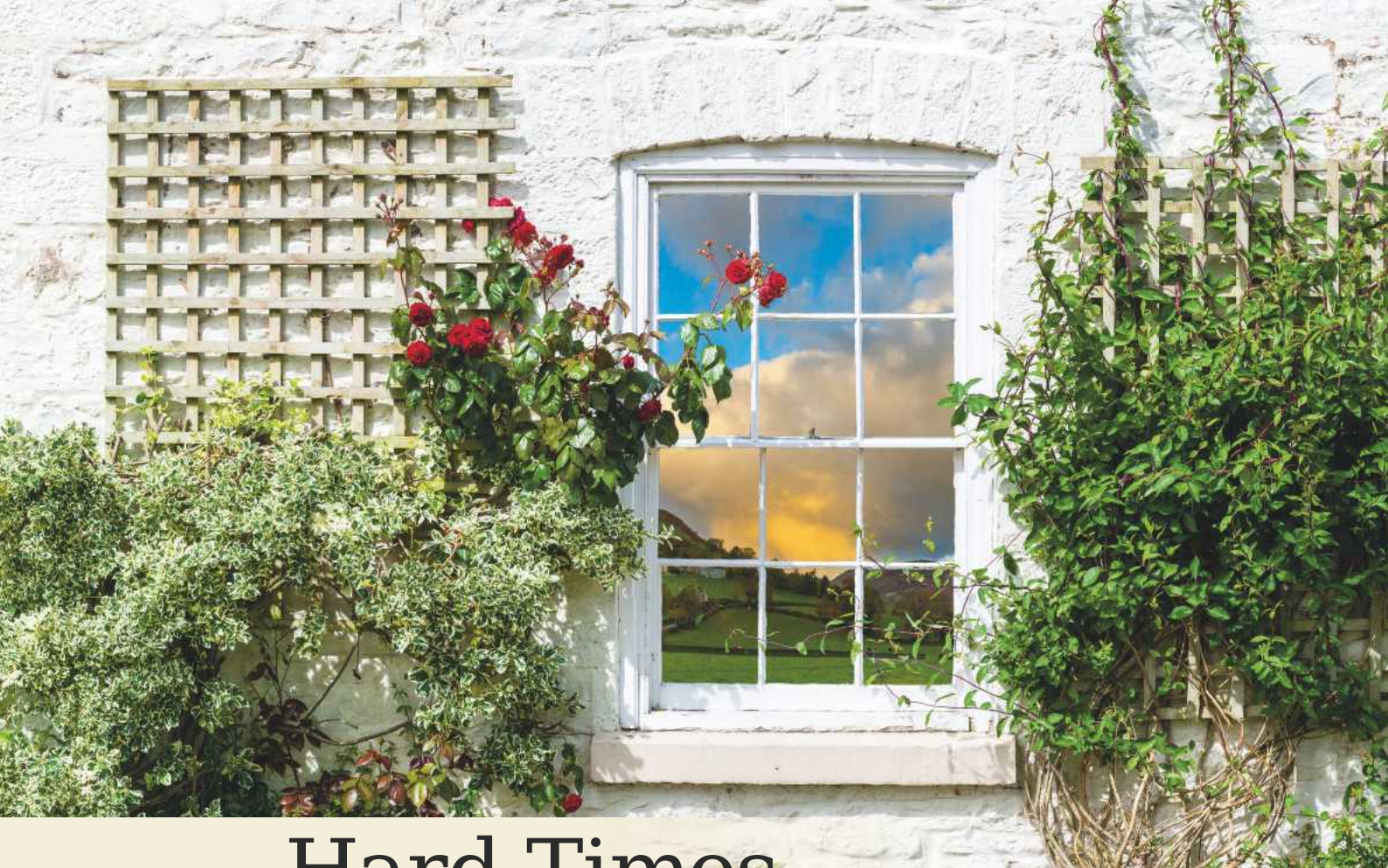
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Hard Times

With work on The Old Vic's sash window looming on summer's horizon, **Dave Roberts** takes a timely lesson in compromise

Though it was hardly Dickens' intention when he wrote *Hard Times* – which argues the error of valuing profit above personal fulfilment – his short tale nonetheless invites a little reflection on woodworking's purposes and practices. Take, for example, Thomas Gradgrind's hard-headed assertion that, "in this life we want nothing but Facts." It may resonate with the practical discipline implicit in the makers' maxim 'measure twice, cut once', but it allows no room for the imagination and creativity that woodworking also involves, still less the margins that must sometimes be allowed when working with a natural medium and one's own fallible hands. In fairness, a chastened Gradgrind comes to acknowledge that, "there is a wisdom of the Head, and... a wisdom of the Heart," and life at The Old Vic' – which isn't involving anything so exotic as imagination and creativity at the moment – often means trying to balance the two in common-all-garden compromises:

Purlin: ogee, oh bother

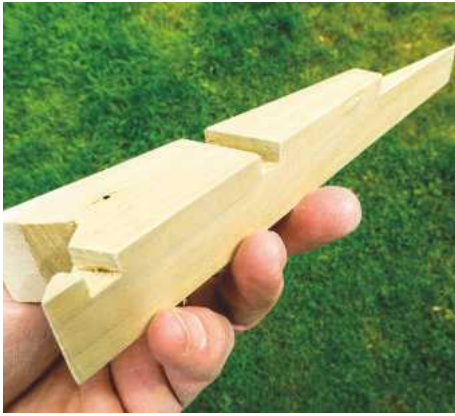
In WTD II (GW319), for instance, I'd made a start on the fascias and soffits of The Old Vic', which Head says must be attended to before winter. However, the hoped-for return of the swifts – which seemed to burst overhead in a wheeling flock one evening – together with swallows, house martins, et al has slowed progress considerably. They've laid claim to established nests in the south and west-facing gables and rafter tails that enjoy the best of the sunshine, and which are now noisy with chicks and fledglings.

Heart, reluctant to disturb them, has persuaded me to shift from my proposed course, and to work on the parts of the eaves not favoured by the birds – the second, north-facing gable.

Here, the weather has exploited 40 years of neglect by attacking some of the woodwork in the verge, necessitating the cutting-in of small repair sections – a type of poor man's marquetry, but satisfying in its way. My biggest problem, however, came with one of the purlin ends: about a quarter of the stub of timber protruding from the masonry had rotted to a depth of 150mm or so. This wasn't enough to create a structural problem, but it did leave an open door to continuing decay, so while the reconstruction was a largely cosmetic exercise, it did need to be effective and proportionate while conserving as much of the sound, original material as possible.

Having cut out the rotten and friable timber, shaped the exposed surfaces as well as I could given the purlin's location (25ft up, buried in masonry) and then hardened them using Ronseal's wood hardener, I set about making a replacement cheek, which I built up using 20mm-thick layers of oak. This method allowed me to not only recreate the missing ogee of the purlin's nose, but also contours that broadly corresponded to the irregular profiles within the pared-back purlin – an approach, I reckoned, likely to be far more successful than trying to sculpt a single block.

When glued and screwed together, the composite repair piece provided plenty of close contact between the old timber and new, through which I drilled clearance and pilot holes ready for the screws that



FAR LEFT: Poor man's marquetry: making repair patches for the gable end was oddly satisfying

MIDDLE: The weather-facing side of this purlin has caught the rain

LEFT: Pared back to create sound mating faces for the repair section, but leaving some tricky profiles in the core



FAR LEFT: The built-up repair section replaces the bulk of the missing timber, and recreates the ogee nose

MIDDLE: It looks as though there's a lot of resin there, but it's really just a skim of filler blending together the faces of the old and new ready for painting...

would hold them together. Those areas where I wasn't able to achieve mating surfaces, meanwhile, were mostly in the core of the purlin end, and here I used Ronseal's two-pack polyester resin to fill the gaps (an alternative might have been an epoxy resin, such as the well-known West System products, which are reputedly more flexible than their polyester counterparts); a final skim of resin helped to blend the old and new timber across the purlin's nose.

Fit for an imperfect world?

Once painted, the repair should be neat and weatherproof, but – given that it'll be subject to the weather year in, year out – what of its longevity? Contrary to the 'repair like with like' principle, I mixed my timbers, choosing to armour the exposed side of the pitch pine purlin with even more durable oak. And yes, I compounded this mixture by using resin that Ronseal tells me is 'flexible', but which (if we're looking for hard, Gradgrindian facts) is unlikely to have the same co-efficient of expansion as either of the two timbers. So will differential movement occur between the woods, and the wood and resin? Will it cause cracks to appear? Possibly; I'll let you know come winter. But even if it does, I doubt that it'll be fatal: the purlin's end took nearly 160 years and the accelerative effect of recent poor maintenance to decay as far as it did; but protected by paint and soffit, and the breathability of lime mortar, I expect the reliability of my mixed-media repair to demand no more upkeep than any other part of the exterior woodwork. If that's so, then to my mind its qualified degree of perfection will be more than adequate to our imperfect world. After all, this is an old house, not the International Space Station; if a breach of the painted wooden 'hull' occurs, no-one will die, it'll simply be time for a little more maintenance.

An abundance of light – & labour

Windows are mentioned 42 times in *Hard Times*: windows from which characters look out, through which they're seen, by which views are tellingly framed, or in which a building's character may be read. Their importance is also reflected in *Historic England's* assertion that windows, "are an integral part of the design of older buildings and can be important artefacts in their own right, often made with great skill and ingenuity with materials of a higher quality than are generally available today. The distinctive appearance of historic hand-made glass is not easily imitated in modern glazing."

Aesthetic considerations such as these probably wouldn't have interested Mr Gradgrind, but two window-related facts that would've pleased him are that in 1851, three years before *Hard Times* was written, the window tax had been abolished, and three years after its publication the duty on

ABOVE LEFT: ... and with a coat of primer, you can scarcely see the join – especially from the ground!

BEFORE & AFTER

Nothing to do with woodwork, but an example of embracing imperfection. Listed building consent required that the repaired chimney stacks be re-rendered as before. While Gradgrind would probably have insisted on square and parallel, we chose to replicate all the former imperfections – including the wayward 'mortar lines' – because they were part of the house's overall character. Head is satisfied by the rebuilt stack; Heart is gratified by the human touch



Repairs to the chimney stacks were faithful to the original form, even down to an unknown workman's out-of-square mortar lines. Head and heart are thus satisfied

MIXED MEDIA & APPARITIONS

While we're talking about mixed media, a technique which I expect to be using involves 'resin metal' – a combination of polyester or epoxy resin and finely powdered metal fillers that allows objects to be cold-cast in brass, bronze, copper, aluminium or iron; resin metal is easy to work, has a fairly generous open time, and cures in just a few hours.

Segueing from mixed media to mediums, Dickens was a sceptic when it came to spiritualism but it's said that his popular ghost stories shifted the genre from the Gothic settings of the 18th century to the Victorian firesides of the 19th century. If that's the case, then *The Old Vic* really ought to have a ghost of its own, though I'd rather that it was one like 'The Specter Chair' from Josh Urso Design – a clever and stylish variation on the classic 'bed-sheet ghost'.

To create the chair, resin-impregnated fabric is draped over a former so that, when cured, the cloth's folds form a functional back, seat, and legs while at the same time suggesting a phantom chair beneath. "We use a two-part epoxy resin," explains the studio's Kim Bricker, "with a working time of about an hour, and a curing time of about 24 hours – it all depends on the temperature and humidity in our studio. I don't want to give away too many of our secrets, but I can say that the soaked fabric behaves very much like fabric soaked with water might – it is wet, but not sticky. After the chair has cured, it is [still] flexible enough to break off the former. One of the greatest challenges of the impregnation process was finessing the ratio of resin to fibre to maximise strength and minimise pooling." You can see more of the studio's work at: www.joshursodesign.com



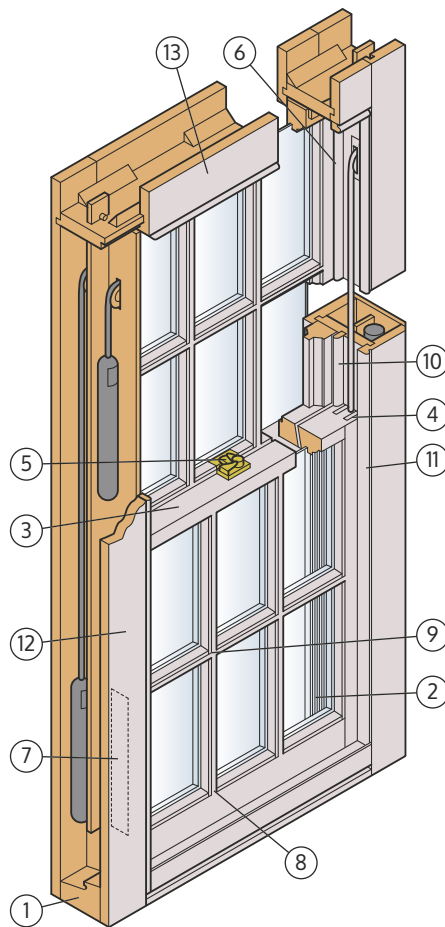
Resin metal is easy to work, follows moulds faithfully, and will weather like the real thing, oxidising to produce rust and verdigris



'The Specter Chair' from Josh Urso Design

glass went the same way. This saw, in the period that *The Old Vic* was built, a move from the 12-paned sliding sashes with six larger panes, bringing what Thomas Webster's *Encyclopaedia of Domestic Economy* called, "the abundant introduction of light [adding] a cheerfulness formerly unknown." There remains, however, a kind of tax on this abundant and cheerful light: with their boxed weights, pulleys, frames and multiple glazing bars, they're going to be demanding in terms of repair and subsequent upkeep.

