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Wood

REVIEW

88

SPOON
CARVING
THE GREEN WOOD WAY

HAND WORKED MOULDINGS

Using Hollows
& Rounds

WOOD WARRIOR

Morris Lake: Man
For All Species

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IS BACK
The New
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- SQUARE BURL BOX
- \$200 VENEER PRESS
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TESTED

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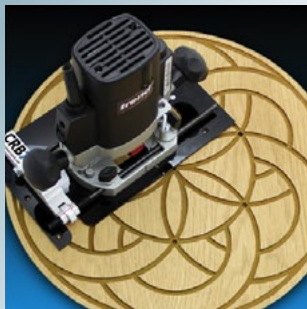
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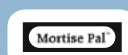
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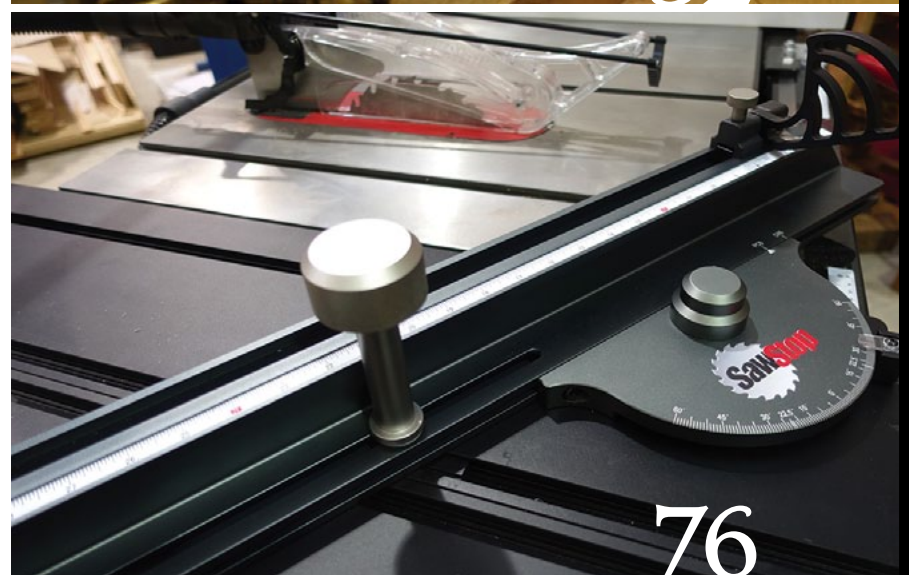
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Several ways to minimise dust in the workshop. Story by Charles Mak.



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Editor's Letter

A new craft revival

For a number of years throughout industry, hand skills have been dwindling as technology has rapidly advanced. At the same time a 'maker movement' has been gaining strength as a new generation of makers and designers combine hand, power, online and digital technology to give form to their ideas. Bespoke is the new black it seems and from p.70 there's some discussion of this trend as we also meet a few people who are part of what's happening.

It wasn't planned, but Philip Ashley's story also issue echoes this theme as he writes how, with the use of CNC machinery, one maker is redefining 'bespoke design and cottage industry manufacturing'.

Hand power

No can deny the renewed interest in unplugged woodworking and traditional and 'rare' trades. This is nothing new for us, as we've always run stories on hand tool usage. Of late however we've featured more stories on using hand planes for joinery.

There's no prejudice against machinery and power tools going on here, however hand tools offer a quieter way to get things done, and on a small scale they can be more efficient, and even offer more flexibility. Troy McDonald says as much as he writes about restoring and using moulding planes.

Another story this issue continues this theme. With workshops and events happening around the place, spoon carving is riding a crest of popularity at the moment. In this issue Greg Miller writes about carving spoons from green timber, and also how hand skills are the basis of learning to work wood. With just a few tools you can make the most of wood you can readily find. If you're new to woodworking, this really is a way to get hands-on.

Going all the way

Darren Oates specialises in engineering solutions for his large-scale and often curved designs. Read how he made a low-cost but heavy duty large panel pressing solution on p.42.

Do you ever marvel at the results some makers achieve? But then are you prepared to go to the same lengths? It took Neil Turner 192 hours to draw and carve the delicate coral pattern on the bowl shown on p.66. Even if you're not, you can still be inspired his technique.

Another maker and Wood Review author known to go to extremes is Vince Manna. We featured some of Vince's collections in our last issue, but some of his rare machines deserved special attention. Vince explains why they are so highly prized on p.56.

Finally, the man on the cover is another who goes to great lengths, and not just in his efforts to share knowledge about trees and wood, as evidenced in the book he has just written. When I visited Morris Lake I learnt about his efforts to promote a new process of wood identification which he feels could help stem the tide of illegal logging that is taking place. See p.46 to find out more.

Everything, including woodworking, is being influenced by digital technology and online accessibility of information. Our eNews is now available via fortnightly eletters, our Facebook page and on our YouTube channel.

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Left to right:
Strips in four grit sizes are supplied with the tool.

Evan Dunstone shows the bow sander in use.



MacFarlane Bowsander

Reviewed by Damion Fauser

Once in a while something comes along that stops you in your tracks and makes you think, 'I wish I'd had one of those years ago'. That was the case for me recently, when I first saw the MacFarlane Bowsander, a very simple yet ingenious sanding tool that was developed by Alex MacFarlane at Dunstone Design in Canberra. According to Evan Dunstone, this tool has undergone a significant R&D process and now, in its sixth iteration, is a fully resolved design.

Essentially it is a timber frame consisting of three components, a flexible beam of hardwood connecting two notched hardwood ends that not

only secure the abrasive strip, but also act as the handles for the tool as well.

Strips of cloth-backed abrasives are cut to length and then secured under tension between the two handles with a simple pair of hardwood wedges. The result is akin to a violinist's bow and the user can now take the tool up by the handles and apply firm, even sanding pressure to compound surfaces.

The tool comes with a set of abrasive strips that provides enough to make three lengths of each grit. These are 32mm wide and in 150, 180, 240 and 320 grits. Accessory boxes of abrasives, each enough for nine strips, are \$25.

This tool makes the hitherto laborious task of sanding flowing organic shapes such as those found on chairs and stools so much quicker and ergonomically friendly. The nature of the tool also puts less wear on the abrasive. Accordingly, you now have a tool that ensures that sanding takes less time, uses less abrasive, and is far less fatiguing on fingers and hands.

If you sand compound surfaces, this tool is an absolute no-brainer must-have. I'm now actually really looking forward to sanding my next batch of stools.

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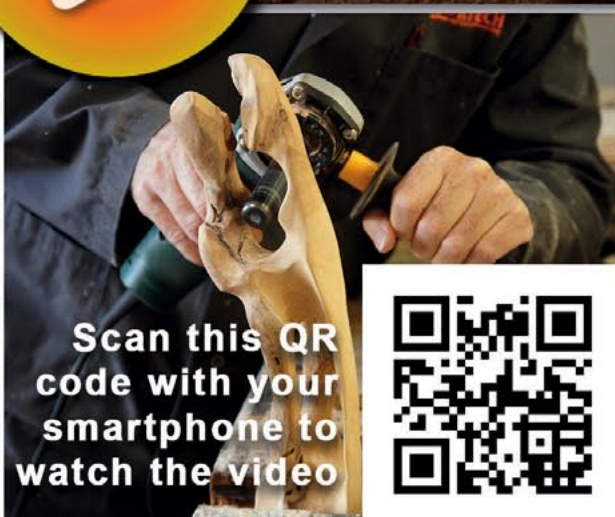
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Arbortech Turboshift

Reviewed by Andrew Potocnik



Over the years I have purchased a number of Arbortech attachments which I find incredibly effective in my line of work, so I was keen to see what this new tool had to offer. Immediate impressions were positive. Every component is machined neatly and accurately to a standard often missing in mass-produced items imported from overseas. The finish and weight simply say 'quality'.

Opening the package I first wondered whether the cutterhead was missing, however, on closer inspection I realised the 8mm cutters are housed within the 20mm diameter head of this tool, meaning it can get into tight spots predecessors couldn't access.

Fitted with carbide teeth that can either be rotated, sharpened or

replaced to present keen new cutting edges, it can be used for freehand detail carving where the small cutterhead easily makes its way into difficult places, especially as it is placed 80mm away from the grinder's body. This allows for plenty of flexibility when used on an angle almost like a freehand router cutter, but with more control and versatility. You can use this tool to carve, sculpt and shape freely.

The kit fits to a 1/2" or 10mm grinder spindle and has a depth setting ring held in place by a grub screw, which can also be used to follow templates or a jig. This lends itself to creative uses and would enable joints such as mortises and housings to be cut quickly and accurately on a jobsite.

In testing this product I chose a sample of oregon with broad growth rings and a piece of dense redgum. The TURBOShaft performed extremely well on both samples, leaving a neatly finished surface, but I found it left a superior finish on the harder wood, where it was also easier to control. The slicing action of the blade creates shavings rather than dust, which you'd otherwise breathe in, so the clean resulting surface lends itself to texturing. I tried this on the outside of a turned bowl and was pleased with the effect, however as is so often the case, the more you use a product, the more uses you find for it.

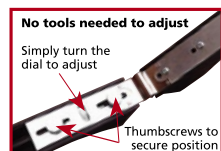
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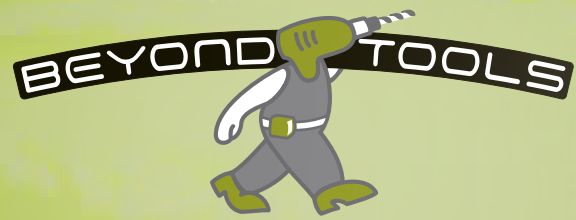


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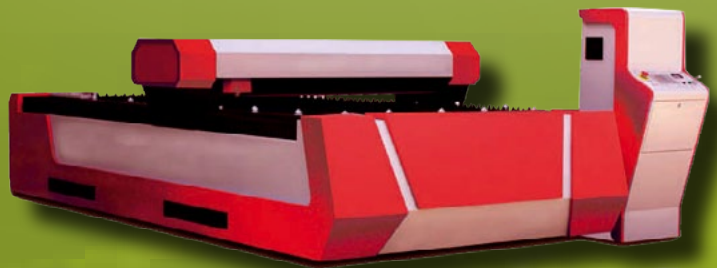
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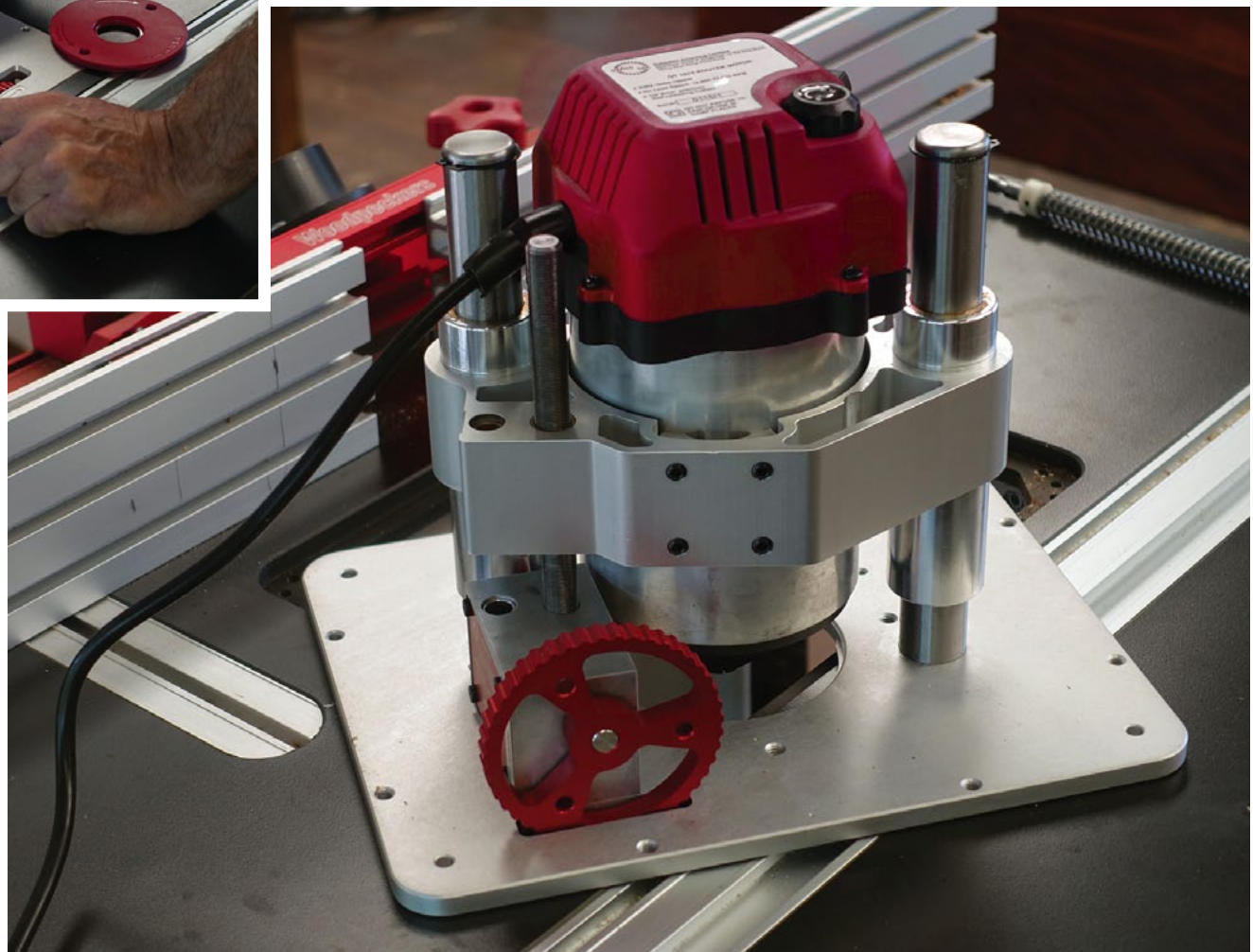
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Left: Cutter changes using two spanners are easy above the table. Various insert rings are supplied for the opening.

Below: Bullet-proof milled aluminium plate and housing runs on steel rods. The motor sits neatly in the carriage, although certain round body routers will also fit. Large thumbwheel in foreground lets you tune in to your desired height.



Woodpeckers Precision Router Lift V2 Package

Reviewed by Raf Nathan

Router lifts are a standard piece of equipment for the modern workshop. The only downside that has ever occurred to me, is that it's a waste to put a hand held router upside-down in what is an awkward position. Enter the new breed of router motors that come *sans* handles and adjustments.

The package shown here is a V2 lift mechanism made in the USA by Woodpeckers and a matching router motor and collet produced by Professional Woodwork Supplies. The motor has NSK bearings and comes with 1/4" and 1/2" collets.

The Woodpeckers V2 lift mechanism has precision machined aluminium and steel components. I don't have shares in this company – maybe I should, as they consistently make high end gear. It has a thick standard sized router table plate, supplied plastic opening rings, robust router motor carriage and full adjustments.

The carriage accepts various routers, but this package deal includes the motor shown here that is secured to the lift mechanism. At a rated 1800 watts the motor has plenty of power with variable speed from 10–22000 rpm. It is supposed to have a soft start but I could not ascertain this. The supplied one metre power cord is a bit too short and the collet is of medium duty quality. There are however a number of new superior collet options available today well worth investing in. Noise level seems much the same as any other router.

The best part of this system design is that it allows above table cutter change. You just raise the router to max height and then use the two supplied spanners to simply remove or fit a cutter. The only time you will need to get under the table is to adjust the variable speed.

The V2 lift mechanism greatly simplifies height adjustment. Slide

the supplied large handle into a hole in the table plate and twist it a quarter of a turn. You can now just pull up or lower the motor and cutter effortlessly. When you are near the desired cutter height disengage the handle and then use the fine adjust. This is a large thumbwheel that lets you dial in your final height setting. One full turn of the thumbwheel is 1/16", so for metric users it may not be of use.

I think having a purpose-built motor as opposed to an upside-down router in a router table is great as it simplifies and speeds up the whole router table experience. Plus this system has all the benefits of Woodpeckers V2 lift which is superb.

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“Accentuates the texture, knots and natural features in fine timbers”

Feast Watson Glass Finish will be touch dry after 12 hours, but leave for 24 hours before handling.

Practise the application on a spare timber panel before you undertake a larger project. Ensure you pop the bubbles following the instructions given in the Usage Guide or on the label.

Feast Watson Glass Finish may be applied to many



The Feast Watson Glass Finish kit contains the resin and hardener components plus a Usage Guide booklet which you should read before you start your project. Available in two kit sizes which will coat coat surface areas of either 1.0 or 0.5 square metres. Your timber surface should first be sealed with Feast Watson Proofseal or a suitable sealer. The resin and hardener are mixed in the correct ratio then quickly poured over the surface. The surface needs to be flat and level. Flood the surface, spread the finish to the edges with a brush or spatula.

It will selflevel but will flow better when the air temperature is greater than 20 degrees Celsius.



types of surfaces including metal, plastics and painted surfaces. Porous surfaces need to be sealed first and remember it's suitable for interior surfaces only.

For further information about Feast Watson Glass Finish or any other Feast Watson products and their application, visit www.feastwatson.com.au



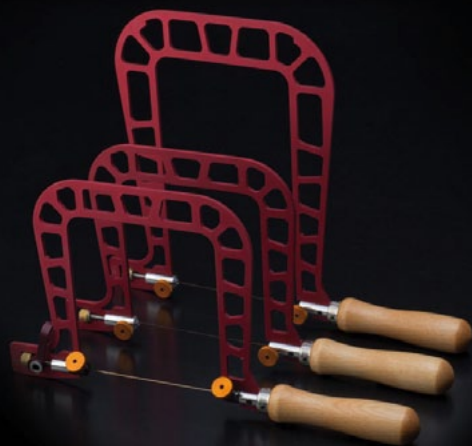
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Plano Vertical Glue Press

Reviewed by Neil Scobie



Above: Wall mounting saves space and clamps keep panels flat.

Left: Top clamp can be hooked up at the back to stop it sliding down when loading boards.

This cleverly designed clamping system has a number of benefits over traditional sash clamps. Set up against a wall a lot of workshop space is saved, and glue won't run off the joins while you are clamping.

When clamping up, the unique design of the linking arms allows equal pressure to be applied – up to 800kp pressure is applied to the edges as well as the faces when you tighten the handwheels. Boards from a few millimetres up to 120mm thick can be clamped.

The manufacturers claim the side pressure will keep the surfaces aligned so no biscuits, dominos or dowels are needed. Being made from anodised aluminium and galvanised steel, rust should not be a problem. A plastic strip on the edge of the vertical rails stops the wood sticking to them and thus becoming damaged.

Following the instructions, I attached a horizontal 50mm thick timber rail to the wall so I could screw on two of the one metre long mounting rails. On the bottom another 73mm wide horizontal rail is attached to pack out the bottom of the clamps from the wall. The bottom is not screwed to the rail so the clamps can slide along the mounting.

The length of what you can glue is determined by the number of clamps you have along the rails. The manufacturers recommend a spread of 300mm, however I think you could go to about 400mm especially on thicker timber.

With my setup I could clamp to a maximum length of two metres. With three clamps you could clamp boards up to about 1200 to 1300 long, or add one or two more if you need to regularly clamp longer lengths.

One disadvantage was when using PVA glue I found it hard to wipe the squeezed out glue off the side facing the wall. You can reach down a certain way from the top and up from the bottom, depending on how wide the panels are. Mostly though, I use polyurethane glue for gluing panels and tabletops, which is better not wiped off, so this is not a problem for me. After reading the instructions I found that you could hook the top clamp up at the back to stop it sliding down as you loaded the boards.

I think this is a great system as it saves space and keeps your panels flat while gluing up.

Review press supplied by Promac, see www.promac.com.au or phone (07) 33902474.

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HNT Gordon Moulding Planes

Reviewed by Troy McDonald



Above:
The planes cut beautifully straight out of the box.

Left: Hollow and snipe bill plane. Note the brass 'boxing'.

Writing the article on p.80 provided an opportunity to trial a number of moulding planes from the stable of respected Australian hand toolmaker HNT Gordon. The planes provided represented a very useful starting set of moulders and included a pair of both 1/4" and 3/4" hollow and rounds (H&Rs), in addition to a single snipe bill plane. As a rough guide, a vintage No.4 moulding plane roughly equates to a 1/4" Gordon plane while a No.10 approximates a 3/4".

The planes were all made of gidgee, the stability and density of which should ensure several lifetimes of trouble free use. The finish on the planes was immaculate and it is a tribute to Terry Gordon how beautifully presented these planes are. All arrived with instructions on use and sharpening, and were ready to use straight out of the box. The planes irons are set at a pitch angle of 60° which makes them perfectly suited to fine finish work on hardwoods.

When compared with traditional moulding planes there are some minor differences in the HNT product. Firstly, the stock is slightly shorter in length and significantly lower in profile. Secondly, the iron on the HNT is parallel in thickness, set slightly askew and much thicker than the tapered irons on traditional planes. Boxwood has been replaced with brass in areas prone to wear or breakage and the wedge design is also quite different with a fine angle at the base of the wedge to direct shavings clear of the throat. Some of these are very useful improvements in design.

In use, the planes felt a little cramped in my hand possibly because I am accustomed to holding a standard sized plane. I put the planes to use on a number of sample mouldings and the more I used the planes, the less I noticed their smaller size. In terms of performance, I have to say the H&Rs cut cleaner than any moulding plane I have ever used. The thick iron,

set with a slight skew and tight mouth produced a beautiful clean finish.

The instructions included a number of innovative techniques to assist with care and maintenance of the planes. Clearly these techniques have resulted from years of trial and error and would be a great help to first time users who are typically daunted by the method required to sharpen moulding plane irons.

The combination of gidgee and brass makes for a beautiful plane but I think their overall appearance could be improved with a more traditional or flowing design for the wedge. This is a very small criticism for what are exceptional planes to use.

You can buy the planes separately, however a pair of 1/4" H&Rs sell for \$320, and a pair of 3/4" for \$340. The price will be a barrier to some, however if you are new to moulding planes they will allow you to get started without getting lost in the complexities of tuning a century old plane. If you don't have time to restore vintage planes you'll also see them as good value. In use, I think they're wonderful tools.

Planes supplied for review by HNT Gordon, phone (02) 6628 7222, see www.hntgordon.com.au



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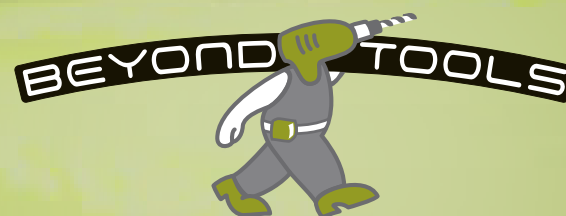
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Bosch GSR 18 VE-2-Li Professional

This is the muscle car of cordless drills. With 18 volts and a choice of batteries up to a whopping 6 amps this drill/driver will handle any task you throw at it.

It has a speed range of 0–1700 rpm, a 13mm metal chuck, alloy housing and 25 torque settings. The metal chuck also has a notched take-up when you twist it to lock, so it really grasps whatever is in the chuck. The body is thick plastic and it all weighs in at just over 2kg.

You use this for big jobs. I sampled it for example on driving in 1/2" coach screws and various 8g screws and it performed effortlessly. The electronics seem well advanced with instant stop on release of the trigger, an LED to light the work area, and a battery level display.

Not a tool for constant use due to its weight, but where you need almost unlimited grunt this is the one. There is masses of power and torque, so it's a builder's delight.

Personally after trialling the 6 amp battery, I feel this is the one to get. You will have longer run time and it seemed unstoppable in use. Even though there are larger volt drills around at 18 volt this one with modern technology is like using an old fashioned corded tool.

Recommended retail price is \$249 for the drill skin, and around \$449 for the kit that comes with charger and two 4 amp batteries.

Tool supplied by Bosch Australia and available from power tool retailers.



Top: Heavy duty, the GSR 18 VE-2-Li handled any task that was thrown at it.

Above: Battery sizes vary from 4 to 6 amp offering longer run time. There is a battery level indicator on the

base so you know how much power you have left.

Right: Metal chuck is strong and has a very secure locking mechanism. There are 25 clutch settings to suit pretty well all applications.



