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REVIEW

98

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Adam
Markowitz

HOW-TO

- SPLAYED STOOL
- CROSSCUT SLED
- ELLIPTICAL HALL TABLE
- ENDGRAIN VENEERS

TESTED

- MIRKA DEOS DETAIL SANDER
- TSO PRECISION SQUARE
- PARF DRILLING SYSTEM
- HE MARKING GAUGE SYSTEM
- FESTOOL BRUSHLESS SANDERS





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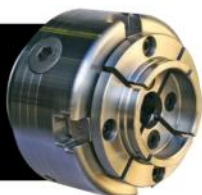
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Editor's Letter

What Can We Learn?

Who is the modern maker? Is it all about style? Materials? Means? What if it were all these things but mostly about being open to all kinds of learning.

On the cover and within this issue we're featuring Adam Markowitz, a designer maker who demonstrates the value of going after knowledge and skills. On top of a degree in architecture and a postgraduate diploma in furniture design, Adam sought out hands-on training from renowned schools in Denmark and the USA. He utilises digital technologies and yet depends on hand skills to inform his design work in what can be called a truly modern way.

Student work is also the star of this issue. Firstly, with the announcement of award winners for our annual Student Awards on p.58. Viewing the 99 entries shown on our website is to witness a great skills transfer in progress from teachers to students. In the same modern way we can see how the full gamut of hand, machine, power and digital tools are being employed to tackle what in some cases were very complex projects.

While we can see that at a secondary level our design and technology teachers are leading the way, tertiary trade training has in recent years been devalued and defunded. However, for an inspiring taste of what a modern trade education can offer, along with insights into current attitudes, see Niklav Rubenis's story on p.96. His article is backed by images of the impressive work completed by apprentices at Canberra Institute of Technology last year.

With TAFE courses fewer and far between, independently run schools are now amongst the strongest options for learning fine woodworking skills in Australia. In New Zealand, the Centre For Fine Woodworking in Nelson is at the forefront of learning, as evidenced by the work shown at the exhibition of last year's full time graduates.

My visit to the CFW was hosted and what a revelation it was to experience at firsthand what can be achieved within an eight month course with the guidance of expert tutors such as David Haig and David Upfill-Brown.

If any of us need some incentive to seek out teachers and courses to up our skill levels, look no further than our first issue for 2018.

AWR LIVE 2018

Last year's conference event was fantastic and it's my pleasure to now invite you to join us on Saturday, August 4 in Sydney for the second AWR LIVE, see p.74. Tools For Design is a jam-packed exploration of exciting concepts, techniques, trends and inspiration points. Our speakers will share the ways they generate ideas and, most importantly, how they translate them into wood. Check our website for updates.

Show Your Work

Judging by the entrants' work already shown on our website at www.woodreview.com.au/studio-furniture, I'm confident that AWR Studio Furniture 2018, an exhibition produced in partnership with Bungendore Wood Works Gallery, and presented by Felder Group Australia, will truly be a milestone for designer makers and wood artists. To enter, upload six images of past work and a short bio via the same link. Work by shortlisted entrants will feature in the exhibition that runs from October 20, 2018 to January 31, 2019. The opening will take place during the Wood Dust Australia festival in Bungendore. See p.57 for more information.

Sign up to our eList at www.woodreview.com.au to receive our fortnightly eNews, event and competition updates.

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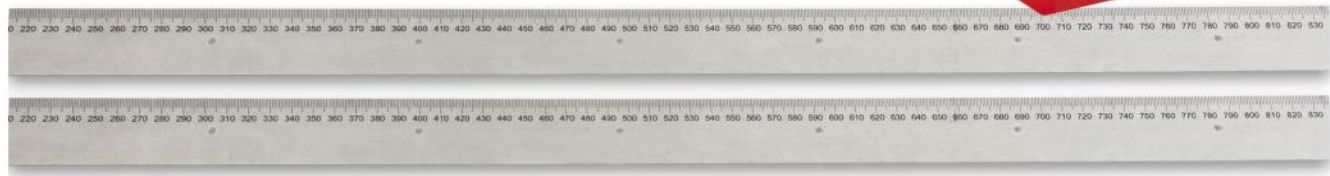
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UJK Parf Guide System and TSO Products MTR-18 Square

Reviewed by Damion Fauser

\$279



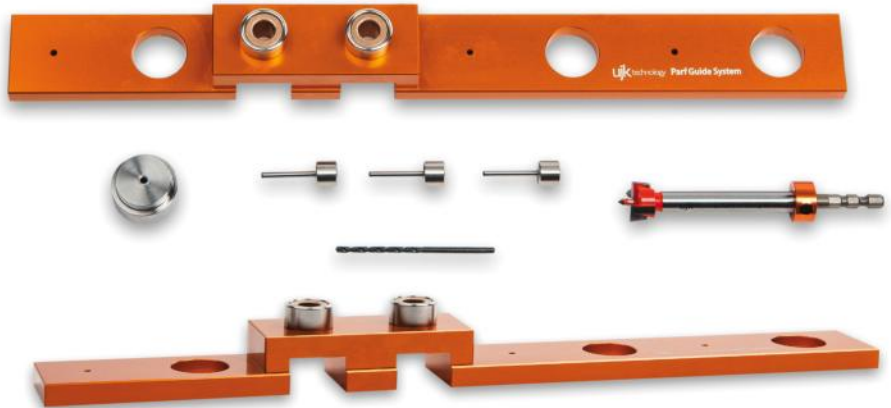
The accuracy of this tool combination has to be seen to be believed. The Parf Guide System from UJK Technology has been designed around one of the most famous mathematical formulas – the Pythagorean theorem. Its purpose is to allow the user to create a grid of 20mm holes in a benchtop whereby any line of holes are in perfect alignment, any two rows or columns are perfectly parallel and any row/column is perfectly square.

There are two parts to this system. Firstly, two stainless steel rules that each have a row of perfectly spaced 3mm holes. By using the provided 3mm drilling guide, 3mm steel locating pins and 3mm drill bit, an initial series of rows and columns of 3mm guide holes can be formed.

The second part is the CNC-machined aluminium drilling guide for boring out these holes into 20mm holes. This component has three 3mm guide holes that allow it to be perfectly located with the aforementioned locating pins. This feature, along with the supplied Forstner-style bit that also has a threaded guide tip, ensures the larger holes are perfectly located.

Unlike commercially available grid tables, this system allows the user to custom make a table of any size

Continued page 10



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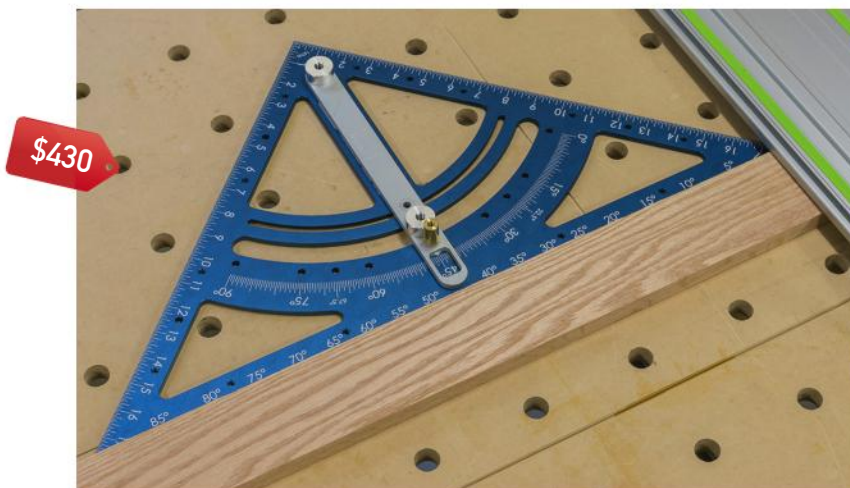
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and with as few or as many holes as desired. When combined with compatible dogs and other accessories, the user can then use a track saw and guide rail to make cuts with exceptional accuracy.

Excellent instructions are included, the build quality is exceptional and everything required is included.

To upgrade the capabilities of a grid table, TSO Products have developed the MTR-18, which is essentially a large CNC-machined aluminium square. TSO claim it to be accurate to within 0.001" over its length.



By using the accessory pivot pin, compass bar with registration cursor-points and a locking pin, this square turns your grid table into a mini panel saw, putting exceptionally accurate cross and mitre cuts within reach of the small shop or jobsite user.

This tool has features that make it useful independent of your grid table. It has a removable edge that can act as a registration lip, or as a shoe to allow the square to stand independently, allowing it to be used for checking case glue-ups for example.

Both of these systems are available from Carbatec. The Parf Guide System costs \$279, with additional accessories available. The MTR-18 is \$430, with the accessory kit costing \$265. Whilst this is a serious investment, I consider it to be good value given the results and performance that are achievable.

This tool combination essentially creates near panel saw like capabilities, albeit on a smaller scale. Accordingly, it would be an excellent choice for smaller workshops or for the discerning jobsite user. As I have a panel saw, I don't see the need to invest in one for myself, but as a furniture maker with an education in applied mathematics, the simplicity of this system and the resulting accuracy were a joy to experience.

*Review tools supplied by Carbatec,
see www.carbatec.com.au*

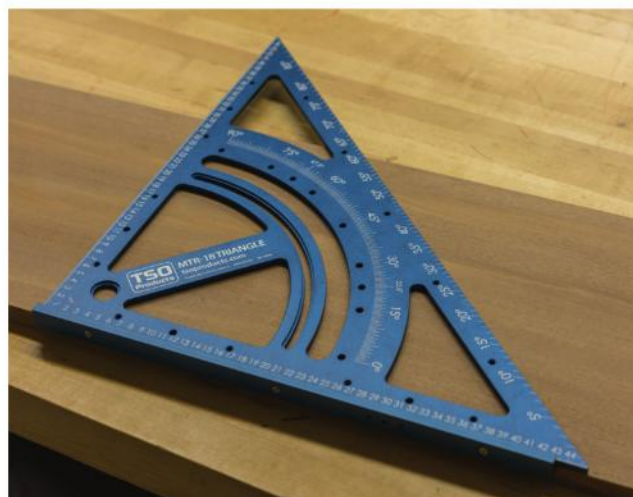


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Henry Eckert Marking Gauge System

Reviewed by Raf Nathan

This is a beautifully designed and built tool made in South Australia by Henry Eckert Toolworks. It has a round cutter and the fence is figured manna gum with a 5mm thick brass wear plate (**photo 1**). The metal body and fittings are made from turned brass with stainless steel fittings.

A steel rod running through the fence has a threaded end that holds the cutters with an allen screw. Remove the cutter and you have the option of attaching various accessories. The micro-adjustment mechanism, an upgrade over the standard tool, is excellent (**photo 2**). It's a great design with a thumbwheel that operates two oppositely threaded turned fittings.



2

To be honest I prefer fixed knife marking gauges but I know plenty of others who only use round cutters, and on soft wood the round cutter does give a cleaner mark. The Henry Eckert round cutters are made of PMA11V powdered metallurgy tool steel which should give long edge holding.

I lined up HE, Hamilton and Wilke kit cutting gauges and tried some comparative marking. On the left in **photo 3**, the Wilke is the clearest with a standard knife cutter, the Hamilton with its fine wide blade is to the right. In the middle is the HE with a clear mark. Bear in mind that these markings are on hard jarrah.

Accessories include fixed width mortise cutters (**photo 4**). These attach with a tiny allen screw onto the rod and come in 6, 8, 10 and 12mm widths. With the micro-adjust you can dial in a mortise setting accurately.



3



1

A pencil gauge is an option. You can't mark less than 20mm in from the fence but it works very well, and a pencil gauge is definitely an underrated tool.

Manganese bronze trammel heads can fit on the rod if you want to use it for checking diagonals and similar measuring tasks. Use one trammel head and the pencil gauge and you have a compass.

Extension rods can screw into the end of the rod and can extend to 1000mm. In compass mode you can draw circles from 50mm up to two metres in diameter (**photo 5**).

The thick brass wear plate does sit slightly proud of the wood fence. In panel marking mode you do need to concentrate to keep the fence pushed flush with the workpiece. Personally I think it would be better to have this brass plate flush with the wood.

At \$189 for the base model this is excellent value for such a quality tool. Spend \$249 and you get the micro-adjust which is the best option.

The rod extensions (\$29 and \$24), pencil attachment (\$29), trammel (\$24), and trammel gauge (\$79) are all great value for money and extend the tool's use.