The *Old Vic* has 11 box sash windows to be tackled, and I'd hoped to make a start on their restoration by now. I have, however, only progressed as far as making the cover that will allow me to remove the sashes (and, if necessary, the frame) and weatherproof the aperture, and familiarising myself with the anatomy of box sashes in order to identify the key areas likely to require attention:



1 Sill: some will require replacement, possibly with oak; some of the joints with the jambs will also need repair

2 Outer lining: peeling paint has led to wet rot, meaning that repair fillets are required – one of the jobs for which I've been hoarding those sections of old, close-grained pine

3 Meeting rails: these bevelled rails should be level when the sashes are closed and pulled together by the window catch

4 Dovetail bridle joint: puts extra strength into a frame which, when loaded with glass and hanging from its sash cords, is quite weighty

5 Window furniture: there's no shortage of the old pattern fittings, and therefore no excuse not to replace broken furniture with matching items

6 Sash cord, pulley and counter-weight: these must run freely and balance the sashes

7 Weight pocket: there're four of these, and two of them are on the outside, so they need to be close-fitting to keep the weather out of the jamb

8 Mortise & tenon joints: fine joints where the slim glazing bars meet the rails, and vulnerable to penetrating water

9 Halving joints: more fine joints, more opportunities for destructive dampness

10 Parting bead: this separates the two sashes as they slide; modern, wooden replacements now incorporate a discreet draught-excluder that also helps reduce rattling of the sashes

11 Staff or stop bead: fitted to both the inside and outside, this retains the sashes in their tracks; again, replacement wooden beads can incorporate a draught-excluding pile

12 Jamb: a three-sided box housing the counter-weights, which are separated in their travel by a parting slip

13 Head: as with the jamb, a three-sided box, and as with the jamb, lots of room for decay...

After weighing up the task ahead, the light falling through those windows now looks not so much cheerful as portentous, full of that liquid, coppery energy that precedes a storm. I've a feeling we'll be revisiting more lessons from *Hard Times* soon... **GW**

NEXT MONTH

More tales from the crypt: "Upon my word and honour I seem to be fated, and destined, and ordained, to live in the midst of things that I am never to hear the last of"



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2 projects in 1

This simple project by **Janice Anderssen** uses basic materials to make a tool box that also doubles up as a handy step stool



MATERIALS & TOOLS REQUIRED

MATERIALS

Small step

- 44 x 44 x 130mm – legs – 4 off
- 44 x 44 x 280mm – top rail – 2 off
- 44 x 44 x 192mm – leg rail – 2 off
- 22 x 94 x 340mm – top slats – 3 off

Large step

- 44 x 44 x 330mm – legs – 4 off
- 44 x 44 x 280mm – top rail – 2 off
- 44 x 44 x 192mm – leg rail – 2 off
- 32 x 94 x 452mm – top slats – 3 off

Storage compartment

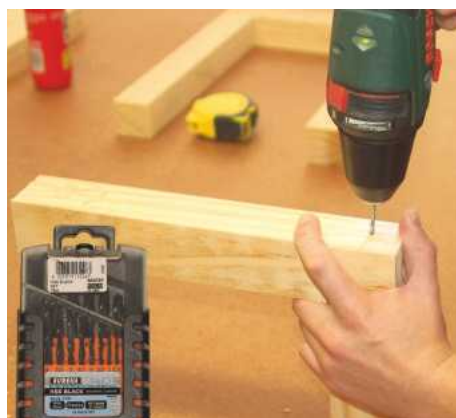
- 19 x 364 x 123mm laminated pine – compartment front/back – 2 off
- 19 x 123 x 192mm laminated pine – compartment sides – 2 off
- 19 x 192 x 326mm laminated pine – compartment base – 1 off
- 250mm ball-bearing drawer runners and 16mm screws – 1 pair
- Full-overlay concealed hinges plus 16mm screws – 2 off
- 4 x 40mm smooth shank screws – 18 off
- 4 x 60mm smooth shank screws – 14 off
- 35mm Forstner bit
- Wood glue
- Wood stain, sealer or varnish and paintbrush

TOOLS

- Drill/driver plus assorted bits
- Orbital sander plus 120 and 180 grit sanding pads
- Quick clamps
- Tape measure and pencil

This step stool I designed is also a toolbox. More than that, it's sturdy enough to support a big guy or gal.

While your ordinary step stools offer little in the way of support for bigger adults, I designed this one so it was easily able to hold weight, and I also added a storage compartment for tools or supplies. **GW**



STEP 3. Repeat step 2 above...



STEP 4. Measure up 41.5mm on the legs – for both the small and large step stool – and use this as a guide for mounting the leg rail

Assemble the stools



STEP 1. Arrange the pieces for the storage compartment and assemble using wood glue and 40mm screws



STEP 2. To assemble the small step stool, drill 3mm countersunk pilot holes through the side rail and into the legs, then join with wood glue and 60mm screws



... to join the legs for the large step stool



STEP 5. For both the small and large step stool, glue together the slats that form the tops/lid



FURTHER INFO

To see more of Janice's projects,
go to www.Home-Dzine.co.za



STEP 6. For the small step stool, glue the legs to the slat seat



STEP 7. Turn the stool over to drive 60mm screws through the top and into the leg assembly on both sides



STEP 8. For the large stool, with the storage compartment upside down, glue the leg assemblies onto the side of the compartment. Pre-drill countersunk holes through the leg assembly, into the compartment, and secure with 60mm screws



STEP 9. Sand all uneven edges with 120 grit abrasive and then sand smooth with 180 grit sanding pads. Wipe clean with a cloth lightly dampened with mineral turpentine. Use your orbital sander to give a chamfered (angled) edge around the bottom of the legs; this gives a nice finishing touch



STEP 10. Secure the 250mm drawer runners to the leg rail on the large stool using 16mm screws



STEP 11. Place the small step stool underneath the large one and pull out the runners so you're able to secure to the leg rail of the small stool. Drive in two screws at the front end of the runner. Separate the runner from the track and drive two screws at the back end. You can then slot the runners back together



STEP 12. Draw a line 3mm in from the back edge of the slat top and drill two holes for the concealed hinge with a 35mm Forstner bit. Drill to a depth of 11mm



STEP 13. Secure the concealed hinges onto the top using 16mm screws



STEP 14. For added strength, a couple of supports can be added to the lid for the large step. These are scrap 22 x 44mm pine strips glued and screwed with 40mm screws



STEP 15. Apply wood sealer or varnish in accordance with the manufacturer's guidelines. I applied a clear sealer, but you can choose to tint the step stool in any colour you wish



STEP 16. The completed step stool and tool box

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PANEL BEATING

Edward Hopkins' blow-by-blow guide takes the fear out of framing

Timber, for all its obliging friendliness, has two weaknesses. Firstly, across the grain. A yew longbow takes all an archer's strength to draw. If the grain were going across, and not along it, the bow could be snapped by a child. Secondly, shrinkage; mainly as it seasons, but also later, along with expansion, according to prevailing atmospheric moisture. As if that weren't enough, it shrinks unevenly, the heartwood being harder and drier than the sapwood. As it shrinks – and according to irregularity of grain due to growing conditions – it is prone to warp. Not so friendly now is it? Furniture (and building) often requires an area to be clad or covered. If you nail up planks side-by-side, you'll come back one fine day and see light between them. Some will have sprung loose. If you'd fixed them down too tightly, they'd have split.



A basic unit of woodwork

The answer to this; the complete answer, the perfectly elegant answer, is the panel. It is a basic unit of woodwork, centuries old and as fresh as the day. A frame of stiles and rails is securely mortise & tenoned together. Being comprised of small section stuff, it is less vulnerable to shrinkage; and being well-jointed, it is held in plane. The frame is grooved all round its inner edge to take the panel which, if it is of solid timber, must be allowed to move as it itself moves. A timber panel must not be glued. The grooves must be deep enough to allow for the expected shrinkage according to the type and cut of wood.

If, in the interests of cost efficiency, smartness, and ease of manufacture you replace the timber panel with MDF, which does not move in any direction except outwards (like blotting paper when it gets wet) the need for it to move within the frame vanishes. It can be glued into the frame. This might allow the rails and stiles to be more slender. A mortise & tenon could even be replaced by a deep rebate. Isn't glue wonderful? But if you use MDF, you announce to the world that the panel is modern. This is the price you pay. Some people say that once it's painted, you can't tell that MDF isn't wood. Untrue. MDF's immaculate flatness betrays it, as clearly as if it were first cousin to a sheet of melamine.

The MDF panel is ideal for kitchen cupboard doors and for fascias to clad white goods. When I rashly offered James and Katie a kitchen as a wedding present, I swiftly qualified that with 'plain and simple' kitchen. Thankfully this was to their liking. Frames, fixed at right angles to the wall, would support the worktop. In between them, I'd fix fascias for cupboards, and a chest of drawers.

Panel making step-by-step

There must be many ways of making panels, but overleaf is the one that suits me. I'd like to take you through it step-by-step. Not everyone has all the equipment employed, so I'll suggest alternatives where appropriate. **GW**

>



STEP 1. Have your client (even if it's yourself) give you the clearest directions. Batch production is simplest if, as here, all the stiles are of the same width and all the rails of the same depth. In a finer piece of work, you might want to vary these dimensions. Rip and roughly cross-cut until you have a pile of component blanks



STEP 2. Groove all rails and stiles. I use the table saw because it is swift and efficient, and because, by reversing the workpiece, I can be sure that the groove is dead centre. In standard 20mm joinery pine I will set a 9mm MDF panel. The groove is 9mm (actually $\frac{3}{8}$ in) deep because this is all that is required, whether or not the panel is glued in place. A router would also accomplish this but I'd rather use one in a table than hand-held with a fence because the latter can have a shaky start and finish



STEP 3. Cross-cut the stiles to precise length allowing a set amount extra, say 1cm or $\frac{1}{2}$ in either end. These 'horns' will be cut off later to form a perfect edge. In the meanwhile they are useful for dry fitting because they can be tapped with a hammer without worrying about bruising the finished piece



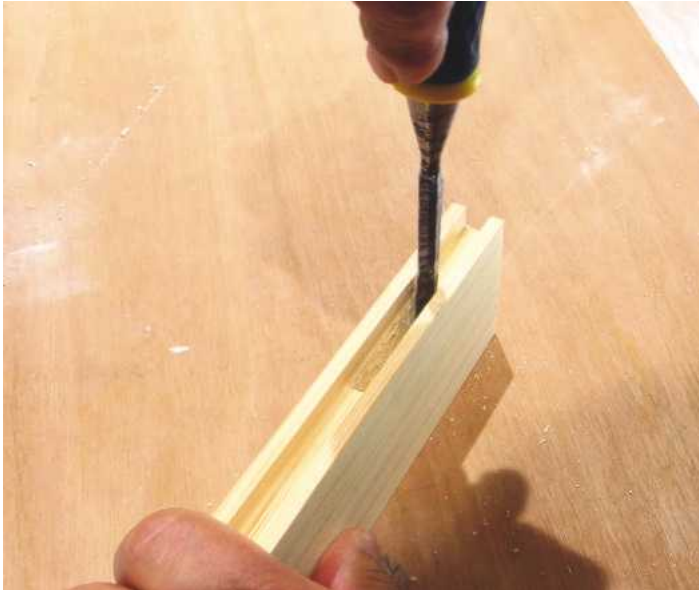
STEP 4. All stiles cut exactly over length. Leave the rails for now. Be orderly: it saves confusion. These panels are for fascias for a washing machine, dishwasher, etc. and are labelled accordingly so that I can easily refer back to James' instructions and double check my measurements



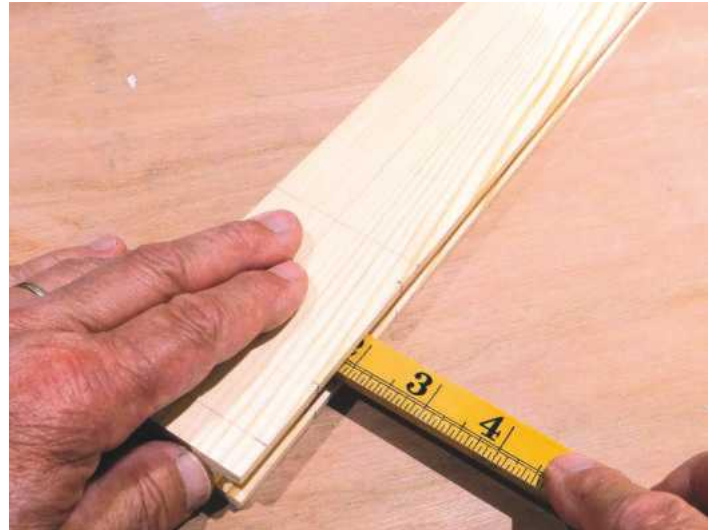
STEP 5. Mark out the mortise (I'm showing it on offcuts) remembering the margin of waste and the lesser depth of the rail due to the groove. The tenon is haunched because if the mortise were to extend right to the end of the stile, it would weaken it hopelessly. This haunch is set at 1in (2.5cm). Exactly where you draw it is a matter of judgement. I consider with any joint that if it were tested to destruction, both parts should be equally affected – neither stronger than the other



STEP 6. The mortise comes first, and the tenon is fitted to it. Again, use a router if you don't have a mortiser. Or maybe a pillar drill to remove the bulk of the waste (drill very fine holes to establish the four corners first) and clean up with chisels. If you do it wholly by hand, set up guides and squares to aid you; it is critical that the mortise is square. The carriage is stopped from right to left so as to cut each mortise identically. The G clamp top right is holding a stop. Although I've been careful to set the mortiser central on the timber (front to back), just in case error has crept in, I'll reset the G clamp on the left for all the mortises on the other end of the stile. I'll make a pencil mark to remind myself of their facings in the carriage so that any error is cancelled out, not doubled up. If you are less cautious than this, simply flip the workpiece round for the second mortise



STEP 7. Clean out the corners of the mortise with a small chisel



STEP 8. Measure the depth of the mortise and thereby the tenon, subtracting 3mm ($\frac{1}{8}$ in) for clearance and to give the glue somewhere to go. Calculate the overall length of the rails. Cross-cut to precise size



STEP 9. Now for the tenons. I have slung my radial arm saw over so that the blade is parallel to the table. It holds the coarsest blade because no blade likes cutting into end-grain, and this does it best, albeit with considerable noise. I move the saw in and out to set the depth of cut. The thickness of the tenon is controlled by the rise and fall of the saw and should be trialled so that it is a snug/easy fit into the mortise



STEP 10. The first time I used this arrangement, I was a little wary. It looks dangerous, but it isn't. I've used it hundreds of times without the merest suggestion of a problem. The board with the knob on is to push the component with my right hand. My left hand holds the component to it, and to the melamine fence. It takes seconds to cut a perfect cheek. To ensure your safety, a guard should always be fitted over the blade, but here, I needed to see what was going on



STEP 11. The sides are cut away from the cheeks. The secondary fence is to stand the workpiece off the saw fence so that the waste pieces won't get trapped between it and the blade. Perversely, this simple cut is more dangerous than the previous procedure because occasionally one of these waste pieces will get moved by the wind surrounding the saw; touch the blade and be whipped off the table at speed. As with all saws, keep hands well back!