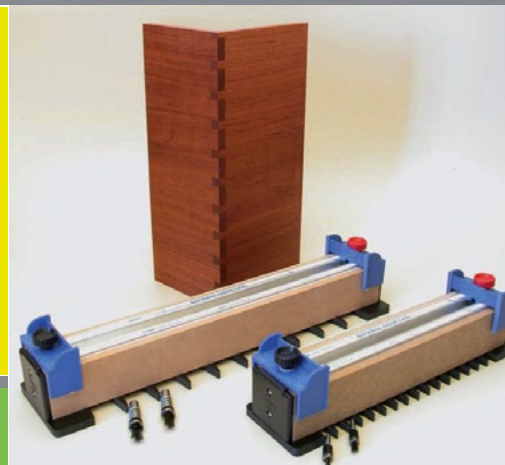
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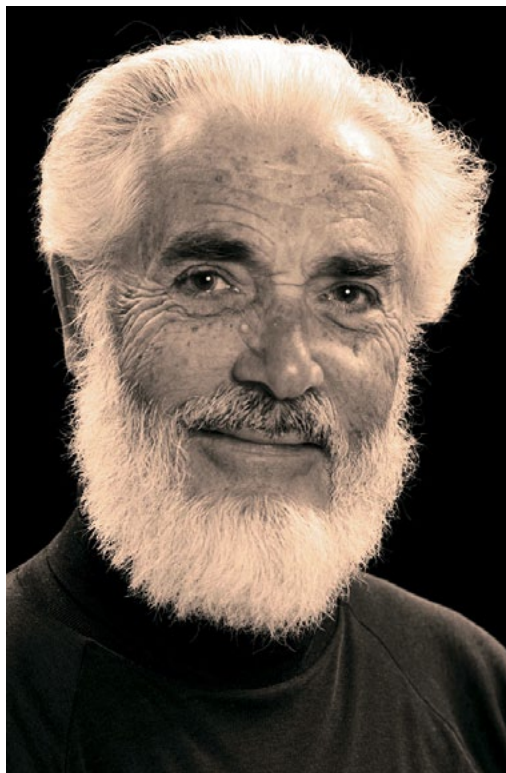
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Right: Terry Martin, *Trees*, red mallee burl.
Photo: Terry Martin.

Below: Alan Wale, OAM

Below centre to right: Peter Stibilj, *Glide*, cabinet with tambour, blackwood, spotted gum; Brenda Walker, *The Journey*, hoop pine. First and second prize winners, Wootha Prize 2015.



Alan Wale, OAM

Alan Wale, fine woodworker and founding director of Sturt School for Wood, Mittagong NSW was announced the well deserved recipient of an OAM 'for service to the visual arts, and to craft and woodworking associations' in this year's Queen's Birthday honours list. Alan taught at Sturt from 1984 until 1991, when tragically he was forced to retire through blindness.

Trees plus

Terry Martin's tree sculptures reflect his environmental concerns as well as

his admiration of their beauty. These along with some of his turnings and paintings from other artists will form part of an exhibition entitled **Trees+** to be held at Bungendore Wood Works Gallery from October 31 to December 6, You can see how Terry makes his trees on Wood Review's YouTube channel. Exhibition details are at www.bungendorewoodworks.com.au

Exhibition honours

In the last few months there has been a roll-call of award winners. After our last issue went to press, **Wootha Prize** winners at this year's Maleny Expo

were announced and collectively won over \$4,000. Top honour went to Peter Stibilj for his blackwood and spotted gum cabinet. Our website (see *Wootha Prize Winners 2015*) has a full run-down. This year's Wootha Prize theme is 'Against the Grain', see malenywoodexpo.com for details.

In early June, **The Australian Woodturning Exhibition** had one of its most successful showings to date. Best of Show was won by **Jim McConnachie** for his beautiful and complex laminated form. **Alan McIndoe** won the Peter Robson Award for his ornamented



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Top to bottom:
 Alan McIndoe,
 lidded container
 Hugh McKay,
 hollow form
 Jim McConnachie,
 laminated form
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lidded container while **Hugh MacKay's** spiral vessel won Best Novice. Entries can be seen on the exhibition's new website at awtex.com.au

Triennial prize

The Rigg Design Prize is surely the most richly rewarding competition for Australia's designers and makers. Seven shortlisted entrants must each showcase a body of work in their own dedicated space. This triennial prize offers \$30,000 and stands as arguably the highest award for contemporary designers. See the exhibition at the National Gallery of Victoria from September 18 through to February 7, 2016. Information at www.ngv.vic.gov.au

Wood Symposium 2015

Rylstone Sculptures Inc is a collective of six sculptors which has secured nine local and overseas artists to take part in an event that will take place from October 29 to November 8 at Rylstone Showground's Sheep Shed, Cudgong St, Rylstone, NSW.

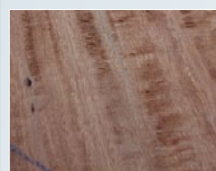
Over the ten days each sculptor will be given a 2400 x 600mm diameter ribbon gum trunk to create a sculpture following a previously submitted proposal. The general public and school groups are invited to attend this free event to witness the transformation. The finished sculptures will be housed in various locations throughout the Mudgee region. See www.rylstonesculptures.org

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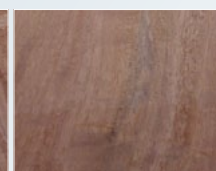
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Shelix cutter head

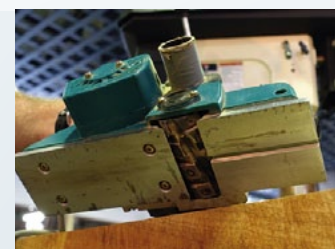
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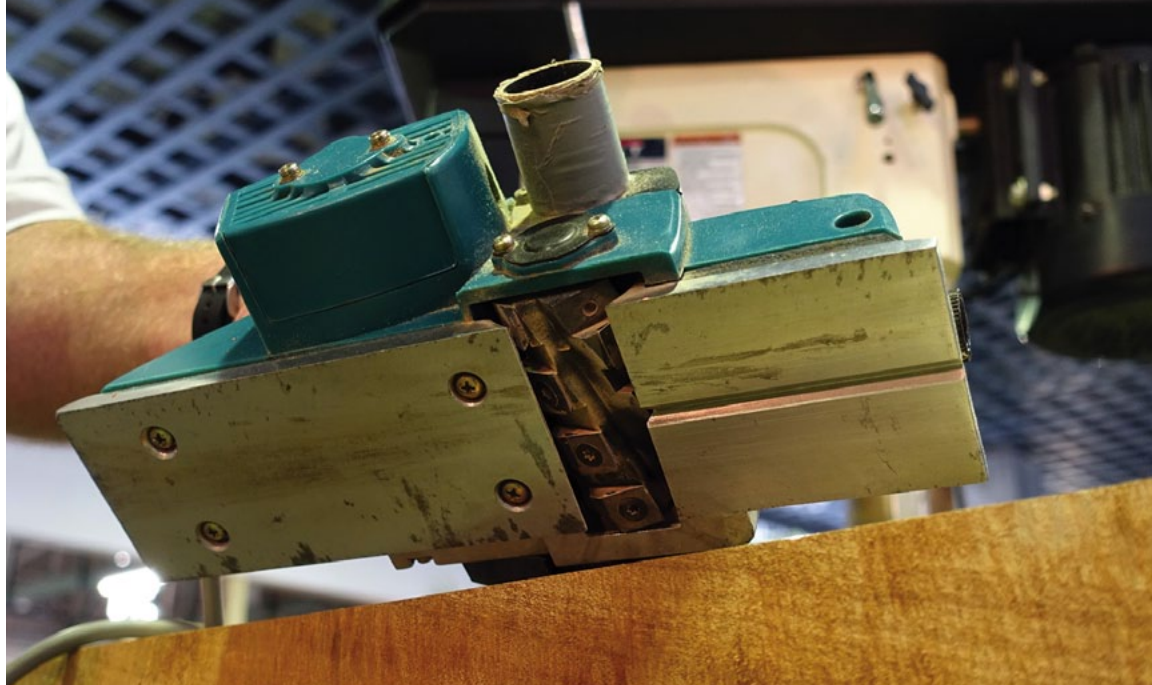
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Product news

A round-up of tools and products to take notice of.



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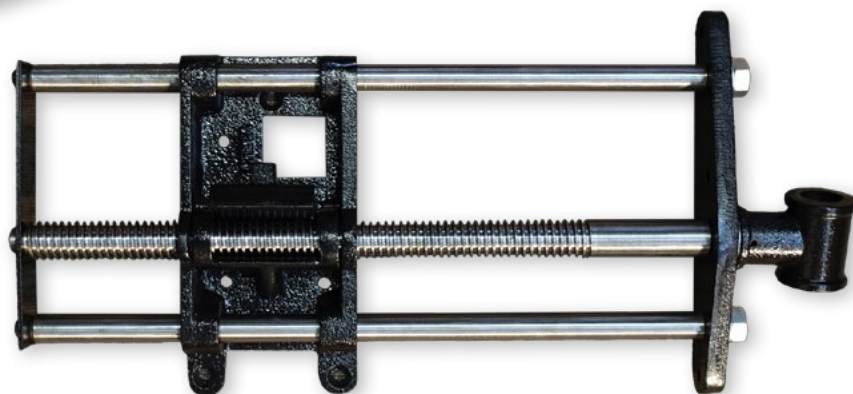
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Bosch claim their wireless 'induction' charging technology is a world first. When the charging station is plugged in to a worksite and a compatible wireless battery is placed on it, the charger detects the presence of the battery and starts emitting a magnetic field. The alternating magnetic field penetrates the battery's internal copper coil, inducing voltage and charging current into the cells until full. Wireless charging means tradies can work with just one battery and one charger. More info at www.bosch-pt.com.au/professional



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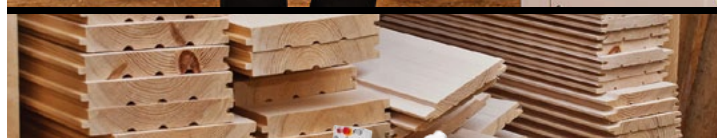


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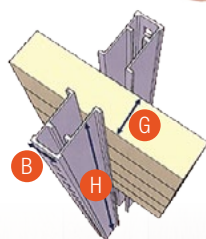
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Width (B)	35 mm
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Clamping height (max)	1200 mm
Clamping width (G)	0-120 mm
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Hitachi's new 18V, 5.0Ah cordless impact driver is dust and water resistant making it an impressive onsite tool for the trade. Weighing in at 1.5kg with a slim pistol grip, the tool packs 172Nm torque. Four speeds, coordinated or on/off LED light, power in the palm of a hand and a barrel short enough to access tight spots. See www.hitachi-powertools.com.au



Plane Power ▼

'Nothing but heavy duty' is the promise of this manufacturer who engineer their power tools especially for tough and trade use. A brand new release is this powerful cordless 18 volt, the first electric planer to join Milwaukee's range. See www.milwaukeekeetools.com.au



Hands-On Sanding ▲

For trade or hobby, Sandi Hands make a new concept sanding glove that protects and gives hands-on flexibility in a range of sizes and grits. Trade gloves suit woodworkers, car detailers, French polishers, surfboard shapers and others. Hand sanding can now be easier for those plagued by arthritis, or those who simply need to comfortably get good results on both basic and intricate jobs. See www.sandihands.com.au



Taking the Plunge ▲

This heavy duty plunge saw is the first of its kind produced by DeWalt. A high torque 1300 watt motor with an output of 690 watts delivers power at up 4000 rpm. Depth of cut is up to 59mm with bevel cut to 47°. Guide rails can be joined for extra capacity. Designed for onsite carpentry and fitting work, the saw is also at home in the workshop. See www.dewalt.com.au

Faster Cure ▶

Boatcraft Pacific's Purbond 10 single-pack, fully waterproof, high strength, polyurethane adhesive now achieves strength in 10 minutes, as opposed to the two or three hours the original version takes. The result is faster turnaround for furniture makers and boatbuilders, and the need for fewer jigs and floorspace. In Boatcraft's own factory the new product has meant that where two transoms could be glued up in a day, 12 are now possible! Purbond 10 comes in 250ml, 500ml, 1, 2 and 5lt quantities and is available from www.boatcraft.com.au, or by phoning (07) 3806 1944.



Wood

REVIEW



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Opposite page: Squaring up the panel with a shoulder plane.

1. To use the shooting board push the plane forward and draw back without tilting.
2. Planed with and without the jig; tearout can be avoided.

The Shooting Board Project

Making an essential jig is a great starting point for beginner woodworkers. Story by Adrian Potter.

One of the many things beginners are taught is how to cut straight and precisely on a knife line with a handsaw. The techniques are easy to grasp but it does take practice, and even for the experienced there needs to be a way to correct inaccuracies. One way to do this is with a hand plane and a shooting board.

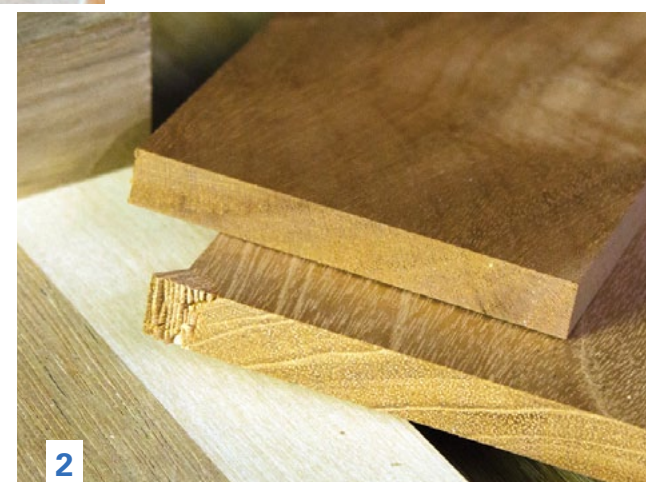
A shooting board is a jig that enables a handplane to trim endgrain straight and perpendicular to the face and edge of a board without chipping the wood off at the end of the cut. Usually the cut is at right angles to both the face and edge of the wood, but it doesn't have to be (**photo 1**).

A shooting board is useful for planing along the grain too, not just the endgrain. They are especially useful to trim small pieces of wood that otherwise would be dangerous to cut with machines.

When a shooting board is used the handplane is pushed along on its side in the track or rebate with the cutting edge of the blade vertical. The wood that needs planing is held against a stop block. This keeps the wood at the correct angle to the sole of the plane and supports the wood fibres at the end of the cut if you are planing endgrain. The latter is probably the most useful feature of any shooting board (**photo 2**).

In this article I'll illustrate how to make a basic shooting board using ply and solid wood. I'll also show some simple ways to use it. This project is ideal for beginner woodworkers, but regardless of your skill level, you'll need to be accurate when cutting the groove for the stop block.

If you are lefthanded make the rebate for the plane on the left side of the shooting board not on the right as illustrated in **fig.1** over the page.



Materials

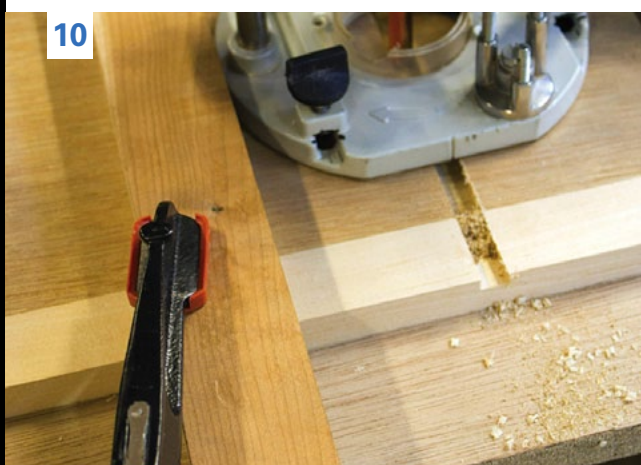
Plywood is perfect for this project. MDF or even particleboard can be used if you prefer. Get something reasonably thick; around 18mm thick ply is good, and make sure it is flat. The lengths and widths are optional but I reckon about 500mm long and 300 wide is a handy size.

An extra-long shooting board (1200mm) for jointing veneers is also useful. I haven't found a need for a shooting board wider than 300mm yet. Making a shooting board completely in solid wood is an option, but be aware the solid wood might cup or warp over time thus making the jig less accurate.

I do recommend gluing solid wood to the surfaces of the ply that the plane runs on. European oak and rock maple are used on this example but you could use any stable, non-resinous hard wood, I just happened to have some



3. First assembly: gluing on the lipping.
4. Flushing off the lipping.
5. Gluing the panels together.
6. Wood is cut for the two stops.
7. Drill and countersink screw holes in the cleats and drill pilot holes in the panel.
8. Showing one of the cleats installed.
9. Mark accurately for the stop, here with marking knife, square and rule.
10. Routing the housing for the stop.



offcuts of those two species the right size, thickness and length.

The solid wood may wear better if the running faces are 'crown' or 'flat' cut; in other words, have the growth rings parallel with the wearing surface. Orienting the growth rings in this way means the medullary rays are perpendicular to the wear surface and act as little pieces of endgrain against the plane. The ends of the cell walls (endgrain) have better wear properties than the sides of the cells.

I used an offcut of teak for the stop block. Again any hard stable wood will do. Plane a bit of the endgrain first to check that the wood you plan to use doesn't crush or bruise easily on the ends of the fibres. It will help if the stop block wood planes crisply on the endgrain.

Making it

Prepare the two plywood pieces to size (get your local hardware store to help if you need to) and apply the solid wood lipping to the narrower one (**photo 3**). I usually make my solid wood edging thicker than the boards and plane them flush to the surface (**photo 4**). Plane the edge of the solid wood straight and square to the face. This straight

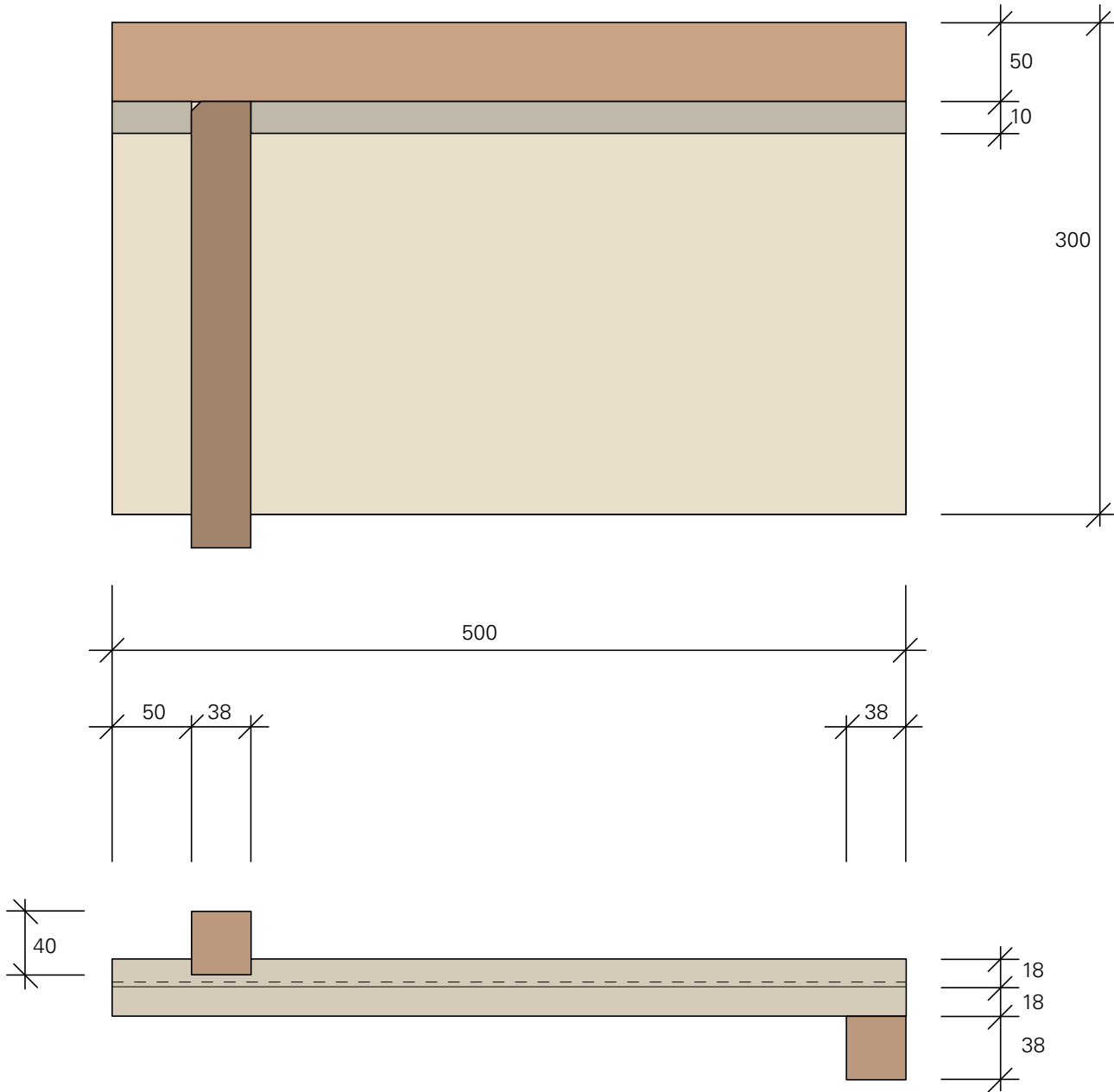
edge is particularly important. As it happened I forgot to plane the edge before gluing together so I used a shoulder plane to make it straight and square (**main photo p.26**).

Gluing the two boards together is simple. If you apply the glue sparingly with a toothed glue spreader or paint roller the two boards won't slip around much as the clamps get tightened. Check the boards are flat and twist free as they are being clamped (**photo 5**). While the glue dries prepare the stop block and cleat material (**photo 6**).

It helps to apply the cleat at the back and bottom of the shooting board now so you can hold the board in the vice as the rest of the work is done. Glue and screw the cleat onto the back edge of the board (**photos 7, 8**). If the cleat is shorter than the overall width it can double as a saw hook by turning the board over and clamping the stop block in the vice.

Now the groove for the stop is cut into the top. It's worth spending time getting the stop precisely at right angles to the running edge. I recommend you use a quality engineers or combination square for marking out and checking for square (**photo 9**).

Fig. 1 Plan and side elevation (dimensions in millimetres approximate)



The groove you make should ideally be a hair width less than the exact width of the stop block you are going to use so you can plane the stop block a fraction and have it fit in the groove as a press fit.

A tablesaw is ideal for cutting this groove or dado. A router can do it easily too as long as the fence you use to guide the router is square to the running edge. If you are a hand tool purist or just want to have a go with a quiet solution, clamp a straight batten perfectly square for the handsaw to run against and cut down to the depth required.

The waste can be chiselled out and the bottom finished off with a hand router. I made the groove with a router as shown in the photos. The depth of the router is set so the groove is about 7mm above the horizontal running surface so the whole of stop block end is planed (fig.2).

Fig. 2 Cross-section (mm)

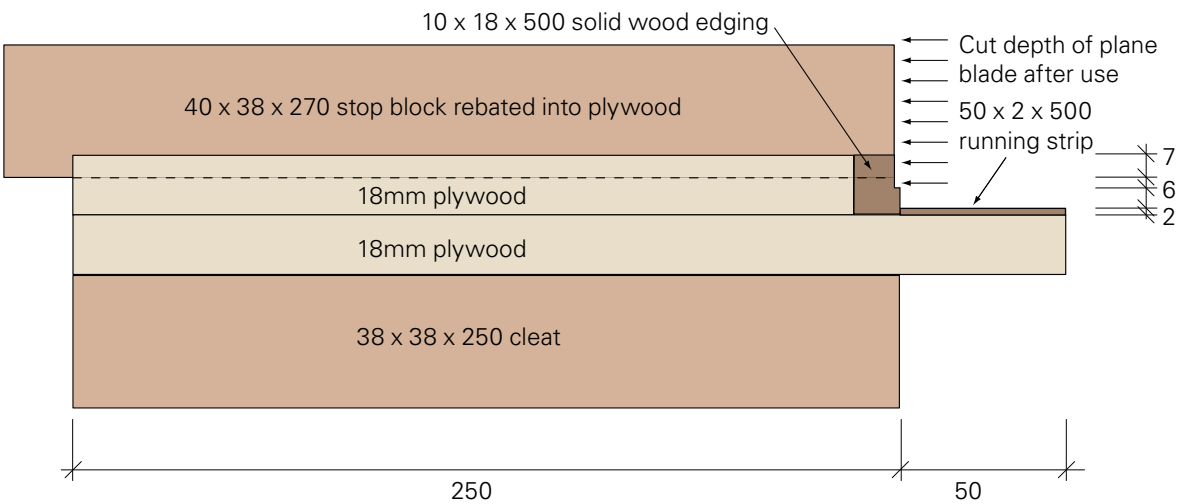
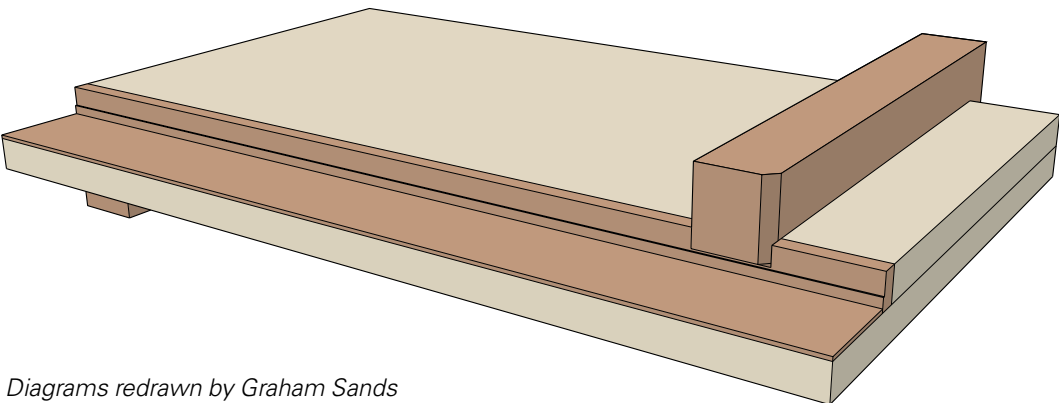


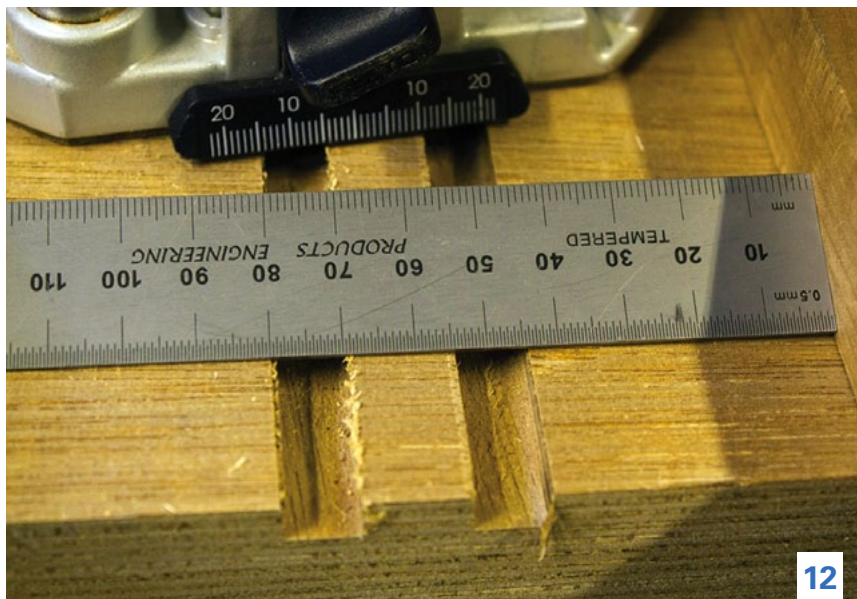
Fig. 3 Arrangement



Diagrams redrawn by Graham Sands



11



12



13

11. Measuring router distance for positioning the guide.

12. Two trenches are routed and the waste between then routed out.

13. The stop is planed to a precise fit.

14. Pencil marks central line for stop screws.

15. Gluing on the runner.

16. Runner glued on.

or plastic between the batten and the running strip so the batten isn't glued down too (**photos 15, 16**). Smooth the edges off with a block plane and wax the runners with a candle end or wax stick.