Review tool from www.thetoolworks.com.au



4



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Mirka DEOS 383CV Detail Sander

Reviewed by Raf Nathan

A new addition to the Mirka sanding family is the DEOS, a rectangular-base random orbit sander. The 70 x 200mm Velcro-faced pad has heaps of dust extraction holes, and in combination with Abranet abrasive sheets the dust collection was excellent.

The 250 watt input rating may not sound high-power, but with a brushless motor there are fewer moving parts, and operation is much more efficient than your regular power tool. Power is more than adequate, in fact 80 grit abrasive on high speed was really able to hog off the wood.

The speed range of 5000–10,000rpm is adjusted via push button control. This limits speed selection to a choice of seven speeds – a minor point, as in reality I used either flat out or slow.

A large top-mounted paddle switch activates the tool and I can't say I thought this better than a simple switch. It's easy to operate, but limits where you can place your hand, as in use you have to be pushing down on the paddle.

The 3mm orbit diameter left a great swirl-free finish, even with 80 grit abrasive. This is much better than I would normally expect and I assume

this is because of the Abranet abrasive as well as the sander.

It is only 100mm high overall and 1kg in weight, so centre of gravity is low for good control. At this weight it is comfortable for extended use on vertical work.

The long 200mm pad meant the sander, in my opinion, wasn't suited to as many tasks as a round-base sander, particularly with reference to table top sanding.

Where the DEOS shone though was for sanding components such as frames and edges. Sanding end and side grain properly without any rounding over on tables and cabinets with a round base sander is tricky. But the Mirka with its long narrow base was excellent at this sort of work, as it was designed to do. The long flat base helps you get things flat and straight.

The DEOS has a built-in bluetooth function that allows you to view vibration levels via a downloadable app. Purchasing an add-on like this allows you to monitor your daily vibration exposure with the aim of preventing over-use. I did not trial this however.

At \$890 the Mirka DEOS is a significant outlay, but it is high tech with its brushless motor, functionality and great dust collection.

If you love or hate sanding and want modern technology to improve your sanding work on edges and components then the Mirka is a great choice.

*Review tool from
www.bestabrasives.com.au*



Main: Low profile, light and easy to operate, more than enough power: the new Mirka DEOS.

Above left: The Mirka shone through for component sanding of frames and edges.

Left: Numerous holes in the base make for highly effective dust



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T55 Elite S Spindle Moulder

Capable of a variety of shaping and moulding operations, the MiniMax spindle range will give you that extra level of capacity in your shop. Sliding tables, aluminium fences & interchangeable spindles will make you more versatile in your designs and projects.

Festool ETS EC/150 Brushless Sanders

Reviewed by Nathan Day

Most of our work is solid timber with a hand rubbed oil finish which requires flawless surface preparation. A reliable sander is very important and makes a large contribution towards the overall quality and efficiency of our work.

I have always used the older style Festool ETS sanders so I was interested to find out if the higher price tag of the brushless models was justified. We trialled the 5mm version (for faster stock removal) and the 3mm version for fine finishing.

Brushless motors are low wearing and longer lasting and obviously you won't be changing carbon brushes as with the older ones. They are also smaller so these sanders are compact, comfortable in the hand and on/off switches are perfectly positioned. With a low overall height you are operating much closer to the work surface, a far more natural position.

Lighter than the old models (1.2kg in lieu of 1.8kg) these sanders are better on vertical surfaces but still heavy enough to be efficient for sanding tops. You don't find yourself having to put any extra pressure on the sander, so it takes less toll on your arms and upper body. They also run much cooler, especially noticeable when sanding for long periods of time.

The electronic brake comes to an almost immediate stop when you hit the switch, a feature I've come to really



appreciate. It means you're not waiting for the sander to wind down before you can put it down to change discs or pads.

We build a lot of tables in the workshop and spend a considerable amount of time sanding out 120 grit scratches left by the wide belt sander. I was surprised at how quickly the 5mm sander removed these scratches. We normally sand 120, 150, 180, 240, 320 and 400. We ran the coarser grits on the 5mm and swapped to the the 3mm for the finer ones. Combining the two sanders quickly produced a very fine finish.

The extraction was efficient. A detection system makes the sander stop if dust is present and can be easily activated or deactivated. Another handy new feature is where the sander automatically drops

its operating speed if extra vibration is detected during sanding.

Another highlight was the Plug-It hose we were supplied with. Here the extraction hose and power cable are integrated into the one protective sheath. I've been struggling with tangled hoses and cords for as long as I can remember and this is a very practical and elegant solution.

Summing up, the new model ETS brushless sanders are fantastic and we have seen an improvement in finish in the short time we've been using them. They are beautifully designed, feature packed, and with the Plug-It hose, a worthy upgrade from the older models.

From www.festool.com.au

Shinwa 150mm Steel Rule

Reviewed by Christopher Scott Duncombe



What if the most useful, high quality hand tool was also the most affordable in the workshop?

I've always disliked 150mm steel rules. I've tried many in the past and always found them to be too fragile, too shiny

and too hard to read with 0.5mm markings. Over time I just gave up on the idea of carrying one.

Recently a good friend gave me a 150mm Shinwa steel rule and it was like finding a golden ticket. Made

from stainless steel with a non-reflective surface finish, these rules are so clearly marked with full 1mm increments that even without my glasses I could read it from across the bench.

It's thin enough to be light, but solid enough to give some flex while maintaining crisp edges. The simplest feature is the raised end behind the hang hole to allow the rule to be easily picked up while lying on a flat surface.

For the same cost as two large coffees this little rule is unbelievable value for any type of woodworker and a joy to use.

Available in 100, 150, 300 and 600mm lengths from www.japanesetools.com.au

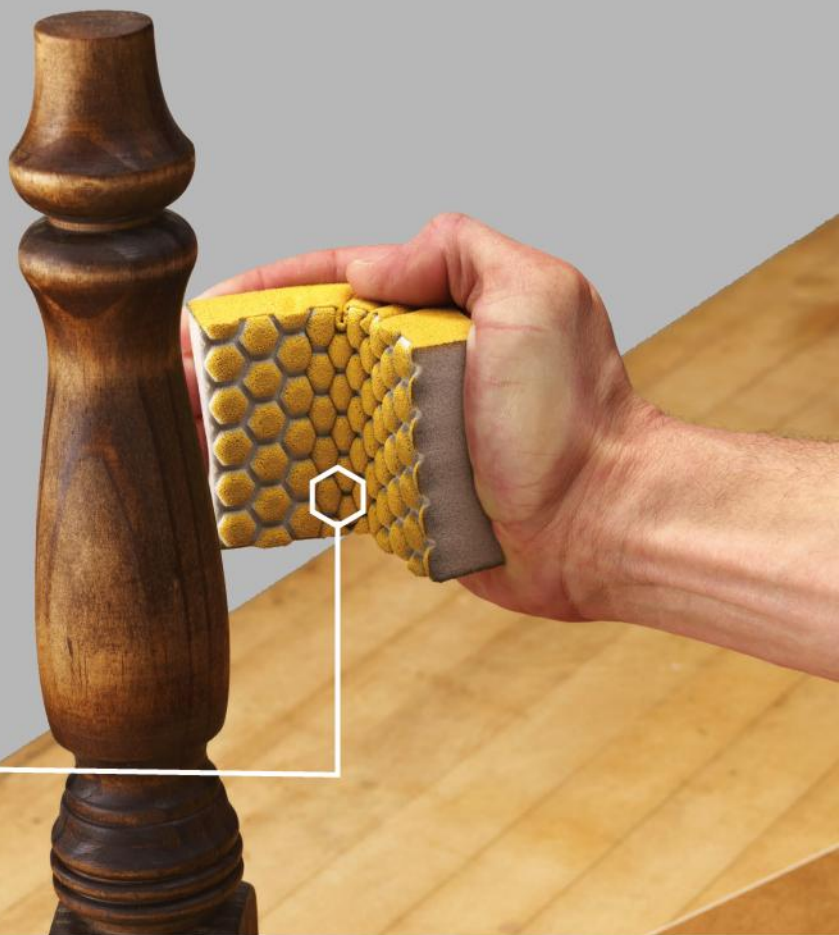
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Patternmakers and Luthiers Vice

Reviewed by Raf Nathan

This is a rugged and very well made vice that is just so versatile. The supplier calls it a patternmakers and luthiers vice but really any woodworker will love it. The main parts are of heavy cast iron connected with thick steel plate.

A large handwheel applies pressure and the jaws can pivot 360° so any shape can be held. Jaws that open up to 140mm will be adequate for most workholding jobs. The well finished

wood cheeks have polyurethane faces fixed to them to protect your clamped work. The quality of build is very good.

The unit mounts to a benchtop via a large 16mm diameter threaded rod. It dropped through one of the existing 19mm dog holes in my workbench and secured under the bench with a large washer and threaded handwheel. A separate base raises the unit well clear of your workbench so the vice can spin

360°. However I found this a bit too high and as shown above in the photo just mounted the unit directly to the bench.

You can hold cabinet parts, guitars, spoons or any shape, and the mass and strength of the unit give a secure and rigid grip. I thought the price quite fair given the build quality and impressive performance of this vice which is made in Taiwan.

Available from www.carbatec.com.au



Dust Deputy Box Separator

Reviewed by Raf Nathan

Most portable dust extractors work very well, but used regularly the collection bags will fill quickly. You can empty the bags (a messy operation), and re-use or dispose of them when full to then fit a new bag. In some cases the bags alone are \$12 each or more.

Adding on a pre-separator like a mini cyclone by Oneida of the USA has two benefits. It lets the collection bag capture only the finest dust so the majority of waste goes into a large box, extending the life of the bag immensely. Secondly, airflow through the system is greatly increased and this boosts suction performance.

With this Oneida separator a mini-cyclone captures dust at the top of the unit. The finer particles swirl at the top and are dragged away by the vacuum. The factory bag only collects the finest dust and may need emptying then only every few months. The bulk of the waste goes into the large 34 litre box which can be used with or without plastic bags. Oneida claim 99% fine particle capture with this unit.

Using the Systainer clips, the Dust Deputy Box separator fits perfectly on Festool CT 26/36/48 vacuums. I have a CT-midi however, a cheaper unit which required some mods to accept the box.

The large hose from the extractor was re-routed and I had to find and use a right-angle fitting at the top. The pressure relief valve and tube at the back was also re-routed. Use of this valve depends on whether you use plastic bags or not to collect dust.

Note that Festool do not officially endorse this unit, however I recommend considering a dust extractor upgrade like this. In a busy modern workshop using power sanders, routers and the like constantly, the dust extractor is the most used power tool. Anything that lessens wood dust and keeps the workshop cleaner is great value and the Oneida certainly does that.

Available from www.carbatec.com.au

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Within Sights ►

The Wixey WL133 drill press laser projects a thin set of cross hairs onto your drill press table precisely where the drill bit will contact the workpiece. The laser unit costs \$59.50 and is easy to mount and align with the centre of your drill chuck. After that, simply position and clamp the workpiece without the need for further bit alignment. The cross hairs stay on centre even when changing table height and regardless of workpiece thickness.

www.woodworksupplies.com.au



Product news

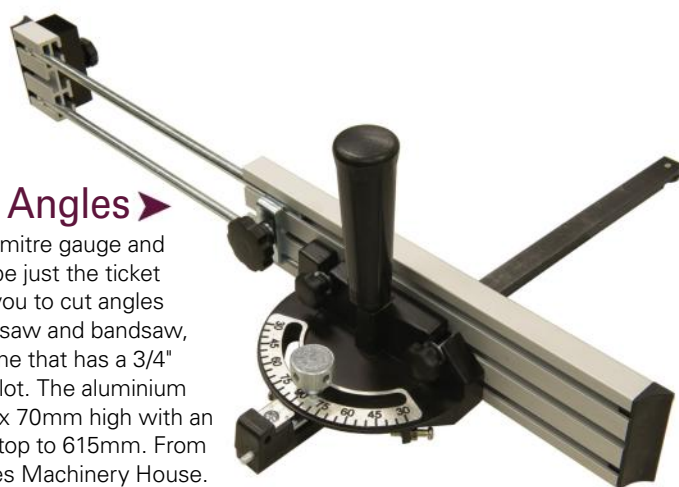
A round-up of tools and products to take notice of.