STEP 12. See how even these pieces of cheek waste are. It really is an efficient system. Before this I'd nibble the waste away face down on the table saw. This would leave a rippled surface, which I'd smooth off by moving it across the blade at right angles. It worked, but took very much longer and did not give such a uniform result. Again, a router could be set up in a jig to cut the cheeks. A well-tuned bandsaw would also work

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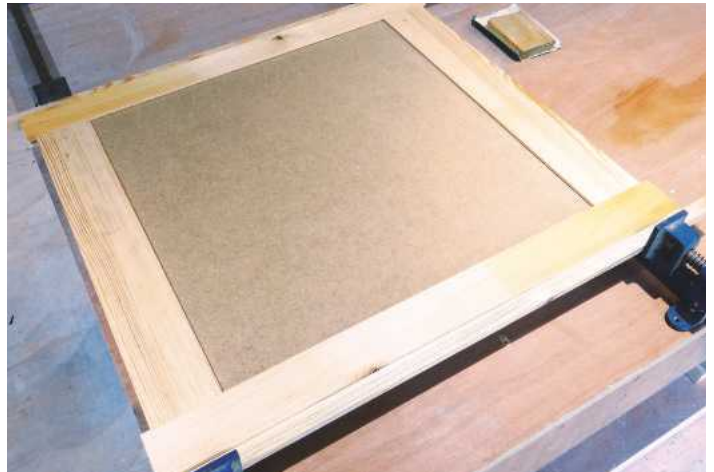
STEP 13. The tenon is haunched so as to leave a little piece to fill the groove in the stile. A radial arm saw would also accomplish this



STEP 14. The haunch completed. Note that the waste is allowed to fall free on the right rather than becoming trapped between blade and fence



STEP 15. The completed joint. Now cut the MDF panel slightly smaller than necessary so as not possibly to foul the frame



STEP 16. Dry fit at least one assembly to be sure. Set up cramps on a flat surface. Arrange them square onto the frame. Use four of those waste slivers to hold the frame off the metal bar lest glue leaves a blue stain around the joint. If the groove is on the tight side, sand the edges of the MDF so that it feeds easily into it. I use PVA because I can wipe it clean before it dries. Polyurethane glue is less desirable here (unless you have sloppy joints) because it will ooze out onto the panel, necessitating surgical removal later. If the joints are square and tight, the assembly will have little choice but to clamp up true



STEP 17. Finally, trim off the horns, finishing with a plane if necessary...



STEP 18. ... and add to the rest of the kitchen

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Harvesting timber

Continuing his discussion on timber, **Peter Bishop** moves on to looking at the next phase in the process: harvesting timber ready for conversion

Previously we've looked at the growth and structure of trees, so logically, the next step is to cut them down ready for conversion.

Harvesting techniques range from the very primitive, less intrusive methods, right through to the extreme clear fell or, at worst, slash and burn operations (**Pic.2**). The latter tends to exist where there is a conflict between forest and population migration, such as in Latin America. Selective trees are felled for lumber and the rest of the forest is cut and burnt for short-term agricultural uses. A fierce debate rages around this subject and who is responsible, so therefore we will concentrate on the other forms of harvesting.

Logging in softwood forests

In man-made, predominantly softwood forests there is a clear and well defined cycle (**Pic.1**). Selected high yield trees are planted. As these mature they are thinned and the smaller logs utilised for pulp, chippings or fencing materials. Once the main crop has matured it is clear felled and the, about, 30-50 year cycle is repeated.



PIC 1. An example of the clear and well defined cycle that exists in softwood forests

In highly mechanised conifer softwood operations, expensive machinery will grab each tree, cut it through at the base, trim off all the branches automatically, and then chop the long logs into predetermined lengths. These highly efficient machines are used extensively throughout Europe and Scandinavia and are called harvesters (**Pic.3**). Piles of logs are then removed from the forest to the road side, using a forwarder, and collected from there for onward shipment to the sawmills by road.

Logging in North America

Logging in the natural forests of North America continues. Here the trees are much larger and the terrain can be more difficult to traverse. In particularly hilly regions the logging companies have developed special methods of extraction. These will include the use of steel cabling systems (**Pic.5**). Mobile or fixed lines are strung up so that logs can be lifted clear and dragged up a main line to a collection area. This may be the main extraction point or the first of a series. In particularly tough terrain, if the lumber being extracted is considered worth it, helicopters might be used.



PIC 2. Slash and burn cultivation – rainforest cut and burned to plant crops in the Ecuadorian Amazon



PIC 3. An all-in-one tree harvester

In both North America and Scandinavia sawmills are traditionally built downstream from the forests on the side of a river. Logs were cut, hauled and dropped into the river to be taken down the river, in rafts, to the sawmill. On lakes the technique varied with huge rafts of logs being gathered together and towed with tugs to the designated sawmill.

Specialist equipment

Huge equipment has been developed to handle the larger tropical and temperate logs. Access roads are cut and laid to enable this equipment to reach the collection areas in the forest. Cranes and special lifting gear load the full length logs onto purpose-built road transporters. Some of these transporters have adjustable carriers so that they can cope with long lengths. The trips from the forest to sawmill may be of many miles, so the vehicles need to carry their maximum weight whenever possible. At the sawmill more specialist lifting gear, including cranes, remove the logs. They are then sorted, visually graded, and stored in a log yard prior to being converted into lumber.

Smaller operations

The above techniques apply to the highly commercial operation around the world. Provided they are complemented by the appropriate reforestation and forestry practices, the cycle can be continuous. However, where smaller operations in both Third World countries and developed regions seek to have a lesser environmental impact, even more basic harvesting and extraction methods are being employed. In some instances this will involve the use



PIC 4. American logging through the ages



of muscle power. If the logs extracted are small and of value they may be dragged from the forest by hand or with the help of oxen, mules or horses (**Pic.9**). Providing each log has been selectively felled, the extraction damage is limited and soon naturally regenerates and repairs itself. In some countries, i.e. Kerala, elephants are still used to move logs around (**Pic.7**).

Harvesting & converting at source

The alternative to the extraction of logs is to harvest and convert them at source. After selective felling, a simple pit saw

(**Pic.6**) can be constructed to slice up the logs into manageable lumber. This can be extracted from the forest a piece or two at a time. Modern, cost effective alternatives are available to replace the pit saw and similar methods of conversion. There are a number of self-propelled sawing rigs available that can be taken in parts or on trailers into the forest. Some of these rigs can be assembled around the log, where it lies, and convert it in situ. Alternative rigs are parked alongside, or in a clearing, and the logs are dragged to and mounted on them. Conversion then follows.

Low impact methods

These are some of the low impact methods of harvesting that can be employed when the economics of the project enable them to be carried out. We would hope that, where possible, these would be the techniques used, but, it must be considered that for high volume operations, they are probably not practical. This is just a taster, really. Throughout the world there are extremes of harvesting employed; take a look online and you'll find a wealth of interesting information at your fingertips. **GW**



PIC 5. Using a steel cabling system to extract timber



PIC 6. Pit sawing



PIC 7. Elephants moving timber in Kerala



PIC 8. A portable band mill



PIC 9. An example of draft horse power

Photograph courtesy of Ramesh Kidangoor



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To be in with a chance of winning the Axminster Hobby Series HBS200N bandsaw, just visit www.getwoodworking.com/competitions and answer this simple question:

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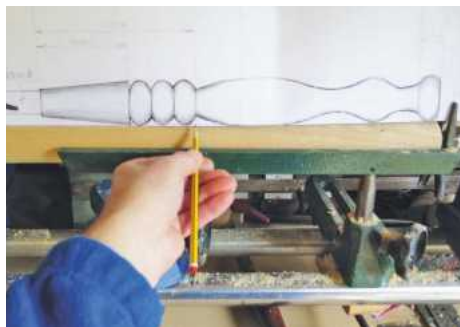
A classic design reimagined

Glenn Perry makes use of a repurposed elm plank and comes up with a unique design for a three-legged stool's central stretchers, which are cleverly joined by a central sphere

My latest project came about after a visit to a timber reclamation yard in nearby Essex. On the lookout for some plywood, I spotted a plank of timber in an oddments rack. It appeared to have been the top of an old bench or small table, as it had four holes drilled in the corners. These holes had domed bottoms, so I reckon these were formed with an old spoon bit many years ago. Underneath layers of old finishes, I recognised the timber as elm (**Pic.1**), and a look along its length revealed an extensive twist in the plank. I would normally reject a piece of timber that is badly warped but by using a small section, I could plane it and lose less of the thickness. The plank, at around 800 × 460 × 45mm-thick, cost me just £2.

Stool considerations

While unsuitable for making a chair, I decided to make a stool. I have made a few stools before and prefer ones with three legs as opposed to four, as they are stable, even on unbalanced floors. Simple stools can be made



PIC 4. Transferring my sketch for a leg to the turned ash cylinder



PIC 5. Marking out leg positions using a protractor

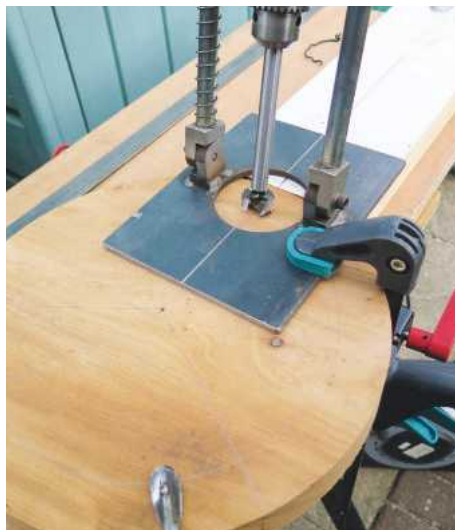


PIC 2. Flattening one half of the plank

with no stretchers joining the legs: I usually assemble mine with two joined stretchers in a T-shape. While effective, being asymmetrical, this can give the stool an odd look. For a more balanced appearance, I decided to turn three stretchers joined by a central sphere.

Planing the elm

My first task was to plane flat a smaller section of the original elm plank and then reduce it to a uniform thickness (**Pic.2**). I did this using a No.5 $\frac{1}{2}$ jack plane. Despite its reputation, the elm timber was a pleasure to work and revealed an attractive grain. From an original thickness of around 45mm, I ended up at 32mm. I created the circular seat plank using a trammel guided router with a long 8mm cutter (**Pic.3**). I find a stool top measuring between 275-320mm diameter is ideal. Mine ended up at 292mm.



PIC 6. Angled drill at 12° with sawtooth bit



PIC 1. Elm plank showing its origins as a bench/table



PIC 3. Using the router to create a circular top

Turning the legs

Next I moved on to the legs. I sketched a full-size design on some card, incorporating a thick central section to locate the stretchers, transferring positions of coves and beads, etc. to the edge (**Pic.4**). These were then transferred to the cylinders I had turned. To complement the elm top, I used ash for all the other parts. I turned three legs at 460mm long leaving a shoulder at the top and a 25mm diameter section, which would be tenoned into the seat. (**Tip:** to make drilling the legs for the stretchers easier when using a cradle, make a section of the leg at each end maximum diameter).

From the centre of the seat underneath, I drew a circle for the positions of the stool's legs. As there were three, I spaced these at 120° intervals using a protractor and drew radii out to the edge (**Pic.5**). Using my angled drill guide



PIC 7. My setup for marking positions of the leg stretchers





PIC 8. The circle gives a rough idea of stretcher lengths

supported on a piece of timber the same thickness as the seat, I drilled 25mm holes for the legs, being careful to stop before coming all the way through. I chose an angle of 12°, which seemed about right (Pic.6). I cannot stress the importance of using good quality drill bits: I bought a Planet sawtooth bit for this project and it worked beautifully. A 3D bit I used previously was useless, only ending up filling my workshop with smoke!

Stretcher sockets

With the holes drilled and the legs positioned in their sockets, I could then mark the position of the stretcher sockets at 240mm from the seat using my arrangement of two squares, as shown in Pic.7. To calculate the diameter of the joined centre sections, I cut a cardboard circle that touched the three marks on the legs (Pic.8).



PIC 11. 15mm Forstner bit in the angled cradle jig



PIC 9. A strip of paper is used for measuring the circumference of a turned ball

I turned a sphere (or an approximation) leaving two identical sections either side for mounting in a cradle. With the diameter of the sphere measured, I could now turn the stretchers that could radiate out from it. I then completed these with 15mm diameter ends that would insert into the sphere and the legs.

With the sphere mounted back on the lathe, a pencil line was drawn around the centre and a strip of paper used to mark its circumference (Pic.9). Dividing this by three using callipers (Pic.10) would allow me to mark the positions of the sockets for drilling. I used an adjustable cradle jig set to 12° to drill 15mm holes in the sphere and legs (Pic.11). I then mounted the circular stool top on my lathe using a screw chuck, where the edges were rounded over and finished using a selection of turning tools and abrasives.



PIC 12. All the stool components



PIC 10. Dividing the circumference by three using a pair of callipers

Gluing & assembly

The next job was to assemble and glue all the parts. This is where a small amount of looseness in the tenons and sockets helps it lock together. My preferred finish for a lot of hardwoods is Black Bison wax in a medium oak colour. To make life easier, this can be applied before gluing and assembly.

Finally, the stool top was finished using a cabinet scraper and some fine abrasives where the surface soon developed a silky, tactile feel (Pic.15). Having seen elm as the seat of many old Windsor chairs and on Ercol furniture, this was the first time I'd used it. I was impressed with the look of the grain pattern and its workability, so much so that I'm going to search out some more to use for future projects. **GW**



PIC 13. Setup showing central stretchers



PIC 14. The completed stool



PIC 15. Stool top showing the elm's grain

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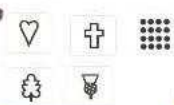
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THE MAKING PROCESS



Scrap wood for the mixture



Expanded foam tests and samples



Gathering sawdust for the mixture



Sawdust from various different timbers sorted into batches



Batches of the material mixture



Applying thin layers of the material onto a mould for one of the chairs, which is exactly the same process as for the stool



Due to the chemical reactions that take place, each seat will form differently, so therefore each piece is completely original



Sawdust, when combined with resin, creates a chemical reaction that causes the mixture to foam



High stool in American ash



Mid stool in American cherry



Low stool in American walnut



Understanding that processing wood from planks to products incurs 50-80% of timber wastage during normal manufacture, Marjan van Aubel and James Shaw looked at ways of incorporating waste shavings into designs using a soya-based resin. "A curious chemical reaction occurs when it's mixed with the shavings, expanding it into a foamed structure," they say. "By adding colour dye and varied-sized shavings from different workshop machines, a colourful, lightweight and mouldable material is created, reinforced by the fibres in the hardwood shavings."