Using it

You won't need much practice to get the hang of this jig. The photo on p.27 shows the position of your hands. I like to use a larger plane like a No.6 or No.5 because the weight of the plane gives the plane more momentum. Any plane size should do a good job.

Try not to tilt the plane into the wood being cut. Simply push the plane forward to cut and draw it back towards you for the next cut. The wood usually moves forward just the right amount for the next cut anyway so you can work pretty fast. If no shavings are coming out sharpen your plane blade and/or advance the blade forward in the plane for a thicker shaving. Obviously you also need to make sure the wood is touching the toe of the plane's sole in front of the blade before cutting.

I'm pretty sure the shooting board was the first woodworking jig I ever made and I still use the same one I made 20 plus years ago. I reckon shooting boards are really handy to have around. I hope you enjoy making one and using it too.

Photos: Adrian Potter

Adrian Potter is a furniture designer/maker and also teaches woodwork in Adelaide. Email: adrian@adrianpotter.net.au

See Adrian Potter show how to use the shooting board on Wood Review's YouTube channel.



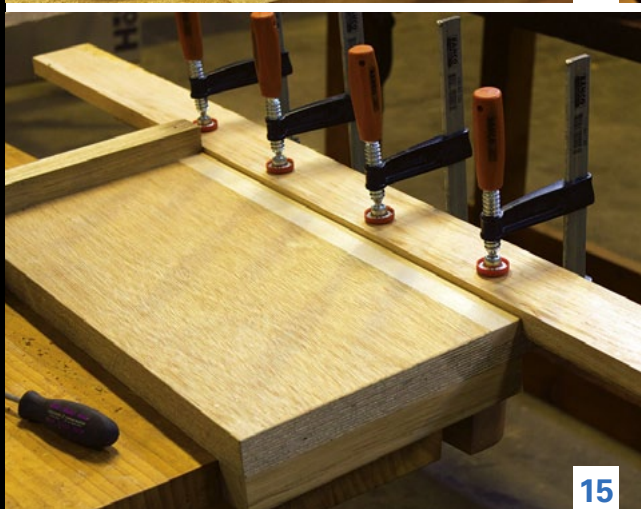
14

I used a wood straightedge clamped to the top of the shooting board to make the groove straight and square (**photo 10**). The wood straightedge is positioned precisely as per the dimension shown in **photo 11**. You can see in **photo 12** how the second part of the groove provides the groove width for the stop block. The waste between these two trenches is routed away and the groove is complete.

The stop block is a fraction wider than the groove so it can be planed down for a tight press fit (**photo 13**).

In my experience the stop blocks take years to wear out so I have just screwed the stop block into the groove; the clearance hole for the screw is not slotted. Don't glue the stop block in because it will have to move forward a touch from time to time (**photo 14**).

We are almost finished; the last task is gluing the thin running strip for the side of the plane. The one used here is 2mm thick. Clamp it on with a flat batten with packing tape, baking paper



15



16



2015

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Looking into the office from the showroom as Graham Loveridge, full time head maker, and owner Will Acland discuss a project.

Opposite: Will Acland and Oliver Waters maintain a great business partnership.

Opposite below: Tim Smith was working on a complex laminated chair frame when the author visited.

Aiming for Perfection

Anton Gerner visits UK makers and woodwork teachers Oliver Waters and Will Acland and is inspired by their attitude to achieving the best results.



Located in Staveley, a small town in the beautiful Lake District in North West England, is a unique business run by Oliver Waters and Will Acland. Not only do they run a furniture making and design business, but also a fine furniture school, where their passion for excellence has created a world class facility dedicated to teaching at the highest level.

I first met Waters & Acland on Instagram in 2014 and have been very impressed with the work in their feed, as well as the really high quality pieces their students make. For some months I also followed an Australian student at the school – Keira James, a qualified speech pathologist who attended their six month course and went from zero experience in woodwork, to making a very fine desk.

On a recent trip to the UK I decided to visit Waters & Acland in person, as I wanted to see how they run a successful furniture making business, as well as manage to teach students to acquire such advanced skills at such an astonishing rate. By the end of my visit I had found the answer.

The showroom, workshop and school are in a two-storey building that is part of the Staveley Mill Yard complex – a former bobbin mill that has been converted into various shops and warehouse spaces. Here a number of unique and interesting businesses operate alongside each other, including a bakery, brewery, and a cycle shop.



A narrow staircase leads directly upstairs to their showroom, a small but inviting space, where clients can see the quality of their work. Leading off this is the office/design studio and main bench area for both the professional workshop (where they make their furniture) and the school.

The work in the showroom was some of the highest quality handmade furniture I saw while visiting the UK. All exposed joinery was perfect. All drawers were piston fitted. All surfaces were perfectly flat. All oil finishes were perfect. Every detail was just right.

Will Acland gave me a tour of the showroom, where most of the furniture on display was made from oak,



including some stunning quartersawn pieces. I would describe their designs as slightly Arts and Crafts in feel, yet with a contemporary edge. Nothing is showy and everything is functional.

Next to the showroom is the very compact, but highly organised professional workshop, where Tim Smith is responsible for creating commissioned furniture. Tim is a hugely talented and knowledgeable craftsman who works with one apprentice, Angus Bruce-Gardner, along with assistance from Oliver Waters.

Angus recently won a silver medal at the World Skills National Final, earning him a place on the UK squad for the international finals in Abu Dhabi in 2017. The National Competitions are designed to test competitors' skills in a range of critical elements that demonstrate excellence in their chosen trade.

On the day I visited, Tim was working on a very complex vacuum formed laminated chair frame, alongside several other commissioned projects.

The school is separated from the professional workshop only by a waist-high wall, so students can watch real commissioned work taking place. This is a great way for students to learn and observe additional skills and it also puts everything into a meaningful context. A range

of courses is offered from one week through to one year full-time, which cover all aspects of furniture making and design.

Full time tutor Graham Loveridge showed me around the school and explained how they aim to teach students to achieve perfection and nothing less from the word go. Small class numbers allow for one-on-one tuition and the development of individual skills, with as much time spent as needed to perfect a technique, before moving on to the next step.

The student bench room is very spacious and well equipped. Each student has their own heavy duty Sjobergs workbench bench, tool storage and some space for ongoing projects. A tool wall has full sets of fine hand tools available for students to use, although they are encouraged to tune up and use their own tools. Graham told me that tool tune up is where learning begins. 'The first thing we teach our students to do, is to tune up and sharpen their tools correctly. You cannot progress to the next stage unless you can sharpen a blade and set up a plane.'

On the day I visited several students were working on cutting and fitting dovetail joints. I was very impressed with the high standard that could easily have passed as professional work.

Opposite page:

The machine room has a collection of quality almost brand-new machines, including the highly desirable Kündig wide belt sander.

Below:

Each student works from their own heavy duty workbench and can access a full set of fine hand tools. Photo: Florence Acland.



On the ground floor Oliver Waters showed me their excellent machine setup, which is ideally suited to making fine furniture from solid timber. Their collection of almost brand new machines includes a Hoffmann jointer and wide thicknesser, a full size panel saw, bandsaw, spindle moulder, radial arm saw, lathe, edgesander and mortising machine. But without a doubt the centrepiece is a wonderful state of the art Kündig wide belt sander. I have to say I don't think I've ever seen such a range of professional heavy duty machinery in such a small space before. Even so, in and out feeding from each machine has been allowed for.

Apart from a small, very full rack, not much timber is stored on site, due to lack of space. 'We normally buy our timber specifically for each job, often in whole logs', said Oliver. 'We deal with specialist sawmills who can supply the quality we need to work with.'

Will and Oliver both bring special skills to this great business partnership. Will does the design work and liaises with clients, while Oliver manages the workshop. Oliver trained in furniture making at the David Savage School – Rowden, where students learn alongside a professional workshop, just as they now do at the Waters & Acland school.

Surrounded by a beautiful country town, astonishing scenery and mountain views, I can see why they choose

to work where they do, but I wondered how they get their work being remote from a large city such as London. The answer is simple. By working to the highest standards Waters & Acland have built their reputation to a point where they don't need to advertise. Commissions and students are gained by word of mouth, their reputation, and through their website.

And the answer to my question about how their students achieve such great results in so short a time was really quite simple – everyone at Waters & Acland is totally dedicated to perfection in everything they do, from design and making through to teaching.

But most importantly I noticed there was a remarkable calm throughout the workshop, where everyone showed great respect for each other, just quietly going about their own work, committed to getting it right. What Oliver Waters and Will Acland have created is not just a workshop, but place where everyone is equal – designer, makers, teachers and students. It's a place where everybody naturally excels.

Photos: Anton Gerner

An interview with Waters & Acland student Keira James follows. For more information see www.watersandacland.co.uk and Instagram: @watersandacland

Below: Waters & Acland student Keira James poses with the pieces she made during the six month course.

Right: The desk that Keira James completed during the course.



Student Report

Anton Gerner spoke to Keira James about her experience at Waters & Acland.

What attracted you to the Waters & Acland school?

I had done a lot of research on the Internet and narrowed it down to three workshops. W&A was the first one I visited and I just loved it as soon as I walked in the door. Being in a workshop with the amazing pieces in the showroom, pieces in progress in the workshop, and even just the smell of wood, I knew then that I had to just go for it.

Why did you choose to learn in the UK?

When I moved over to the UK for two years, I (saw it) as time out from the real world and a chance to focus a bit less on work. It meant changing my lifestyle to save enough to pay for the course and not earning money for six months. I even doubted I would be able to succeed at the course and if it really was the right choice for me. In the end I just decided to jump in and see where I ended up.

You must have learnt a lot, but what stands out the most?

I had next to zero experience when I started and feel confident in saying everything I know, I learnt in the W&A workshop. The biggest lesson I learnt was to aim for perfection and nothing less. I spent the last three months of the course building my desk and if



something wasn't spot on it got done again until it was. Yes there are flaws in it, but I built a desk with more complex processes and to a higher standard than I had dreamed possible. Being encouraged to achieve perfection actually makes you strive for it. I now carry the attitude and belief that I can make really high standard pieces with me moving forward.

Are you going to continue with furniture making in the future?

Yes, definitely. I'm still not sure if it will be as a serious hobbyist or as a job, as I need to find the right balance once I'm back in Australia. I'm already looking at where I can rent bench space, so we will see how it all plays out. I can't imagine not continuing on the furniture journey. I think it's pretty special to find something you are truly passionate about so I have no plans to give it up now!

Anton Gerner is a furniture designer/maker in Melbourne whose first story for AWR appeared in issue no.1 in 1992. Email: anton@antongerner.com.au





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The Joy of Spoon Carving

Green wood is easier to carve and opens up more possibilities for interesting spoon shapes, writes Greg Miller.

Spoon carving is a rapidly growing pastime in Australia, following a few years behind its massive popularity across North America, the UK and many other parts of Western Europe. A quick look on the internet will show a wondrous array of spoons and inspiration, reflecting the level of interest in this craft.

Wooden implements have been used for cooking and eating throughout human existence. Spoons can be functional, decorative and symbolic. Some are heirlooms handed down for generations. Most kitchens have at

least one wooden spoon and often more. In the Scandinavian cultures, households traditionally had a spoon rack, holding each person's eating spoon for everyday use.

Handmade spoons seem to have a life of their own. Making them is a delightfully creative activity. It's easy to get hooked.

Why green?

What is the difference between spoon carving in seasoned wood versus green wood? When carving seasoned wood, we generally look for straight grain in the piece of timber. Seasoned wood is harder, so some of the

techniques will be different. Wood is softer when it is green, so it's easier to carve, and we can also use wood with interesting curves in order to create spoons with non-linear shapes.

Split not sawn

In the green woodworking tradition, wood is split rather than sawn. Splitting the wood along the grain, along the line of the fibres, is also known as riving or cleaving. This gives superior strength by reducing the incidence of short grain and grain runout. In green woodworking, we commonly carve across the grain, rather than along the grain. Green woodworking necessarily pre-dates dry wood woodworking. The combination of ancient skills and knowledge, simple tools, and wood fresh from a tree all come together in green woodworking.





From Raw Material to Finished Spoon

1. Start with a piece of tree.

A hard, dense timber is ideal for durability and will give a clean finish off the knife. Straight pieces can be used, and strategic bends and curves can be utilised in those which aren't (**photo 1**).

2. Cleave the piece in two, through the pith.

The pith must be excluded as this will usually be the source of splitting or shakes. A bend in a spoon will be obtained from a bend in the branch section. At any fork in the branch, the pith also forks. This too must be excluded, so the placement of the froe needs to reflect a careful selection of the desired path of the split. Start from the top end of the branch section, to better control the split (**photo 2**). Hopefully, it will split down the line of the pith to its junction and again down that line to the base (**photo 3**). Of course, sometimes the material has another idea!

3. Use the axe to remove much of the waste.

Use a nice sharp carving axe on a block to face off the pith side (**photo 4**). This would be a good time to draw the planned outline of the spoon's shape. The axe will quickly remove much

of the waste from the handle area and around the bowl (**photo 5**). The more axe work, the less knife work needs to follow.

4. Use the sloyd knife to further refine the overall external shape.

The sloyd knife is a Scandinavian carving knife with a straight blade. With a longer blade and a skewed cut, slices of material are quickly removed from the handle area (**photo 6**), while a closer hold and short controlled cutting action will commence the outer shaping of the bowl and the transition between the bowl and the handle. While not completing the external shape of the spoon, we have now created a shape which fits firmly and comfortably in the hand while we carve out the bowl. Some people may like to use a drawknife and a shaving horse to do some of this initial shaping.

Main: Spoons in progress and a selection of spoon carving tools.
Photo: Linda Nathan.

1. With green wood you can utilise bends and curves in the timber.
2. Split from the top for better control.
3. Aim to split down the line of the pith.
4. Use a sharp carving axe on a block to face off the pith side.
5. The axe can quickly rough out the handle and bowl.
6. Using the sloyd knife to pare down the handle.



7. Hook knives are used to scoop out and refine the bowl.

8. A shorter knife is used for refining the back of the bowl.

9. The same knife can also be used to refine the handle and finials.

10. A trio of spoons in progress.



6. Use a shorter detail knife to complete the outer shape.

This is the final stage where the finish texture, profile, curves and transitions are completed, including any finials and other

details (**photos 8, 9**). You might choose to complete the spoon with an 'off the knife' finish. However if you choose to sand the spoon, you will need to dry the spoon first. Sanding green wood will just clog the abrasive paper, as it won't create loose dust.

7. Dry the spoon.

The thinner the spoon, the quicker it will dry. Wood is always seeking to be at the same moisture content as the air around it. Moisture escapes from the endgrain faster than through the side grain, so we seek an even rate of drying throughout to reduce shakes and other degrade. For this reason it's best to let spoons dry slowly, away from radiant heat and out of the wind or draughts.



If the wood feels cold on your cheek, water is still evaporating from it.

An alternative is to use the microwave to speed up the drying. Using short bursts, and allowing the spoon to cool down between bursts, you can reduce the drying process from days to under an hour. You can also destroy your spoon and even set fire to it, so care needs to be taken. The length of the bursts required will vary depending on the species of wood and other variables.

8. Finish the spoon.

With the spoon dry, you can now sand it if you wish and apply a finish. Most food safe oils are generally plant-based natural oils. Do not use lacquers, polyurethanes or waxes. Finishing the spoon with penetrating oils not only makes the spoon look like a million dollars, it also helps to preserve and protect the wood.

9. Managing your material.

Green woodworking revolves around the availability of the resource. When a nice piece of green wood comes your way, make sure you seal the ends to slow down the rate of drying and degrade. A waterproof PVA glue, like Titebond III, is a fantastic end sealer and it dries clear, which is important for choosing your line when you are going to cleave it through the pith. The wood will wait a few weeks for you if you leave it in a cool shady place out of the wind. You can seal it in a plastic bag also, though surface mould will eventually form. Alternatively, do the initial shaping for your spoon blank, put it in a plastic bag and then into the freezer. It will keep for years until you are ready to defrost it and start carving.

Spoon carving with green wood is a wonderfully creative process, each piece of wood a lovely gift from the tree just longing to be given a new life. It is an activity which re-connects us with the tree, with ancient traditions, and our inner need to be creative in a very tactile way.

Sitting in a chair doing the knife work lends itself perfectly to being a social activity, with spoon carving groups springing up in many places. What a pleasant way to build community and honour the trees!

Photos: Greg Miller and Mike Ford

See www.tweedspooncarving.com.au and *Wood Diary*, p.86 for information about an upcoming event this October.



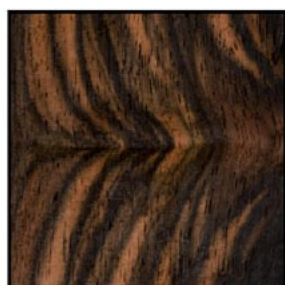
Greg Miller is a cabinetmaker/joiner who lives in Perth and teaches woodworking skills to people of all ages. Contact him at: adventure@wn.com.au

TopVeneer

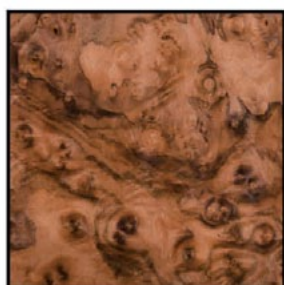
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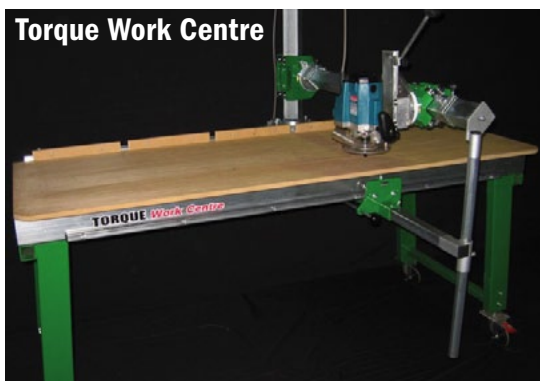
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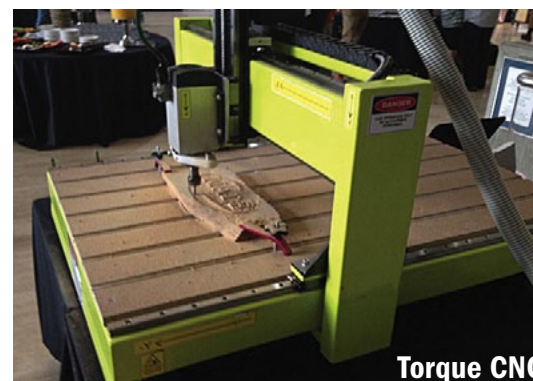
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DIY Veneer Press

For under \$200 you can make a press that will take large panels and store away easily. Story by Darren Oates.

Recently I had a commission for a round table with a diameter of 1600mm that required a veneered substrate with a solid timber edging. My vacuum press can only press panels up to 2000 x 1000mm so I had to come up with a new way of pressing large veneers.

I probably could have outsourced the pressing of the substrate, but to not be in control of a piece of furniture that I am being commissioned to make is not something I could ever consider, and I rightly thought that this veneer press would be used again in the future. And, soon after it was.

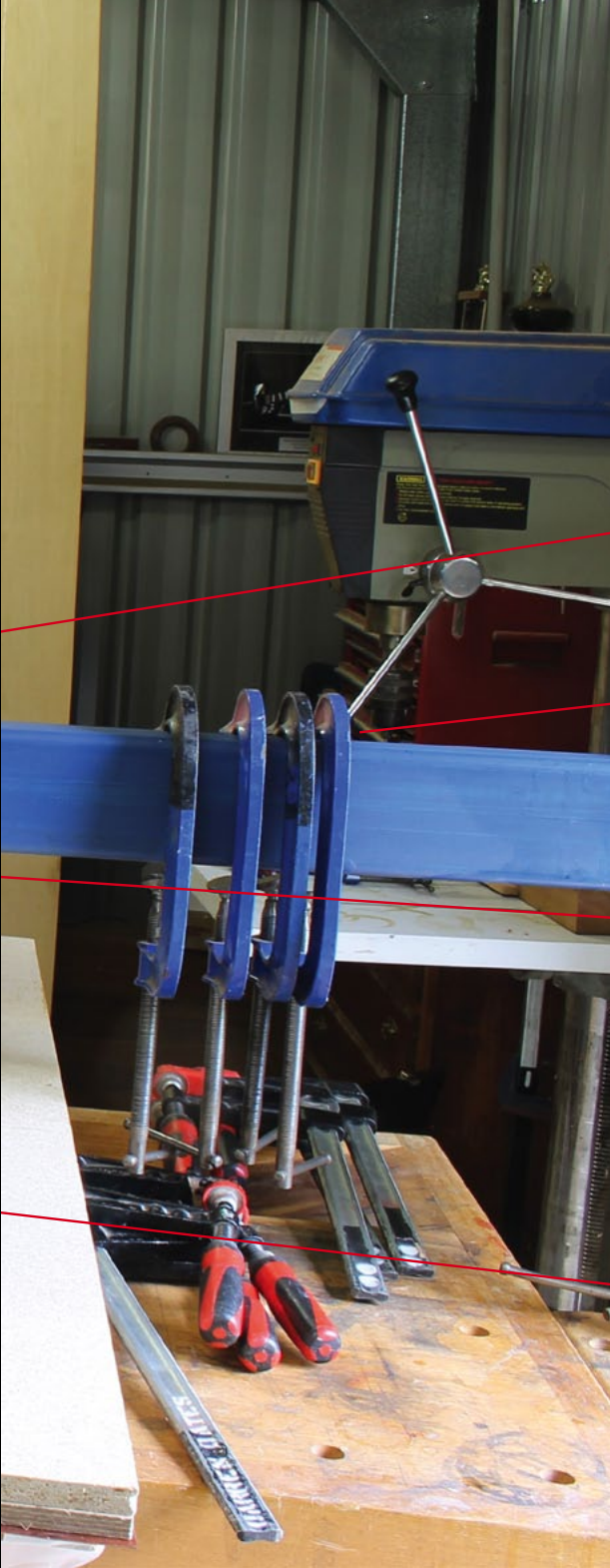
The NSW Woodworkers Association is having an exhibition at the Lane Cove Gallery in September this year

and I wanted to make one of my *Spiralay* wall panels. The 1220 x 1220mm half panel of 12mm marine ply I used as substrate was again too large for my vacuum press so once again my large manufactured veneer press was lowered down from the spot I now store it.

Materials and construction

The press cost me less than \$200 to make and takes panels up to 1600mm in width. If you decide to make one, you will need basic welding skills and access to an MIG welder. The actual welding takes about two hours so you could hire a welder for half a day and still have time to weld up anything else that needed doing around your workshop.

Frame Construction



7 x 300mm
lengths of 5/8"
BSW threaded rod

The frame is made from 100 x 50 x 4mm thick RHS. You need 4 x 400mm lengths, and one length that is the distance between your mounting poles.