◀ Super Sander

Just released in Australia for \$1,975 including stand, the SuperMax 16-32 drum sander is well worth finding out about. The newest member of the SuperMax family has a quick adjustment lever to reduce set-up time, built-in digital read-out, turbo vented dust port and rear placement of the gear motor to improve conveyor belt tracking. Adjusting for wide and narrow stock is fast and easy. All this is on top of existing SuperMax Intellisand technology.

www.gregmach.com



Cutting Angles ►

For \$74, this mitre gauge and fence could be just the ticket for allowing you to cut angles on your tablesaw and bandsaw, or any machine that has a 3/4" x 3/8" table slot. The aluminium fence is 335 x 70mm high with an extendable stop to 615mm. From Hare & Forbes Machinery House.

www.machineryhouse.com.au

Fine Brass Hinges ►

Gerner Hinges new relaunched online webstore carries high quality brass hardware designed specifically for fine woodworking by well known Australian furniture craftsman Anton Gerner. The range includes butt hinges, knife hinges, quadrant hinges, small furniture knobs and box locks. Most items are available in polished brass or aged brass, and several are also available silver plated.

www.gernerhinges.com



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JTA

Hillbilly Forge Tools ►

Wicked looking and sharp out of the box, this sweet kit of tools for spooncarvers and whittlers is handcrafted by Hillbilly Forge in NSW. The handles are dense mallee burl with racy orange G10 liners. The blades are 12C27 with 416 stainless steel bolsters. The spoon tools are single edge and the knives are narrow body. Handmade for tool connoisseurs, kits start at \$299. Order sets or singles from hillbillyforge@hotmail.com



◀ Sawstop Add-Ons

SawStop tablesaws are known for their blade-stopping safety feature. Three new accessories are now available. A larger sliding table provides 1800mm of table travel with plenty of support. A fold-down outfeed table with built-in rollers offers generous support for larger work, and lastly, a fully floating Suva-style overhead dust collection guard is now also available. SawStop is distributed exclusively in Australia by Maxis Distribution. www.maxis.com.au



▼ Dry Check

For only \$44 how can you afford not to own a digital moisture meter such as the Hafco unit shown here? A plus/minus 2% accuracy can certainly raise an alert to wood that is not dry enough to guarantee effective joinery. The digital readout is backlit and has auto power off. www.machineryhouse.com.au



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Splayed Stool

Figuring out the right angles for legs and stretchers and then drilling mortises for them is easier than you think, writes Peter Young.



1. Splay angle – the leg angle as viewed from the front.
2. Rake angle – the leg angle as viewed from the side.
3. Variations in rake and splay angles can make a big difference even in a very similar design. The cedar stool in the centre has the biggest splay and rake angles of these three stools, while the walnut stool on the right has the smallest angles. The blackwood stool on the left has leg angles between the other two.

Stools in various forms have been around for centuries and not a lot has changed in the way in which these furniture items are made. Essentially there are two types of stool, those which have a seat attached to a frame, and those in which the seat is penetrated by the legs with the seat forming an integral part of the structure. It is the latter type we'll focus on here.

Splay and rake

While chairs may have vertical legs, stool legs almost always have splay angle as you look at the chair from the front (**photo 1**) and rake or side view angle (**photo 2**). Variations in rake and splay angles can change the appearance of a stool even with a similar overall design (**photo 3**).

Many people are put off by the idea of making a stool because they don't know how to make the seat mortises to provide the desired rake and splay angles. There is also the business of fitting stretchers to angled legs. There are some complicated methods involving mirrors and sets of sliding bevels and augers and while these methods work, there is an easier way involving a drill press and an angle jig.

Stools have angled legs for a number of reasons. The footprint of a stool is generally smaller than a chair; stools are generally taller than chairs; and many stools can be sat on in a number of different ways. All these factors add to instability, so angling the legs makes a lot of sense.

There are no absolute correct numbers for rake and splay angles but somewhere between 5 and 10° will look about right, depending on the design. If the legs are too far splayed, the stool will look like an ungainly newborn foal, and the ends of the legs will extend a long way beyond the seat margins, which might cause people to trip. For a circular or

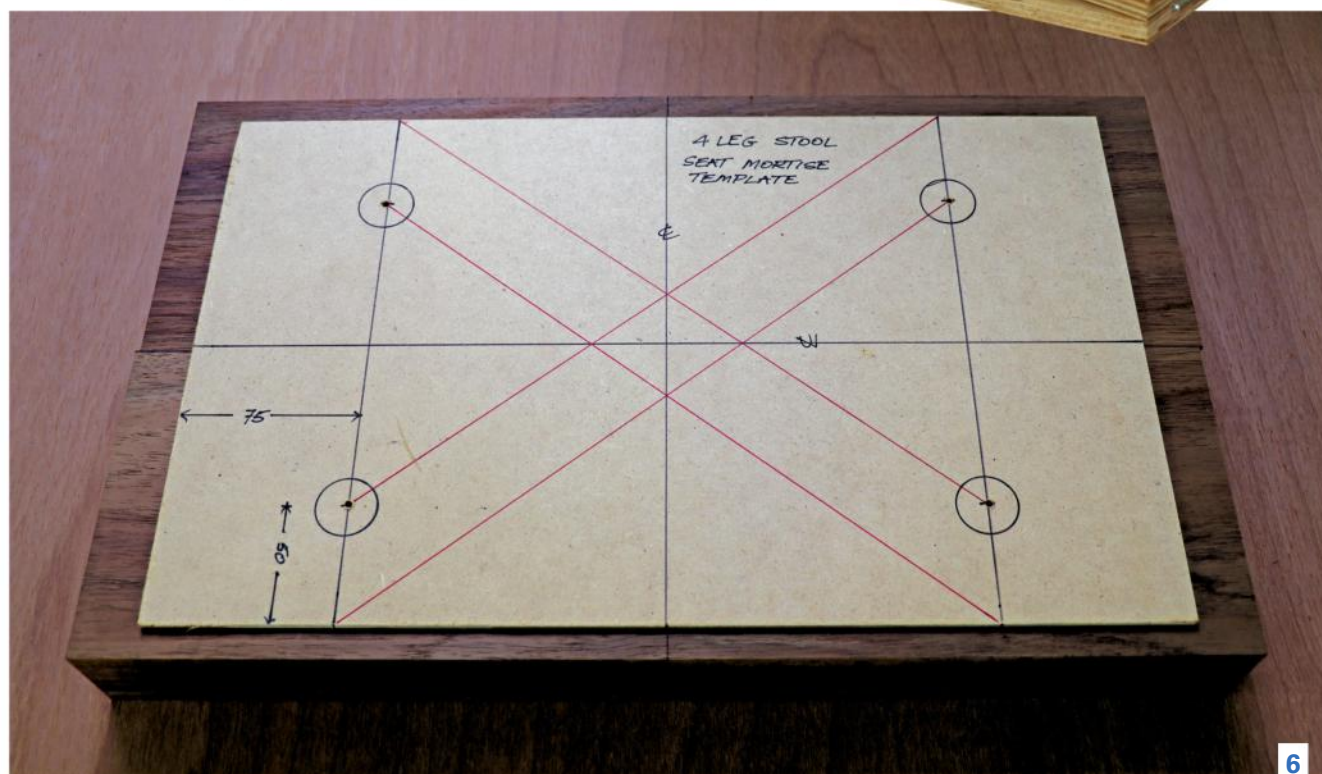
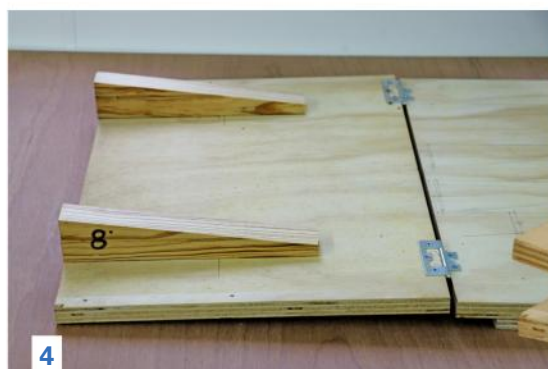
square seat, the rake and splay angles can be the same, but for a rectangular seat the splay angle is usually greater than the rake angle.

Resultant angle

To accurately drill the seat mortises, we need to find the included or resultant angle. If you have a stool at hand, you can determine the resultant angle by placing the stool upside down on a table or bench and moving it around until one of the legs appears to be vertical. That is, it has neither rake nor splay. If you now place a sliding bevel against the inside of the leg at that point, this will give you the resultant angle. Furthermore if you draw a line from the leg across the



4. Open angled sled showing 8° wedge.
5. Angled sled closed, sacrificial ply is screwed to the surface.
6. Template for drilling leg mortises, sight lines are drawn in red.



bottom of the seat, this is the sight line or the horizontal line along which the leg appears to be vertical. In a rectangular seat, if the sight line is at 45°, then the splay and rake angles will be identical.

Angled drilling sled

The resultant angle and the sight line are all you need to get a consistent result. The next thing to do is to make an angled sled or drilling platform for the drill press. I do this by hinging two pieces of ply and angling one face with wedges (**photos 4, 5**).

The angle of the wedge is the same angle as the resultant angle. Strictly speaking, you don't really need to know what the actual resultant angle number is. Using the sliding bevel, you can make some wedges for the

angled drill press sled. However it's better if you can use a digital protractor with a magnet to attach to the blade of the sliding bevel and you can then easily check that the angle on the sled is correct.

Seat mortises

I like to make a template which is the same size as the seat, showing the location of the mortises and the sight lines (**photo 6**). I can transfer this information to the bottom of the oversize seat blank. For shaping the seat, which is done after the mortises are cut, I use separate templates (**photo 7**).

To make the leg mortises use a Forstner bit in a drill press. The seat is placed bottom side up on the angled platform with the sight

line in line with the post of the drill press and the seat angled down towards you (**photo 8**). Now it is simply a matter of drilling each seat mortise in turn, following the same procedure with each. The mortise could be anywhere between 15 and 30mm diameter.

In traditional Windsor chair seats, a tapered mortise is used with a corresponding tapered tenon. The idea is that the taper provides a wedging action and the tenon is more securely locked into position than with a straight mortise. This method has worked well over many years, the only downside being that over time the tenon often comes through the seat a bit more than when the chair was made, which can cause some discomfort to the sitter.

If you want to use a tapered mortise and tenon you can use the method described here to drill a pilot hole and then use the appropriate angled auger to make the tapered mortise.

Making the tenons

I make the round tenons on the lathe as I find this is a quick and easy method. However you do need a lathe with a relatively long bed as the legs can be 600–650mm long. I leave a small 5mm shoulder which will contact the bottom side of the seat when the leg is fully home (**photo 14**).

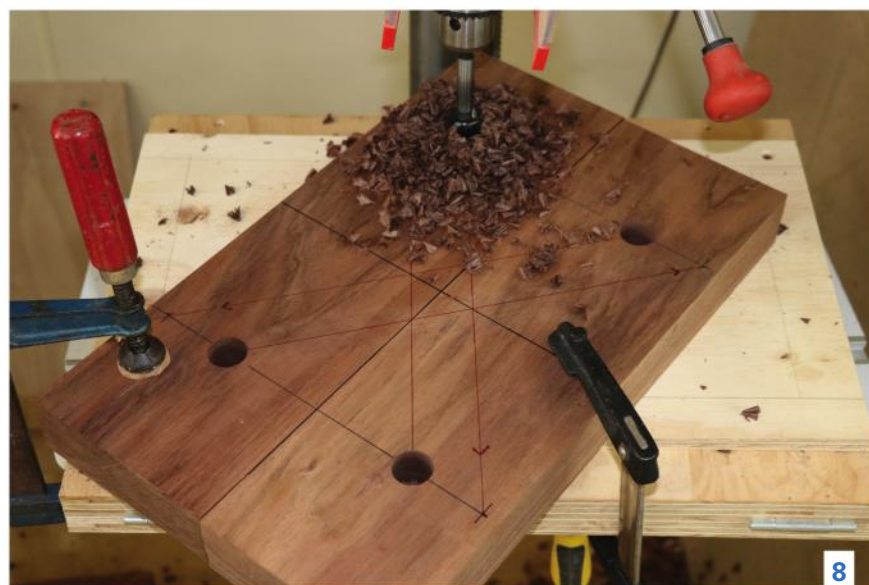
Another method is to use a plug cutter in a floor standing drill press. It takes a bit of time and care to set up, but once that is done the work goes quickly. The drill press table needs to be accurately set vertically and the leg needs to be held securely so the tenon is cut in the middle of the leg. After making the tenon, create a shoulder using either a tablesaw or a handsaw.