The porridge-like mixture of resin and shavings is applied to the underside of the stool shell by hand, building up the material wherever extra strength is required. The mixture then foams explosively, expanding by up to 300% to create its own exuberant form, anchored by the simple turned legs of American ash, American cherry or American walnut.

A ground-breaking new material

Originally designed as a chair developed with the support of the American Hardwood Export Council, 'The Well Proven Chair', launched back in 2013, was one of the first pieces of furniture to be subjected to

Life Cycle Analysis (LCA), measuring its total environmental impact across its production and usage. The 'Well Proven Stool' takes the lessons learnt from this design and applies them to a mass producible item. By experimenting with different waste materials and adding other components, Marjan van Aubel and James Shaw have achieved a collection of furniture made out of a bio-resin foamwood - a new, resistible and environmentally conscious material. **GW**

FACT FILE

Designers: Marjan van Aubel and James Shaw

Maker/manufacturer: James Shaw Studio

Wood supplier: G&S Specialist Timber

Wood species: American ash, American cherry, American walnut

FURTHER INFO

Pieces in this series are available to buy through Transnatural - www.transnatural.org - and a range of selected partners.

To find out more about each of the designers, see their websites: www.marjanvanaubel.com and www.jamesmichaelshaw.co.uk

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Jackie is a retired chartered accountant who is currently studying woodworking at Chichester college, his goal is to be able to make fine furniture for his family to remember him by, something they can say "Jackie made that and it's very good".

To achieve this, Jackie needed to develop skills he didn't have, hence college, and then to purchase solid, reliable woodworking machines that would fit into a home workshop in very close proximity to other homes.

In October last year Jackie was visiting the W16 woodworking exhibition at the NEC in Birmingham on a college INSET day where he purchased a Hammer C3-31 comfort combination machine, a Hammer N3800 bandsaw and a Felder AF 12 mobile dust extraction unit. Jackie said "I came across this beauty (C3-31) at the show and it

has huge capability in such a small footprint, everything I want is on this machine.

My only concern was, can I do it quietly enough but after owning it and using it for 3 or 4 weeks when my neighbour came round to see if for the first time, he asked when I was going to start using it."

Going on to say "The AF 12 is the star of the show, it's an enabler, I couldn't work without it and because all you can hear from it is a dim hum it has saved me 10s of thousands of pounds not having to sound proof my workshop."

Talking about the service he received from **FELDER GROUP UK** Jackie said "it has been first class, from the sales representative to the engineers whenever I have had a question they have come back to me immediately. I have fallen in love with wood, I have fallen in love with woodworking and I am very, very happy with what I got."



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Wine & dine

Peter Harrison's rustic wine rack, made using oak and yew, houses at least 12 bottles and is designed to be either placed inside a cupboard or used freestanding



PIC 1. The yew offcut used for the project



PIC 2. Cut edge of yew offcut



PIC 3. Three pieces cut to size



PIC 4. Cutting the part-circles on the drill press with the back of the yew referenced with a makeshift fence

I was asked by my brother if I could make him a wine rack, for at least 12 bottles, to be placed in his glass-fronted cupboard. He sent me a link to some designs he'd seen as well as the dimensions of the space, so I came up with a couple of ideas. My first idea, unconventionally, had the bottles facing bottom out, so bottle and label were presented to you. Unfortunately, after I sketched it out,

the dimensions of the space couldn't accommodate this idea.

In the end I went for a more traditional layout, which sees the necks of the bottles to the front supported at both ends with strips of timber with holes cut on the tops, which prevents the bottles from moving.

In terms of design, I like the rustic look and love waney/live edges on wood, so I asked if he wanted something a little more interesting. Luckily he said yes, so I decided to use some yew that I had left over from previous projects.

Horizontal timbers

I had a few offcuts of yew (Pic.1) measuring around 500 x 50 x 50mm that I used to rip to a more sensible width. I ripped each piece to around 20mm and ended up with six pieces of varying lengths. I left them at their maximum length at first – from the photos, you can tell that the width of the yew varied hugely from end to end. I wanted to use the maximum length available to me, which would allow

me to plan the holes for the bottles the best I could. I started off by drawing the centreline of each bottle on a scrap piece of MDF, so I could move these lines around on the yew to find the best layout. When I was happy with the position, I marked them on ready for cutting.

I cut the part-circles on the drill press with the back of the yew referenced with a makeshift fence (Pic.4) – a straight piece of timber

MATERIALS & TOOLS REQUIRED

MATERIALS

- Yew – 50 x 50 x 500mm – a few pieces
- Oak – 100 x 15 x 800mm – 2 off
- Screws x 24
- Glue

TOOLS

- Table saw
- Router
- Drill and drill bits



PIC 5. The front pieces with the holes cut



clamped to the drill table – and I drew on this so I could line everything up well. As I was drilling part holes, the yew pieces needed to be clamped to the drill press too as the forces are exaggerated quite a lot when you're not cutting full circles. I knew I needed to do this but didn't with my first hole, and the timber together with my hand were dragged towards the drill bit. My thumb did get a bit of a drilling

but a few minutes and a plaster later, and my yew was firmly fixed to the drill table. As you can see from the photos, some of the holes were very close to the edge and very minimal. I did test a wine bottle in one of them and luckily it did seem to work OK. Next I needed to make the rear rails. These were going to be a little more tricky as I didn't have a drill bit large enough,

so I decided that a router would be the best method for cutting these, but as they were at the edge I couldn't make them using a circle cutting jig, so I made a template to use with a pattern bit (**Pic.6**). I initially used a circle cutting jig to cut a circle in some MDF, and I then ripped this along the circumference to make a segment template (**Pic.7**).

I used this template clamped to a workbench >



PIC 6. Template and yew clamped to workbench – note the pattern bit mounted in the router



PIC 7. Marking out the segment



PIC 8. MDF template clamped ready for routing



PIC 9. Minimal design but it should still work



PIC 10. All three horizontal pieces completed



PIC 11. Timber cut to size



PIC 12. I made multiple passes on the table saw

(Pic.8) and the yew piece to trace out the segment onto the wood. Remove the waste beforehand with a normal drill, or just remove little by little with the router bit. Again, some of these holes were quite big and others were very minimal.

Side panels

For the side panels I had two pieces of oak that I first ripped to 50mm and then cross-cut into four pieces measuring 400mm and four at

200mm long. The height was determined by the amount of timber I had left – I worked out that I could only have 400mm maximum from the remaining wood, which tied in with the dimension of the space it was going to fit in. I determined the width of the panel by looking at a wine bottle to see where I wanted to support it.

As the oak I had was only 15mm-thick, I knew that I didn't want to use biscuits and I couldn't use pocket hole screws. I therefore needed to do some proper woodworking, so opted for half lap joints. If I was in the US I'd probably have a dado stack, but as they're illegal in Europe, I ended up using my normal blade. I could have used a router, as this would have been quicker, but I didn't have a safe method of cutting these.

I have a sliding extension on my table saw so I used that, but a cross-cut sled would work just as well (Pic.13). I adjusted the depth of my blade to just under half the width of the wood and made multiple passes at both ends of the cross-pieces and at the ends offcentre for the upright pieces. Once I was close to the required width of the joint, I made very light passes,



PIC 13. Using a sliding table attachment to make cuts



PIC 14. Top joint ready for trimming



PIC 15. All the joints on two vertical pieces...



PIC 16. ... together with the two cross members



PIC 17. Time for a test fit!



PIC 18. All pieces ready to assemble



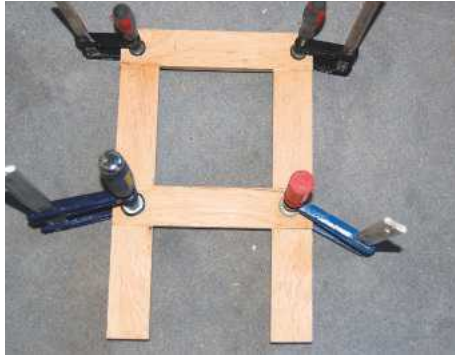
PIC 19. Sanding the internal edges

testing the fit after each one. I then raised the blade a fraction and removed a small section of the cross-pieces until the two pieces of the joint made a flush face.

Once they were all cut, I sanded the internal edges of the timber (Pic.19) – as these would be more difficult later – and proceeded to glue and clamp the panels together (Pic.20).

Bringing it all together

Now that all the pieces had their holes, I cut them to the maximum size I could in order to fit them in the cupboard, ensuring there was a little



PIC 20. One of the panels glued and clamped up

bit of wiggle room either side. I then set out my screw holes for the front and rear yew pieces on the side panels, before pre-drilling and countersinking the side panels and pre-drilling the ends of the yew. Note that the rear pieces need to be placed further down than the front ones, which will ensure that the bottles aren't on too much of an incline.

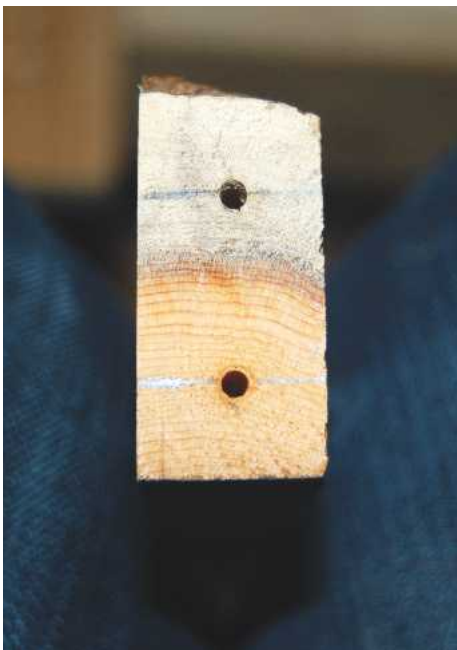
I then used an oscillating bobbin sander to round over the smaller holes and to smooth over and finish sand the larger ones (Pic.27). Once I was happy that the bottles were going to fit in nicely, I moved on to the sanding of all



PIC 21. The rear member needs to be marginally higher than the front to ensure the bottle is level



PIC 22. Drill positions are carefully marked using a bradawl



PIC 25. Holes are pre-drilled into the ends of the vertical pieces



PIC 26. Matched holes are pre-bored on the side panel and horizontal members



PIC 23. The side panels, pre-drilled and countersunk



PIC 24. The side panels are now complete



PIC 27. Shaping the curves



PIC 28. All the vertical components once sanded and shaped

Project: Rustic wine rack

the faces, to the side panels and then the yew cross-pieces. I sanded with 100, 150, 180, 240 and 320 grit to ensure I achieved a satisfactory finish on the wood. This was then followed by an application of three coats of Danish oil (**Pic.30**).

Once dry, I assembled the wine rack and tested it with the maximum number of bottles in place. I was very pleased with the outcome and it will be ideal for holding bottles in the cupboard or just as good freestanding. I'm not sure how well it will fit in my brother's cupboard, as he lives in Germany, so I need to send it to him. If his measurements were correct, then everything should be OK. **GW**

FURTHER INFO

You can view this project on Peter's Instructables page, as well as other wooden creations he has made – see www.instructables.com/id/Wine-Rack



PIC 29. The wine rack pieces, ready for oiling



PIC 30. The components once oiled



PIC 31. The completed rack, minus the all-important wine...



PIC 32. ... and with a good few bottles in place



PIC 33. The project, as viewed from the side



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BEER TENT AND A GREAT ATMOSPHERE.



✉ Letters & Makers

Letter of the month

Richard Arnold's charity tool auction

Dear *Good Woodworking*,

Any readers who have an interest in vintage woodworking tools might like to see my photographs for a forthcoming article in the September issue of *The Woodworker*. The photos are from a charity tool auction that was recently held in aid of Macmillan nurses, hosted annually at the workshop of traditional Leicestershire-based joiner, Richard Arnold. The charity day offers a chance to donate some quality tools to a good cause and buyers can bid on the auction items, or pay what they think an item is worth on the table items. My upcoming article in *WW* hopefully gives a flavour of the event and I hope to make it back next year. Many thanks, **Gary Cook**

Thanks for the heads up, Gary. There's some great photos here that really give a great insight into the event as well as a glimpse at the many exciting tools and pieces of old equipment on show. If any readers would like to find out more about Gary and his excellent blog, Hackney Tools, see www.hackneytools.com, where you will find all manner of useful information on buying and selling vintage woodworking tools. Tegan



Richard Arnold giving a demo



A selection of the auction and for sale items on display in Richard Arnold's workshop



A beautifully worked dovetail guide



Small tools and miniatures on show



Some auction items including a miniature boxwood smoother by Jim Hendricks

Saw maker identification



Are any readers familiar with the insignia shown on this saw's medallion?

Dear Editor,

Please can you help me identify the maker of a saw I have in my toolkit. It has on the handle and stamped on the blade the logo 'Tools Specialists Bishopsgate EC2'. All the other wording is worn off, but I have attached a photo of the medallion. Thank you, **Bill Croucher**

Hi Bill, sadly no one here has yet been able to identify this particular saw, but we're still looking. Despite the medallion (pictured) showing promise as an identifier, we're still in the dark. For anyone else engaged in this sort of sleuthing, it's good to view the tool as a whole as often there are clues to be gleaned from the handle shape, etc.

You may have some luck if you approach the Ken Hawley Collection, the largest collection of saws in the UK, based in Sheffield. See www.hawleytoolcollection.com for more information. **Mark Cass**

SENCO competition winner

A big congratulations goes to Andy Cumbley, who was recently chosen as the winner of the SENC Systemair Compressor bundle with 3-in-1 tool set and accessories competition, which appeared in GW319. Andy bags himself a prize worth a combined total of over £700! The 10 runners up also received a SENC polo shirt. Thank you to all who entered and look out for other exciting competitions that are coming soon!



Erratum

In Peter Bishop's article on buying and using small bandsaws (GW318), we incorrectly captioned an image on page 39 as the 'Axminster Industrial Series AP3501B3 bandsaw', where it should have been labelled as the 'Axminster Hobby Series HBS250N bandsaw'. We apologise for any confusion this may have caused

David Charlesworth sharpening DVDs

Dear Tegan,

I was rather disappointed by the reviews of my latest DVDs in the July issue. It seems to have been written by someone who is unfamiliar with the benefits of accuracy. How out-of-square does he/she want edges to be when gluing up table tops or panels? Why are 'engineering tolerances' used so often as a pejorative description? No reasons or data are supplied; they are just assumed to be a bad thing! This is very odd. I think we need to know how out-of-square our set squares are.