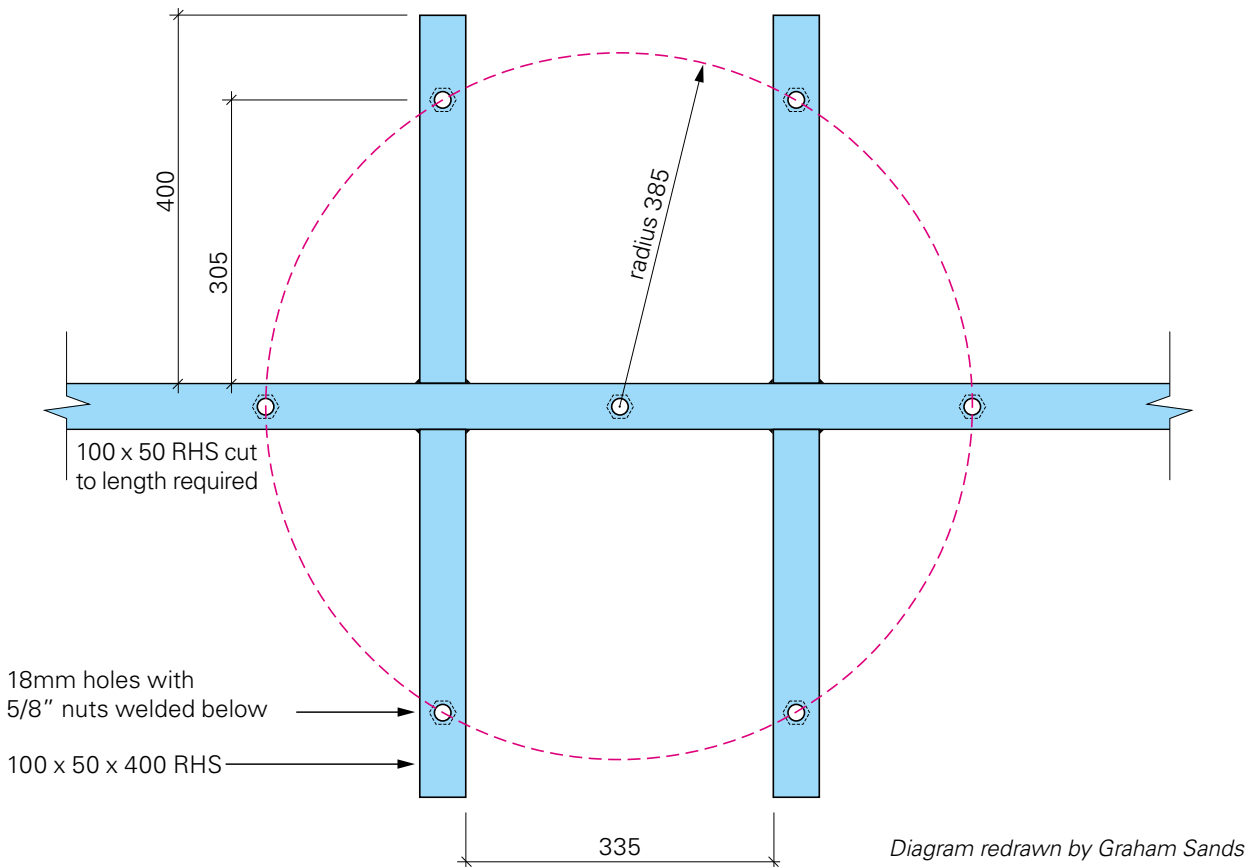


14 x 5/8"
BSW nuts for
rod ends



Pressure plates
made from
marine ply with
flat steel / tube
for locating rods

Placement of the main beam and side beams for welding and drilling.



I had all the rectangular hollow sections (RHS) metal cut to size by a local metal supplier. You could do this yourself but for around 60 cents a cut it is not worth saving the money as the cuts from the metal supplier will be nice and square and clean.

You will also need threaded rod. I used 5/8" BSW zinc plated mild steel rod, which can be bought from many places including Bunnings. To go with the rod you will need 14 nuts to suit.

To use the press you have to be able to mount the main beam across your workbench. I have two poles in my

workshop that I drag my workbench between when using this jig that I can mount the main beam to. I have my setup attached to a chain block and tackle, so when not in use it is raised to its highest level and bolted in place so it doesn't interfere with any of my normal workshop activities. When lowered for use it is bolted in place to the two vertical beams.

You also need a strong and flat workbench. Like most woodworkers I made my own bench and have confidence that it can handle this sort of work.

Welding the frame

As shown in the photos, there are seven individual presses that are equally spaced apart. Before welding anything, drill the seven holes, three in the main beam and one at each end of the cross beams with holes large enough to clear the threaded rod.

The cross beams can now be welded in place with a simple butt join. After the side beams have been welded the nuts can be spot welded onto the underside of the jig. You can also weld the remaining nuts onto the ends of your seven lengths of rod.

After welding all parts, spray paint them to prevent rusting. If you're going to store them as I do with a hoist you will have to make an eye for the hook to latch onto that will not interfere with the winding down of the centre press.

Pressure points

Together, the seven individual presses give an even spread of pressure. I made mine out of marine ply mainly because of its stability, but you could use whatever substrate you have lying around the workshop. The diameter of the base is 250mm.

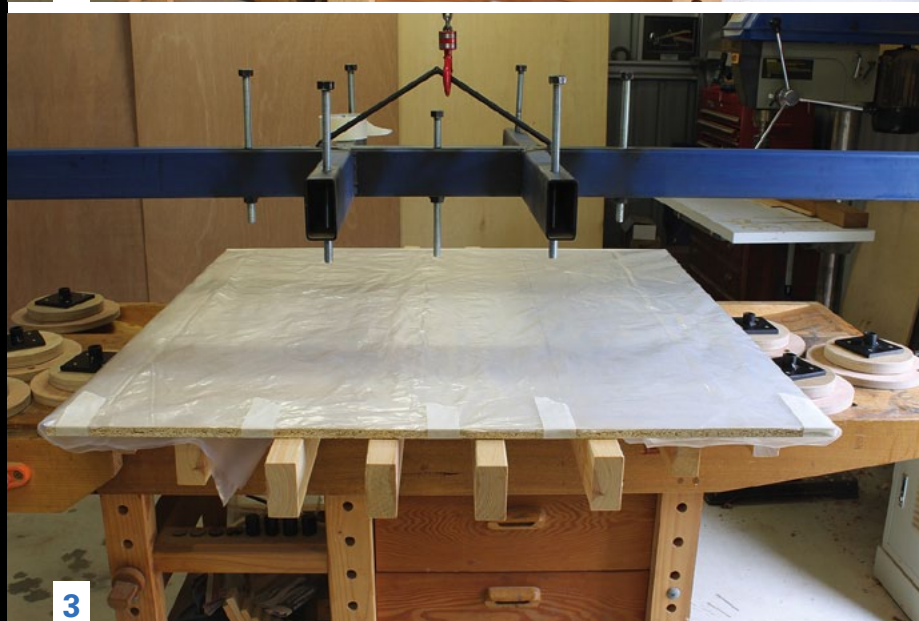
The 100 x 100mm flat steel was drilled and screwed to the top section of the press. To keep the threaded rod in the centre of the press I welded a small piece of steel tube onto the top, but this is not really necessary. I drilled a hole in each of the presses so they can be hung on the wall when not in use.

Using the press

Move your workbench so the centre press is in the middle of your four workbench legs and secure to the outside vertical poles or walls.

You will need bracing under the substrate – I used eight pieces of 90 x 45mm kiln dried Baltic pine. You want really stable timber here, so don't scrimp and buy the cheapest radiata pine you can find.

On top of this rests a backing board covered in plastic, as this is the side the glued veneer will be placed on. The last thing you want is for adhesive to seep through the veneer and then glue itself to the backing board as this will cause tearout.





1. Your workbench needs to be centred under the press.
2. Use stable timber for the bracing that goes under the substrate.
3. Cover the backing board in plastic so the veneer won't stick to it.
4. Use two-part epoxy or UF adhesive for longer open time.
5. Once even pressure has been applied, use packers and clamp up.
6. The author with the completed *Spiralay* wall piece.

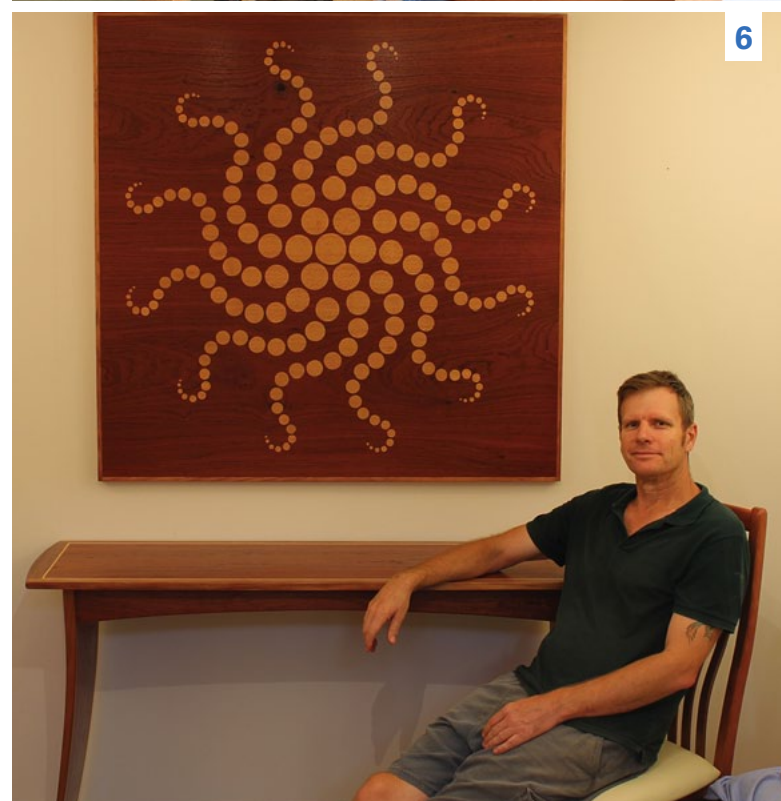
For a glue-up of this size you will either have to use a two part epoxy or urea-formaldehyde, as you need a glue with a long open time. I use Techniglu which gives me about half an hour to get the substrate into the press. I use a 5" wide piece of perspex to apply the glue. Take care not to apply too much glue. You only want a wet look to both the veneer and the substrate. Too much glue and you'll have too much seepage through the veneer. Disposable gloves are a must as this stuff gets everywhere and is very hard to wash off afterwards.

Place the glued veneer with the glue side up and then place the substrate on top of this. Start winding down the seven presses so there is even pressure on all (*see main photo, p.42*). You don't need a huge amount of pressure for a successful glue-up. The main beam will lift slightly so you will have to go around several times adjusting each press until an even pressure is felt.

Now, using packers, use F and G clamps to press the outside of the substrate. I leave these glue-ups in the press overnight. Once out of the press you can tap the ends of your fingers onto the veneer and any spots that are properly glued will make a dull thud and any spots that have not taken will make a much higher pitched lighter sound. This is the second time I have used this press and I have not had any improperly glued spots yet.

The time taken to build this setup has already repaid me in what I've been able to press in-house with it. I know I'll use it many more times, and until then it's stored in such a way that's it not taking up valuable workshop space.

Darren Oates is a studio furniture maker in NSW who also teaches at Sturt School of Wood. Email darrenoates@gmail.com 



Wood Warrior

Why identifying tree species can help to save the earth's forests. Story by Linda Nathan.



Morris Lake, 74, welcoming me into his Queenslander style house, is not the person you would think most likely to wage war on illegal logging practices...but that is in reality what he is doing.

I have to confess I am in awe of Morris. In the course of his 37 years as a technical officer with the Department of Primary Industry, Morris has put out over 450 books

and publications. We're not talking literary fluff here, these are works based on numerous research projects, statistics and a lot of trekking around the back blocks of Queensland visiting beef, dairy, pig and bee farmers, for example. On top of that he wrote for and edited *World of Wood*, journal of the International Wood Collectors' Society (IWCS) for another seven years. 'For my whole working life',

says Morris, 'my aim has always been to take knowledge and make it available to other people'.

Morris reels off statistics at a dizzying rate that just keeps going. Compared to other continents, Australia has a staggering number of native tree species. A whopping 5300 in fact. To put that in perspective, the UK has 47 and Western Europe has 67. (For the record, Morris listed 4500 Australian



Left: Morris Lake in his workshop, standing near shelves stacked with an assortment of wood species.

Inset: Wood samples are labelled and filed.

There's a table made from *Alloxylon pinnata* (NSW waratah), and another from Huon pine (*Lagarostrobos franklinii*) with King Billy (*Athrotaxis selaginoides*) and Californian redwood (*Sequoia sempervirens*) inlay. Morris made both by the way, and all the *Quercus* (oak) chairs that sit around them.

There's a small drawer chest of native *Allocasuarina torulosa* (forest sheoak), 'really hard to cut across the grain', and sculptures shaped from *Callitris* and a stump of boonaree (*Alectryon oleifolius*). Quarters of the latter were reversed and joined, mirroring the way the roots of this tree grow in such a way as to funnel precious water back into its entire organism.

species in *Australian trees and woody shrubs – common, local and scientific names*, in 2006¹)

Of our 5300 native species, 1200 may be classified as rainforest. Morris's newly published book, *Australian Rainforest Woods*², lists 141 of the most significant. What makes this book special for woodworkers is that, unlike botanical publications, it also describes their wood.

It's no surprise that wood is everywhere in his house, nor is it that Morris uses mostly scientific names as he describes some of its contents. 'To me, every piece of wood that I pick up tells its own story about its genetics, how it grows and where it evolved from', he says.

The floor in his house is *Flindersia australis* (crow's ash), that he got from Kalbar some 20 years ago.

There are display cabinets made by Morris, and others by local wood artisan Jada Bonaventura filled with collected turnings, carvings and boxes made from many different species. But wait there's more. Throughout the house are numerous landscapes and paintings in oil, because it transpires that Morris is also a painter, and in fact studied art for a couple of years at Armidale University in the 60s. Is there nothing this man can't do?

Descending a beautiful custom made red cedar (*Toona ciliata*) stairwell past the expected library of books takes the visitor into Morris's real world of wood. Of his 3,000 or so wood samples, more than half are catalogued and filed in purpose-built cabinets made from mulga (*Acacia aneura*) – by Morris of course. (The next set of drawers will be made from beefwood (*Grevillea striata*) by the way).

Through the door and into a wood workshop. Bandsaw, drill, tablesaw, lathe, finisher, drop saw, walls covered in tools, jars, bits and bobs make this a real 'shed' – and the laundry doesn't take up too much room.

Meetings with other members of the International Wood Collectors Society always involve swapping and sharing samples of species local to members. For the collector these will be processed into standard sample

sizes. The 'leftovers' can become boxes with feature lids that Morris likes to give away.

Another book is on the way, this one will cover Australian forest woods and may take up to two years to complete but in the meantime there are important projects to launch. It's obvious that Morris is passionate about trees and wood. However trees also have a much more profound importance that he points out in his book and in other writings. 'We have a direct evolutionary relationship with trees', he says. 'Plants, through their chlorophyll, produce almost all of the oxygen we breathe. As well, trees suck up huge quantities of rainwater that would otherwise flow back to the sea. In a single day a large rainforest tree can pump over 1,000 litres of water into the atmosphere.'

Rainforests represent a 'cradle of biodiversity', essential for sustainability of all forms of life. Less than 0.12% of Australia's land mass is now covered by rainforest – once upon a time that figure was 60%. However of greatest concern are current levels of deforestation that are occurring throughout the world.

In a paper presented to the IWCS and to the International Wood Anatomists Society in July, Morris wrote: 'If I am to respect the advice from my peers at the Australian National University and the University of Papua New Guinea – that with the massive escalation, of mostly illegally harvested rainforest hardwoods, throughout most of the tropical regions of SE Asia, and now the recent re-escalation in south America, then more than 80% of the world's rainforests will be gone by 2025 at the latest.' The



impact of this is manifold, reduced biodiversity and rainfall are at the top of the list however.

One great factor that allows the demand for illegally harvested logs to exist, is the fact that it is so hard to identify the wood and the resultant supplying of them under other names obfuscates this even more. We need to be able to 'actively control quotas and species in order to control sustainable harvesting of the world's rainforest hardwoods', Morris said.

At the same IWCS meeting Morris launched a project which aims to facilitate the creation of an international species identification database enabled by the streamlined process of preparing endgrain samples for macro photography developed by fellow IWCS member Jean-Claude Cerre in France. This would draw on existing computer pattern recognition

technology extended with algorithms that would allow for variability. With Cerre's system, one technician can process up to 30 specimens a day, making such a project feasible. Existing techniques are far more time-consuming and currently only 7% of the world's wood can be identified without accompanying botanical specimens.

I asked Morris what the average person can do to at least *not* contribute to the world's deforestation? Buying wood certified as sustainably harvested should be the answer, however it's not that simple as Morris feels that surety of imported and even local species is not always possible. Part of the answer is for people (more so woodworkers) to learn more about wood species and how to identify them, while endeavouring to seek out reliable sources. Sharing knowledge is always the first step.

Photos: Linda Nathan

For information about Morris Lake's book email publishing.sales@csiro.au.

To learn about the International Wood Collectors Society visit: www.woodcollectors.org

1. Lake M J (2006) *Australian trees and shrubs-common and scientific names and toxic properties. Second Edition 2006. International Wood Collectors Society. ISSN 1 876601 04 3.*
2. Lake M J (2015) *Australian Rainforest Woods, Characteristics, Uses and Identification. CSIRO Publishing, Australia. ISBN 978148631799.*

Left to right:

Morris Lake's house is filled with paintings and wood art, much of it created by himself.

Samples of wood will be prepared, labelled and then filed.

A sculpture by Morris Lake that was an exercise in steam bending.



A Square Burl Box

UK fine furniture and toolmaker David Barron makes a dovetailed box.



The starting point for this box was a nice chunk of red mallee burl which leant itself to a square lidded box which would make best use of the wood. The lack of grain direction found in burrs was also helpful in keeping the lid looking square in the finished box. The burl panel was cut on the bandsaw using a carbide toothed blade which gave a very clean finish and cut this very hard wood with ease (**photo 1**).

The wood I chose to harmonise with the red mallee was a small piece of Cuban mahogany which I'd had for years. It wasn't thick enough to re-saw and get all four corners matching, but the grain was straight and even so the fourth corner wasn't a problem.

All the sides were cut on the tablesaw using my newly upgraded crosscut sled, fitted with the excellent Flipstop system (**photo 2**). Coloured dots were added to identify the matching parts, as well as showing which was the outside and which was the top. I've seen many methods of identifying parts but for me this remains the easiest and most foolproof.

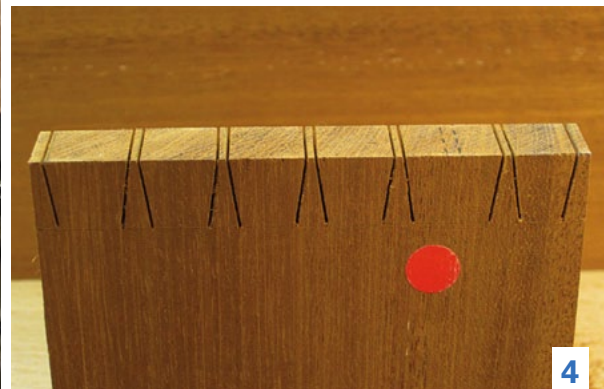
Marking out for the dovetails needed to be done with care, remembering to add 2mm to the section where the lid was to be separated on the bandsaw. The dovetails were cut using a Japanese dovetail saw and my magnetic dovetail guide (**photo 3**) with a 1:6 angle (my favourite). The resulting cuts were straight, at the same angle, but above all, dead square (**photo 4**).



1



2



4

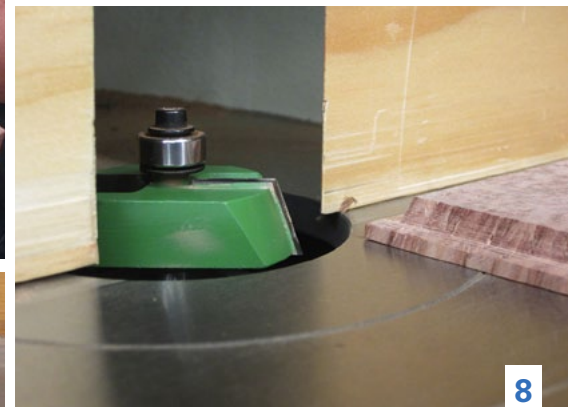


3

Opposite page:
The finished box
in mahogany
with red mallee
burl. Photos: Jon
Banfield

1. A chunk of red mallee burl I've had for years sliced cleanly on the bandsaw.
2. Box sides cut with a crosscut sled. Coloured dots make matching up easy.
3. Cutting the tails using the author's own 1:6 magnetic guide.
4. Showing nice clean and square cuts on the tails.

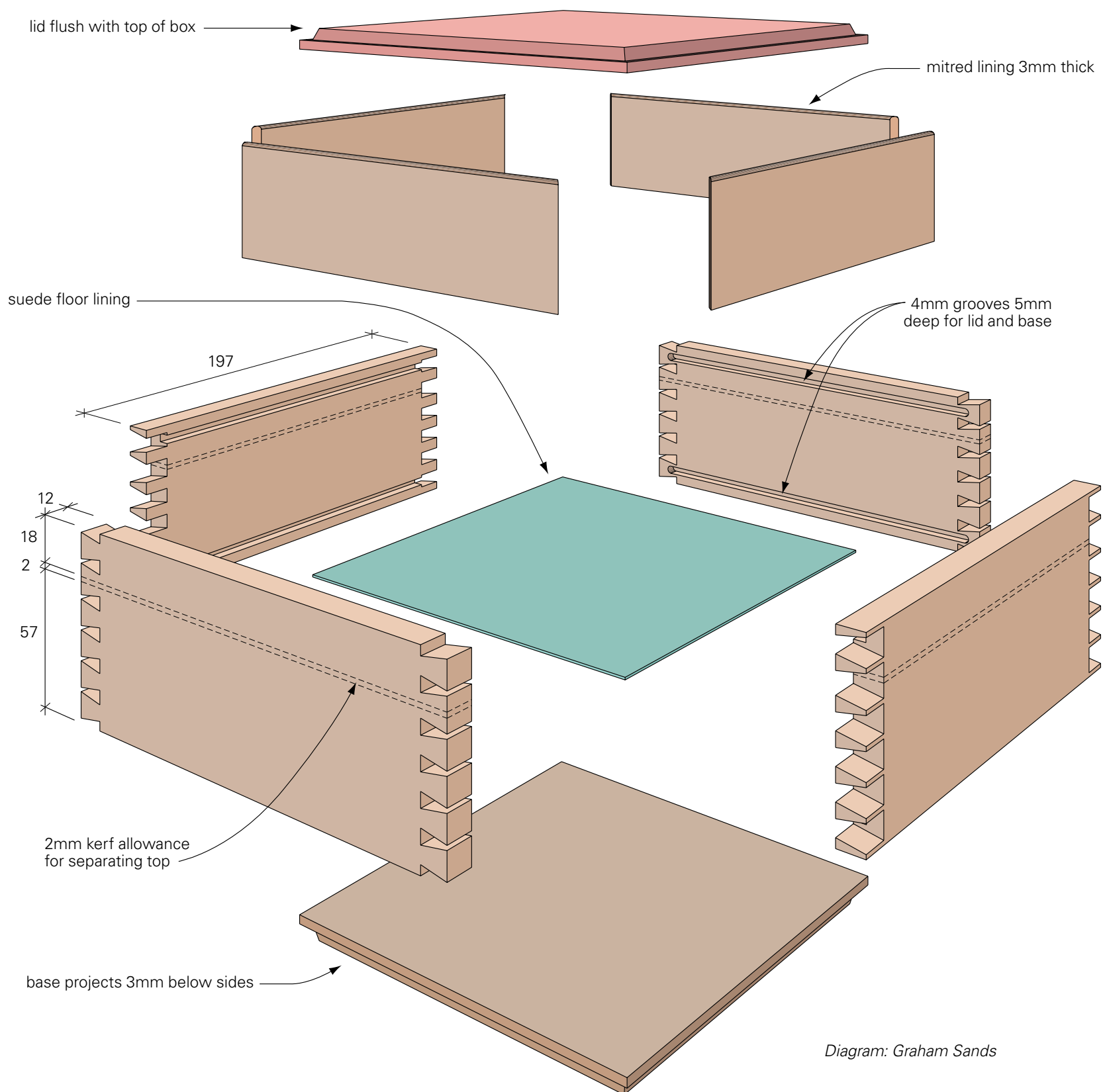
5. Removing the waste with a fine jewellers saw.
6. Marking the pins with a dovetail alignment board.
7. Routing the grooves for the top and base panels.
8. Becksvoort angled rebate cutter gives good results.
9. Starting the dovetail assembly before adding glue.



With the waste cleaned out (**photo 5**) it was time to mark the pins. This is made a lot easier and more accurate with the use of a dovetail alignment board which clamps the pin board securely in the vice and allows the tail board to be moved until its position is just right for marking (**photo 6**). By lining up both parts against the fence it not only keeps things square, but ensure that grooves for the lid and base also line up*.

The grooves for the lid and base were cut on the shaper with a 4mm router bit; this was done in three passes to a depth of 5mm (**photo 7**). For the stopped cuts on

Square burl box construction (mm)



the tailboard, I again used the Flipstop system on my shaper fence to limit the travel of the cutter.