Fitting the stretchers

You can now fit the legs to the seat and check the angles. The next step is to fit the stretchers. These elements provide a lot of stability and are necessary except for the stools with really short legs.

The function of the stretchers is to push the legs apart and provide a really strong triangulation. In addition they serve as a useful foot rest. There are a number of different arrangements for stretchers but I commonly use one between the front legs, another between the back legs and then a central stretcher between those two.

I use spacers at the foot of the legs to push the legs apart and then clamp a batten across the legs where the stretcher will go, usually 130–180mm from the floor (**photo 9**). Use blue tape on the inside of the legs and mark across from the batten for the location of the leg mortise.



7. Templates for seat shape.
8. Drilling the last leg mortise using the angled sled on the drill press table.
9. To measure the shoulder to shoulder length of the front and rear stretchers, use battens as spreaders at the toe of the legs to spread them evenly, then clamp a batten horizontal to the floor where the stretcher will go and measure between the legs at this point. Use blue tape on the inside of the legs and mark across from the batten.

10. Use a sliding bevel to measure the actual splay angle.
11. Use a digital protractor to record this angle.
12. For turned legs make a cradle by cutting a V into thick scrap stock and then use a wedge or a thick batten to raise the cradle to the correct angle. For all four legs, the top of the leg is to the left and the toe to the right.
13. To cut the stretcher mortises, use the V-cradle flat on the drill press.
14. Shape the seat to provide a small dish for comfort and curve the edges.



You can now measure between the legs and this provides the length of the stretcher from shoulder to shoulder. Getting an accurate measurement between two round legs can be tricky so I use two small battens taped together as you might for checking squareness for a drawer. Another handy device is a telescopic aerial from an old radio.

The stretcher shoulders do not have to be large, just 2–3mm, but they perform a really important function of pushing the legs apart. Only the top part of the shoulder will come in contact with the leg, but that is sufficient to do the job. The strongest option is to use wedged through tenons but stub tenons also work quite well.

Stretcher mortises

To drill the angled mortises in the legs, you need to measure the splay angle on the inside of the legs (**photos 10, 11**) and then use this measurement to create an angled ramp for the drill press (**photo 12**).

For turned legs, I cut a V-shape in thick stock to hold the leg, but for square or rectangular legs a flat platform is all that is necessary. Either use a wedge or a batten under the

ramp to obtain the correct angle, easily checked using a digital gauge (**photo 12**).

For turned legs, centre the Forstner bit on the bottom of the V of the cradle and this will centre the mortise in the leg. For stub mortises you can drill about two-thirds of the thickness of the leg.

For through mortises in turned legs you need to take some care to avoid break-out as the V-cradle does not provide support. I continue drilling until the point of the Forstner bit just comes through, then I reverse the cradle (top of the leg is now on the right and the toe is on the left) and drill through from the other side.

The stretcher tenons are made either on the lathe or with a plug cutter, as for the legs. You can now fit the stretchers to the legs and then the legs to the seat. You will immediately notice how the stretchers provide some rigidity to the whole structure.

The next step is to measure for the central stretcher. As for the front and rear stretchers, place spacers at the toe of the legs and then measure between the front and rear stretchers to provide the distance between shoulders of the central stretcher. Drilling the stretcher mortises is fairly straightforward as there are no angles involved. For turned stretchers use the V-cradle flat on the drill press table and an 8 or 10mm Forstner bit (**photo 13**). The tenons can either be stub or through wedged.

Now put together the leg-stretcher assembly and then tap the legs into the seat mortises. Even without glue you will now have a very rigid structure, quite strong enough to sit on. Mark the tops of the legs where the wedges will go, they need to be at right angles to the seat grain direction. If you have used through tenons on the stretchers you can also mark where those wedges will go.



Final stages

All that remains to be done is to shape the seat. I like to have a small dish in the seat and a small curve on the long side and the short sides (**photo 14**). Use a bandsaw to rough out these shapes, then refine with a spokeshave and block plane.

Before glue-up I like to apply a coat of finish to all components. This really simplifies the removal of excess glue which can be just wiped off with a paper towel or dry rag, followed by a damp cloth.

The glue up is fairly easy. The leg-stretcher assembly is glued up first and then the four legs are tapped into the seat mortises. When the glue is set, remove the excess tenon wedge and plane flush with a block plane. Apply a final coat of finish and the job is done.

Photos pp.24, 25 and below: Andrew Porfyri

Process photos: Peter Young



Peter Young is a studio furniture designer and maker who lives in Brisbane. Email him at pydesign@tpg.com.au





The Modern Maker

Melbourne maker Adam Markowitz combines ways and means to create a multi-faceted career in woodworking and design. Story by Linda Nathan.

Adam Markowitz, 31, straddles worlds. They don't collide, in fact they allow him to be a uniquely well rounded creator, but at times they can seem at odds and as though he may ultimately have to choose one over another. Architect, product designer, maker, teacher – Adam is all those things.

He teaches at the timber furniture workshop at Melbourne School of Design within the faculty of architecture at Melbourne University. It's a place which for over 20 years has offered a workshop environment for primarily digital designers to explore the physicality and use of materials through the making of models, prototypes, furniture and experimental structures. It's where he got into making things when studying for his architecture degree. Now, in a new building with Adam now the teacher, there is more focus on digital technologies and a more contemporary approach to furniture making.

After graduating, Adam wanted to learn more about the making side of things so he enrolled for a postgraduate diploma in furniture design at the University of Tasmania in Hobart. This led to an opportunity to study for six months at the Royal College of Design in Copenhagen in Denmark. Most recently he got himself over to Maine, USA to spend four months at the Centre For Furniture Craftsmanship.

Even in formal study Adam takes charge of his own education. One story illustrates this well. Towards the end of his study at the Centre for Furniture Craftsmanship he wanted to focus on chair design rather than techniques he had already covered. 'We were shown how to make templates, mark out lines and sand slowly to the curve. So I just

Main: Adam Markowitz in the machine room of the Meat Market Arts House in North Melbourne, next to the workshop he shares with other makers.

Photo: Ben Clement

Below: *The Mobius Chair*, 2012, final project from Danish Royal Academy of Fine Arts, Copenhagen. Laminated birch plywood with curly maple veneer outer layer.

Photo: Tamara Maynes



1. *Fred Table*, Tas oak, jarrah splines. Designed by Adam Markowitz, made by Stephen Ziguras. Early in the development phase of this award-winning design Adam said he 'went too thin on the crossrails' as there was too much flex in the frame. 'When looking at the work of the Danish designers that I really love (and what led me to pursue making) was that they really knew how much material to leave and how much to take away.'
Photos: Ben Clement
2. *Flea Chair*, blackbutt, natural and ebonised. Designed and made by Adam Markowitz. Developed during study at the Centre for Furniture Craftsmanship in Maine, USA, Adam settled on the final form some time after returning to Australia. Initially based on angles in one of Børge Mogensen's chairs, 3D models were designed in Rhino and then prototyped. Early iterations had laminated backrests and coopered seats however it became apparent that these methods would never achieve production efficiencies. Subbing out the making to others was an option explored with a significant investment. The name has a playful connection to the Fred table, named for a child of Princess Mary, which draws on Adam's own ties to both Tasmania and Denmark.
Photos: Ben Clement
3. *Moshi Moshi Stool*, 2014, American white oak, ebony wedges, handcut dovetails. Built at the Centre for Furniture Craftsmanship whilst studying under Tim Rosseau.
Photos: Ben Clement

googled, found a guy down the road with CNC, went down there, and came back with all my parts milled out and ready to go. And they were just gobsmacked.'

'I think that CNC is totally part of the woodworker's tool set and needs to be,' said Adam. Expressing his ideas to Peter Korn, CFC founder and director, Adam said, 'You can't be putting guys out into the woodworking industry who don't know how to use CAD and CNC, because (at that point) you stop being craftsmen and you're more like a historical re-enactment.' Not long after, the school acquired CNC.

However, Adam is not saying there should be a lessening of emphasis on hand skills. 'I think the mistake a lot of schools make is they focus too much on the digital and not enough on the traditional.'

The reverse can happen with the old guard though, he said: 'The mistake some woodies make is that they stick their heads in the sand and say I want none of this. The reality is that 100

years ago when bandsaws came in there would have been the exact same discussions. There are inefficiencies that come through not preparing wood through a traditional manner but (CNC) is just a thousand times faster.'

Once again, there is a tension between worlds. 'My interest is the connection between making and designing. Most of the excitement comes in the prototyping phase where you're actually influencing the outcome through making. Once that's done I tend to quickly lose interest in the repetition of batch production.'

However he can't divorce that interest from the fact that it's the processes of making – hand, machine and digital – which enable that conduit into creating better designs for furniture based on tactile and physical observations of strength and resistance. 'I'll sketch and make, sketch and make – but there's this thing that happens when you're working with your hands and you're also in control of the design, where you're dynamically making decisions, and it results in a far better things.'



2



Q/A

Which end of a scale are you closest to: maker or designer?

Bang in the middle. Designer-slash-maker.

Can you define your style?

Trying to find that tension between elegance, minimalism and yet still sculptural quality.

Hand tool or machine lover?

Both essential, including the CNC.

Native or exotic woods?

Native.

Favourite designer?

Gio Ponti.

Maker?

Yuri Kobayashi.

Favourite tool?

Spokeshave.

Favourite machine?

CNC. There should be one in every workshop.

Most influenced by?

Hamish Hill.

Favourite wood?

Blackbutt. Actually I hate the stuff because it tears out and it's difficult, but I like it because it's blonde, and strong, and I can do things with it that I can't do with Tas oak.

The thing I hate most about woodworking is...

My bank balance.

The thing I love most about woodworking is...

It's one of the few areas where the link between design and making is in some ways implicit.

Where do you see yourself in 10 years time?

I would love to have my own shop on the Surf Coast where I can surf and make every day. If I could be left alone to make and not have to worry about money...

Makers need to make more time to...

Talk to each other.

Makers need to have less...

Disdain for things that don't exactly align with their world view.

What would you tell someone starting out as a designer maker?

You need to focus on both sides of that phrase in equal measure.

3





4

4. *The Hanging Studio Table*, 2015/2016, spotted gum, black oxidised steel.
Photos: Ben Clement

5. Suspended high up in the atrium of the Melbourne School of Design, the Hanging Studio is the most popular conference room in the building and in fact several people attempted to enter during our booked timeslot.

It's a faceted and angular space whose focal point is now the meeting table for 12 people which Adam Markowitz was commissioned to make. The success of its non-hierarchical shape is proven. Made from spotted gum felled to make way for the building, the design was also a pragmatic response to the odd-shaped boards milled from it.

Made over a three month period, it wasn't an easy build. Each piece was hand jointed, the grain tore out all over the place and the changing curves of the edges were hand shaped primarily with a spokeshave. 'Once glued up the top had no rigidity, there was flex the whole way', said Adam. The lowered ring allows unseen installation of services.