Precision Planing is clearly not meant to be a bodger's guide. I believe the principles explained and demonstrated will be of great interest to many woodworkers, particularly as they are not well taught elsewhere. They are not difficult. The DVD demonstrates what is possible, not what has to be done.

Plane sharpening is covered on the second day of my 'Tool Tuning' course. I don't believe my students find the methods 'convoluted', just effective. They get edges as good as mine. The DVD does not claim to assist woodworkers 'looking to make a living'; it is aimed at keen amateurs who have not mastered sharpening. I know from my short courses that there are a great many of these around.

The positive comments were noted and appreciated, but I do feel that the reviewer missed the point.

Best wishes, **David Charlesworth**

Hi David, thanks for your email and for passing on your comments regarding the review that was featured in GW320. I'm sorry to hear that you weren't pleased with what was written, but I do think it's a case of 'different strokes for different folks'. The person who reviewed the DVDs was assessing them from a professional woodworker's perspective, as opposed to someone attending a course who perhaps has more time to truly absorb and put the methods you teach into practice, or indeed a professional furniture maker. There's no doubting your expertise in this department and I apologise again for your disappointment, but here at GWV we always try to remain impartial and give our honest views and opinions regarding whatever product/DVD/piece of machinery lands on the test bench.

Best wishes, **Tegan**



David Charlesworth explaining an interesting method for cambered plane blade sharpening

One to watch: Amy Grigg

Amy Grigg is an artist and woodworker whose work has been sold in galleries across the United States and internationally. She began working with wood in 2001, started spindle turning in 2007, and became interested in turning wooden bowls in 2012. Her work, although simplistic in form, is really anything but and it's clear to see how her skills have been carefully honed since she first started. Amy describes discovering wood as sparking her true passion, and she loves nothing more than taking a tree trunk and, literally, turning it into a functional piece of art.

One-of-a-kind pieces

Each wooden bowl is created as a unique one-of-a-kind heirloom piece, and each one is made with great care and consideration regarding form and balance, both visually and experientially, with extra attention given to creating a pleasant overall tactile feel.

In Amy's words: "My heartfelt aspiration is to continue to make a living exploring the infinite possibilities of the creative mind. My hope is that these offerings bring some small joy to the people who keep them."

Telling a story

As well as bowls, Amy also creates pens, each of which is presented in a lovely display case, helping to make these pieces even more of a collector's item. One of the examples shown here is a steampunk bolt action pen with yellow cedar burl, which is certainly a conversation starter!

Every piece Amy makes and sells seems to tell a story and from her descriptions of them, as well as hearing her talk about her love of wood, it's obvious that this is something she holds very dear. I for one would love to own one of her pieces as each is made with a great deal of love. You can follow Amy on Instagram – @_amy_grigg_ – or see her website www.amygrigg.com.



Amy with a collection of bowls she has turned



Steampunk bolt action pen with yellow cedar burl



Olive ash bowl with black banding



Black walnut bowl with painted detail

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WRITE & WIN!

We always love hearing about your projects, ideas, hints and tips, and/or like to receive feedback about GW's features, so do drop us a line – you never know, you might win our great 'Letter of the Month' prize, currently a Trend Easyscribe scribing tool. Simply email tegan.foley@mytimemedia.com for a chance to enhance your marking capability with this versatile workshop aid



Ich bin ein *Good Woodworking*... or in this case, *Good Woodworking* attends the Milwaukee Berlin Conference!

Flying out of Birmingham Airport at 6am on a Monday morning is all part of flying the flag for the *GW* readers, and it was straight into the thick of it as soon as we arrived at the venue where an array of woodworking tools were on show; more than enough to satisfy any avid woodie!

'Must haves'

Kicking off with the usual introduction as to where Milwaukee have been investing and making inroads, Oliver Lerch, the Vice President of Product Management, gave us an insight into the latest developments before we departed to move around the various workstations where we could have a closer look at things as well as getting hands-on to try things out.

If you're looking for diversity, then Milwaukee certainly tick the boxes:



The future of tool technology

Always keen to keep up with the latest tool developments, **Andy King** recently set off to Berlin, eager to find out what new offerings Milwaukee had up their sleeves...

the range of tools in both corded and cordless covers not only the woodworkers, but plumbers, electricians and automotive industries, and with some pretty specialist tools among them. If I was working in any of those particular fields, then they would certainly be on my list of 'must haves'.

New tools

But it is of course the woodworking tools that got me out of bed at such a ridiculous hour, and there was plenty to get my teeth into. The batteries, as seems to be the case nowadays, were at the forefront, and one of the new tool offerings, a brushless motored double compound 250mm blade mitre saw, was designed to be driven by the new 9Ah 18V High Demand battery pack.

This new battery pack has given tools

such as the new mitre saw the chance to compete against the mains tools for capacity and performance, and although running slower than a mains machine, it's certainly no slouch and when I had a quick go on it, I was able to cut through 100 x 75mm stock without experiencing any lagging in the cut.

Runtime on high drain tools such as this will always be an issue, especially as it drives a standard kerfed blade found on the mains models.

This machine will chomp through around 300 cuts on 100 x 50mm timber when fitted with the new 9Ah High Demand battery, which is certainly good enough for a decent day's work in most instances, such as studding or roofing if you are

cutting and fixing as you go. No corners were cut on the build quality either: it's a solid piece of kit that is designed for day in day out trade use, and if you're already a Milwaukee user, then the standard 18V Li-ion batteries are also compatible.

A new hoop/top handled jigsaw has also entered the arena and it's certainly a welcome addition to the 18V range, sitting alongside the existing body grip version. I find hoop or top handle jigsaws better in general as they normally have variable-speed triggers and are easier to manoeuvre as a result. It looks like Milwaukee have got it right with this one: a tool-free base adjustment, compact design and a blower that, once engaged, clears the dust away from the work area spectacularly well.

'One-Key' system

The last conference I attended was the launch of the 'One-Key' system and this has moved on at quite



The Vice President of Product Management, Oliver Lerch, opened the conference with snippets of what was to come



The new 9Ah High Demand battery is designed to be used for high drain applications...



... such as the impressive new double compound 250mm blade pullover mitre saw



Features such as this large paddle for compound cuts are great for easy adjustment



The mitre saw is easily capable of cutting through this 150 x 75mm softwood



The new jigsaw is a solid performer with tool-free adjustments and powerful blower



This dinky little collated screw gun for fixing sheet stock has great features



It wasn't all power tools – having a look at Milwaukee's level construction range proved to be very interesting

a pace since then. Bluetooth technology forms part of the system; allowing owners to track and keep tabs on the tools they own as well as an inventory database that can build up an entire record of your kit. But it's the 'One-Key' development that really piqued my interest. There are now a few tools with the system built in, which allows standard tracking and so forth and on the more specialist stuff, parameters have changed such as torque, speeds, etc. to suit particular applications where it is necessary to have uniform tolerances. All of this can be controlled and altered from the app, and this is free to the end user, so it looks like it's a winner from the off. Couple it up with the adaptability of 'One-Key' in general and it becomes a whole lot more.

I had initial reservations as it is reliant on Bluetooth technology to work its magic, so the downside is the need to be in close proximity to the Bluetooth device, such as your smartphone to trace its whereabouts, which means that if it gets stolen and goes out of range, it will only show the last location where it was within range of

Bluetooth detection. This doesn't seem so good, but Milwaukee have built some specialist programming into the technology and the app, which allows it to pick up the whereabouts of a missing tool if it comes into close enough proximity to any other Milwaukee 'One-Key' user. This is triggered regardless of location and sends a signal back to the owner to indicate its location, so they're able to track it down.

This is a massive step forward in tool theft prevention, but the best is yet to come! Even if you don't lose a tool, the app allows you to disable it, which is great in situations when you have to leave it somewhere to prevent others from using it, or if it's stolen, in which case it simply won't operate. Additionally, if it is stolen while still functional and a tracking signal is picked up from another 'One-Key' user, you can send a signal to disable it remotely so the would-be thief now has a tool that no longer works.

All very clever stuff and if the word gets around that such technology is out there, and you can mark up your van, workshop

or even your toolboxes to read that if stolen all tools will be disabled, then this a huge benefit for the end user. Who knows, this clever system may even help to drive down insurance premiums?

Track your tools

For any other tools or equipment Milwaukee have released, there is also the 'TICK' Tool and Equipment Tracker, which is a more simplistic version of 'One-Key'. It features the same tracking and inventory options so you always know where things are or where they were last seen, but of course, this lacks the function to disable any power tools. The 'TICK' can be fixed to any piece of equipment, tool or machinery, which can help protect or locate any that get stolen, and even heavy plant machinery can have this discretely placed on it, allowing these to be easily found by users but not so by potential thieves.

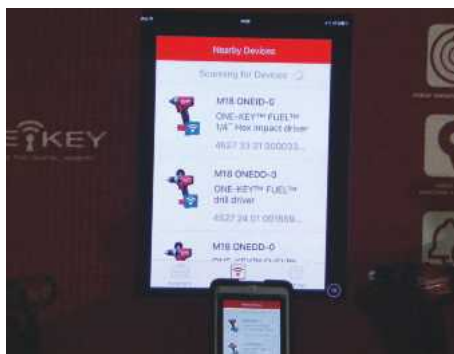
Exciting times ahead

It wasn't all power tools, however; Milwaukee's range of hand tools is expanding alongside and the new range of levels looks exceptionally well made. The cutaway display showing different manufacturers' anti-shock methods for the vials was certainly an eye opener!

So despite a long day checking out all the new equipment, the early start was well worth it. It looks like exciting times are ahead for Milwaukee with their new technology, let alone the new tools that are either available now or in the pipeline. I can't wait for the next conference, but hopefully it will either start a little later, or I can get there the night before! **GW**



The 'One-Key' system proves to be a massive leap forwards for tool users



Tools can be managed, altered and disabled, all via an app on your smartphone



David Moody shows that no matter what the budget or resources available to you, anyone can make their own tools and experience the joy and satisfaction that goes alongside this

It's always hugely satisfying to stand back and enjoy the project you have just completed, but it becomes even more satisfying when you have used tools that you've made yourself. My first proper exposure to tool making was through a forum called www.homemadetools.net, where anyone can share what they've made. Other resources such as Dad's old textbooks, including *Practical Cabinet-making*, Roy Underhill's *The Woodwright's Shop*, Pinterest, and of course GW, all proved to be very useful. The tool cabinet, featured in last month's issue, was a great start, but I needed much more than that.

Workshop tools

I needed a mallet (**Pic.1**)! It's impossible here in Phuket to buy a traditional mallet, so I made one out of scrap, the same composite wood that I used for the tool cabinet and other projects. It is a laminated design, glued with TOA latex glue and the handle carved and sanded to a comfortable fit. A year and several dints later, it is still almost as good as the day I made it.

Another staple tool in any workshop is the bench hook; this is my first, and it too is very satisfying to use. Another immensely valuable tool is my sander (**Pic.2**), which my Dad used for years on a simple table that he'd made. However, as my parents started downsizing, he gave the sander to me, but to make it work I had to get creative: it needed to be compact, storable, and inexpensive. The frame is made of pallet wood, the table is cut from

a piece of shop-shelving, and the power-source is an electric drill. I made the sander so that it can be easily clamped to the end of a table (**Pic.3**). The drill is attached to an adjustable block using a hose-clamp, which is screwed to the block. I made the belt pulley for the drill by laminating plywood in two different diameters, running a bolt through it, and then turned and sanded it using the drill. It proved invaluable when making the jewellery cabinet for my wife.

Another tool that I've made is my workbench. I was inspired by the one featured in GW307, which was made using entirely recycled materials (**Pic.4**). OK, mine is not as classy as Paul's, but it has a necessary party trick: it can fold away into a small space. The angled braces quickly unscrew, the legs fold up under the table,

and the braces pack away inside the legs. It is made entirely of pallet wood and recycled plywood, as well as recycled door hinges.

Tools for everyone

What I am sharing with you here is just a drop in the ocean compared to what people all over the world are making, but the important thing is that anyone can enjoy the satisfaction of DIY tools, and you don't have to spend a fortune on materials either: recycled materials work really well, as you can see here. I have some very nice tools, modern and antique, but none of them give me the same level of satisfaction as those I've made with my own hands. I hope that you too can have a go at making your own workshop additions – it's certainly very addictive! **GW**



PIC 1. Hand-made mallet and bench hook, made using scrap materials



PIC 2. My sander – another valuable tool



PIC 3. The sander is easily clamped to the end of a table



PIC 4. My workbench is made using recycled materials...



... and folds away easily when not in use

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A tall order

Mike McCrory's growth chart project is not only beautifully hand-crafted, but also visually appealing and entirely functional

I have a friend with a toddler who is a little over a year old and just beginning to walk. A mutual friend of ours who lives in Austria contacted me and asked if I could make a growth chart for our friends as an Easter gift, so that they could record the child's growth and create a lasting memento. She left the design up to me and trusted that I would be able to come up with something that was hand-crafted and visually appealing. The parents are originally from France, so I knew that it would be important to have both imperial and metric scales. I decided to use

two pieces of wood that would be edge-glued together, with metric on one side and the imperial system on the other. I would use walnut for the imperial side and cherry for the metric side.

Making up the boards

I started by jointing the walnut and cherry boards to create a flat face and a flat edge



PIC 1. I started by jointing the walnut and cherry boards to create a flat face and a flat edge...

(**Pic.1**), then I ran the wood through the planer/thicknesser to ensure they would both be the same thickness (**Pic.2**).

I tested the edges of the boards prior to glue-up to make sure that there were no gaps. I then marked the two jointed edges with tape so that I wouldn't lose track of which edges to glue (**Pic.3**). Next, I ripped the walnut and cherry boards to their final width, being



PIC 2. ... then I ran the wood through the thicknesser to ensure they would both be the same thickness



sure to keep the edge with the tape running along the fence (**Pic.4**).