The fence is attached to the cast iron surface with a pair of large Magswitch featherboards. The rebates on the lid and base panel were cut with an angled cutter, designed by Christian Becksvoort (**photo 8**) and available from Lee Valley in Canada. If used accurately this gives a tight fitting panel whilst maintaining a nice even reveal and I've been using this on my lid panels for years.

The thickness of the top was cut so it was flush with the box sides giving a clean look. The base was made 3mm

thicker than the top and therefore protruded beyond the box sides to give a subtle floating appearance. This extra thickness also added welcome weight to the base which helps with the stability of the box.

The pins were cut using the other side of my magnetic dovetail guide and the whole thing was ready for glue up. I like to get all the dovetails engaged before adding any glue, this checks the fit as well as speeding up the assembly before the glue starts to dry (**photo 9**).

I used the bandsaw to cut the lid off (**photo 10**), but this could just as easily be done on the tablesaw or router table.



11



12



13



14

It could also be done with a handsaw if your skills are up to it! Whichever method is used just allow the appropriate amount of waste when laying out your dovetails. Cleaning up the sawn surfaces dead flat is easily done on a planing board by working through the grits (**photo 11**).

The hinges I used were Neat Hinges made by Ian Hawthorne, they have a built-in stop at 95° and are easy to fit as long as they are done very accurately (Brusso also make these hinges). Stops need to be set in both directions to exactly 31.5 mm from the cutter tip and I set this with a spacer. I used an 8mm up spiral bit for a super clean finish and took great care as there wasn't much waste left either side of the groove (**photo 12**).

It best to clean up and finish the back of the box before the hinges are finally fitted (**photo 13**), otherwise this could be awkward. The same applies to the inside surfaces where the lid was cut off. The other outside surfaces are best

cleaned up after the hinges are fitted so they are perfectly flush. The top panel being flush with the sides is also easier to finish off, using a random orbital sander, after the box is assembled.

The next stage is to line the interior, which was done with padded pig suede and mitred inserts to give a soft close to the lid. First some 0.3mm card was cut to 1mm less than the interior base, to allow 0.5mm clearance on each edge for the suede to fold over. Some 3mm thick foam was cut on the bandsaw using a sharp blade (**photo 14**), this sounds as if it won't work but it cuts surprisingly easily.

The foam was then glued to the card using permanent spray adhesive and trimmed flush (**photo 15**). A piece of nice pig suede was cut 20mm wider than the card all round and then good quality double-sided tape was applied to the back.

10. Removing the lid on the bandsaw.
11. Cleaning up the bandsaw marks on a planing board.
12. The finished hinge rebates.
13. Cleaning up the dovetails with a HNT Gordon palm smoother.
14. Foam for the lining was cut on the bandsaw.
15. Card is spray glued to foam and then trimmed.
16. Double-sided tape was used to stick the pig suede to the foam.
17. The end result is a nicely fitted suede base.
18. Cutting the mitred lining on a shooting board.
19. Mitred inserts give a soft-closing quality feel.



15



16



17



18



19

Each corner of the suede was cut (**photo 16**) to allow a neat fold over and the foam side of the card was carefully positioned onto the suede after removing the tape backing.

This gave a nice tight fit without buckling and could be left like that (**photo 17**), although I like to add a mitred wooden lining which gives the box a soft close to the lid. These were cut to 3mm thick and the mitres carefully cut on the shooting board (**photo 18**).

The outside edges of the inserts need rounding over until the lid just closes without obstruction. If you've got it right the lid can be dropped closed without banging, giving a quality feel (**photo 19**).

The discrete fingerhold doesn't clash with the square lines of the box and is made with a rasp and followed by sandpaper wrapped round a small cylinder. I kept

the finger pull as small as possible to match the small proportions of the box. I find that burrs are best finished with a surface coating such as shellac — oils can leave a blotchy result and have a habit of seeping back out causing shiny spots, even days later.

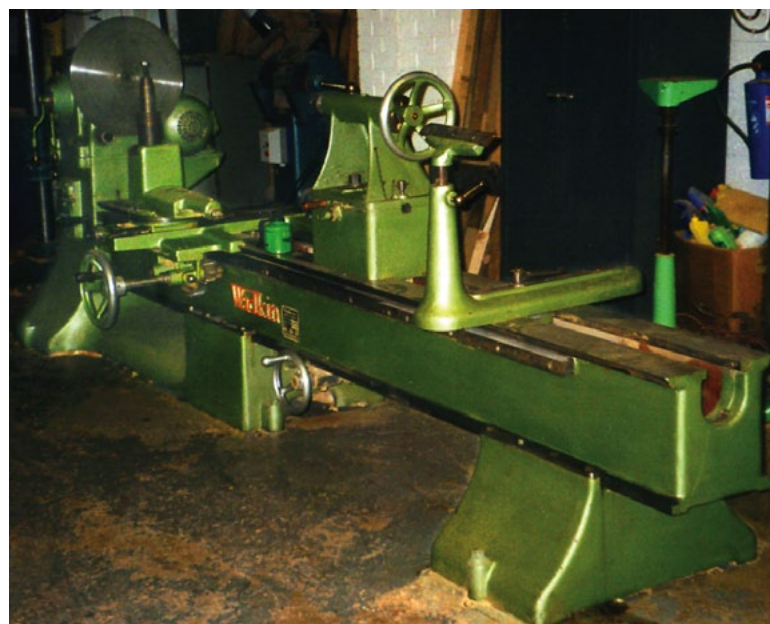
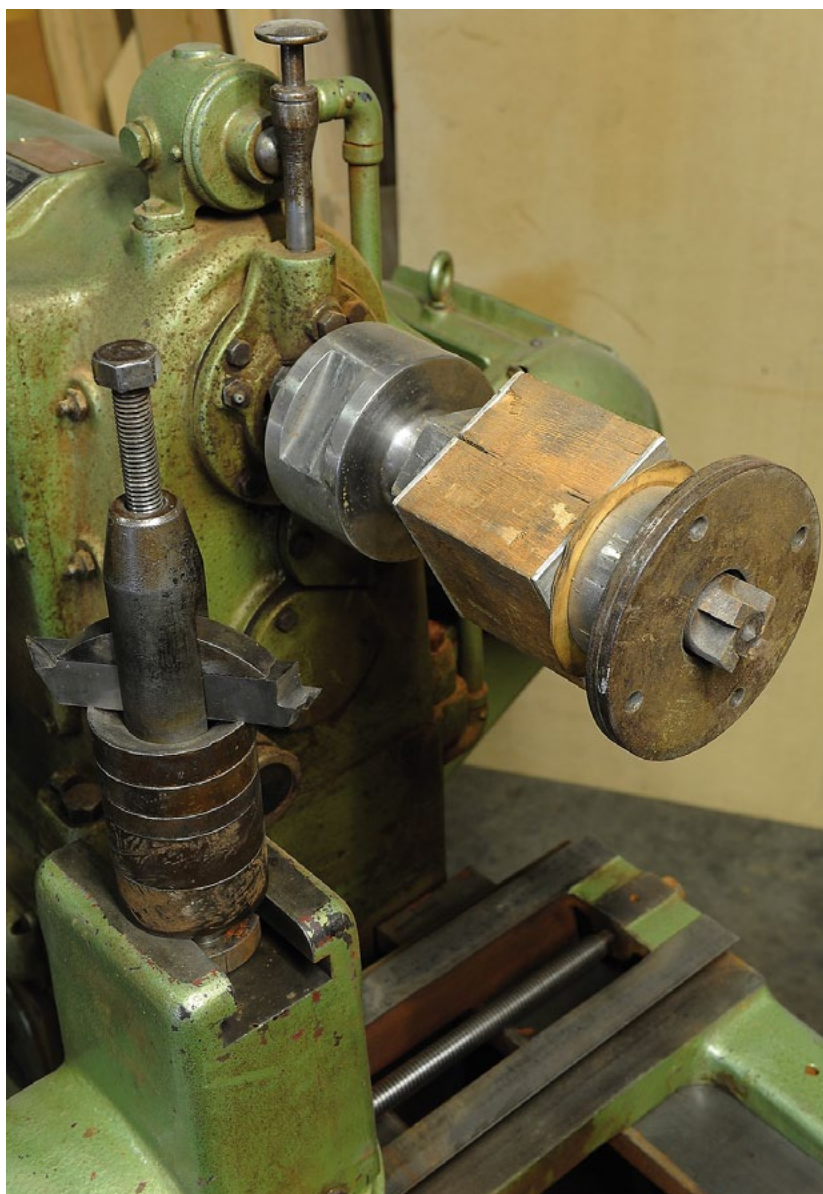
My chosen finish was Melamine Lacquer which I rubbed on with a cloth and immediately wiped off with a clean rag as it dries very quickly. Two coats of this followed by a gentle rub with a soft Abranet 600 grit pad, gave a soft and durable sheen.

Photos: David Barron

** You can see how to make a dovetail alignment board on David Barron's YouTube channel.*

David Barron is a UK fine furniture and boxmaker, who also retails some marking tools and guides of his own design and manufacture. See www.davidbarronfurniture.co.uk for more information.





Rare Machines

In a follow-on from last issue's Collector Special, a tour of some of the special-purpose Wadkin machinery owned by Vince Manna.

Patternmaking is one of the many tasks I am contracted to do from time to time. It is challenging work to say the least. The thing I have learnt about patternmaking is that you spend a hundred times longer thinking about and making the necessary high precision moulds, replicas, patterns and jigs for castings, than the actual parts to be cast.

Over 25 years ago, when I was producing furniture and fittings on a commercial scale, I went to the UK and purchased several containers of Wadkin machinery, including the three great lathes shown here. These monsters weigh around 2.5 tonnes each. Even to move and house them was a challenge.

Wadkin produced machinery for Britain's war effort during the First and Second World Wars. The dealer I bought the RS 10" and RU 12" giant lathes from told me they were used during WWII to make innumerable wooden moulds, castings and prototypes for tanks, aircraft and artillery shell components.

The night I was to leave the UK, I found myself instead heading back from the airport to the centre of England. I had been ridiculed by the many patternmakers I had phoned in the hope of finding someone wishing to sell an RU 18" inch lathe as it was a very rare machine and much sought after by local patternmakers.

More than 350 calls later, one man informed me he would sell it to me upon an inspection. The premium and immaculate machine shown above was paid for on the spot and shipped back for me to Australia.

This machine was the last of its type to be manufactured in 1955 and used in the UK aviation industry at the De Havilland Eng Co. I couldn't make up my mind which large lathe to purchase at the time so I bought them all instead. I designed the head spindle to accommodate a number of mechanisms, including a special hollowing tool attachment for a series of massive timber vases.



Opposite page: Wadkin RU 18" patternmakers wood lathe has a 36" dia swing/turning capability, sliding gap bed and all-gear spindle speed change. It can turn lengths over 2.5 metres and is a true gem.

The company badge is named after Captain Sir Geoffrey de Havilland, British aviator and aircraft engineer.

This lathe enabled the turning of very large architectural mouldings for fitouts of worldwide Tiffany stores which the author was commissioned to do.



Left: Wadkin RS 10" inch gap bed patternmakers wood lathe, fitted with rack-driven carriage assembly and compound slide rest for turning long work. 'A great machine for turning to high precision and accuracy, even to the finest of details.' This RS 10" was fully stripped back and restored by Vince to its original colour. The detail shows the cutter profile.



The nature of the work I do has changed, however the Wadkin machinery I still own remains central to any machining work I need to carry out. Despite its age, these old Wadkins were made purely with function and accuracy in mind, and no shortcuts were taken in their construction. Of all my collections these machines are by far the most precious to me. In fact soon I'll be using them to create some very challenging 'out of this world' pieces!



Vince Manna is a woodworker, a photographer, an adventurer... and a collector. See www.vincemanna.com and email him at vincemannapictography@gmail.com

www.vincemanna.com and email him at vincemannapictography@gmail.com

Above: The Wadkin RU 12" patternmakers lathe with sliding gap bed and all-gear spindle speed change is smaller in swing action but much longer than the 18" lathe. Turns 3.5–4.2 metre lengths between centres. A true giant. With its incredible length it has the appearance of a train. It has been used to turn long massive architectural columns. A fine detail on all these lathes are the handles made from buffalo horn.

Right: Rare Wadkin JTA vertical reciprocating sanding bobbin and disc with tilt table. Great for accurately sanding mitres and solid curved edges – such as this rare black ancient red gum burl!

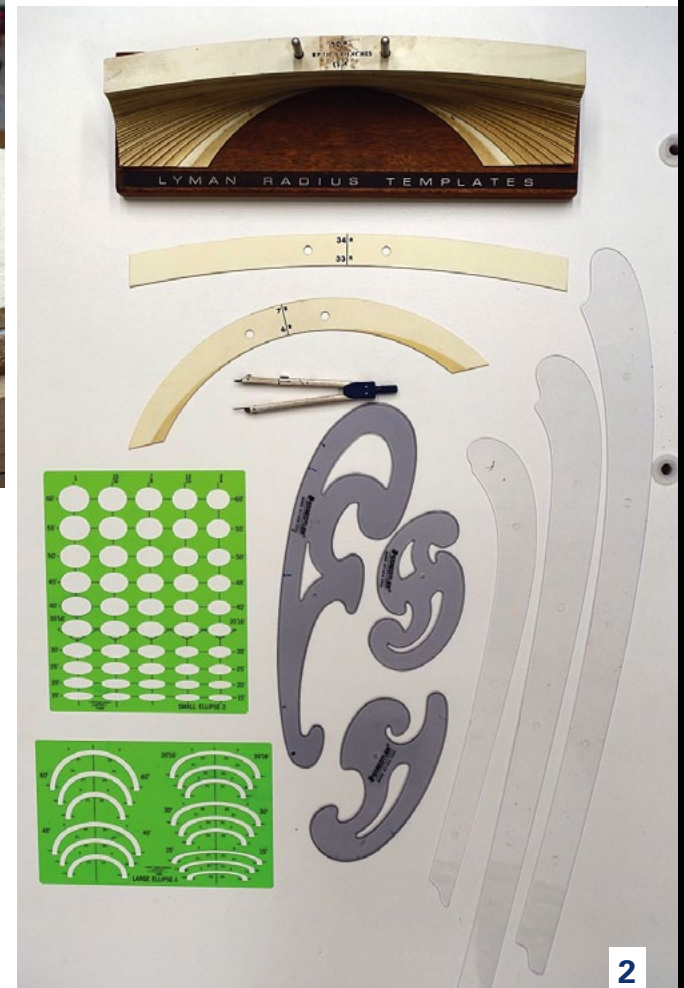




The author cuts out a curved leg template on the bandsaw.



1. You can buy trammel heads like these and machine a beam to fit. These work well for drafting larger circles.
2. Tools for drawing curves, clockwise from top: radius templates, shipwright's templates, compass, french curves, mathematical templates.



Drawing and Fairing Curves

Simple techniques for drawing and cutting curves for your next project. Story by Damion Fauser.

At some stage many woodworkers decide to break away from straight lines and add some curves to their pieces. Curves can add grace and elegance, as well as lighten the visual weight of a piece. Incorporating curves into a piece doesn't necessarily require elaborate or expensive equipment.

My aim here is to show you a few methods that I've developed or picked up for successfully drawing and cutting curves, and also ways to remove the saw marks that may result.

Curves fall into two broad categories, geometric and freeform. Here we'll look at two common types of geometric curve, the circle and the ellipse, as well as freeform curves.

Template or not?

You can use the following techniques directly on components, or to generate templates. I like to maintain a library of templates for all my projects, in case I ever need to build one again. Templates also allow for the design and construction of jigs for production work.

Another advantage of templates is that if you do your curved drawings directly onto a component and make a

mistake, either whilst cutting or fairing the curve, you will need to repeat the drawing stage again. If you make a template you can just mill another blank, retrace the master drawing and go back to work.

Drawing curves

Circles. For smaller circles I use a number of items, including a drafting compass, plastic circle templates from art stores, or even random workshop items such as tin and jar lids, tape rolls, saucepans etc.

For larger circles I use two methods. The first is a trammel arm, which is essentially a long straight beam with a pivot point at one end and a pencil at the other at the desired radius. You can make this yourself or buy trammel heads from tool suppliers (**photo 1**). By maintaining the same pivot point and shifting the location of the pencil head you can generate perfectly concentric circles, which is great for designing tabletops with inlaid border patterns for example.

Secondly, I use one of my two sets of radius templates. These are machine-cut sets of plastic or laminate templates that are each cut at slightly different radii. I got both of mine from eBay for a fraction of the price they are available new (**photo 2**).



Elliptical Jig

This jig is very simple to make. It will draw a mathematically precise ellipse, which is a shape defined by the fact that the sum of the distances from any point on the circumference to the two focal points of the ellipse is constant.

1. For the centerpiece, take a piece of ply or MDF that is at least 12mm thick. Run two grooves through the centre that are perpendicular to each other.
2. Fix four small pieces of mitre track into these grooves, leaving a small gap in the centre to allow both tracks to have a full range of movement, and to drill a hole through the base so you can align your jig over the centrepoint of your workpiece.
3. Mill some hardwood stock to act as runners in the tracks. This should fit snugly but be able to slide freely without any rub points. Drill and counterbore holes for some pivot pins (I used 1/4" bolts) through these runners.
4. Mill some stock for a trammel arm. Mine is 3/4" x 1/4" in cross-section as I use my Starrett trammel head with this jig, but you can make yours based on however you choose to secure your pencil. Drill some holes through the trammel arm for the pivot pins (I glued extra stock to the sides for this task) and secure your runners to the trammel arm. I've simply used wingnuts and washers.

Using the jig

Place one runner in each slot. Mount your trammel head/pencil at the chosen point of your trammel arm, locate your jig over the centrepoint of your workpiece or template stock and rotate the trammel arm around the base piece.

The runners will slide back and forth in the two mitre tracks as the trammel arm tracks a perfect elliptical shape. The jig works because at any point on the path that your pencil takes, the sum of the distances from the pencil to the two pivot points remains the same.

You can make concentric ellipses with the same profile by maintaining the same pivot points and simply shifting the location of the trammel head on the arm. Or, you can alter the form of the ellipse (ie longer and narrower or shorter and wider etc) by changing the location of the two pivot points on the trammel arm itself. By playing around with the pivot points you can achieve the very shape you want.

To cut a perfect ellipse, make a trammel arm that can be fixed onto the base of your router and use the technique described in this article to cut circles with the router trammel.



Above: Ellipse Table, photo Frank Pronesti

Ellipses. The ellipse is a very elegant form and surprisingly easy to draw accurately. Again, for smaller versions I have a number of plastic drafting templates, which I commonly use for drawing profiles on the ends of table and stool legs as a visual guide for shaping legs to an elliptical cross-section. For large ellipses I use the jig shown opposite.

Freeform curves are any non-linear line or shape that does not fit a standard geometric or mathematical definition. Designing projects with freeform curves and drafting those curves can be a lot of fun.

I use a large range of drafting aids for this purpose, including drawing bows (**photo 3**) french curves or shipwrights templates (**photo 4**). You can even achieve freeform curves by blending sections of geometric curves such as circles and ellipses. Of course you can also do this completely freehand.

Cutting curves

The methods you use will depend on the scale of your drawing. Regardless of which tool you use, you'll need to consider the tightness of your curves and choose a suitably narrow blade profile to allow the blade to turn within the curve's profile without binding inside the kerf.

Freehand. You can cut curves by hand, with a coping or fretsaw. You could use a handheld power tool such as a jigsaw or oscillating tool. Or you can use the bandsaw, with an appropriate blade. With geometric shapes, there are also other ways by which you can achieve a surprising level of control and precision.

Bandsaw circle jig. Take a sheet of ply or MDF at least 12mm thick and sized so that about a third of it fits on your bandsaw table and does not hit the frame of the machine.

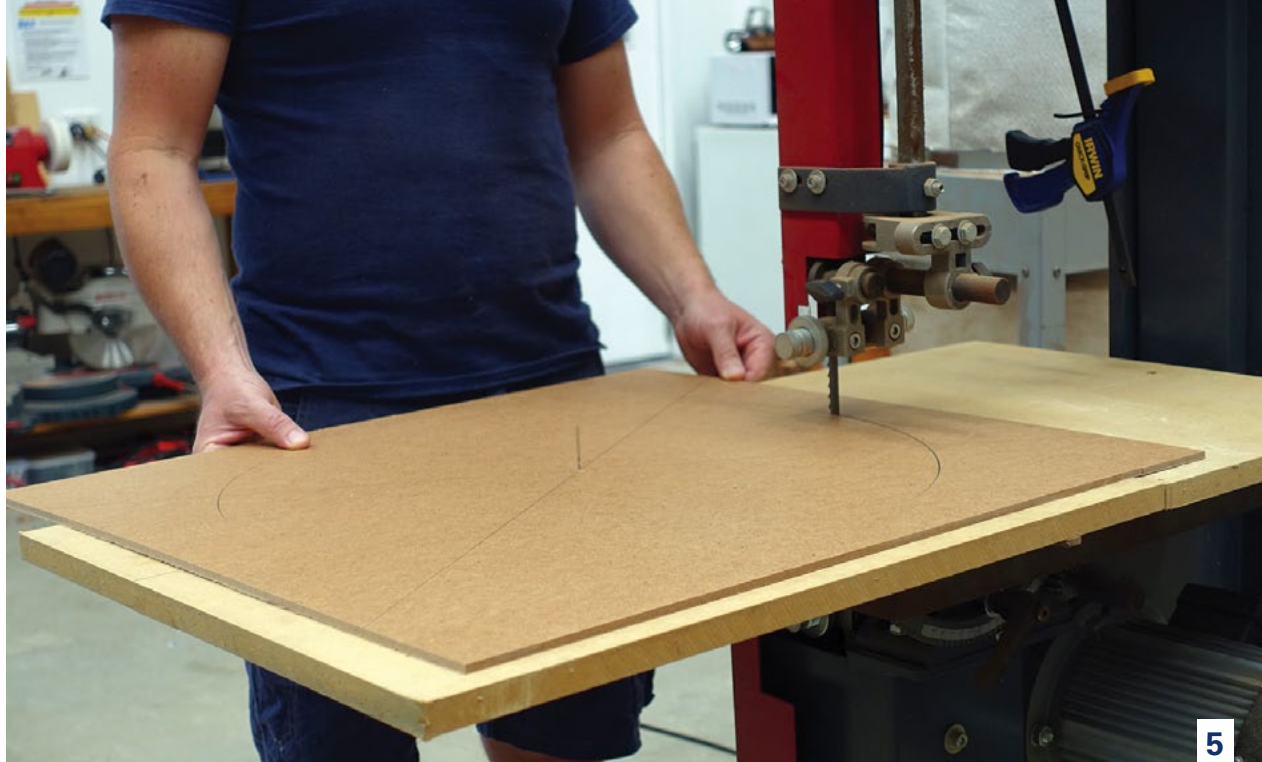
Machine a hardwood runner that slides neatly in the mitre slot of your saw table and fix this to the underside of your sheet. Now, turn the saw on, and with the runner in the slot, engage the sheet into the blade until the sheet is cut approximately halfway through.

Mark a pencil line from the leading edge of the blade that runs parallel to the front edge of your saw table and away from the frame of the machine. From this master line you can locate a pivot point at the desired radius. You should also drill a small screw as a stop into the underside of your slot runner, so you can stop the jig at the same point on the table every time.

I use a short section of an old 2mm drill bit as my pivot point. Drill a 2mm hole at your desired radius along your master line. Drill another shallow 2mm hole on the underside of your workpiece where you want the centre of the circle to be.



3. Drawing bows for larger constant and non-constant radial curves.
4. Radius templates were used to draft a full-scale headboard for a king-sized bed.



5. Using a shop-made circle-cutting jig at the bandsaw.
6. A trimmer in conjunction with a trammel arm can define perfect circles.
7. The waste from the router trammel is removed at the bandsaw.
8. A flush-trim bit on the router table smooths the edge with no residual surface work required.



With your pivot point in your workpiece, register it in the hole on your jig. Start your machine, register the runner in the table slot and engage the workpiece into the blade. Ensure you prevent it from rotating at this point. Once the jig stops moving forward as the screw stop engages the table under the jig, you can begin to gently rotate the workpiece around the pivot point. With this method you can cut a very accurate circle but you will have saw marks to remove (**photo 5**).

Trim router trammel jig. This is my favourite jig for cutting circles. Trace the screw hole locations for the base of your trimmer onto a long, narrow section of 12mm ply. Drill and counterbore those holes so the hardware is beneath the resulting surface. Drill a clearance hole for your router bit to pass through.



With a 1/4" straight bit loaded in your router collet, fix the jig to your router. Take a square and draw two pencil lines across the trammel arm, registering the blade of the square on both sides of the bit. Scribe another pencil line longitudinally down the centreline of the trammel arm.

By measuring from the inside edge of the router bit to the pivot point on the centreline, you can cut a circle of an exact outside radius. And vice versa, by measuring from the outside edge of the router bit, you can cut a circle of an exact inside radius. This is a very powerful technique that I use for perfectly matching radial borders to circular tabletops.



Now that you have your jig made, drill a 1/4" hole at your desired pivot point (I use 1/4" holes as I use the shank of an old router bit as my pivot point) and another 1/4" hole at the centre of the circle on your workpiece or template.

Load the jig in the pivot point, set the router bit to cut to a depth of 4–5mm, turn the machine on and lower the bit into the workpiece. Rotate the jig around the pivot point slowly until you have completed the circle (**photo 6**).