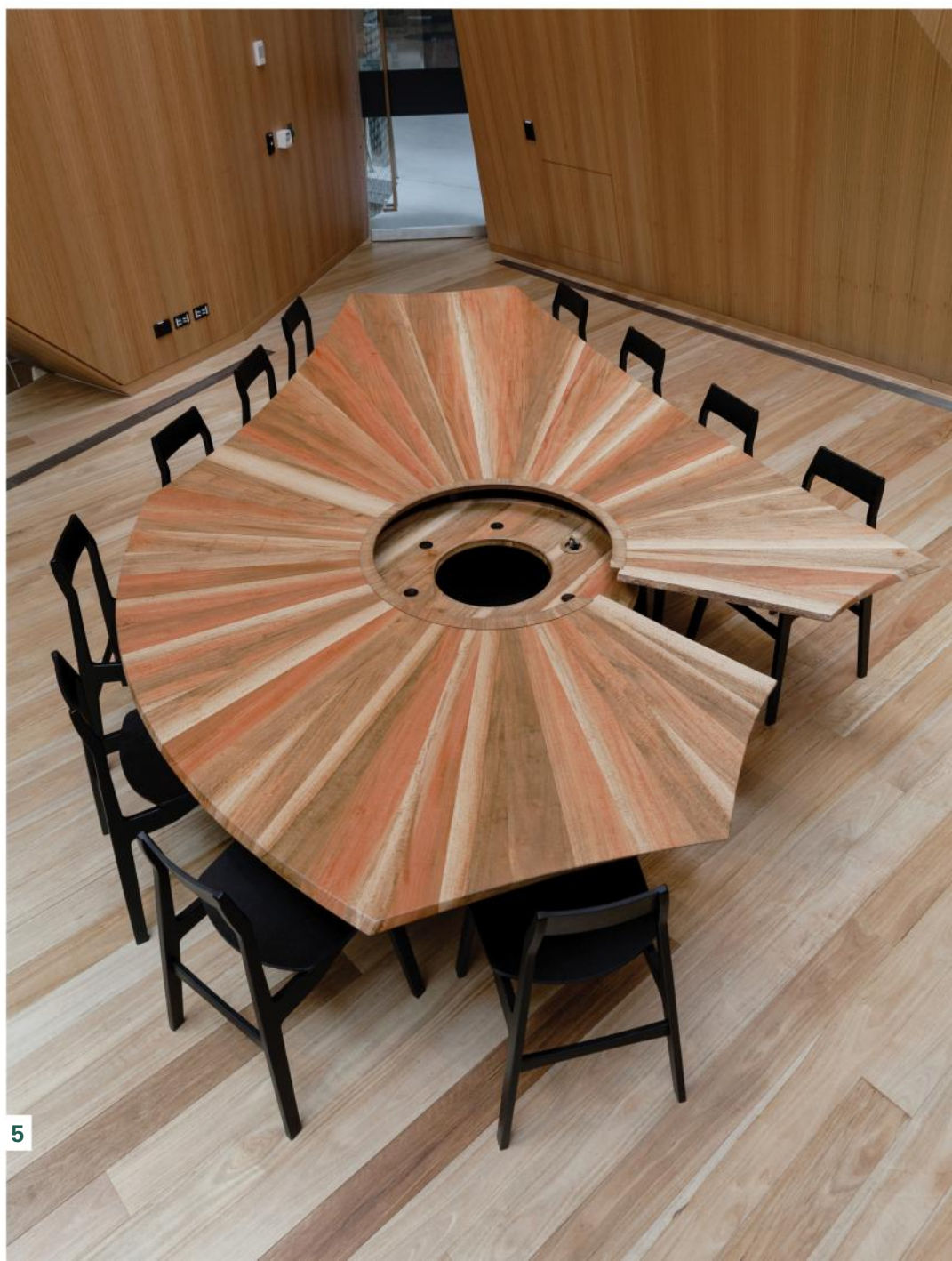
6. *Homogenous Cabinet*, 2014, American white oak, natural and ebonised. Completed whilst studying under Tim Rosseau at the CFC.
Photo: Dalton Paley
7. *Pull Sideboard*, 2017, Tasmanian oak, blackbutt, Brusso knife hinges, hand turned pulls, shopsawn veneer doors. Designed by Adam Markowitz, jointly built with Bailey McFarlane Farmer.
Photos: Alex Turner

According to Adam, designing and making is a reciprocal conversation. 'I think a lot of makers are focused on the making, and some designers are too focused on the designing. What I'm trying to do is combine. You see some woodies that design exquisitely made but ugly things, and you see a lot of designers that have got no idea how wood works and how to put things together.'

Mass-made technology has fuelled consumerism and a new maker culture has arisen in reaction to that. 'Younger people are rethinking

that, wanting authenticity and a relationship with makers and local design. People want to see the dirt under the fingernails, and shake the hand of the guy of that made it.'

That doesn't mean however that it's any easier for makers to earn a good living. 'There is wider interest but it is still a challenging environment for makers. A lot of them have their noses to the grindstone just to make ends meet. Trying to compete against low quality imports with big marketing budgets, makers are trying to cut costs to be competitive. We need to



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work together to educate people as to what quality is and why people should be investing in it.'

Figuring out the money equation is a very real pressure point. Subbing work out to others can speed production and lower per unit costs, but that in turn means spending more time on marketing and promotion. Time spent creating a sustainable career can paradoxically take a designer maker away from doing what's most enjoyable.

Custom work can be stressful. Working with tight budgets, compromising and putting often unpaid for time into prototyping and testing designs also makes it hard to

make money from bespoke. Teaching and also practising as an architect – all these things are worthwhile but demand more and more of the finite amount of time available.

Choosing between worlds is not restricted to a particular age group. Often it comes down to questions of happiness and living a so-called authentic life. Creative people more than others are faced with the need to justify their own worth in their own and others' eyes. Achieving financial sustainability in creative industries can force decisions that a lot of other people don't have to make.

Contact Adam via www.markowitzdesign.com and @markowitzdesign





Making Your Mark

Key tools and techniques to make laying out your work more accurate. Story by Vic Tesolin.

Next to developing good sharpening techniques, I would reckon that solid joinery marking skills are the next to master. Accurate marking techniques will greatly improve the chances of you cutting accurate joinery, especially when working with hand tools. There are some key tools and techniques that we will explore that will make your joinery layouts intuitive and simple.

Is it square

Before you get too far down the joinery road, you will want to make sure that the surfaces of your parts are square to each other. For the purposes of this article, we will assume that your components need to be square. For joinery that isn't 90°, you would trade in your square for a tool like a sliding bevel.

The key to success with a square is to understand the parts and how to use them. The thick bit of the square is the reference head and it should be the first part of the tool to touch the wood. Place the reference head firmly on the reference surface and slowly slide the blade (the thin bit) down until it contacts the wood. Then sight down the board to see if the blade contacts the entire surface.

Also, be sure to check multiple locations on the part to make sure that it isn't twisted. Be wary of simply sliding the square up and down the board. This is poor technique and will lead to bad readings. Take the time to do it right, if the layout is bad you'll be fighting it the whole way through the build. With that out of the way, let's move on to the fun stuff.

A word about pencils

In the woodworking world, I feel that pencils should be relegated to coarse marking only (**photo 1**). They're good for tasks like marking parts for identification and certain layout tasks that don't require hyper-accuracy. An example is marking the tails of a dovetail with a pencil because the tails will become the pattern for pin board. Be mindful to press softly with pencils because they can dent the wood making it difficult to get rid of them prior to finishing.

Why the knife is boss

I do the majority of my marking with knives of some type or persuasion and to be fair, as a lazy woodworker, I will normally grab the knife nearest to my hand. I have a lot of



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1. It's best to leave pencils for the design phase.
2. The best versions of these knives have a lock built in.
3. This blacksmith-made knife is good for more than just marking.
4. No woodworker should be without one of these marking staples.
5. Buy these knives in pairs to get the most out of them.

different knives and that is mainly because I have an affinity to them. Along with dividers and hammers, I collect and use marking knives for different tasks in my shop. The advantage that a knife has compared to a pencil is that you are making a physical mark in the wood. This is an advantage that we will discuss further, later on in this article.

The simplest and most readily available blade is the snap-off variety (**photo 2**). The beauty of these knives is that they are always sharp – simply snap off the dull portion and carry on with your work. Along with being lazy, I've also been called frugal, so sometimes I will sharpen one of these knives a couple of times before snapping off the blade.

These knives have a double bevel and require the user to tilt the knife slightly in use. This may sound difficult to do, but with a little practice you will wield it like a pro. Other double bevel blades, like the pictured kiridashi-style knife in **photo 3**, find other uses in the shop such as paring or whittling things like tapering pegs for tenons or even sharpening pencils.

A more traditional marking knife shape is the dual bevel knife (**photo 4**). These knives are somewhat spear-shaped and feature a single bevel which allows you to place the knife back firmly against a straightedge or reference piece.



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6. Your chisel has nowhere to go but the right spot.
7. These two knife cuts guide your saw for accurate cuts.
8. Just drop in your saw and go.
9. Accuracy starts with just a small notch.

The dual bevel ensures that you can work with either edge of the knife while maintaining that solid connection with your workpiece.

You can also find single bevel knives that have much larger flats on the back and wider bevels that make them easier to sharpen (**photo 5**). The only downfall (if you see it that way) is that you need a pair of them in order to work. This really only comes into play when marking things like dovetails.

So why all the excitement about the knife? A knife line allows you to use other edge tools like chisels with more accuracy (**photo 6**). When you place a chisel into a knife line, the chisel registers exactly where you want it. Imagine trying to place a chisel down on the exact same point of a pencil line. You could put that razor-edge down in an

almost infinite number of places – none of them the same. It's for this reason that I always mark joinery with a knife.

You can also guide a joinery saw using a pair of knife lines creating what is known as a knife wall. The vertical knife mark sets the position and the 45° line removes a small bit of waste that accepts the tooth line of saw (**photo 7**). This is one of the secrets to sawing directly on a line like that of a tenon shoulder (**photo 8**).

Using a knife usually gets paired with a square or some other reference surface like one half of a joint. This is commonly seen when striking the shoulder line of a tenon.

To strike a line using a square, start off with a small notch made with the knife (**photo 9**). This notch will likely get positioned by using a rule or another component. Best



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practice is to place the knife into the notch, then bring a reference surface (in this case a square) and have it come to rest gently against the knife (**photo 10**). Then remove the knife and make a series of light cuts against the square to ensure a crisp, accurate knife line (**photo 11**). Don't go too heavy with the knife or try to make the mark in one pass. Pushing too hard can cause the knife to wander or worse, lead to the knife slipping and cutting you.

Knives in disguise

There are other tools available that are based around incising a line into the wood. Marking gauges are essentially a small disc-shaped knife that comes paired with a fence (**photo 12**). This pairing allows the user to reference a surface and strike a line in relation to that surface. This technique is widely used when marking joinery like the mortise and tenon, and dovetails. There are even marking gauges made specifically with two cutters which make mortise and tenon layout a breeze (**photo 13**).

These gauges can be used in conjunction with measurement tools like rules or referentially using existing parts. Personally, I prefer referential because there are no numbers to gum things up. When you think about, it's not often that you really need to know the numerical size of something, so transferring dimensions directly from a piece works well. Take the base line of a dovetail joint for example. You could measure the thickness of a board with a rule then use the rule to set a marking gauge, or you could cut out the middle man and gauge the board directly. Who cares what the numerical value is?

When accuracy really matters, you can always count on one type of knife or another to line things up for you. As with any edge tool, it's important to keep your knives sharp for optimum performance. As for the pencils, they may be best left for the design portion of your next build.

Photos: E.K. Knowles

- 10. Go easy here – you don't want to dull your blade.
- 11. A few light cuts are better than one heavy one.

- 12. A marking gauge is a knife with a built-in reference surface.
- 13. Two cutters are better than one when marking a mortise and tenon joint.



11



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13



Vic Tesolin is a furniture maker and former editor of *Canadian Woodworking* magazine. He is also woodworking/technical advisor for Veritas/Lee Valley Tools. Vic's book *The Minimalist Woodworker* was published in 2016. See www.minimalistwoodworker.com

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Why I Like Sanding

Changes to abrasives and backings, not to mention some handy tips really can make hand sanding an enjoyable task.

Most woodworkers complain about sanding and I really do wonder about this and believe it's time to question that notion. Over time 'sandpaper' has lost the sand, and the paper now has alternatives which are more effective and durable, although paper backing is still standard in sanding belts to prevent the stretch that cloth alone would allow. Cloth backed abrasives are more flexible as well as longer lasting and mesh versions are a further evolution in improving the sanding experience.

Enjoy the journey

As one who makes one-offs in solid wood and loves curves I do get my share of hand sanding, and I don't want to waste energy resenting it. It is a process I do progressively. Apart from the fact that it is generally easier to sand components before assembly it gives a change of pace, a break from machining, a time to consider stuff. This may be thinking about refining a process, or developing a jig or something else.

That pragmatic approach of using the time is part of enjoying sanding while you get done something that has to be done.

Added to that is the real pleasure involved in fingertips constantly exploring to check that the lines are sweet and the surface is fine. Wood is made to be touched and sensual is good. I make sure I'm as comfortable as I can be, sitting on a suitable stool whenever possible rather than stooping, having a fan keeping the dust from my breathing, and choosing music or a podcast to suit my mood at the time.

Get ready

Having lights that can be shone from various oblique angles is another essential. This enables picking up even the minor cross grain scratches and tiny chip-outs that are almost certain to become visible with finish and awkwardly obvious once the piece is installed. There is a very wide range of powered tools for sanding flat surfaces and although the principles above do apply to tabletops and panels, the focus here is on shaped work.