Marking the increments

I aligned the two boards on the assembly table prior to marking the increments for the metric and imperial sides (**Pic.5**). I placed alignment marks on the two boards so that it would be easy to put them into their proper

positions when gluing up. I decided to start the metric side at 50cm and go up to 180cm. The imperial side started at 2ft and goes up to 6ft. I marked an increment at every inch on the imperial side, and every 5cm on the metric side (**Pic.6**). I was very careful to be sure that I started at the correct position as determined by my alignment marks. I clamped the tape measure to the board to make sure that each increment



PIC 3. Marking the two jointed edges with tape so that I wouldn't lose track of which edges to glue



PIC 4. Ripping the walnut and cherry boards to their final width



PIC 5. Aligning the two boards on the assembly table prior to marking the increments for the metric and imperial sides



PIC 6. I marked an increment at every inch on the imperial side, and every 5cm on the metric side



PIC 7. Cutting slots into the board at each increment mark. I cut these so that I could insert strips of contrasting wood to mark each of the increments



PIC 8. Cutting slots into the walnut

would be accurately marked. I then cut slots into the board at each increment mark. I cut these so that I could insert strips of contrasting wood to mark each of the increments (Pic.7). The idea was to insert cherry strips into the walnut side, and walnut strips into the cherry side. I used a blade on the table saw with a 3mm kerf. It is very important to use a blade that has a flat top so that the strips will insert cleanly.

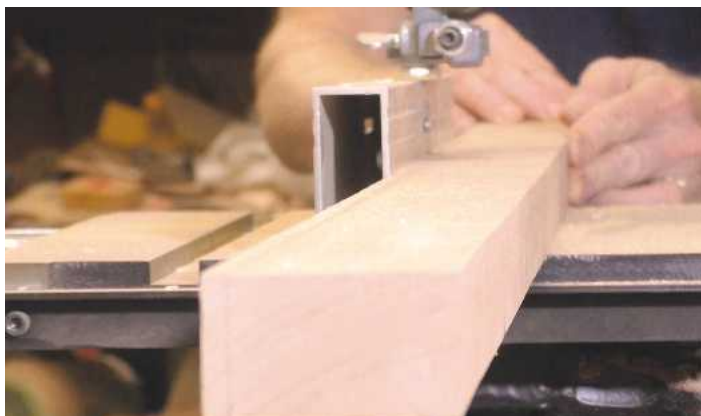
On the imperial side, I cut short slots for each inch mark; intermediate sized slots for each 6in mark; and long slots for each foot mark. On the metric side, I cut short slots for each 5cm mark; intermediate-sized slots for each 10cm mark; and a long slot for the 1m mark.

Next, using a bandsaw, I cut the cherry and walnut into strips that were about 6mm, which I would then sand down to 3mm (Pic.9). Next, I ran the strips through the drum sander multiple times in order to get them to their final thickness (Pic.10). I tested their fit to make sure that they would fit snugly into the slots that I'd previously cut.

I trimmed each of the inserts to the correct length on the table saw so that they were slightly longer than the slots I'd cut, before gluing them into place (Pic.11).

Making the slider

While the glue was curing, it was time to



PIC 9. Using the bandsaw to cut the cherry and walnut into 6mm strips



PIC 10. Running the cherry strips through the drum sander in order to get them to their final thickness



PIC 11. Gluing the inserts into place



PIC 12. Cutting the strip of padauk...



PIC 13. ... before cutting a 45° mitre to create a point on each end
(PLEASE NOTE BLADE GUARD HAS BEEN REMOVED FOR CLARITY)

turn my attention to the slider that would ride along the growth chart and sit atop the toddler's head. I decided to make the slider using padauk and Spanish cedar. The choice of cedar was important because I needed a piece of wood that could be large enough to sit on the head, yet light enough that its weight could be supported. I started by cutting a thin strip of padauk (**Pic.12**), before cutting a 45° mitre to create a point on each end (**Pic.13**). For the piece that would sit atop the head, I used a leftover piece of wood from my cedar glider project (see GW318), which I cut to be approximately 150mm long (**Pic.14**). Next, I cut two dados into the end (**Pic.15**):

one of the dados that runs vertically will be used for the padauk pointer. The purpose of the pointer is to align the points with the centreline where the walnut and cherry sides meet; this ensures that the slider is horizontal.

The other dado that runs horizontally will form a horizontal bar that is used to help visually align the top of the head with the measurement increments on each side. I added tape to the cedar to prevent tear-out when cutting the dados (**Pic.16**). I used a dado blade to cut these, but you can also achieve this using a regular blade (with a flat top tooth) with multiple passes. The slider is going to attach to the growth



PIC 14. For the piece that would sit atop the head, I used a leftover piece of wood from my cedar glider project, which I cut to be approximately 150mm long



> PIC 15. Cutting the dado in the head piece



PIC 16. Cutting the dado for the horizontal bar – note tape added to the cedar, which helps to prevent tear-out when cutting the dados
(PLEASE NOTE BLADE GUARD HAS BEEN REMOVED FOR CLARITY)



PIC 17. Drilling the recesses for the rare earth magnets, using a Forstner bit



PIC 18. Epoxy was used to glue the magnets into the padauk strip



PIC 19. Gluing the horizontal bar into the other dado using regular wood glue



PIC 20. A piece of wax paper is applied on top of the magnets prior to clamping up

chart using rare earth magnets. I used a Forstner bit to drill recesses for these (**Pic.17**). I used a total of six magnets, each one being 3mm thick and about 18mm in diameter. I used epoxy to glue the magnets into the padauk strip (**Pic.18**). These magnets are so powerful that I had to be careful that their attraction wouldn't pull them out after setting them into the epoxy.

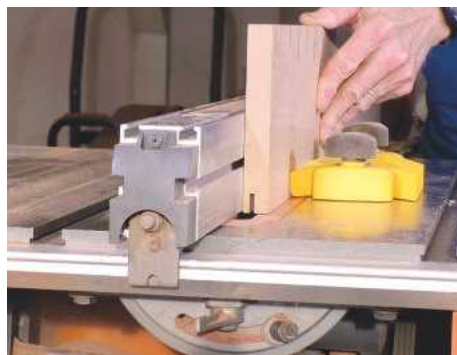
The next step was to glue the horizontal bar into the other dado using regular wood glue (**Pic.19**). The bar is made using two pieces of leftover strips that I made for the inserts. I used walnut on one side and cherry on the other, then I applied a piece of wax paper on top of the magnets prior to clamping everything up (**Pic.20**).

While the slider was gluing up, I ran the growth chart boards through the drum sander to remove the excess from the inserts that had been glued into each increment mark (**Pic.21**). This could also be done using a hand plane or card scraper, but the drum sander makes quick work of the task. I then trimmed up the excess along the edges by running the boards through the table saw.

To enable the rare earth magnets in the slider to stick to the growth chart, I inserted a steel bar down through the centre of the growth chart along its entire length. I used a piece of steel that was 3mm thick and 250mm wide, so I cut a slot into each of the boards that measured 3mm wide and



PIC 21. Running the growth chart boards through the drum sander to remove the excess from the inserts that had been glued into each increment mark



PIC 22. Cutting a slot into each of the boards that measures 3mm wide and about 130mm high, which will house the piece of steel



PIC 23. Cutting the steel bar to length so that it was just slightly shorter than the growth chart



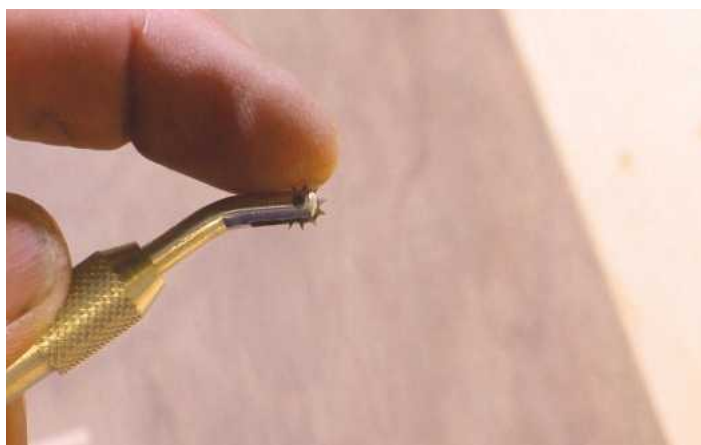
PIC 24. Inserting a small piece of the leftover strip to plug each end of the growth chart so that the steel bar won't slide out



PIC 25. The boards are clamped up, making sure they remain absolutely flat



PIC 26. All of the numbers to be carved are printed out and laid out on the board



PIC 27. A pounce wheel is used to trace around the numbers and transfer the outline to the board



PIC 28. Using a pencil to clearly mark the outline of each number

about 130mm high (Pic.22). This slot is cut along the glue line of each board. Next, I cut the steel bar to length so that it was just slightly shorter than the growth chart (Pic.23).

I applied glue to the edges of the two boards and inserted the steel bar, then I inserted a small piece of the leftover strip to plug each end of the growth chart so that the steel bar wouldn't slide out (Pic.24). I clamped the boards up, making sure that it remained absolutely flat (Pic.25). I did this by placing a caul on top of the board across the centreline and clamping it to the flat assembly table.

Hand-carving the numbers

At this point, the assembly of the growth

chart is complete. The only tasks remaining are to hand carve the numbers for the metric and imperial increments and to apply the finish. I printed all of the numbers to be carved and laid them out on the board (Pic.26). I used a pounce wheel to trace around the number and transfer the outline to the board (Pic.27). Alternatively, you could use a sheet of carbon paper to transfer the image. After using the pounce wheel, I took a pencil and clearly marked the outline (Pic.28). I drew a centreline down the centre of each digit, and at each end and corner, I marked the angles that I would follow with the chisel, which would help to create a 3D effect. Starting with a V-parting chisel, I cut along the centreline

(Pic.29). This is an important first step, so that when you carve in from the outer edges, the wood will break away cleanly. When you get to an end or a corner when the angle guides are marked, it is important to use the V-parting chisel only as far as the angle guide, and no further. Then, use the V-parting chisel in the opposite direction along the angle guide and push carefully as you approach the centreline (Pic.30). The straight edges are relatively easy: you want to use a straight chisel and approach the centreline at a 45° angle so that you have a 90° angle where the two bevels meet at the centreline (Pic.31). When you reach a curve, you'll want to switch to a curved chisel on the concave side (Pic.32). For a curve with a large >



PIC 29. Starting with a V-parting chisel, cut along the centreline



PIC 30. Using the V-parting chisel in the opposite direction along the angle guide



PIC 31. Using a straight chisel, approach the centreline at a 45° angle



PIC 32. When you reach a curve, switch to a curved chisel on the concave side



PIC 33. On the convex side of the curve, switch to a straight chisel and carefully cut inwards in small steps to create a smooth curve



PIC 34. Change the angle of your chisel to do a final clean-up, in order to achieve smooth curves and edges



PIC 35. When carving the smaller digits, you'll need to use a much smaller curved chisel



PIC 36. Using a router to cut a keyhole slot so that the growth chart can be hung on the wall



PIC 37. Applying a single coat of shellac to seal the wood



PIC 38. Spray on several coats of lacquer to give a satin finish

radius, you'll want to use a chisel that is large enough. You can still get it done using a smaller chisel, but the curve may end up with a scalloped appearance due to the multiple cuts that you'll have to make.

On the convex side of the curve, you'll need to switch to a straight chisel and carefully cut inwards in small steps to create a smooth curve (Pic.33).

It does take a bit of patience to get the edges all cleaned up, but the time spent is well worth it. After cutting away the bulk of the material, you can change the angle of your chisel to do a final clean-up in order to achieve smooth curves and edges (Pic.34).

I used a smaller font size for the metric side. It was more difficult to carve the smaller digits, primarily because the radius of the curves was smaller and I had to revert to a much smaller curved chisel (Pic.35). It took me about 15 minutes, on average, to carve each digit. With a total of 42 digits to carve, this amounted to about 10 hours of work that spanned about four evenings.

Finishing steps

After the carving was finished, I used a router to cut a keyhole slot at the top and bottom so that the growth chart could be hung on the wall (Pic.36). For the finish, I applied a

single coat of shellac to seal the wood (Pic.37), and after it had dried, I sanded it lightly with 320 grit abrasives and removed all of the dust. The next step was to spray on several coats of lacquer to give a satin finish (Pic.38).

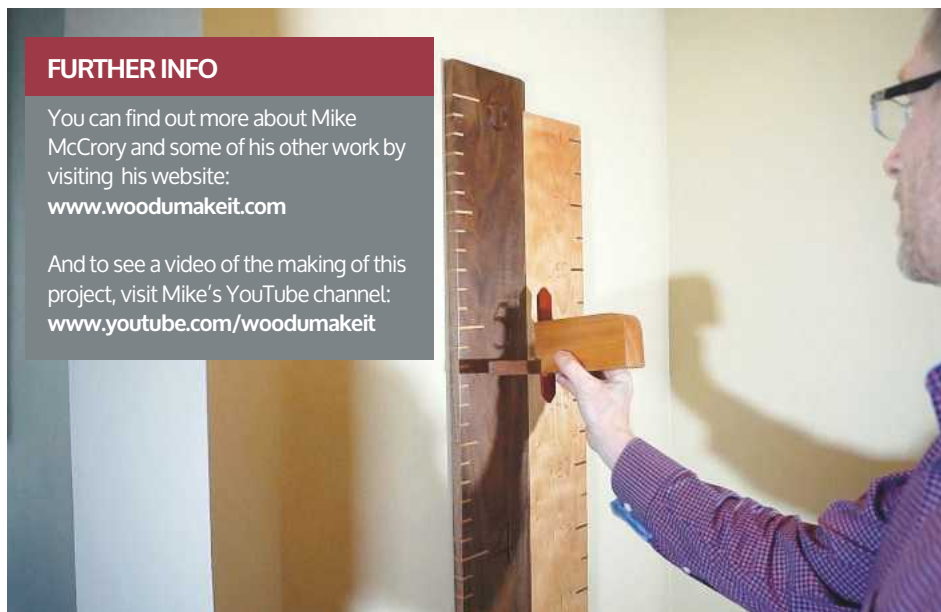
After the growth chart was installed on the wall (Pic.39), we were ready for the first

measurement (Pic.40). After installing the growth chart, however, I realised that the slider was too heavy for the magnets. Gravity was causing it to slide down about 5mm an hour. I corrected this by drilling holes in the slider to reduce its weight (Pic.41). I think the holes also add a nice design element. **GW**

FURTHER INFO

You can find out more about Mike McCrory and some of his other work by visiting his website: www.woodumakeit.com

And to see a video of the making of this project, visit Mike's YouTube channel: www.youtube.com/woodumakeit



PIC 39. Hanging the growth chart on the wall



PIC 40. Leo's first measurement



PIC 41. As a design modification, holes were drilled in the slider to reduce its weight

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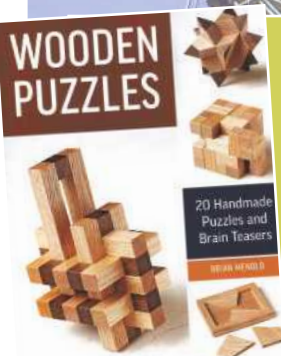
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AROUND THE HOUSE with Phil Davy



For me, this month has been a bit of a diversion from the usual routine of woodworking. Perched some 35 feet up on scaffolding, I spent two or three days cleaning the stonework of my church with a small phosphor bronze brush. The Bath stone window sills and ledges had seen more than 160 years of pollution, resulting in carbon deposits blackening the surfaces. A beautiful listed Victorian building, this was the venue where I'd previously spent a good part of summer last year restoring the lower windows. It made a change wearing a hard hat and Hi-Vis jacket and the builder's tea breaks were welcome. All the same, I think I'll stick to woodwork...