Use the bandsaw to remove the waste, ensuring you keep the sawblade in the path cut by the router (**photo 7**).



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What you have now created is a perfect circle with a rebate around its perimeter which can be used to guide a pattern-bearing bit to remove the remaining waste (**photo 8**).

This process can also be used to cut perfect elliptical shapes, just modify the trammel arm of your elliptical drawing jig to accommodate your trim router.

Fairing curves

A fair curve is one that travels in a seamless path, with no visible or tactile high or low points. The best way to determine if a curve is fair is to visually sight along its length (**photo 9**). If you have to fix areas, or just need to remove machine marks, there are a few ways to do this.

A **spokeshave** combined with an appropriate workholding device such as a shavehorse, is a surprisingly fast and effective method of smoothing out curves, as in **photo 10**.

Block planes work well for convex curves, as long as you concentrate on keeping the cutting edge in contact with the curved surface at all times.

Compass or circular planes are basically bench planes with an adjustable, flexible sole that you can match to your desired profile (**photo 11**).

A **kerf board** is a thin board of straight-grained material (hoop pine is ideal) with closely-spaced, crosscut saw kerfs along its length that don't quite sever the piece. They can achieve an amazing amount of flex (**photo 12**).

Fix some adhesive-backed abrasive to the board and you have the ideal tool for fairing out rough curves. The length and flexibility of the board allow it to perfectly match the curve you are working on, and just like a handplane, the board will bring the high points down (**photo 13**).

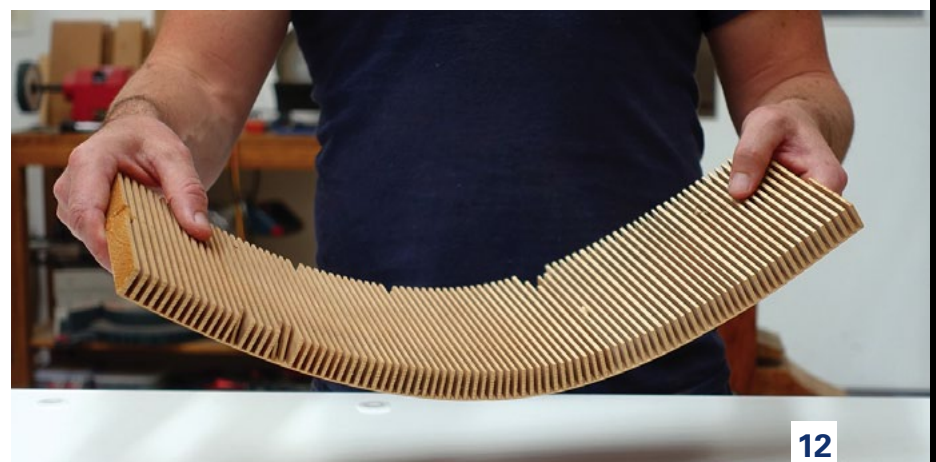
Spindle sanders. You can use oscillating spindle sanders or drum sleeves on the drill press, but I've found that with such a small amount of surface area engaged on the workpiece at any one time it is quite difficult to actually fair out the curve.



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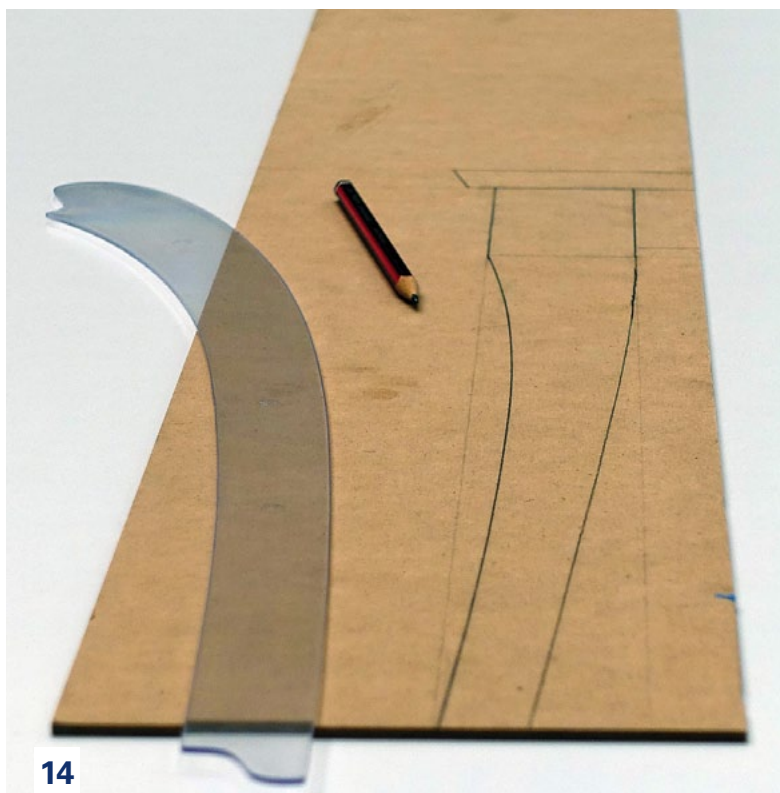
9. Sight along the length of curves to check for areas that need further fairing.

10. Using a spokeshave at the shavehorse to smooth and fair out a curved stool leg.

11. This Stanley Victor No.20 circular plane is great for curved components.

12. A kerf board is the ultimate smoothing and fairing tool in one.

13. Abrasive is applied to the underside of the kerf board.



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14. To make a template, first draft a full-scale drawing of your component.
15. Transfer the drawing to some tracing paper.
16. Fix the tracing to the template stock with contact adhesive.
17. Cut the waste away at the bandsaw.

Making a template

Now that we've covered drawing, cutting and fairing curves, let's use these tools and skills to making a template for production work.

First, draw the desired full-scale profile, in this case a small table leg (**photo 14**). Take some tracing paper and use some magic tape to temporarily fix it to the drawing, then trace over it with a pencil (**photo 15**).

Remove the tracing paper and then use some spray contact adhesive to fix it down to your chosen template stock (**photo 16**), which should ideally be at least ¼" thick, to allow for the bearings of your pattern bits to be safely engaged.

Cut this out using your preferred method – I generally use the bandsaw (**photo 17**), and then use one of the methods above to remove the machine marks and fair out the curve. Take the time at this stage to ensure your template is absolutely perfect, as whatever you end up with is exactly what your project components will replicate.

Now you have a master template for your component. At this stage, the next thing I do is to take my master template and use it to make another exact copy that I then use for my production work. My master is left intact and stored in my template library for future use.

Curves can take your work to the next level, both from a personal challenge and an aesthetic point of view. Some of the tools, skills and techniques that I've outlined in this article may help you to make a successful start.

You can see a video of Damion Fauser demonstrating some of these techniques on YouTube, search for Wood Review TV.

Photos: Linda Nathan



Damion Fauser is a furniture designer/ maker who lives in Brisbane. He teaches woodwork from his Darra workshop.

Email: damion@damionfauser.com.au





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Coral Bowl

Seaweed and coral inspire the see-through layers of Neil Turner's intricately detailed bowl.



The delicate pattern on Neil Turner's *Coral Bowl* has been worked from both sides. Made from sheoak, the finished bowl is 400mm in diameter.

While walking on the beach I found the skeleton of a piece of seaweed. Taken with its fine transparent nature, I thought it would be nice to create a piece that mimicked this.

It then occurred to me that I might be able to combine two pieces of inspiration in one piece, to create a very unique look. My thought was to make a reasonably thin walled form and then embellish both sides with a coral texture. Some of the small holes within the coral texture would line up, creating a see-through effect.

Many years ago an old friend gave me several turning blanks of sheoak.



I told him I didn't really need them all, but he said he knew that one day I would do something special with it. With an upcoming exhibition, the right opportunity came along.

I chose a form that was open, just as some coral reefs are in part. It would also be easier to create the coral texture on a shape like this.

Turn the form

The blank was checked for defects and the 400mm diameter marked out with a large compass, or you could use a round template. Any excess can be trimmed with a bandsaw. Mark the side that will be the top.

Turn the blank between centres in case you need to adjust the tailstock to minimise vibration so it will run truer (**photo 1**). This is a fairly large blank, so variable speed control will help deliver a safe turning speed.

True up the blank and start removing wood to create the outside shape (**photo 2**).

I use a system of different cuts to achieve the final result. Working with the grain from inside to outside, use a pulling cut to remove the waste, ensuring you rub the bevel as you go (**photo 3**). Then use a fine scraping cut to refine the final shape (I use a rounded skew but any round nose scraper will do).



1. Turning the blank between centres to minimise vibration.
2. Roughing out the outer shape.
3. Use pulling and pushing cuts to continue the shaping; make sure you rub the bevel.



4. Shaping the spigot for reversing the form.
5. Spigot completed. This will later be removed.
6. Shape the bowl interior with a similar system of pushing and pulling cuts.
7. Use a finishing cut with the bowl gouge.
8. Refining the curve with a rounded skew chisel.
9. Power sanding to 400 grit.

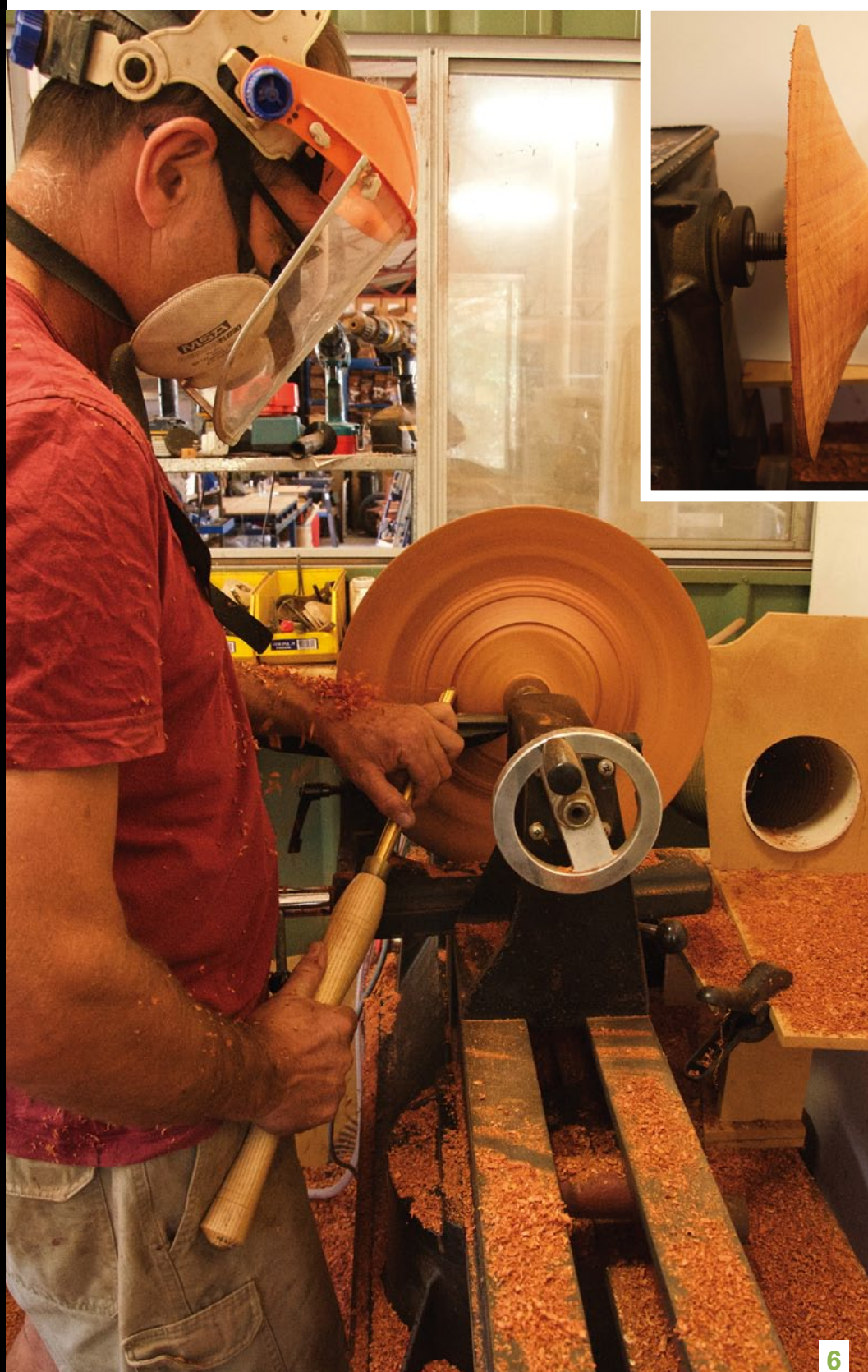


A large spigot for reversing the form was turned on the bottom with the final profile kept in mind so it could be incorporated into the final shape (**photo 4**). The spigot was shaped so the jaws could wrap right around it, giving better holding strength. I was able however to have the tailstock in position during the removal of most of the timber from the inner surface.

Photo 5 shows the roughed out profile with the spigot. With the spigot positioned in the chuck, check to make sure it's running true. If not use light cuts with a bowl gouge, then refine with a scraper of your choice. Again use pulling and pushing cuts to remove the wood from the inside, rubbing the bevel as you go (**photo 6**). A wall thickness of 3.5mm is crucial; check with calipers as you work towards the centre.

Refine the final curve with some shear scraping cuts (**photo 7**). I worked in stages of around 50mm at a time, making sure I achieved the correct wall thickness. A rounded skew was used to refine the curve (**photo 8**). After the inner surface of the form was completed I sanded it to 400 grit (**photo 9**).

I made a large round disc from scrap wood and covered it with thin foam. This was used to help drive the form when it was reversed to finish the base. The outside was also sanded to 400 grit. Remove the mark left by the tailstock centre with a sanding pad and complete the base (**photo 10**).





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10. Spigot turned off, exterior complete prior to detailing.

11. Drawing the five-sided shapes on both sides took 24 hours.

12. A 1mm round burr acted as a depth gauge as it did the initial hollowing out of each unit of the coral pattern.

13. A smaller burr was used to pierce each pentagonal section.



Texture the surfaces

To create the coral pattern I started by drawing five-sided shapes with sides that were 4–5mm long. It took 24 hours to draw the pattern on both sides of the form. Pencil would have rubbed off, so I used a 0.5mm Artline pen (**photo 11**).

On 3mm thick walls, the pattern could only be around 1mm deep, so a 1mm round burr driven by a micro motor acted as a depth gauge as it removed the bulk of the material from the pentagons (**photo 12**).

I worked the top first, removing material from the pentagons and sharpening up the details. A 0.6mm round burr was then used to make sponge-like piercings to a depth of 1mm (**photo 13**).

The other side was then worked as material was again removed from the pentagonal markings. The small holes pierced from the top acted as a depth guide.

I then went back and pierced the underside using the 0.6mm burr. Some of the holes lined up, facilitating the overall layered and lacey effect.

The finishing touches were to very lightly sand any remaining evidence of the drawing, and also to apply a light spray of Mirotone 30 per cent satin lacquer.

The whole process was extremely time-consuming and took around 168 hours. The reward is the creation of a unique see-through coral and sea-sponge inspired effect.

Photos: Suellen Turner

Main image: Victor France

Neil Turner is a wood artist who lives in Stratham, WA. He was profiled in AWR#78 and wrote about making a Sea Urchin box in AWR#80.

See www.neilturnerartisan.com.au



Bespoke makers Michael Hayes and Bern Chandley (below) exhibited as a collective at FURNITEX connect in July this year.



Bespoke is Back

Hipsters not hippies, are leading a new craft revival.

Story by Linda Nathan.

The wheel turns. Once upon a time custom made was how it was. There was no power other than the hand. Then machines came along, and repetition and economies of scale were possible. And then, in the 70s, the wheel was reinvented. We had a craft revival, and the 'hand' as in 'made' came back.

Then craft became art, and design skills were valued and taught, so much so that hand skills appeared to be on the verge of dying out. Technology took over. At TAFE colleges furniture and cabinetmakers were taught some hand skills but industry became more

interested in employees who could assemble and fit components that had been cut, drilled, bored, stacked and packed by computerised and robotic machinery.

Lower priced goods from overseas large-scale operations led to the shrinkage of local manufacturing industries. Individual furniture designer/makers continued to make things, but for most, sustainability was more about staying afloat than using ethically sourced materials. Profitability was either about competing against increasingly lower priced mass produced goods, or

charging more to an aesthetically informed but elusive sector of people who valued the handmade.

Not all will agree with this gross oversimplification of what's happened in the last 50 years or so, but it seems a new 'maker movement' is underway. Everywhere there are signs that bespoke is the new black. Gone are the hairy hippies of last century's craft revival, in are a new generation of hipsters, who see themselves as makers more than designers.

We're now seeing more and more programs and events that expose makers and designers and create market opportunities. Here are just a few examples. This year DESIGN Canberra features Modern Market and Living Artists. Sydney Design has events for bespoke makers and adopters of new technologies. Workshopped 14 runs concurrently as does a Mini Maker Faire. Adelaide will have a Mini Maker Faire in November. Well over 100 independently run 'fares' now take place around the world. In Melbourne this year Den Furniture Design Fair was launched and spotlighted design and bespoke. Decor + Design in Melbourne this year once again featured emerging makers in VIVID and the bespoke in Design:Bazaar.

In 2011 professional designer/makers created their own association, Studio Woodworkers Australia, which supports professionals and offers accreditation through a peer-judged process. However mainstream furniture industry now looks to be giving more support to custom makers. This year, the Australian Furniture Association (AFA) formed a new sub-committee headed by bespoke maker Michael Hayes to represent others like him. This new focus reflects the fact that the AFA estimates that 72% of our furniture industry comprising around 250,000 people is made up of small to medium enterprises with most large-scale manufacturing taking place overseas.

Bespoke Online

'Last year was proof of concept', says Fred Kimel, founder and manager of the Handcrafted online client-meets-maker type brokerage which is certainly making a mark. The site now represents over 250 woodworkers, and the plan, as originally envisioned, is to extend the platform to those who work in metal, stone, leather and more.

Recently received funding will help Fred to further develop the business by providing him with a survival wage and payment for his small team. The latter currently includes a full-time developer and most recently marketing support.

'Any start-up needs time to refine the business model', Fred says, having survived the financial drought of the very early days. Receiving investment from the Sydney Seed Fund, QUT Creative Enterprise Australia (CEA) and a number of 'angel' investors, Handcrafted has raised \$275,000.

To achieve a critical mass of makers on the site to attract the briefs, maker's fees were initially waived, however a recently introduced fee for Premium Profile listing signals the commencement of subscription fees.

Handcrafted has now facilitated hundreds of thousands of dollars worth of projects. 'Not all (briefs) come to fruition but there is a 30% conversion rate', says Fred. 'Now that we've got many more makers with different styles, geographies and price ranges, it means that when a brief comes in I can match it to a few makers.'

Ten years at Macquarie Bank as a senior product manager with responsibility for online business banking show when Fred Kimel talks. 'Etsy is an online marketplace that has demonstrated the value of handmade goods, \$1.9 billion US dollars was transacted last year,' said Fred, 'and that was 50% on the US\$1.35 billion year before – and they have now listed on a US exchange at a valuation of over \$2 billion'. All of which demonstrates there is market interest in connecting directly with a maker and purchasing something handmade. Whereas Etsy's average transaction is for \$25 for typically textile and crafty items, it's not as well targeted to higher value and furniture sales.

'Bespoke furniture sustainably made by local makers' is how the site advertises itself. Looking through the maker profiles on the site, the commitment to sustainably sourced, often reclaimed materials is frequently stated. For makers, running a viable business is the other side of the sustainability coin, and that means keeping the amount of time spent detailing down to a level that both they and their clients can afford.

'The younger generation of makers is just a bit more pragmatic about what people can afford but still giving clients an alternative to terrible mass-produced goods that aren't made to last,' said Fred. Where structures may have been standardised and simplified, boxes such as 'being made locally, original design, solid materials, not going to be thrown away', are still being ticked.

www.handcrafted.com 



Handcrafted founder and manager Fred Kimel.



1

Design and Carpentry

Josh Pinkus, 34, says he is 'unbelievably happy going to work each day'. He started off way back as a builder's labourer and then decided to do a carpentry apprenticeship at TAFE. When he found there wasn't much woodwork involved in the jobs he was doing he shifted into doing fitouts and making furniture.

He still calls himself a carpenter though, and maybe that's why he enjoys working with recycled wood, seeing the transformation when outer surfaces are machined back, although he also likes seeing the signs of its past, old nail holes and saw marks. 'One of the last bathroom vanities I made was from a piece of timber that started off as this black ugly

thing. No one could have known it was such a fantastic piece of hardwood.'

Josh works in shared makerspace within a former factory complex where the sound of overhead jets are a frequent reminder of its proximity to Sydney airport. The wall on the longer side of his rectangular workspace is lined with shelves and compartments full of tools and hardware. It's all very organised and there's lots on the go.

Josh likes making furniture and also likes a challenge. He will do 'anything that's thrown at him', including fitouts and set, prop and house building.

Doing detailed or finer furniture making can tend to depend on the budget that clients have to work with. Not all clients

1. Josh Pinkus in his Botany studio.
2. Recycled oregon coffee table with oxidised copper top.
3. Fitout for Avilla Crepes in Bondi using mostly recycled baltic pine with a distressed white finish.
4. Josh Pinkus carving Red Bull's logo onto recycled western red cedar.



2

want to pay for the time involved in fine crafting. 'I say to them, if you want dovetails you're going to have to pay me for the time it takes to do them.'

Accordingly with some constructions it's about the look, but Josh says he saves the 'fanciness' for when clients have got the budget to pay for the extra labour. 'I just try to make it as cool as I possibly can for what their budget allows,' remembering that even recycled wood can be costly if premium material is required.

The industrial 'bare bricks and rough rustic timber look is in now and a lot of people have jumped on that bandwagon' he says. but Josh also wonders when the 'flavour' will change, whether a 'modern, crisp look' will come back and whether 'I'll have to adapt my style again or continue doing what I do'.

In the meantime though, Josh says, 'I really enjoy having creative licence, when people just say "make me something cool", but a lot of the time people say what they want made and I help them get their ideas out'.

What's the best thing about his job? 'I just love working with wood. I really just enjoy making things and I enjoy the challenge.'

www.joshpinkus.com



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4



Workbench area
in Josh Pinkus's
studio workshop.

It doesn't get more bespoke than traditional trade skills and what are now known as rare trades are definitely receiving attention. The first Lost Trades fair last year attracted 7,000 people to a non-capital city location. This year's event, again in Kyneton, had over twice as many visitors.

On the airwaves this year, the appearance in the US of two reality television shows focusing on furniture makers and designers is another sign, albeit offshore, that makers are now cool. Locally the popularity of DIY reno, building and decorating TV shows continues to escalate.

Not only are new generation makers being exposed and becoming more visible, there are signs their numbers are multiplying. In June, on a 774 ABC Melbourne radio panel discussion, Katrina Sedgwick, Member of the Creative Industries Taskforce, referred to 'the rise of the handmade, the bespoke, the authentic' and how 'that kind of maker artist was proliferating'.

Ironically it's online technology and globalism that is fostering the return of the hand and the fact that new makers can now reach global markets through online craft sales platforms. Early models of these were US-based Etsy, founded in 2005 and CustomMade.com in 2009. Technology is also enabling networking amongst makers, and according to Katrina, the 'cross-pollinating and blurring of artforms' in arts hubs, collectives and 'makerspaces'.

Launched in Melbourne less than a year ago, Space Tank Studio is developing a 'makerspace ecosystem' where creatives in a host of modalities and mediums may lease space and utilise a fully stocked metal and woodworking 'tool gym'. It's an incubator for innovation, a 'smart factory' where not just individuals, but also companies can rent space for projects, product development and specialised training.

Solidifier in Darlinghurst claims to be Australia's first makerspace

for 'hardware start-ups'. Makers Place Inc in Erskineville, NSW is a makerspace opened by Three Farm, a social design enterprise. David Byworth of Fab Lab Adelaide was quoted by dhub.org as saying "The massive loss of labour-intensive, low skilled manufacturing roles are having significant effects on whole communities and the days of large companies with thousands of employees are numbered. Instead, the future lies with dozens of small, entrepreneurial businesses, each employing a handful of skilled employees. These businesses need makers."

New technologies of digital fabrication (CNC machining, laser cutting and 3D printing), which threatened to make hand skills redundant, are now bolstering the capabilities of smaller operators and cottage industries. According to Wikipedia, 'maker culture' is a 'technology-based extension of DIY culture' that includes engineering-based and also traditional

metalworking, woodworking and arts and crafts technologies.

Within the last decade some short-lived attempts have been made to create successful Australian-based online craft and maker brokerages. But now locally based online businesses such as Handcrafted (*see p.74*) and Makers Lane appear to be succeeding. On the surface they work a bit like dating services. Registered makers are featured. Clients post briefs, which are matched to makers who then quote. Commissions for providing this platform and marrying up service go back to the businesses that market and facilitate these exchanges.

Making a living as a custom or bespoke furniture maker has been notoriously hard. Materials are expensive, you need a fair amount of equipment and space, and processes and hand detailing are labour intensive, even if you are producing limited production runs of some items. Those that survive have often resorted to other income streams; teaching, selling timber or tools, relying on the income of a partner.