Get set

For starters it is good to remember that steel is for shaping and efficiently removing what is not part of the shape you



Main: Just some of the options available for hand sanding curved surfaces. Clockwise from front: 3M Sandblaster flexible sponge, cork block and scouring pad, flexible backed abrasive, kitchen sponge/scourer combination.

1. The evolving face of modern abrasives show a variety of materials with cloth and flexible backings.
2. Store bought and shed made tools are convenient and comfortable to use.
3. Concave and convex sanding tools are worthwhile making.
4. Various sizes of dowels with sandpaper attached are handy for reaching tight curves and holes.



want. Power tools, rasps, files, rifflers, spokeshaves and the blessed scraper are the primary shaping tools. Sanding is almost exclusively about refining rather than shaping.

Working across the grain rips off wood rapidly but leaves grooves that must be removed by working along the grain with the tool, or grit of sandpaper that made the grooves, before moving to the next finer tool or grit. Using your lights at oblique angles will show when it is okay to move to the next grit. It is pointless to count on moving to a finer cut to remove coarse cuts. That inevitably means more time and effort, and unnecessary resentment of sanding.

Making tools for a particular job is what our species is good at and here are some tools and tips on using them that may put some joy into sanding for you.

Go

Sandpapers, more accurately known now as 'coated abrasives', have evolved (**photo 1**). Garnet paper (red) is still available but the standard abrasive is now aluminium oxide (white, and wet and dry black) Cloth-backed gives increased durability, the mesh gives an even longer life and when used in discs it also enables significantly improved dust extraction.

Aluminium oxide impregnated sponge is widely used in car body shops and is very useful in woodworking. The very thin and remarkably flexible Sandblaster sheets from 3M are a recent addition to the range of coated abrasives available, and their abrasive coated sponges are another option.

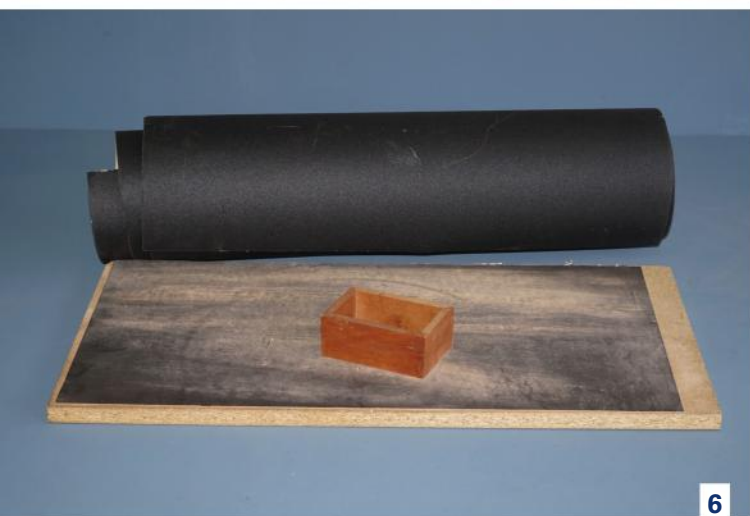
Two variations of a plasterer's sanding tool, one off-the-shelf and the wider shed-made version, are great for taking out the hollows in any larger radius convex curve (**photo 2**). They are also much better than a regular cork block for removing any power tool sanding swirlies on a large flat surface.



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5. Tweezers help to keep things at arm's length.
6. An easy way to flatten box components.
7. Taping off some areas can help avoid scratches.
8. Sanding into joints with sandpaper glued to ply.
9. Flexible and cloth-backed abrasives are good for sanding curved components.

Examples of bespoke sanding tools are shown in **photo 3**. They were bandsawn to match the inner and outer surfaces of a cylindrical cabinet I made many years ago. Their very basic construction took minimal time but assured a very satisfactory surface. They have been a useful part of my tool kit since, and been added to along the way.

Various dowels can serve as mandrels for sanding inside curves, such as on mouldings or inside holes (**photo 4**). You can effectively make a rat tail rasp to suit the job in both diameter and grit.

Shaping the edge of ply or wood is another way of sanding concave details, and of course ply can also be shaped to deal with convex forms in mouldings or detailing. The result will be much more consistent than relying on the flexible surface of folded sandpaper or fingertips.

Avoid sticky fingers and the irritation of overspray by using tweezers to hold the sandpaper, and making sure the excess lands on waste paper (**photo 5**). Spray adhesive will hold the sandpaper reliably in place and then be refreshed when the sandpaper dulls.

Spray adhesive, preferably the kind described as repositionable, is readily available from stationery suppliers and is better than PVA because it won't make the sandpaper curl. Spray adhesive is also quicker. Spray the back of the paper and the surface, then allow both to tack off for a couple of minutes. This way you'll get a contact glue effect with immediate and long lasting adhesion.

This is relevant when using sandpaper to add grip to jigs. If you expect to renew the sandpaper then you press the sandpaper to the ply while wet. You can easily peel it off when it needs replacement.

Boxmakers will know the set up for truing the junction of lid and box shown in **photo 6**. MDF or chipboard is



more likely to be flat than an offcut of wood or even ply, however make sure it is truly flat before relying on it to flatten the work. Wide sandpaper such as the roll shown is available and preferable to butting up narrow sheets and use of spray adhesive gives a flat surface.

Sanding often involves a meeting of opposite grain directions but good old masking tape can prevent ugly cross-grain scratches (**photo 7**).

Photo 8 shows how sanding into shelf to carcase or rail to leg junctions are easier when you use spray adhesive to have sandpaper right to the edge of a piece of ply. Allow the sandpaper to overlap slightly then cut it flush with a snap-off knife so you can sand right to the corner. Two grits on the one sanding board is handy.

There are some very beautiful sanding bows made to more elegantly sand such complex curves but lacking one of those you can simply use hand held strips of cloth backed or flexible abrasive (**photo 9**).

Your hand can get hot and tired when sanding shaped surfaces. A scourer sponge makes a good buffer between hand and abrasive for such jobs. The coated sponge from 3M serves the same function. Dense foam rubber glued to a cork block helps form an even concave curve such as in the seat shown here. There is quite a range of sponge rubbers and it is worth your while stocking a selection of pieces for various sanding jobs.

Photos: Richard Vaughan



Richard Vaughan is a furniture designer/maker in Brisbane who also teaches woodwork classes. See richardvaughan.com.au



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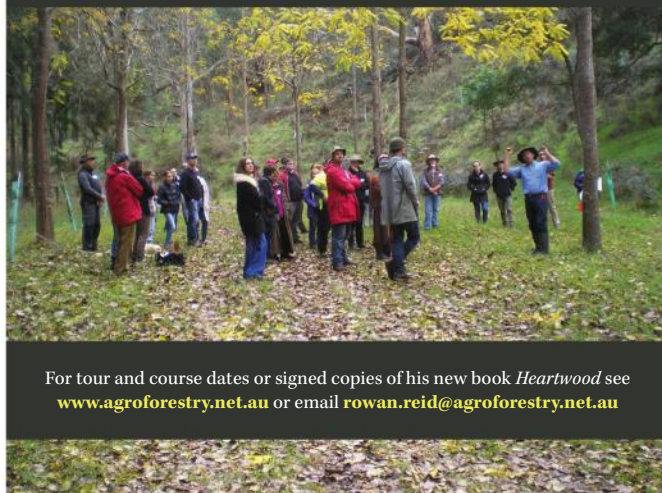
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The author with his shopmade crosscut sled. Safer and more accurate tablesaw cuts are now possible.



Making a Crosscut Sled

Andy Groeneveld designs and makes a crosscut sled for his tablesaw.

I consider a crosscut sled to be the most important jig in my workshop. It enables me to make square, accurate and tear-out free cuts. It allows me to size material safely and perform repeat cuts with the use of a stop block.

Material selection

The sled I made is sized to suit the style of work that I do. You can make yours smaller or larger depending on your needs. I used 15mm plywood, but any flat sheet goods material would be fine also. The Kreg runners I used are 762mm long and have nylon set screws along the length to adjust side-to-side movement in the mitre slots.

Alternatively, you could make your runners out of a dense, preferably quartersawn, hardwood by measuring the width of your mitre slot and cutting the wood to fit snugly.

Building the sled

Break down the plywood to manageable pieces, then cut the sled components to size on the tablesaw (**fig.1**).

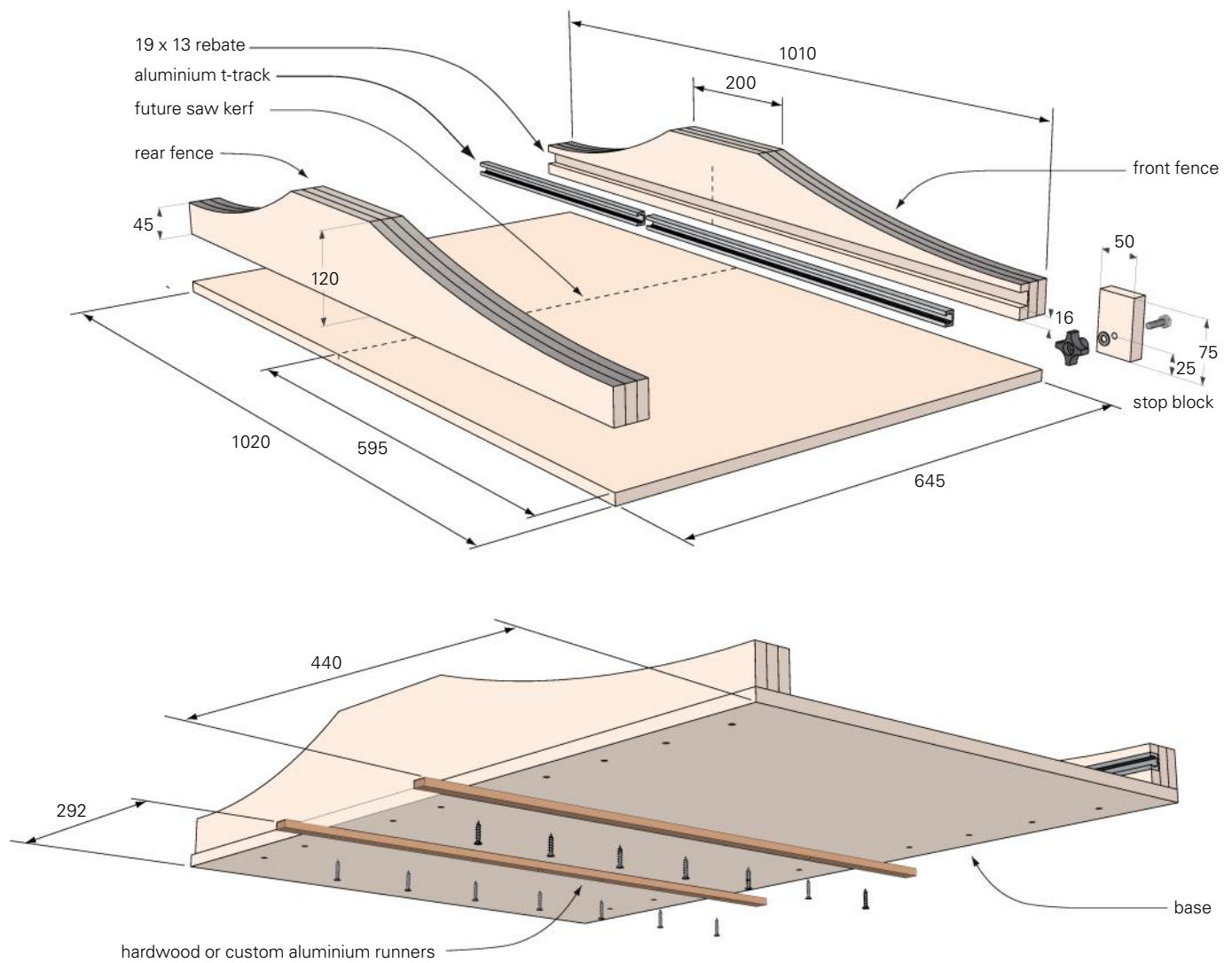
The front and rear fences are sturdy, each being made from three pieces of plywood laminated together (**photo 1**).

Allow the glue to dry overnight then use a straightedge to check both fence faces, selecting the flattest one to use as your front fence.

Use a jointer or a handplane to clean up one edge and rip them both to correct width and length. The curves on the fence make it easier to hold down material when using the sled. These were drawn and then bandsawn. You really only need to do this to the front fence, but I shaped both to look the same.