WOODEN PUZZLES



BOOK REVIEW: Wooden Puzzles

It would be easy to assume that puzzles are mostly for kids, but a closer look at this book confirms that there are some pretty complex wooden brain-teasers out there. When you discover that many such pieces end up with serious puzzle collectors, it's perhaps not surprising. This assortment of 20 projects from various makers range in complexity,

from cubes using five blocks to those comprising truncated octahedrons. With names such as Convolution, Distorted Cube and Octahedral Cluster you start to get the picture. Thankfully, the final chapter does give detailed solutions for each puzzle.

Surprisingly, very few hand tools are featured, the author concentrating on table saw, jointer, thicknesser and sanders. And that's the problem in Blighty, as the use of jigs for sawing means removing the crown guard. Admittedly, most of the jigs use clamps and hold-downs to secure the relevant workpiece and are well designed, but it's not a procedure I'd endorse. Incidentally, artwork for these jigs is excellent, along with photography throughout the pages.

Woods used here are American red oak, walnut, cherry and maple, which look slightly restrained but classy in the finished pieces. The use of exotic timbers can really add drama to a puzzle visually, although simply contrasting temperate hardwoods can be effective.

If you enjoy working wood to precise dimensions (dial calipers recommended) and like a challenge, I suspect *Wooden Puzzles* could keep you occupied for weeks. But perhaps a greater puzzle would be to find a safer way of replicating such precision on a bandsaw, or even with hand tools.

THE GW VERDICT

- ▶ **RATING:** 3.5 out of 5
- ▶ Brian Menhold, published by Taunton
- ▶ **PRICE:** £17.99
- ▶ **WEB:** www.thegmcgroup.com

USEFUL KIT/PRODUCT: Veritas Mini Cabinet Scraper



At around a quarter the size of the grown-up version, you may wonder whether this mini cabinet scraper from Veritas is worth bothering with. It measures just 100mm from end to end. Made from cast steel and finished in black, it's cute enough to display on the mantelpiece, but is it of any use for the workshop? It all depends on your area of woodwork.

The tool comes in a rigid, fitted leatherette box that snaps shut for storage. The underside of the scraper is machined dead flat, with a fairly wide throat for the spring steel blade. This is 24mm wide and secured with two screws from the back (a hex key is provided). You adjust the cut via a locking thumbscrew, which is just big enough to grip. I did wonder how tricky it would be to put an edge on a blade so tiny, but it wasn't too difficult with a burnisher. A full-size cabinet scraper like this is a great tool for working difficult grain, and may be the only tool feasible to stop tear-out on certain wild, exotic hardwoods. An obvious use for the mini tool is for cleaning up inlays and purfling, which it actually handled quite well. I reckon anyone working on small-scale projects such as dolls' houses or models would find the Veritas a handy little extra in the toolkit, not just the display cabinet.



The throat for the spring steel blade is 24mm wide and secured with two screws from the back

THE GW VERDICT

- ▶ **RATING:** 3 out of 5
- ▶ **TYPICAL PRICE:** £37.51
- ▶ **WEB:** www.brimarc.co.uk

SUMMER PROJECT – SANDING STORAGE

TAKES: One weekend

TOOLS NEEDED: Marking tools, drill and bits, router and bits, bench plane, sander, biscuit joiner, circular or table saw, jigsaw, hacksaw

All in one place

Phil Davy's handy sanding storage solution will ensure you never lose bits of abrasive again – just as long as you remember to put them back after you've finished!

Life used to be so simple when you needed to do some sanding. You either wrapped a piece of abrasive paper around a cork block, or attached a disc to a rubber backing pad mounted in a drill. If you owned an orbital sander, then you probably had a pack of replacement sanding sheets, too. With the variety of powered sanders now available, though, you may need a belt for a belt sander, a triangular pad for your detail sander, hook-and-loop discs for your random orbit tool, not to mention the continuous rolls for either hand sanding or fitting to appropriate power tools. Even if you do most of your sanding by hand, you'll often need several different grades to complete a project.

I suspect I'm not alone in this respect, but every time I reach the finishing stage of a project I have to hunt for the correct abrasive. About time, then, to get organised in the sanding department: a box for storing new sheets, pads, belts and odd scraps of abrasive paper.

You could use an old document file with expanding pockets, but this doesn't really help when it comes to accommodating abrasive belts or rolls. I needed something for storing everything in one location. If you have plenty of space and only one or two electric sanders, it's easy enough to make a pigeon hole for these power tools, but remember that a large machine will add a fair bit of weight to the construction. For frequently used grades, it's more economical to buy sheets by the pack, rather than individually. Usually in wads of 25 or 50 sheets, these fortunately are a standard size, making storage straightforward.

The problem with exterior ply

I'd originally planned to build the box from 12mm birch ply, but as I couldn't obtain any at short notice, I settled on exterior ply instead. This was a bit of a mistake in hindsight, as it's difficult to work with this poor quality material. Firstly I had to decide on surface veneer grain orientation. Normally with ply I would have the grain running around a box, parallel to front and rear edges. As there would be several routed grooves for the sliding trays, it made sense for the grain to run from front to back. This would mean little or no breakout when routing the grooves, although splintering would be likely along front and rear edges. I overcame the splintering by using masking tape along the cutting line when sawing the ply. What I hadn't expected were the cavities revealed when routing the grooves, a risk when lower grade veneers are used for the inner core. You would be far less likely to have this problem with better quality birch ply, with a reduction in splintering, too. That'll teach me. Next time I'll use MDF and put up with the dust.



Build this unit to save yourself hunting for the right abrasive

Routing grooves

If you don't have a powered saw for cutting ply, then use a fine point hardpoint handsaw. When cutting with a handsaw you should have the face side upwards, and have it facing downwards if using a portable circular saw.

Even with a dedicated housing jig, routing 10 grooves across a piece of ply is pretty tedious. To reduce the amount of work and, more importantly, to ensure the two sides match up, rout these two panels as one piece. Then you can saw it in half once the grooves have been formed. I used No.0 biscuits for the corner joints. Admittedly, 12mm-thick material is getting a bit thin for biscuits, but you can just about get away with this jointing method. If you don't have a biscuit joiner, simply rebate the corners of the box.

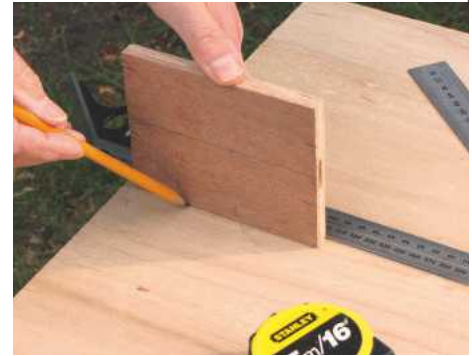
Damp is the enemy of abrasive sheets, so if your workshop is susceptible then you may want to add a door to the front of the unit. Without one you may find your crisp sheets of paper begin to curl at the edges. The simplest solution here is to rout a groove around the inner carcass edges before gluing up, then you can slide in a 6mm-thick panel, either from the top or from one side. The easiest way to hang the unit on the wall is to screw through the back panel, though bear in mind that the empty box is pretty heavy. A stronger and neater method is to use French cleats. Simply set the upper rear panel further forward and fix a bevelled batten behind it. Of course, you may prefer to sit the box on top of an existing cabinet or shelf.



STEP 1. Check there is sufficient width to accommodate different size sheets, including divider panels



STEP 2. Cut the ply to size. A strip of masking tape along the cutting line helps to reduce splintering across the grain



STEP 3. Mark out positions of ply dividers and transfer these to opposite panels as necessary



STEP 4. Carefully mark the positions of sliding trays. Space them equally apart by about 25mm



STEP 5. For routing a number of grooves the easiest method is to use a housing jig. Adjust this to suit the thickness of the tray



STEP 6. Cramp the jig to the ply and line up the pencil marks. Rout the grooves to a depth of 25mm



STEP 7. Rout a 7mm rebate around the rear edges of panels for the MDF back panel



STEP 8. Cut slots in panels for No.0 biscuits, making sure you check the settings on plywood offcuts first



STEP 9. Work out an efficient clamping sequence, then glue components together with PVA glue



STEP 10. Assemble the box in two stages. This frees up clamps and it's easier to maintain square joints



STEP 11. Use cauls to spread the pressure when clamping up the side panels, then check for square



STEP 12. Trim the MDF back panel to size and attach with a nail gun, or simply pin and glue in place



STEP 13. Mark 20mm dowel centres and bore end panels with a Forstner bit. Clamp an offcut to stop breakout occurring



STEP 14. Cut a strip of piano hinge to length and screw to the edge of the lid, avoiding splitting the ply



STEP 15. Supporting the lid, carefully mark and drill screw pilot holes. Screw the lid to the divider panel



STEP 16. Using a Dremel tool or similar, cut off the ends of the protruding hinge fixing screws



STEP 17. Drill a 20mm access hole in the centre of the front panel, removing waste using a jigsaw



STEP 18. Pass the dowel through an abrasive roll and into the end holes. Check that the roll rotates



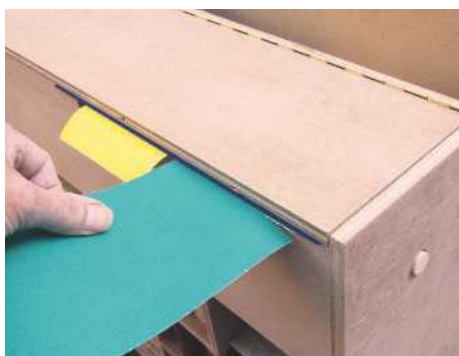
STEP 19. Clamp a 300mm hacksaw blade to the inside of the lid with epoxy glue



STEP 20. Cut sliding trays to size and check that they slide in the grooves. Add a finger hole if you so wish



STEP 21. Fill any dents and clean up inner surfaces of the box with a detail sander, if necessary



STEP 22. With the lid shut you can simply tear off the length of abrasive needed from a roll



STEP 23. There's plenty of space for a random orbit sander as well as belts, discs, pads and sheets



STEP 24. What a handy storage unit, eh

USEFUL KIT/PRODUCT

MIRKA AROS CORDLESS SANDER

The new Mirka Aros is one of the neatest cordless sanders I've come across. A specialised 10.8V tool for spot repair work, its compact, shaped body sits comfortably in the hand. Weighing just 0.57kg, it's arguably the smallest random orbit tool ever. Evolving from Mirka's range of air tools, having no air hose means there's no risk of oil contamination often associated with using a compressor. Superb design and build quality comes at a high price, though, which is likely to restrict its use to professional workshops.

Mirka system

With a pad diameter of just 32mm, the Aros uses special 34mm abrasive discs. The Mirka system includes Abranet open mesh discs (hook-and-loop), Abralon silicon carbide pads (foam-backed) and coarser Ultimax aluminium oxide discs. With grades from 40 right through to 4,000 grit (depending on abrasive type) you can sand just about any material imaginable, including hard and softwoods, MDF, metal, and

even glass. Three backing pads are provided, including hook-and-loop and PSA (self-adhesive). These are dead easy to swap: just a quarter of a turn to release them from the steel threaded collar fitted to the spindle.

Orbit size is 5mm, though, if you prefer, a similar model (the Aos) has a 3mm orbit for the same price. Speed range is from 4,000 to 8,000rpm, though rather than selecting this via a thumbwheel the method is neater. There are seven preset speeds, chosen by depressing the + or - buttons on the back of the tool. If you want to lock it at one speed for a job, this is done by pressing them simultaneously before pulling the trigger. Green LEDs above the buttons display battery status and active mode. When battery life is low the left LED flashes red, switching to solid red when expired.

Fast charge

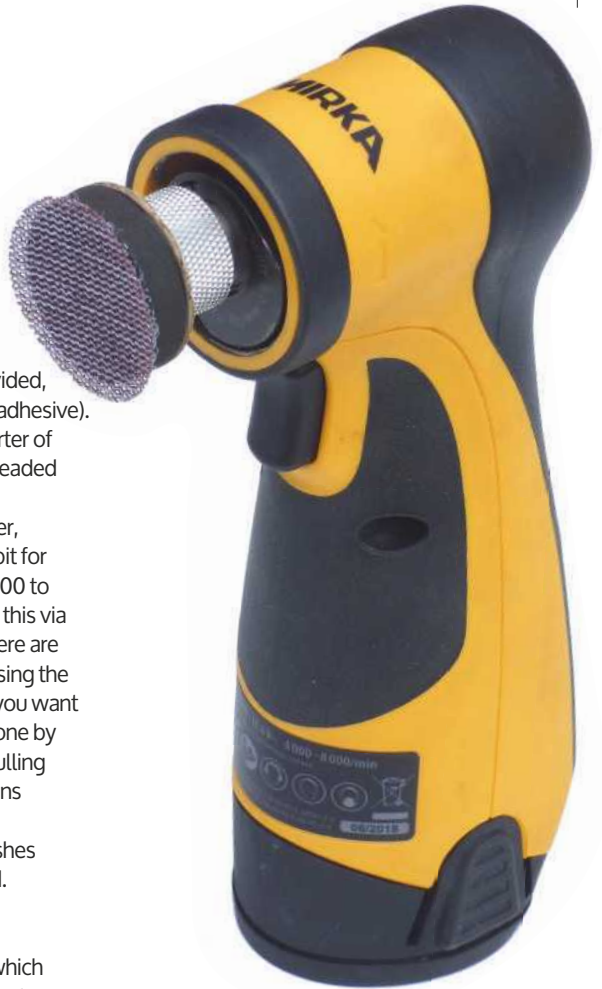
Two 2Ah Li-ion batteries are provided, which simply slide into the base. A surprising feature of this sander is its run time. Mirka claim it's about 16 hours, though I'd guess this is not continuous use. Although I tested the tool on several projects it did take ages to drain one battery. Recharge time is 35 minutes, with three blue LEDs flashing in sequence on the charger indicating status.