Survival for bespoke makers can come down to a play-off of time versus quality or detailing. Economies of

scale are difficult if not impossible when making prototypes, art, one-off or commission pieces – especially where traditional construction and fine detailing is concerned.

As before, makers can either charge more to fewer clients or compete on price to a larger market by simplifying constructions, producing in-fashion designs or adopting hi-tech machining or detailing means. Working within a collective, makerspace, hackerspace, fab or maker lab can side-step start-up and ongoing capital investment costs.

Apart from specialised maker fairs and exhibitions; online sales, ideas sharing sites and social media are now the way forward for makers to network and market themselves in order to create a name or a brand. Websites, Facebook, Instagram – today's makers now can brand and market their work globally on a variety of online platforms.

The wheel is still turning, but whereas the craft revival of the 70s was a rejection of technology and industrialisation today's maker movement is being fostered within an increasingly digital and hi-tech environment.

Photos: Linda Nathan



Above: View of Nathaniel Grey's workshop



The Furniture Builder

Out front of the Sydney Bondi terrace, with its small but lush garden, you would never suspect the highly productive workshop that exists out back.

Walk down the side and in through a gate and you'll enter an undercover assembly and finishing area which leads into a machine, handwork and storage area. It's not his house, but this is the pleasant setup that furniture maker Nathaniel Grey works in.

It's surprising how well this compact workshop is equipped: tablesaw, bandsaw, routing centre, dust system, clamps, power and hand tools and all the other stuff a maker needs is tucked away. There's no room (or budget) for



1. Nathaniel Grey in his studio.
2. Nathaniel Grey's custom made hollow wooden surfboards are light and curved for performance.
3. Round dining table in American oak.
4. Desk and shelf combination in birch plywood and plantation mahogany.
5. Detail of desk and shelf combination.



a big panel saw but getting materials like plyboard delivered cut-to-size is a viable option.

Nathan wasn't always into making furniture. After art school he worked on a farm, and designed and made clothes for ten years, amongst other things.

Coming to Australia in 2000 he first worked as a house painter in his mum's business. Becoming a furniture builder, as he calls himself, happened a couple of years later in an organic kind of way, meaning he took on a job and it went on from there. Nathan is self taught but 'was always making things'. 'As a teenager I was a complete skate rat, so I was building skate ramps and things like that'. Add to that, he said, 'I'm probably stubborn and have an enquiring mind'.

There was more to it though. 'Part of why I got into this is because of seeing old kitchens and pieces of shoddy Swedish produced furniture thrown out on the street. They might as well have just got some milk crates and cable ties and some planks of wood, it'd last longer. It made me feel quite depressed...'

Nathan now specialises in complex custom shelving and fitouts, and still completes some custom orders for surfboards. 'I don't just make pretty boards', he said, 'they're lighter than a foam fibre board and the wood is bent and curved for performance.'

Early on he decided that profit-wise, custom work was much better than consignment. 'I make a modest living, but it's taken me a long time to get to this point,' he said.

Asked what his aesthetic is, Nathan replies: 'It changes, but it's probably a Danish, Japanese kind of thing. But I'm also inspired by micro-architecture and grass roots movements that sprout up around the place. In the woodworking space I like George Nakashima's work and Carlo Mollino's, and also Japanese architect Fujimori's. I like furniture that's a bit sculptural but I'm not into the flourishes. I like details but the classics are quite often simple pieces.'

www.nathanielgrey.com.au



Safety Plus Performance

SawStop tablesaws are known for their safety feature, but how do they perform? Damion Fauser investigates.

By now most of you will have heard of, and likely seen, the hot dog video of the flesh-saving tablesaw technology that was developed a number of years ago. This technology is now incorporated into a line of tablesaws under the label SawStop. I was recently loaned a Professional 3hp cabinet saw for a few weeks to trial and review. The unit was supplied with a number of accessory options, including a mobile base, sliding table assembly, and an overhead arm for dust extraction.

Clever circuitry allows the spinning blade to detect changes in electrical resistance due to the presence of moisture, for example in stray fingers that may accidentally come into contact with the blade. If the mechanism is triggered, the undertable cartridge drops the blade carriage infrastructure below the table and clamps a large section of aluminium over the blade to stop it, akin to the brake calipers on a vehicle brake rotor. This process takes milliseconds and therefore prevents all but superficial injury to the errant user. In this case, the cartridge and blade are rendered unusable and therefore must be replaced.

Having lived and worked in the USA for three years recently, I had already experienced using these saws in some large workshops and so had a head start on what to expect from the machine. Whilst the iconic safety aspect of this saw is hard to ignore completely, my focus was trialling its machining capabilities.

After familiarising myself with the machine, with both a thorough read of the operating manuals and an unplugged walk-around and play, I tested the saw by running a

number of long and deep rip cuts through some sections of Tas oak and hoop pine, and then made some crosscuts using the provided sliding table.

Let me just say this at the outset – this is a very good tablesaw. On the walk-around inspection, it is evident that SawStop have gone to great lengths to make a saw that is solid, powerful, intuitive, ergonomically friendly, easy to adjust and fine-tune, and that has good safety features.

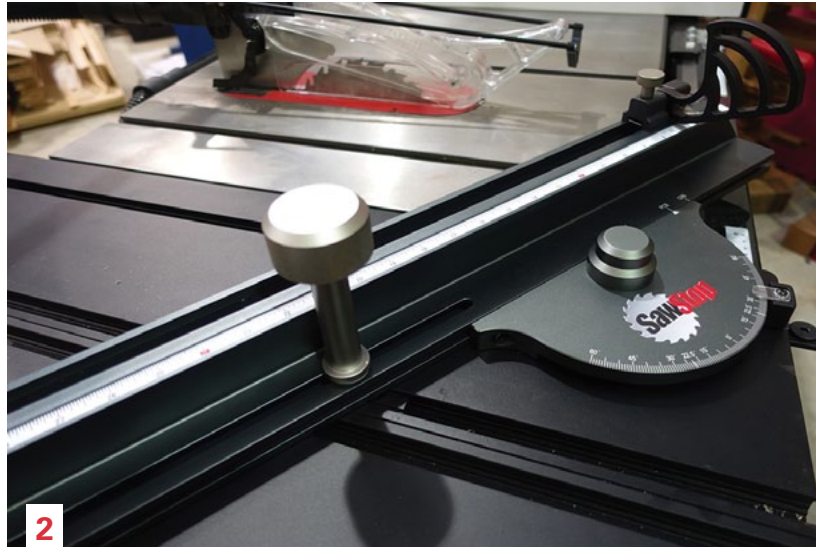
Other than the centerpiece blade-clamping mechanism, this saw has very good safety features. In particular, the overhead guard achieves so much more than others I have seen and used. It provides a clear view of the work and is designed to minimise physical access to the blade by sitting flush on the table and pivoting up just the required amount of clearance when the workpiece is presented to it. Astride the riving knife are two toothed anti-kickback cauls for additional benefit.

The 3hp motor, coupled with quality CMT 250mm blades (which required reducing bushings to secure to the 5/8" arbor on the unit), ran deceptively quietly, and was easily powerful enough to make sustained deep, long cuts with clean results on the cut surfaces.





1



2

1. SawStop 3hp Professional Cabinet Saw
2. Sliding table assembly adjusts easily for perfect repetitive cuts.
3. One 100mm duct handles dust from above and below.
4. The guard sits flush and gives a clear view.



3

Dust extraction was extremely effective. This was due to a combination of the supplied overhead arm which captured dust produced above the table, and the 100mm outlet at the rear base of the cabinet. Cleverly, SawStop have connected the overhead pipe directly to the primary 100mm outlet, allowing the one 100mm hose/ducting to take the dust from both above and below the table.

Adjustments to blade height and angle are easy to make with the large ergonomic handwheels that have a secondary locking mechanism to secure the desired setting once achieved. Blade changes are extremely quick and simple with the supplied proprietary spanner.

The rip fence is a robust and solid unit that is easy to move, and once locked, does not budge, allowing for maximum confidence and accuracy. The crosscut fence was a particularly nice feature. It was perfectly horizontally aligned with the primary table surface, slid smoothly along its entire length of travel and the fence and stops were easy to adjust and fine-tune for perfect, repetitively accurate crosscuts. Your woodworking will definitely become more efficient and enjoyable with this addition to your saw.

The mobile base allowed for easy movement of the unit and retracts to allow the machine to rest solidly on the floor, therefore minimising vibration. All the required operating tools, including a narrow riving knife for using thin-kerf blades, are cleverly stored on the saw cabinet.

It must be noted the SawStop circuitry can be adjusted to allow for the additional moisture content in green wood. Also, the circuitry remains active for a few seconds after switching the motor off. Touch the blade while the green light is still flashing and the cartridge will be activated.



4

The 36" Professional T-Glide fence is \$440, the sliding crosscut table assembly \$1799, the overarm dust collection \$339, the mobile base \$439, and replacement brake cartridges are \$99. As with any machine that cuts wood, the better quality tool you put on the machine, the better quality cuts you will get, so set aside some funds for quality blades.

For most of you, this will be the last tablesaw you'll ever need to buy. Iconic safety features aside, this is a very well designed and made machine that will give you a lifetime of powerful and accurate service.

One final word however, please do not fall into the trap of thinking that this technology is a panacea to prevent you from being injured by your machine. Yes, it will stop you being cut if you come into contact with the spinning blade, but it is still a tablesaw and you can still have an accident due to kickback for example. Ensure you protect yourself by operating the unit safely at all times. If unsure about a certain operation, seek out the guidance of a professional woodworking teacher for some training and advice.

Review machine supplied by Carbatec, see www.carbatec.com.au



Damion Fauser is a furniture designer/maker who lives in Brisbane. He teaches woodwork from his Darra workshop. Email: damion@damionfauser.com.au





- 1 Hollow and round planes. Size 2 on the left through to size 18 on the right.
- 2 Moulding planes with irons set at steeper pitch of 55°–60° are preferred for working hardwoods.
- 3 Two side bead planes and on the right a centre bead plane. All are 'boxed' with boxwood inserts in wear prone areas.
- 4 Snipe bill plane.
- 5 Dedicated moulding planes. Complex moulder on the right with twin cutting irons.

Hand Worked Mouldings

Discover the genius and effectiveness of traditional moulding planes. Story by Troy McDonald.

As I continue to develop my skills as a woodworker I find myself drawing on traditional techniques whilst staying open to the advantages of modern methods. This article explores the use of traditional moulding planes, not so much to replace the spindle moulder or router, but to consider the benefits they can bring when used either independently or in conjunction with modern methods.

Moulding planes

A selection of the more common and arguably the most versatile types of moulding planes is shown above (**photo 1**). 'Hollows and rounds' (H&Rs) are so named for the shape of their soles, although some describe them by the shape they cut. H&Rs are very flexible planes that allow the user to cut an endless variety of profiles.

These planes are wonderfully simple tools made up of three or four basic components. The stock, typically quartersawn for stability has a sole shaped to the inverse of the moulding it is intended to cut. The shaped iron, available in various angles of pitch

between 45 and 60°, is held fast with a wooden wedge (**photo 2**). 'Boxed' moulders were fitted with a thin strip of hardwearing boxwood to lengthen the life of the plane.

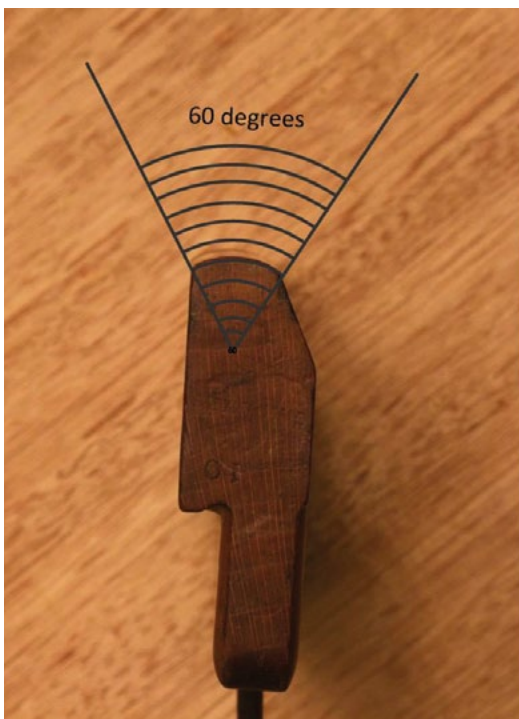
Photo 3 shows a selection of side bead planes. As the name suggests these are used to work a simple bead on the edge of solid timber. The plane on the right is used to cut a bead in the centre of a panel.

Available in left and right hand versions, snipe bill planes (**photo 4**) are used to clean up the quirk of a bead, or to cut an initial track or trench in which a hollow or round can follow.

Finally, **photo 5** shows three examples of dedicated moulding planes, so called because they are capable of cutting only a single profile. On the left is a simple sash plane and on the right is an example of a complex moulding plane with double irons. Complex planes, often difficult to tune and use, required multiple irons to cut wide mouldings and are best left for the collectors.



Fig.1: H&R planes of various sizes all scribe an arc within a 60° segment of a circle.



- 6 Sharpening and honing equipment.
- 7 Grain selection should flow up and out of the edge to be worked.
- 8 Begin moulding at the far end of the work, moving progressively back with each pass.
- 9 Handcut side bead. Note the small quirk which is not possible with router bits.
- 10 Spring lines indicate the angle of incline on which the plane must be used.



Choosing planes

Moulding planes were made in staggering quantities between the 18th and early 20th century and are still widely available through antique tool dealers or retailers. Some of the more common and useful planes, including H&Rs, are again being produced by a handful of manufacturers. Which planes to purchase will depend on your style of work, however a selection of smaller side bead planes and one or two pairs of H&Rs (such as a pair of No.4s and 10s) will allow a good range of mouldings to be cut.

Buying H&R planes in matched pairs is an advantage but not a necessity. The sole of H&R planes describe a 60° segment of an arc and were stamped with a number which roughly corresponded to 1/16" increments in size (**fig.1**). Apart from a warped stock, there aren't too many defects that can't be fixed on moulding planes, but my advice is to only purchase tools in good condition with a nicely fitting wedge and an iron that closely matches the sole of the plane. Vintage planes invariably require tuning and this is where we'll begin.

Tuning moulding planes

Tuning a vintage plane starts with flattening the back of the iron using the same technique as for flattening the back of your bench plane irons. With the back flat you will need to sharpen the profiled edge of the iron.

First mount the iron in the plane with a small amount of protrusion and sight along the plane sole to determine how closely the iron matches the sole. With a close match, sharpening the iron should be as simple as working the hollow sections of the cutting edge with a selection of shaped slipstones and strops. The round profiles can be sharpened on standard bench stones (**photo 6**).

If the profile of the sole and iron are grossly mismatched then it's best to extend the cutter from the sole and



re-mark the profile on the iron with the help of a sharp scribe. A splash of spray paint on the iron helps with clarity of the scribed line. With the profile marked, the iron can be reshaped through the combined use of a bench grinder and rotary burs or grindstones mounted in a Dremel.

For final honing of the bevel I use a short length of wooden moulding cut by the plane you are working to sharpen. Load the wooden moulding with slurry from a waterstone and work the iron backwards and forwards maintaining the appropriate sharpening angle. Keep one or two short offcut pieces of moulding matched to each plane for this purpose. You should end up with a nicely polished iron ready for remounting in the plane.

Next comes the wedge. Looking deceptively simple, the wedge is precisely shaped with angled edges that both bed the iron and deflect the shavings clear of the throat. When these angles are not fitted perfectly, planing mouldings can quickly become a very frustrating process.

To tune the wedge, start by ensuring the rear of the wedge that fits to the iron is planed perfectly straight. Some moulding planes have skewed irons and these will need the wedge bevelled to match the skew angle of the iron. Similarly, the front face of the wedge must seat perfectly against the throat of the plane. Any gap here

will see the plane quickly choke with shavings. Getting the wedge shaped perfectly sounds daunting but with a little perseverance you should find it relatively trouble free.

With iron and wedge tuned, the wedge can seat the iron with a light tap from a mallet (never a hammer). To unseat the wedge, avoid the temptation of tapping it up out of the throat of the plane. Instead, tap the heel of the plane with a sharp rap of the mallet. Similarly, adjusting the iron is done by tapping on the heel (to retract) or the toe to increase the depth of cut. Lateral adjustments can be made by tapping side to side on the iron itself.

Moulding planes in use

Choose straight grained stock.

Regardless of the type of moulding plane, stock selection is a critical aspect of success. Material should be chosen that has the grain running up and out of the edge being moulded (**photo 7**). Straight grain material is typically required for successful moulding and highly figured stock, changes in grain direction and reaction wood around knots should all be avoided.

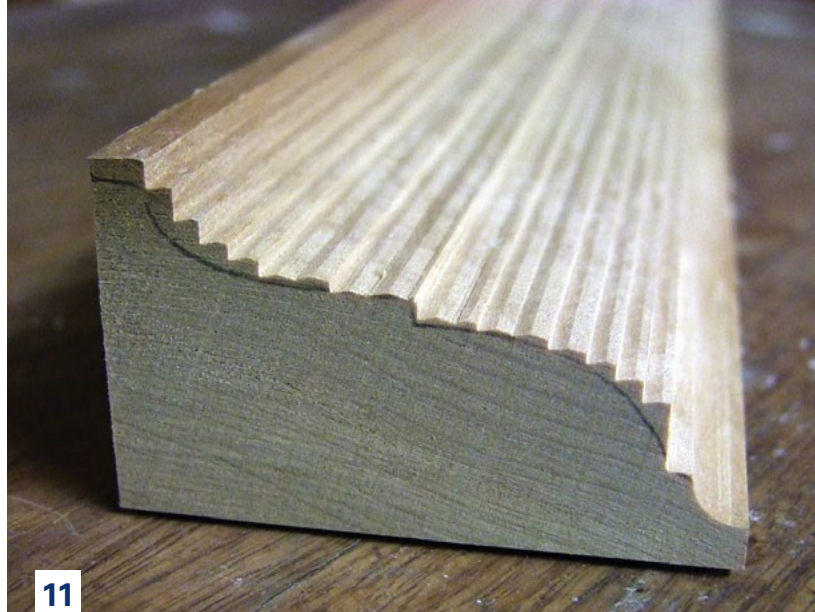
Start at the far end. In use, moulding planes are started at the far end of the board with each subsequent pass started a little further back to allow the cut to follow through the previous pass (**photo 8**). Planing in this way, assists the plane



to track in a path already cut. This is opposite to how we traditionally use bench planes where the cut is started at the nearest end of the workpiece.

Side bead planes are simple to use. With these you'll amaze yourself at how a small bead almost leaps from the board after a handful of strokes. Used correctly they will leave a very detailed bead with a quirk much finer than anything that can be achieved with a router (**photo 9**).

Stay on track. Dedicated moulding planes are typically required to be held at an angle indicated by the spring lines marked on the heel or toe (**photo 10**). H&R planes on the other hand have no such angle of set. With no fence or guide, the angle of the plane can be varied to alter the radius of the profile being cut. This freedom in use, can make H&R planes a little more difficult to use initially. Experiment with extending your fingers as a fence to help guide the plane and keep everything on track.



Remove excess stock. Due to the difficulty in sharpening, it is always desirable to minimise the amount of cutting the moulding plane is required to perform. For this reason excess material should always be removed with the tablesaw, plough or rebate plane prior to calling on a moulding plane. **Photos 11–14** demonstrate the technique used to replicate a length of period moulding. **Photo 11** shows the waste removed on the tablesaw followed by a small cove being cut with a round plane.

Typically I wouldn't make the number of tablesaw cuts shown in this example however this degree of waste removal makes the moulding work much easier and is worth considering for your first attempt.

Combining profiles. Next, the large cove was cut with three sizes of round plane and the fillet was smoothed with the rebate plane (**photo 12**). Finally, the large ovolo was then cut with a hollow plane. The finished moulding and the planes used to produce it are shown in **photos 13 and 14**.



- 11** Waste removed, fillets set in and the first cove cut.
- 12** Round planes used to cut the large upper cove.
- 13** Finished moulding and the planes used to produce it.
- 14** Finished moulding with the original that was copied.



Moulding planes and more particularly H&Rs are very flexible tools that shouldn't be seen as the domain of the traditional woodworker. Like any tool, there are limitations to their application, but to understand their strengths and become proficient in their use is to add an additional dimension to your woodworking.

I find these planes particularly useful for small runs of complex moulding or when used in combination with modern machines to modify or add to machine-cut mouldings. Side bead planes in particular allow for the addition of fine detail to cabinet work.

I hope this article will provide some inspiration to dust off your old moulders or alternatively encourage you to invest in a small number of new planes to build on your woodworking skills. Next issue we'll look at joint making planes and how to use them.



Troy McDonald is an engineer and woodworker based in Brisbane. Email him at: helenofitroy1@optusnet.com.au



RULE, SET, MARK & SQUARE WITH THE

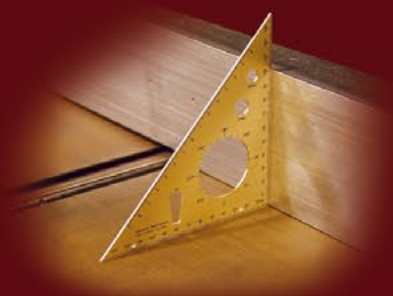
MULTI SQUARE



MARK OUT DOVETAILS



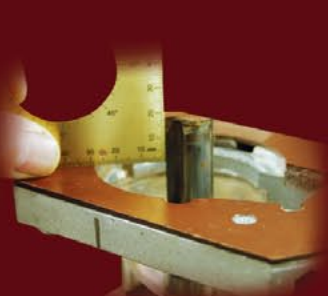
CHECK YOUR JOINTS ARE SQUARE



SET PLANER FENCES AT 90°



USE FOR GENERAL RULING



SET DEPTH OF ROUTER CUTTERS



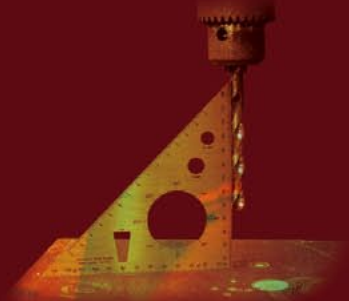
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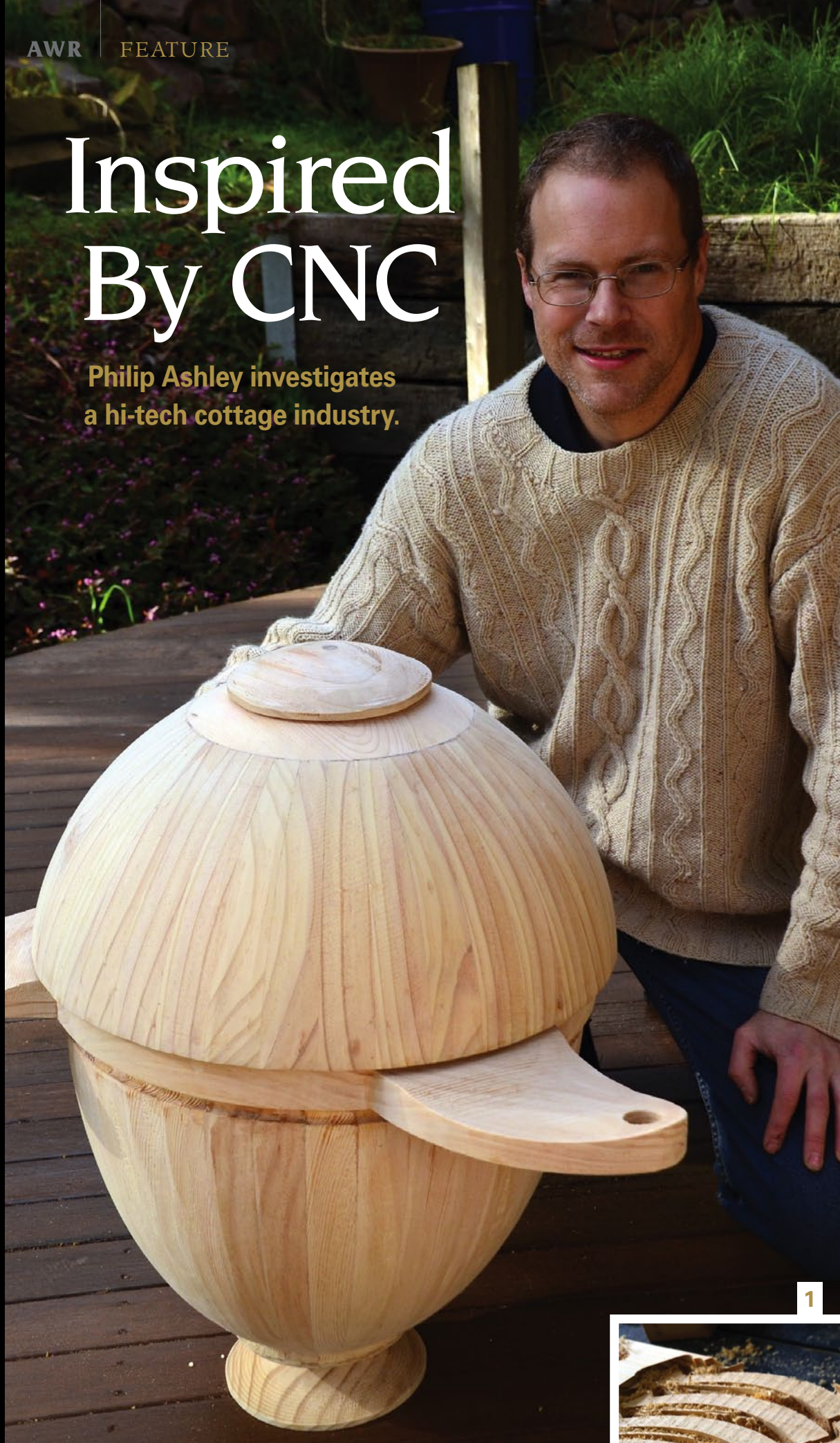
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Inspired By CNC

Philip Ashley investigates a hi-tech cottage industry.