Rounding over the edges on the router table makes the fence nicer to handle and also prevents dust build-up which may affect the accuracy of your cuts.

To ensure a dead-flat surface, tape some 120 grit sandpaper to your tablesaw top, draw on some pencil marks and sand the front fence (**photo 2**) until all the pencil marks are gone.

Fig.1 Components (mm)

1. The stock for each fence was laminated from three strips of birch plywood.
2. Sandpaper temporarily glued to the tablesaw was used to flatten each fence.





3. Insert a shim the same thickness as your sawblade into the blade slot and square up the fence to it.
4. Squaring the blade: first cut off a 20mm strip, then mark the top A and the bottom B.
5. Next, accurately measure the width of the top of the test strip.
6. A feeler gauge that is as close to 1.272mm is inserted between the scrap piece and the fence at the adjustment point.
7. Adding a stop lets you make accurate repeat cuts.



For repeat cuts when using your sled you could use a scrap piece of wood and a clamp. This works fine, but I like the idea of having a built-in stop. I routed out a 19mm wide x 13mm groove to fit an aluminum T-track then use a scrap piece of plywood with a T-bolt, washer and knob as a stop block.

Assembling the sled

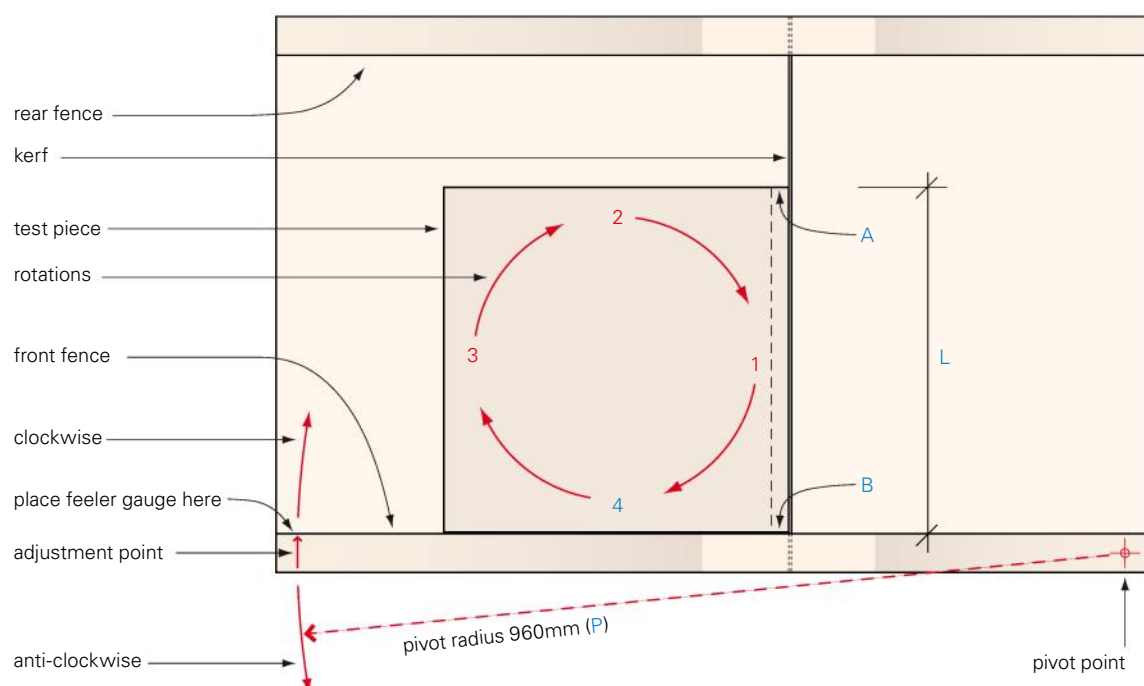
To assemble the sled first place washers or any other spacer you have every 100mm in the mitre slot and insert your runners. The runners should be just proud of the tablesaw surface. Apply some glue to the runners and position the sled so the front is flush with the tablesaw. My sled is offset so I have more crosscut capacity to the left.

Weigh down the base with something heavy, ensuring the runners are still able to move freely in the slots. Once dry, pre-drill and insert screws from the underside of the runners into the base. If you do use wooden runners, inserting the screws by hand will avoid splitting them. The Kreg runners come with countersink holes so simply pre-drill and insert screws.

Position the rear fence so it's flush with the edge, clamp it down, then pre-drill and insert screws every 100mm. The rear fence does not need to be squared to the blade as it's only in place to hold the base together to create a more rigid sled.

Now it's time to cut into your sled for the first time. Lower your blade below the tablesaw surface and position your sled so the blade is approximately in the middle of the base. Turn the saw on, raise the blade and push your sled so it's about 40mm from the front edge. Turn off the saw and attach the front fence flush with the base, then insert one screw only about 50mm in from the right side of the fence so that it pivots.

Place a shim that is the same thickness as your blade and insert it in the blade slot and square up the fence to the shim (**photo 3**). By lightly clamping the left side of the fence I was able to use a small hammer to make micro adjustments. Once squared, tighten down the clamp and insert one screw about 50mm in from the left side of the fence.



Five-Cut Method

1. 400mm test piece of MDF
2. Mark sides anti-clockwise 1, 2, 3, 4
3. Cut edge 1, rotate clockwise
4. After four cuts trim 20mm off side 1
5. Mark top of strip A, bottom B
6. Calculate error with following formula
7. If E is negative measurement move fence clockwise
8. If E is a positive measurement move fence anti-clockwise

Formula

$$A - B \div 4 \div L \times P = E$$

A = width test strip top

B = width test strip bottom

4 = number of test cuts

L = length test strip

P = distance between screw RHS fence pivot point and adjustments made on LHS fence

E = error

Squaring the blade

To test for square and then adjust the fence to the blade I used US maker William Ng's five-cut method formula, see opposite. If done correctly, only one adjustment is needed for your sled to make perfect 90° cuts.

If the error (E) is a positive number, the fence needs to be pushed back away from the blade. If negative, the fence needs to be pushed forward towards the blade.

For example (in mm): $20.12 (A) - 18.50 (B) \div 4 \div 400 (L) \times 960 (P) = 1.272\text{mm}$

This means my fence needs to be pushed back away from the blade 1.272mm (E). I clamp a scrap piece of material against the fence and remove the screw from the left side of fence. I insert a feeler gauge that is as close to 1.272mm as I can between the scrap piece and the fence (**photo 6**) where my point of adjustment is.

My fence is now pushed back away from the blade. Clamp the fence down and pre-drill and insert a new screw. It's very important that you do not use the old screw hole as the fence will want to pull back where it was. Repeat the

five-cut test and measure the error. I ended up getting an error of 0.4mm which was the cumulative error over the four cuts, so my actual error is 0.1mm ($0.4 \div 4$) over 400mm which is way more than I need for woodworking.

If your error (E) is a negative number, clamp your scrap piece and feeler gauge against the point of adjustment. Remove the feeler gauge and screw and push the fence forward towards the blade so it's against the scrap piece. Then clamp the fence down and insert a new screw.

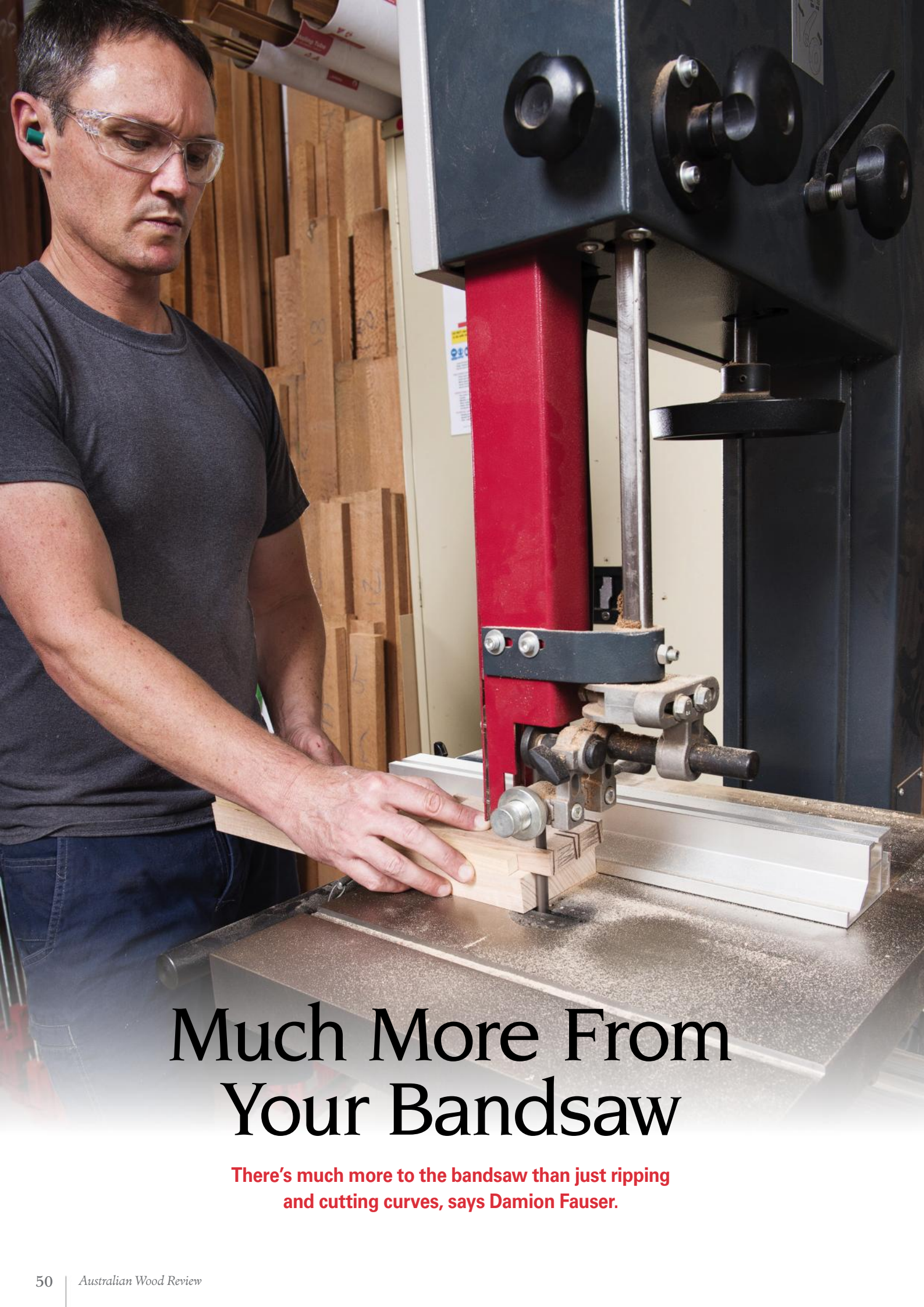
Once your sled is squared up, wax the base and runners so it runs smoothly. Now you can put your sled to good use knowing it will cut perfect 90° cuts every time with zero tear-out. And now, with the use of the stop (**photo 7**), you can repeat these cuts for all your production jobs.

Photos: Andy Groeneveld

Diagrams: Graham Sands



Andy Groeneveld is a Sydney based woodworker who takes on furniture commissions on a part time basis. Email AGwoodcreations@hotmail.com



Much More From Your Bandsaw

**There's much more to the bandsaw than just ripping
and cutting curves, says Damion Fauser.**



The versatility of the bandsaw basically comes down to its anatomy. With most woodworking machines an element of rotational or lateral vectors are applied at the intersection of the blade and the stock. On a tablesaw this can contribute to kickback and it's also why we need to always mill stock on the jointer from the right to the left.

On a bandsaw the vectors applied at the cut are lineal, and the direction of force applied is downward onto the table, rather than laterally across. This makes the bandsaw a far friendlier machine to use and that's why I do most of my ripping on it.

Damage control

With a downwards cut the teeth exit stock at the base, so this is where any chipping or tear-out will occur. On finer cuts, or to minimise damage, add a zero-clearance base to the saw table. Simply take a small sheet of masonite, set the saw fence to the desired setting and run the masonite partially through at that setting (**photo 1**). Stop the saw and clamp the masonite in position to give a clean and slick surface and protect against tear-out.

Get the best tooling

Remember it's not the machine that makes the cut – it merely drives the blade. To get the best performance out of your bandsaw invest in the best tooling you afford. I use BiMetal blades for general cutting and carbide-tipped blades for times where I need to maximise performance and minimise waste.