Ergonomically the Aros is excellent, with vibration almost non-existent and a very low noise level. On the downside, there's no dust outlet so you can't hook up a vacuum extractor. Not that the Mirka creates clouds of dust, but it's very efficient when sanding wood so this can build up quickly.

Testing tasks

I tested the Mirka in several situations to check how useful it is in a woodworking context. My oak kitchen worktop looked slightly tired and it was a cinch to sand out small isolated patches and dings without having to strip the entire surface before re-oiling.

I suspect the Aros was designed primarily for the vehicle bodywork repair industry, so trying it on epoxy filler seemed like an appropriate test situation. Filled nail holes and timber defects are generally tedious to sand when there's a quantity, but this job was quickly achieved with the Mirka.



A specialised 10.8V tool for spot repair work, the Aros' compact, shaped body sits comfortably in the hand



With a pad diameter of just 32mm, the Aros uses special 34mm abrasive discs



The Mirka system includes Abranet open mesh discs (hook-and-loop), Abralon silicon carbide pads (foam-backed), and coarser Ultimax aluminium oxide discs



Three backing pads are provided, including hook-and-loop and PSA (self-adhesive)



There are seven preset speeds, chosen by depressing the + or - buttons on the back of the tool



Two 2Ah Li-ion batteries are provided, which simply slide into the base

THE GW VERDICT

- ▶ **RATING:** 4 out of 5
- ▶ **TYPICAL PRICE:** £450
- ▶ **WEB:** www.mirka.co.uk

Interestingly, I found the Aros ideal for de-rusting and restoring several rusty old hand tools. If you work through the grades it's possible to end up with nicely polished surfaces, though this does mean any crisp, clean edges may become softened in the process.

Abranet and Ultimax discs come in boxes of 50, costing about £12 a pack, while Abralon pads are roughly £7 for 10. For most repair work you'll need a range of grades, and switching between them is fast. Because discs are so small the grit numbers are not stamped on the back (apart from the odd one); this means it's difficult to differentiate between finer grades as they all look and feel much the same. A dot on the back with a coloured marker pen solved the problem for me, though.

Conclusion

I reckon the Aros could be a handy addition for musical instrument makers, perhaps even antique restorers – certainly anyone dealing with a range of different materials. Fitted with the appropriate discs it would be a useful tool for cutting back coats of lacquer or paintwork on small projects, besides coarser sanding tasks. If Mirka were to produce polishing bonnets or pads to fit, this would increase the scope of the tool even further.

Disappointingly, the sander comes in a cardboard box (with foam insert), a bit surprising on a tool this expensive. Still, I suspect in a professional workshop the Aros would earn its keep – people would probably be queuing up to use it. Warranty is three years when registered via the Mirka website. **GW**



Filled nail holes and timber defects are generally tedious to sand when there's a quantity, but this job was quickly achieved with the Mirka



Recharge time is 35 minutes, with three blue LEDs flashing in sequence on the charger to indicate status



If you work through the grades it's possible to end up with nicely polished surfaces



The backing pads are dead easy to swap: just a quarter of a turn to release them from the steel threaded collar fitted to the spindle



On oak kitchen worktop, it was a cinch to sand out small isolated patches and dings without having to strip the entire surface before re-oiling

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A race against time

Les Thorne uses ash and ebony to make this wonderful skeleton clock with finials, which is then finished using ebonising lacquer and gilt cream to create a stunning contrasting effect



About a month ago I spent a couple of days demonstrating at the excellent Woodworks show in Daventry, Northamptonshire. This show has been going for a number of years and is more of a get together for the local clubs than a trade fair. There were a few trade stands ready to relieve you of your hard-earned, however, and one of the new names I encountered was that of Christopher Milner's Time and Weather Instruments – www.clocksandbarometers.com. Christopher's business has been in operation for a number of years but we've obviously missed each other at various events that we've both attended in the past.

The company supplies all sorts of clock movements and kits, as well as plans and brassware for both woodturners and you flat guys out there.

I have made skeleton clocks with students before and they are a great project with some interesting techniques that can be applied during the process, such as offset turning and parting off rings on the lathe. The design is purely personal, but I wanted to incorporate a coloured piece with added finials.

As with many of the projects that I undertake, you can find different designs online and part of the fun in that is trying to work out the order of tooling and chucking required to make them. **GW**



STEP 1. Some timbers just work together and ash and ebony are two great examples. The ash will lend itself to the grain filling colouring technique that I decided to use here



STEP 2. The blank needs to be marked in the centre on both sides – this needs to be done before you cut it into a disc. The centre finder will work on round timber but it's a little too small to be perfect



STEP 3. Use a large Steb centre in the headstock and a ring centre in the tailstock. Before you turn the lathe on, check that the work is running as true as possible



STEP 4. It's important to use a bowl gouge and not a spindle roughing gouge to work on this side-grain piece. The Tormek jig gives you an easily replicable grind on the tool, and the CBN grinding wheel does seem to give a keener edge when compared to a normal aluminium oxide version



STEP 5. Line the bevel up with the direction of cut and set the speed to around 1,000rpm. A common mistake is to try and push the tool through the wood too quickly; just ease it through and allow the timber to cut in front of the edge



STEP 6. You have options on the faces and the right-hand side is completed using a pull cut. The flute of the tool should be pointing towards 10 o'clock with the handle down low; the tool will scrape rather than cut if you have the tool handle too high



STEP 7. The left-hand side should be completed using a push cut, with the flute position the same but now the bevel is rubbing. Running your finger along the toolrest will help you to maintain the accuracy of the cut



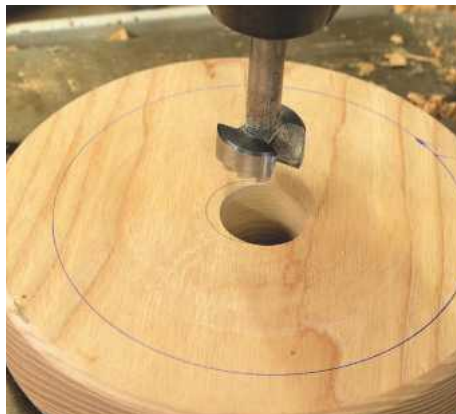
STEP 8. It's good practice to compare the two surface finishes left by the push and pull cuts – in this case the pull is probably a slightly better finish but it is wood dependent. You can then round over the edge a little using a gouge



STEP 9. You need to be careful with the sanding as it is possible to heat up the timber, which can lead to the cracking of the end-grain. Slow the lathe down to around 500rpm and be careful to keep the abrasive moving across the surface



STEP 10. I decided to offset the clock slightly; it doesn't need to be done too much, so about 5mm will create the desired effect. Mark the diameter of the hole for the clock to make sure it fits in OK



STEP 11. The hole needs to be accurately drilled through the piece and the drill press is the tool for the job. 30mm is the right size to suit my own pin jaws



STEP 12. Next, mount the blank up on pin jaws. These are an essential part of your woodturning armoury and probably the first extra jaws you should add to your scroll chuck



STEP 13. The central section needs to be removed and you will need to make sure that the cut you make is straight. Line up a 10mm skew chisel with the bed of the lathe, ensuring to watch the speed as the piece is obviously now running out of true



STEP 14. To make sure that the tool doesn't bind in the cut, you need to make a cut on the inside. If you tilt the tool over slightly, then the side of the tool will shear cut the timber and improve the finish as a result



STEP 15. The silver ring requires you to cut a small step on one side. You could measure this but I just kept making small cuts until the ring fitted in snugly. This ring will hide any problems if you end up with the main hole being a little too big



STEP 16. I decided to go just over halfway with the cut. I did experience a little vibration with the cut through, so probably should have swapped to a tool that gave me a smaller cut rather than the 10mm tool I used



STEP 17. After turning the blank around on the pin jaws, the diameter of the hole required must be accurately marked on the other side. If you get this wrong, then the holes will not line up and the clock will sit in at an angle



STEP 18. It's not easy to just cut through, so you need to prepare for the point when the blank becomes two pieces. Lots of masking tape wrapped around the piece will stop the ring flying off and breaking



STEP 19. Invariably when you turn the piece around it will run slightly out of true. Here you can see that I have cut through in one area but the piece hasn't come off yet. If you have the luxury of variable-speed, slow the lathe down to about 350rpm at this stage



STEP 20. Quite often you don't always get it right and the clock didn't fit, so I needed to make a jam chuck, which would allow me to re-turn the inside. The flexibility of the MDF means that I was able to achieve a really tight fit



STEP 21. I found that I could take quite big cuts and was surprised at how well the jam chuck held the ring. The hole was a little tapered from both sides, so the centre part just needed to be opened out



STEP 22. The ring will sit on a flat, so mark out the thickest and thinnest part of the ring. Do this by measuring, or you can use the indexing system on your lathe if you have one



STEP 23. The three finials need to be evenly spaced and a pair of dividers will do this job easily. Experience has told me that they tend to work between 1 and 2 o'clock and 10 and 11 o'clock



STEP 24. Drill 10mm holes in the ring; this will allow you to mount the finials in the piece. You can buy a jig to help with this but if you're careful, it can easily be done freehand



STEP 25. Having access to the woodworking machinery in the workshop next door does come in handy. The large disc sander made short work of sanding the flat on the base of my clock



STEP 26. Before any colouring can be done the ring needs to be sealed with sanding sealer. A screw in the top will allow you to hold it while spraying and you can even make a little stand for it, as I did



STEP 27. When I first discovered this technique many years ago, I used black shellac polish, but luckily nowadays we have ebonising lacquer, which makes the process much simpler



STEP 28. Mount the ebony up between centres, using drives with very small points as they can split the wood when working on pieces this long. Turn a 10mm spigot on one end to suit the holes in the ring



STEP 29. Shaping needs to be done using a small gouge and a skew chisel. Due to the denseness of ebony it's not the most difficult wood to turn and a good finish off the tool can be easily achieved



STEP 30. I would normally cut down at the drive side until the finial comes off, but ebony can split, so I took it down as far as I dared. The bead above the spigot will sit over the 10mm hole and hide it



STEP 31. Once again, use the pin jaws to hold the 10mm spigot while you turn the top of the finial. You should be able to start sanding the timber at 240 grit working through 320 and finally 400 to give a smooth surface



STEP 32. I like my ebony to be really shiny and the gloss lacquer will give a great long-lasting finish. Apply a coat then, when dry, cut it back with '0000' wire wool before giving it a final spray



STEP 33. Even though I sprayed the ash the grain was still open and this is ideal for filling with gilt cream. I used silver as it matches the silver in the clock. Rub it in across the grain making sure that all the low points are filled up



STEP 34. Remove the excess by rubbing it off with a rag. I used lemon oil to act as the lubricant for this process but finishing or Danish oil will do the same job – you can still add a little more gilt cream if you need to



STEP 35. The grain should now all be filled with the silver cream. You do need to make sure that there is no torn-out grain or scratches left from sanding as these will fill up with the silver as well, which can make the final project look messy



STEP 36. The completed skeleton clock in ash and ebony should look something like this

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RU125A	1/4"	RU125A	1/4"	1/8"	1"	2-1/2"
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Spontaneous eruption

Testing a hypothesis

It's easy to pontificate. I do it all the time. I did it in the last issue, encouraging you to be spontaneous. Well, I have just followed my own advice. Frannie is at work. 20 jobs around the house and garden are queueing for attention, but I'm not doing any of them. I want to test my own hypothesis. I want to have fun. Now, six hours and 236 components later, an aching back and weary shoulders, I've had it. Fun, I mean. And there's more to come.

A pile of square beech strips was left over from the Champagne tower (GW319). I felt that the beech had earned its keep, so I could do what I wanted with the rest. It could be anything. It didn't have to be useful, saleable or even giveable as a gift. On the other hand, it didn't need to add to my private collection of peculiarities. Some sort of function would be good. So having become momentarily excited about a Tower of Babel, I recalled that, sadly, no one apart from me it seems is interested in the Tower of Babel, and there's not a lot you can do with one, even if you have one, except perhaps wire it up with a light on top and fit a revolving lampshade depicting lightning strikes. Oops. That does sound rather good. Perhaps I've missed a trick.

I had suggested that a coffee table might be a theme upon which to improvise. That bit for me wasn't what happened. My theme was the blockwork construction, gluing square strips together. With sculpture dismissed, I returned to furniture and, perhaps unsurprisingly, to a coffee table, a small one for the side of a sofa. It didn't take long. I wanted feet curving up to a column and a top fanning out from that. Ideas for clever and fanciful decoration flew in through the window of my imagination, and I swatted them one by one. This piece was to be simple. Quick. Fun must not become laborious.

Holistic shrinkage

I didn't explain why I like this method of construction. **1)** It allows architectural detail; **2)** it is unconventional – most furniture takes pains to hide end-grain; here it is celebrated; **3)** it is shrink-proof – not that it won't shrink, but that it'll shrink as a whole; **4)** it is humorous; **5)** it crosses boundaries for, to my eye, it is half children's building blocks, part computer projection and something of Moorish decoration; and **6)** it is easy.

No.6 is wrong. Most of the assemblies were straightforward, using a cramping jig and the odd concrete block, but the final assembly of the top arms and the infill quadrants – all upside



Coffee table made using leftover square beech strips from the Champagne tower featured in GW319

down around a short dummy column – was impossible (for me) to cramp. I was relieved that the pieces did fit and rub-glue pretty well. Not much glue oozed out to spoil the top, but I couldn't see this 'till later. I think that No.3 is not quite right either. Timber shrinks unevenly across its width in the tree – heartwood less than sapwood. Shrinkage therefore throws the strips from square section to rectangular (or rhomboid). Here, it's only slight, but because I took the strips at random (deliberately ignoring grain pattern) some assemblies accrued error.

As the work progressed, I began to doubt that the table would be pleasing. This often happens. I'm too close for too long. Now I can stand it on the workshop floor and walk away. When I turn round, I try to look afresh. What hits me first is the energy that the piece has, shooting up from the ground, fanning out to be helpful. It is eye-catching. It's a bit silly, and I like that. It has a devil-may-care attitude. And, if I may say so, it shows spontaneity; presumably, the very spontaneity that spawned it. Quod Erat Demonstrandum. **GW**

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