1

Cottage-industry CNC is gaining momentum as machine prices drop, but it's still a long way from the maturity of usage by professional cabinet and furniture manufacturers. Carbatec's CNC Shark will cut profiles within its 635 x 635mm table limit and although it's a great introduction to CNC, it's a far cry from furniture making on full-size machines. The software is capable of 2D cutting or 3D engraving and what they show you at trade shows are slot-together dinosaurs and engraved panels. Forget those; what about a beehive in the shape of an egg? For anyone who doubts that CNC is real woodworking, Nick Killey's story is inspiring and he's well on his way to re-defining bespoke wood design and cottage industry manufacture using CNC equipment.

Nick bought his CNC machine only 18 months ago but despite this, his current project is both technically challenging and conceptually innovative. It's a stunning modern example of the sun hive designed by German sculptor Guenther Mancke, from research into the natural environment of the honeybee colony and usually made from cane, straw and plywood.

Nick is not an apiarist, so working with Guenther's design and local Warburton (Victoria) biodynamic bee expert Tobias Mager, Nick



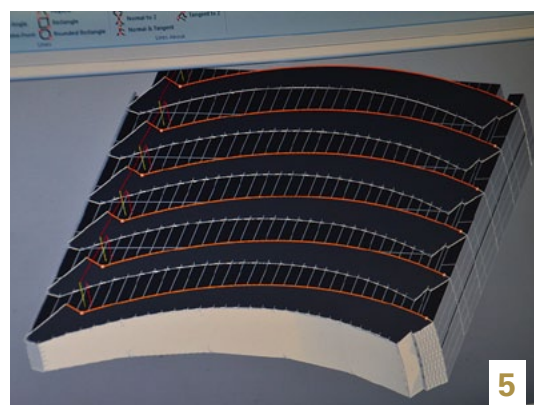
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3



1. Nick Killey with one of his dome hives prior to finishing.
2. Twelve bars of paulownia sit under the lid.
3. The staves are cut from long lengths of radiata pine.
4. Nick's CNC router.
5. CAD drawing of the hive staves.



developed the wooden dome hive. It's made from 101 pieces of kiln dried radiata pine and paulownia and all the parts are cut from only a few long lengths of wood bolted to the CNC machine table.

When assembled, the hive consists of a barrel-like base, a landing cone for the bees, a central ring that the top and bottom attach to and a dome lid made from pine. Inside the dome are 12 bars made from paulownia for the honeycombs to hang from. These are designed to provide a large surface for the honeycomb to attach to, and when assembled they form a dome. This means that each piece is different but they are all machined at the one time.

The bars are numbered by the machine for assembly and shapes are cut into them to enable easy separation and removal while wearing gloves. The hive is naturally humid, so wood movement is a consideration and paulownia is quite stable. This is left un-sanded and the rough surface is ideal for the honeycomb to attach to.

Making the hive conventionally would mean producing every part separately using accurate jigs. 'If you were only doing a limited run, making them on conventional equipment wouldn't be worth it', said Nick.

Nick likes CAD because the entire product and any alterations to its design can be seen instantly. The CNC machine makes it easy to do things that would be extremely difficult by hand. Granted he has a Masters in Mechanical Engineering from the University of Birmingham (UK) followed by six months in the workshop and design centre at Mirrlees Blackstone working with CAD design and diesel engines, but his woodworking is mostly self-taught and the result of a need for home furnishings and joinery. With no formal woodwork training, Nick doesn't think like a woodworker and that's to his advantage. He's not held down by customs or traditions. He's free to express his ideas without restrictions.

Nick spent six months researching CNC equipment and this led to a Chinese manufacturer that came highly recommended on the CNCzone.com forum. The machine came with a 3kW (4hp) single phase motor, industrial drives and guides, a 2.4 x 1.2 metre table and even after shipping, Nick considers the machine a great buy. Apart from a modest workshop with a combination machine, it's all he needs for the most complex jobs. After ten years successfully day-trading the stock market, Nick is financially able to

explore CNC woodworking and doesn't need to rely on sales to support him; though he concedes this will eventually change. By then, he should have many new products to keep him busy.

'If you made something yourself you would love it because you made it', Nick says. 'CNC allows you to alter an unresolved design without the pain of making new jigs. It's the ease and speed of the feedback loop (design, make, redesign, remake...) that allows you to perfect the design.' He considers there's 'lots of scope in the middle' between cheap mass produced furniture and the high quality handmade kind. Maybe hand work is romantic but CNC is just as creative. I'm looking for an emotional response from my work and I can get this in a much shorter time'. With wood and CNC he's found the ideal combination of design and manufacturing, enabling him to create just about anything he can imagine using CAD software and his CNC machine.

More information about Dome Hives at www.domehives.com 



Philip Ashley is AWR Machinery Technology Editor. Email philipneilashley6@bigpond.com

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Note: Listings are correct at time of publication but may be subject to change. It is advisable to check details with the organiser before visiting.

11-13 SEPTEMBER

Melbourne Timber & Working With Wood Show

Caulfield Racecourse, Vic
impressiveexhibitions.com.au

13 SEPTEMBER

Saw Sharpening workshop

The Traditional Tools Group
Brush Farm House, Eastwood, NSW
www.ttg.org.au

18 SEPTEMBER-FEBRUARY 7, 2016

Rigg Design Prize exhibition

National Gallery of Victoria
www.ngv.vic.gov.au

15-26 SEPTEMBER

Creations in Wood

Woodworkers Association NSW
Lane Cove Gallery
www.woodworkersnsw.org.au

26-27 SEPTEMBER

Ballarat Wood & Craft Show

Ballarat Woodworkers Guild Inc
Wendouree Sport and Events Centre
George Davies 0400 610 515
www.ballaratwoodies.com.au

27 SEPTEMBER

Sharpening Planes and Chisels

The Traditional Tools Group
Brush Farm House, Eastwood NSW
www.ttg.org.au

3-4 OCTOBER

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with master spoon carver Bob Howard

Uki, Tweed Valley, NSW
www.tweedspooncarving.com.au

10 OCTOBER

19th Annual Wood Show

Alexandra Community Shed & Eildon and District Woodworkers Guild
Alexandra Timber Tramways Museum,
Bob Carroll: carr.10@bigpond.com

10 OCTOBER

Woodworking Tools and Skills

The Traditional Tools Group
Brush Farm House, Eastwood NSW
www.ttg.org.au

10-11 OCTOBER

Melbourne Guitar Makers Festival

Abbotsford Convent, Vic
www.guitarmakers.com.au

11 OCTOBER

Tuning/Fettling Hand Planes

The Traditional Tools Group
Brush Farm House, Eastwood NSW
www.ttg.org.au

25 OCTOBER-2 NOVEMBER

Jacaranda Woodwork Exhibition & Competition

Northern Rivers Woodworkers Association
Ex-Servicement's Club, Wharf St,
South Grafton, NSW
www.jacarandafestival.org.au

29 OCTOBER-8 NOVEMBER

Wood Symposium 2015

Rylstone Showground, Cudgegong St
Rylstone, NSW
www.rylstonsculptures.org

30 OCTOBER-2 NOVEMBER

Tasmanian Craft Fair 2015

Deloraine, Tas
www.tascraftfair.com.au

30 OCTOBER-5 NOVEMBER

New Works in Old Wood

Furniture and sculpture by Steve Whitby
Logan Art Gallery, Logan Central, Qld
www.logan.qld.gov.au

8 NOVEMBER

Melbourne Tool Sale

Hand Tool Preservation Assoc
Glenferrie Primary School, Hawthorn
www.htpaa.org.au

31 OCTOBER-6 DECEMBER

Trees+

Sculpture and turnings by Terry Martin
Bungendore Wood Works Gallery
Kings Hwy, Bungendore, NSW
www.bungendorewoodworks.com.au

6-8 NOVEMBER

Canberra Timber & Working With Wood Show

Exhibition Park, Canberra, ACT
impressiveexhibitions.com.au

21-22 NOVEMBER

Eltham & District Woodworkers

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Geoff: 03 9432 9047 Barry: 03 9439 7901

21-22 NOVEMBER

Churchill Scrollsaw Weekend

Churchill Community Hall, Vic
Bob Calhoun 03 5135 3675

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Woodturning Exhibition and Sales
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Brian Creese: brian.creese@bigpond.com

28-29 NOVEMBER

Barwon Valley Woodwrights

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Masonic Centre, Regent&Church Sts, Belmont Vic
Laury Vella: lauryvella@bigpond.com

6 DECEMBER

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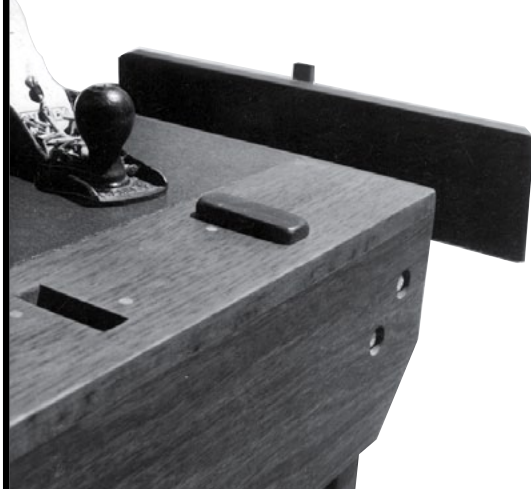
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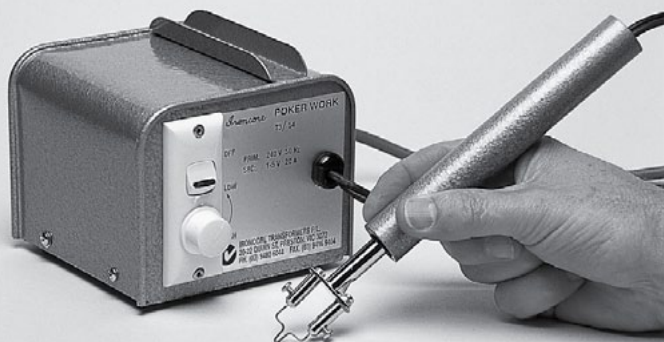
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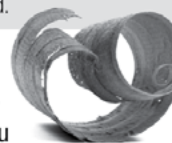
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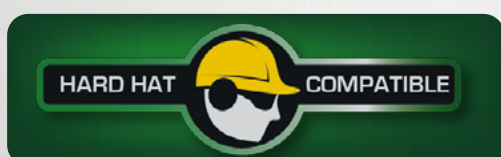


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CNC For Small-Scale Use – Part 2

Stuart Lees roadtests the Torque CNC 9060.

This is a very solid looking machine. Welded steel beams in all directions interspersed with rails bolted to the frame speak of strength, quality and attention to detail and design, right down to the ball screws and grease nipples at the end of bearing sections.



Main: Very solid construction on the Torque CNC 9060.

Above: Plan uploaded, 3D carving a Celtic cross took around three hours.

You may wonder if it's too heavy or over-engineered to work precisely and quickly. The first time you move each of the axes that concern is quickly dispelled, and one look at the stepper motors will explain why. They are huge, and have absolutely no difficulty in shifting the bulk of the overhead gantry very quickly, and with a lot more accuracy than you would give them credit for.

Unlike other CNC routers, the Torque CNC looks more handmade, and for a very good reason: it is. It comes from YAS Engineering in Queensland, a one-person operation that works very much more on the quality of the individual machine, than on the concept of mass production.

YAS Engineering also makes the Torque Work Centre, the RouterMaster, and the SlabMaster, each of which have dedicated followers, based simply on two factors: quality of the build, and innovation in design.

I've been really struck with the noise factor, or moreso, the lack thereof. The Torque CNC is really quiet – I was really pleasantly surprised, to the point that I have had absolutely no hesitation running some really long jobs late at night in the middle of a suburban area. That is not true for all jobs, as noise comes down to the material being machined, the speed, and type of job. Routing aluminium tends to be quite a bit noisier, especially as it needs constant chip clearing and lubrication (and that involves an air compressor).



Close-up of overhead gantry, big motors ensure smooth operation.



The frame is made from solid section steel.

On a very practical front, the 9060 refers to the approximate operating range of 900 x 600mm (in practice 985 x 685mm) and the router can overhang the front by about 45mm, allowing machining into the end of tall, vertical items that can be fixed to the front of the CNC.

The 9060 has a 160mm vertical operating range. It can machine up to around 200mm/sec, but for the good of my router bits, I tend to operate it around 50mm/sec. More overall experience with CNC operations will increase my confidence on just how far and fast I can push the machine, and importantly the tooling.

While I'm still experimenting with what can be done with a CNC router, I've had no problem machining timber, MDF, ply, acrylic,

polycarbonate, foam, corflute, corian, aluminium, brass, copper and carbon fibre. I was pushing my luck with the metals, as I was running without lubrication or active chip clearing, which would have tortured the router bits more than anything.

While I've done some 3D routing work, I've found nesting operations to be the most fun – churning out lots of toys, using plans sourced from MakeCNC.com. I'd like to develop my other skills further, particularly modelling in 3D.

The bed comes with a basic setup of rails and sacrificial surface to secure objects to, but I prefer adding an extra spoilboard on top (such as a thick piece of MDF), that can then be planed level (so the bed is perfectly parallel with the gantry), and after it has become too

damaged from use, another quick pass with a surfacing bit brings it back to new. The other benefit of a sacrificial MDF board as a base is that you can easily screw, nail or bolt parts to it that will be machined.

Forecast developments for the Torque CNC include a 4th axis (typically a rotating axis, so the workpiece can be rotated under the router bit, allowing 3D routing on all sides). I am also keen to add a misting unit for machining aluminium, and a vacuum bed to further aid in holding parts down, particularly during nesting operations.

The Torque CNC 9060 is certainly a machine worth considering when looking at the possibility of adding a serious CNC router to the hobby or cottage-industry workshop. The combination of its inherent strength, speed and quiet operation makes it a particularly versatile tool, and one you quickly won't want to do without, once you've experienced how much it expands your workshop's capability.

Review machine supplied by yasengineering.com

Photos: Stuart Lees

Stuart Lees is a woodworking enthusiast and authors one of the first (and largest) woodworking blogs in the world, *Stu's Shed* (stusshed.com). He has been an engineering officer in the Royal New Zealand Navy, and is currently a Facilities Manager at an Australian University.

Parts for this 'spinosaur' were cut in under an hour.



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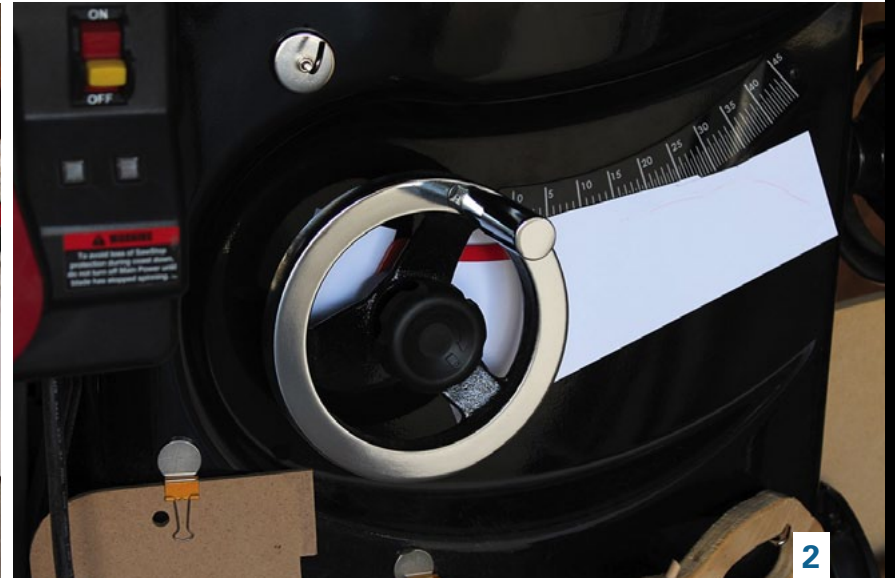
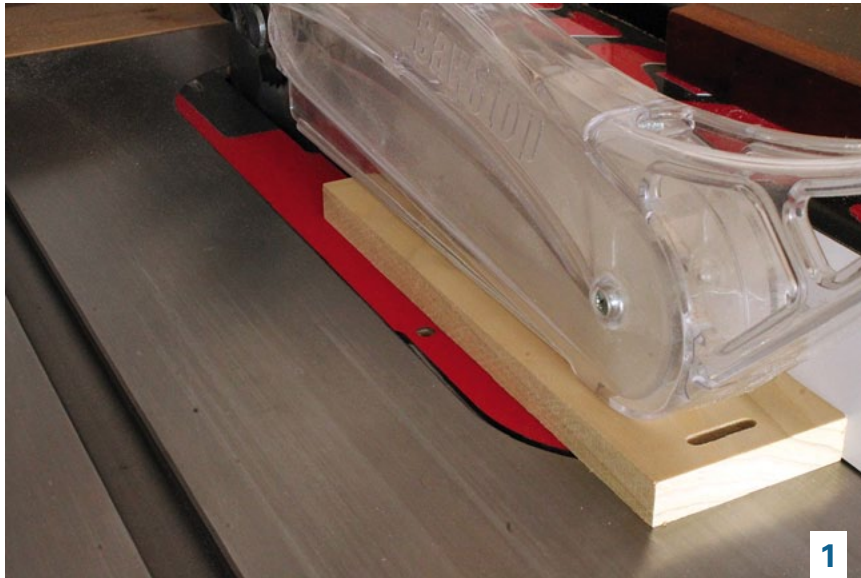
Capturing dust at its source is the first line of defence in effective dust control. My small shop has no room for a central filtration system and the associated ductwork, so I rely on two mobile dust collectors. Here is how I dustproof tools that produce the most or the worst sawdust that I can or cannot see.

The tablesaw

The tablesaw has always been my most used machine and also the largest source of sawdust. With dust control as one of the key factors in mind, I replaced my contractor tablesaw with a cabinet tablesaw. However, the below table dust collection alone in any cabinet saw is not enough to keep all the dust contained. To capture dust above the saw table, in Europe, crown guards are used. In North America, some woodworkers mount an over-arm blade cover system, which needs to be raised or lowered when cutting stock of different thicknesses.

My new cabinet saw has an over-arm dust collection guard built in with the riving knife that rises and lowers together. The independent lateral slides keep the guard in full contact with the stock, delivering a 99% above table dust collection performance (**photo 1**). The new saw resulted in one of the most noticeable improvements in dust collection in my shop.

The big openings around the blade adjustment wheels can affect the below table dust extraction. I plug the only one such opening on my saw with a magnetic sheet bought at a local office supplies store (**photo 2**).



I use a cross-cut sled to make repetitive cross-cuts. The over-arm dust guard gets in the way of the sled and so I built a separate dust hood to trap all the dust at its point of creation (**photo 3**). A colleague of mine and an executive in tool R&D, Rick Blaiklock cleverly uses a blast gate to channel more suction for above table dust collection whenever needed (**photo 4**).

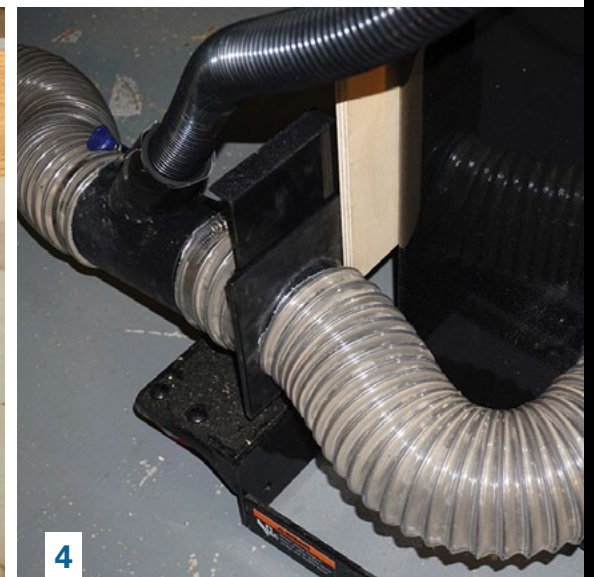
The mitre saw

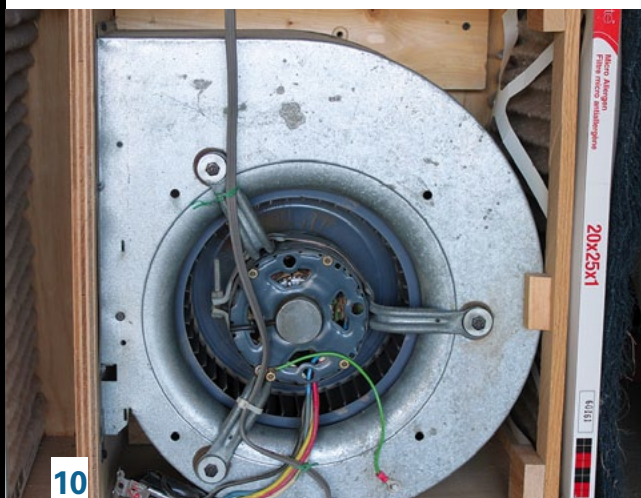
Poor dust collection is the Achilles' heel of most mitre saws. But you can make a small change to improve your saw's dust collection if you use a dust bag: connect the saw's dust port to a dust collector rather than a dust bag (**photo 5**).

My sliding compound mitre saw has a factory-stated dust collection efficiency of 91%. Its wide-mouth chip deflector diverts sawdust up into the dust port consistently. However, a thick, wide workpiece can interfere with the rubber deflector, affecting its extraction performance. To overcome this, I modified the deflector by adding a row of bristles around it, thanks to the idea of an American woodworker, Dave Askew (**photo 6**). The strip brushes increase the surface area of the deflector and improve the overall dust collection for all sizes and angles of cuts.

Fine-dust generating machines

Sanding produces the finest – and hence the worst – kind of dust.





A downdraft table is a good way of trapping fine dust as it is created, but many woodworkers have no space for it. You can, however, turn your tablesaw into a small downdraft station: attach a piece of perforated hardboard on a frame sized to fit into your mitre slots (**photo 7**). Unplug the tablesaw and lower the blade before you remove the throat plate. As soon as you place the hardboard fixture over the opening and turn on the dust collector, your downdraft table is born!

Another way to enhance dust removal is to hook up a portable sander to a shop vac. For instance, I made a hose adaptor from a flexible coupling so I can use my random orbital sander with a shop vac (**photo 8**). Better dust removal also means better finishing and longer life of abrasives.

Sanding on the lathe or using the sanding drums on the drill press also produces lots of fine dust, for which I have a simple, low-cost solution: attach a fine dust filter to the inlet side of a box fan and place the fan behind the machine (**photo 9**). For prolonged sanding, always wear a dust respirator using a filter with a NIOSH rating of N95 or above.



Invisible airborne microscopic dust

In woodworking, some fine dust is always bound to escape into the air. To limit our exposure to such airborne dust, we can install an ambient cleaner to filter and circulate the air in the shop. I built an air filtration system with an old furnace blower (**photo 10**). The filtration unit uses a reusable pre-filter and pleated filters (rated MERV 6–8 1) and is plugged into a timer switch that keeps the blower working for an extra hour after I leave the shop.

Dust collectors

The first dust collector – a dust extractor with an integral automatic switch-on/shut-off – is usually deployed for machines that generate lots of dust such as the tablesaw and router table. To increase the capacity of the dust extractor and extend the life of its HEPA filter and dust bag, I use a cyclone separator (**photo 11**).

The 30 litre shop vac is similar to the dust extractor in airflow and noise level and I use it more with smaller tools like the mitre saw and sanders. It does not have a built-in auto-start function, but that was easy to fix.



I attached two boards to the vac to make a mounting bracket for an automatic vacuum switch, see main photo p.96. The vacuum continues to run for six seconds after the tool turns off to allow the hose to clear.

I replaced the standard vac filter with a HEPA filter to trap particles as small as 0.3 microns. A clogged filter will lower the vac's performance, so I turn to an old trick to reduce clogging: Covering the filter with pantyhose which acts as a pre-filter (**photo 12**). I clean the pantyhose with a brush and, now and then, simply replace it – this can be found for free whenever I try out a pair of shoes at my local shoe store.

MERV stands for Minimum Efficiency Reporting Value and is a US rating for filter effectiveness.

HEPA stands for high-efficiency particulate air and is a type of filter.

NIOSH is a US agency: National Institute for Occupational Safety and Health

Photos: Charles Mak, Rick Blaiklock

See also Dustproof Your Machines by Darren Oates, AWR#68, Dec 2010.

Charles Mak, a semi-retired businessperson in Alberta, Canada, enjoys writing articles, authoring tricks of the trade, teaching workshops, and woodworking in his shop. Email: thecanadianwoodworker@gmail.com

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