Sawing boards from a log

Knowing how to yield boards from a log or branch can help maximise resources. Here the bandsaw excels, and the average mid-sized 14" or 16" machine will easily handle a log in the order of 1000mm long and up to 150mm thick. For larger logs you need outfeed supports or an assistant.

A jig will help you traverse the round log in a straight line past your blade. A simple right-angle section can work as a cradle with the outside face running against the fence.

The log is fixed to the inside of the cradle with countersunk screws from the outside of the jig, both the vertical side and from underneath to give maximum support. The screws will go into bark and sapwood so the holes will be sawn off. Always be aware of the path of blade when positioning the screws so you don't damage the blade (**photo 2**).

Set the fence so the blade will skim off the outside edge of the log, to give an initial flat surface. Detach the log,

rotate it 90° to now register the flat face into the cradle for better support and then take another pass to yield a second flat surface perpendicular to the first (**photo 3**). Now you have a piece of wood that can be safely jointed and registered at the table and fence of your saw for sawing boards (**photo 4**). Store your boards for drying and check their moisture content before use.

Cutting narrow stock into veneers

Making the most of a special piece of wood by resawing it into veneers makes sense. Shop-made resaw fences will allow you to do tall resaws. Use MDF to make simple jigs supported by 45° brackets glued and screwed in place. Take a small chamfer off

1. Setting a zero-clearance base in place.
2. Log-cutting cradle with a log screwed in place.
3. Making the second cut to yield the second flat surface.
4. Once the first two flat faces are cut you can just run the log on your saw without the cradle.



5. Squaring up a shop-made resaw fence.
6. Resawing 2.5mm veneers.
7. Cutting narrow strips.
8. To make a jig for cutting wedges, first mark for a 5° notch.
9. Using a chisel to clean the saw marks from the bandsawn notch.
10. Push the stock all the way past the blade to prevent the wedge being caught by the blade.
11. Cut wedge showing the knife edge that is possible.
12. Take a wedge off the other corner, then take two more wedges from the other end.

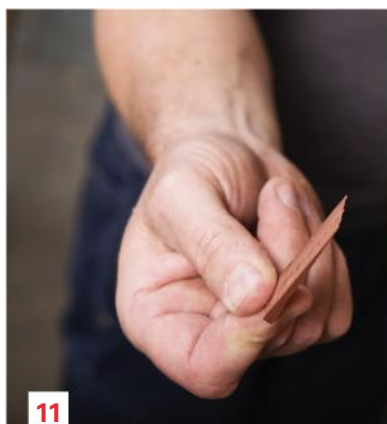


the bottom of the vertical face of the fence to provide clearance for any errant dust during the cut.

The resaw fence is clamped in place directly to the table. The distance from the blade determines the thickness of your resawn components. If your saw is already adjusted for drift, use a square to set the fence square to the front edge of the table. Otherwise, determine your drift angle and set the fence using a bevel gauge set to that angle (**photo 5**).

When determining veneer thickness and the number of pieces don't forget to take account of the kerf (blade) thickness. I generally saw veneers 2.5–3mm thick and then dress them down to around 2mm.

Remember these are ripping cuts, but you are asking the machine and the blade to remove a lot of material, so slow the feed rate down to give the gullets a chance to remove the waste (**photo 6**). You may need to redress the sawn face so it registers cleanly against the fence for the next pass.



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If you plan on arranging your veneers into a decorative pattern, ensure you mark the edge of the stock with a cabinetmakers triangle prior to sawing so that you can always rearrange them into their original orientation when experimenting with your patterns.

Cutting narrow stock into strips

Narrow strips are useful for edge-bandings, string inlays, splines and more. This is also just a ripping cut, but a very thin one so you might want to use a blade with a finer pitch.

Start by using the techniques from resawing veneers to take wide, thin strips. Set a zero-clearance base down on your table at your desired



fence setting. Because the guides may interfere with lowering the post down, either use a supplementary fence made from a piece of plywood, or if your machine allows, rotate the fence extrusion 90° (**photo 7**). Redressing the reference edge each time ensures at least three dressed faces, meaning strips can be rotated for optimal grain orientation in a project without further work.

Cutting wedges

Wedges are one of the most useful workshop accessories, though I mainly cut small wedges for wedging through tenons. I generally use a 5° angle for my wedges. Draw this in from the edge of a piece of dressed wood and then bring it back up to the edge so the resulting drawn angle is 90° (**photo 8**). Bandsaw the long section, trim off the short one, then clean up the two cut surfaces with a chisel (**photo 9**).

Set the fence so the blade runs just along the outside edge of your jig. Run and clamp a zero-clearance base in place to stop the cut wedges from disappearing down the throat plate and getting caught in the lower guides.

Now take your wedge stock, locate it into your 5° notch and run the pass through to the rear of the blade (**photo 10**). Your wedge will drop onto the table when you take away the stock and will have a nice clean knife-edge to it (**photo 11**).

Flip the stock to take a wedge off the other corner at that end and then rotate the stock to take two more wedges from the other end (**photo 12**). Whilst you have this setup in place, run a quantity of wedges to store for future use.

Cutting tenons

The bandsaw excels at this task because the cheek cuts are square and flat. It is easy to set a stop block to stop the cut at the shoulder and if doing twin tenons, it is also easy to use nibbling cuts to remove the waste in between the two tenons.

Lay out your tenons (**photo 13**) and then set the fence to cut the inside cheek, ensuring you keep the blade in the waste. Mark the shoulder, line it up against the front edge of your teeth and use this to visually set and clamp a stop block on the fence (**photo 14**).

Run the first outside cheek and rotate the stock 180° and run the opposite cheek (**photo 15**). Leaving the fence in place, place your stock against the blade as if it was going to cut the inside cheek. Your stock will be offset away from the fence – mill a piece of wood to that thickness and then you can use that to shim your workpiece away from the fence and make the two alternate cheek cuts (**photo 16**).

With this shim technique, you only need the one fence setting to make

four cheek cuts, which will save you enormous time. Careful planning will allow you to use this fence setting to also remove the sub-cheeks to form the shoulder all around the tenons (**photo 17**). To remove the waste in between the two cheeks, push the stock into the blade to take nibbling cuts – the stop block will prevent you from going below the shoulder line.

For the shoulder cuts use a crosscut sled on the tablesaw or do them by hand as it is important to have clean and crisp shoulders. In **photo 18** you'll see that I've just buzzed them off at the bandsaw for the purposes of this article to show the final result.

Trimming splines

Mitre splines are a great way to reinforce and decorate small mitre joinery. Trimming the excess spline material away can be risky and time-consuming, but a bandsaw jig can counter that.

Take two pieces of MDF and fix them together with the top layer offset and parallel to the bottom layer. Cut a small notch away from the edge of the top layer – this is where the bandsaw blade will travel during operation.

Position the jig so the edge is square to the front of the saw table and the notch houses the sawblade and then clamp it in place. Now you can simply run your project against the edge of your jig and the saw will remove the excess spline material quickly and easily (**photos 19, 20**).

And dovetails too!

Yes, the bandsaw can even cut dovetails. In my experience, one of the most common causes of poor dovetails is the inability of the woodworker to make repetitive and accurate tail and pin cuts that are square. The bandsaw ensures each and every one of these cuts is perfectly square.

In issue 94 I showed how to make stock that tapers from edge to edge using the planer/thicknesser. Use this technique to machine some stock with

an angle suitable for dovetailing (9.46° for 1:6, and 7.13° for 1:8) and then glue a small cleat on the top along the low edge. Layout your pin spacings on the end of your pin boards (highlighted with a marker pen for the photos), register it against the cleat and use this to set the fence to make the cut on one face of the first pin.

Use a series of shims to progressively space the jig away from the fence to make the first cut on successive pins. Once you've made the first cut on the pins, rotate your jig end-for-end and



- 13. Lay out for twin tenons.
- 14. Set a stop block on the fence to hold the cut at the shoulder.
- 15. Cutting the outside cheeks.
- 16. Using a shim to cut the inside cheeks.
- 17. Cutting the sub-cheeks.
- 18. Completed twin-tenons.
- 19. Spline trimming jig showing notch to house the blade.
- 20. Using the spline trimming jig.





21

- 21. Tapered pin-cutting jig.
- 22. Tail-cutting jig with registration stop for symmetry.
- 23. Bandsawn dovetails, straight off the saw.
- 24. Starting the cut at the birds-mouth.



22



23



24

repeat the process to make the second cut on each pin (**photo 21**).

Take a bevel gauge and set it for the angle of your pin-cutting jig. Now take this angle and use it to mark out a tapered long edge on another piece of wood to act as the guide for cutting the tails (**photo 22**). Glue a small offcut to one end to act as a cleat for registering your tailboards.

Set the fence to make the first cut of the first tail. Because this jig is symmetrical, you can simply flip your tailboard and make the first cut of the opposite tail. Now, use a series of shims to progressively space your jig away from the fence to make the successive cuts.

Remove the socket waste as you normally would and, if you've been

careful in your setups, you'll have fantastic dovetails straight off the sawblade (**photo 23**). This technique takes some time and diligence to setup accurately so it's best kept for a job with a lot of cutting to do.

Template trimming

The bandsaw can be used to remove waste from template components to within a consistently fine distance without risk of cutting below the line, leaving components that are ready to be buzzed off in your templating jig.

You'll need to make a simple jig that consists of one base platen and a second birds-mouth component fixed perpendicular to the first. The birds-mouth notch is where the sawblade will run and the template runs against the mouth of the birds-mouth (**photo 24**).

Fix your template to the stock with double-sided tape and start the cut, carefully registering and running the template against the end of the birds-mouth. Careful setup will leave you with the perfectly consistent amount of material to remove at the router table or shaper.

Understanding how the bandsaw works is the key to exploring its versatility. Grab some scraps, make some simple jigs and have a go. I'm sure you'll enjoy the process and improve your woodworking.

Photos: Donovan Knowles



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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Beyond Expectation

Announcing the award winners for Wood Review's Student Awards 2017, with comments from judges Linda Fredheim and Darren Oates.



As in past years, entrants in Wood Review's Student Awards 2017 were fearless in the projects chosen and tackled. Perhaps the emotions were different for teachers who took up the challenge on their behalf, doubtless going the extra mile.

Canoes, cabinets, cajons, couches, clocks, coffee tables...and desks, shelving and entertainment units were just some of the work entered. Decorative techniques made some entries stand out, as did curved and bent laminated work. The gallery of

work by Australian students in years 11 and 12 that you can now see on www.woodreview.com.au/student-awards remains the only national online showcase of its kind and demonstrates that there is a generational skills transfer going on. But more than that it highlights how new technologies of design and making are being widely taught and utilised to explore ideas and realise them.

Some of the entrants are clearly brilliant, unbelievably so in terms of their design, engineering and

making skills, and that must also reflect the incredible input of their teachers. However, although this is a competition, it's really about putting the efforts and skills acquisitions of all entrants on a pedestal.

Our industry sponsors are fully behind this initiative to promote, encourage and enjoy the skills in design and technology attained by younger woodworkers. We also celebrate the achievements and dedication of their educators, parents and communities who



OVERALL BEST

Carafe Desk, Ben Selig, Year 12, The Kings School, NSW. Teacher: Jayden Taccori

Ben Selig credits inspiration from Sydney designer Charles Wilson's Carafe table which is made by Herman Miller Furniture. The top and drawers of the desk are made from American walnut, while the legs and connecting rail are bent laminated from hoop pine with walnut accents down the centre. The drawer curves were shaped to complement the curves of the legs.

Darren Oates: *Having viewed the Charles Wilson Carafe table which inspired this piece, I believe that Ben has taken the original design and made it his own.*

Linda Fredheim: *A complex design that uses a wide range of techniques and elements. Ben has shown a high degree of craftsmanship to resolve the connections between all the elements and complete this piece.*

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enable this learning. Our sincere thanks goes to 3M Australia, Triton Tools, Carbatec, Hare & Forbes Machinery House and Arbortech for supporting this endeavour. Award winners now receive a share in over \$5,500 worth of great tools and machinery.

This year our esteemed judges are Linda Fredheim, Tas and Darren Oates, NSW. Both are respected designer makers and woodworking educators who have exhibited widely and taught at tertiary level.

Both share a passion for the efforts of younger makers.

By their account it was tough choosing some entries over others as there were clearly many that stood out for differing reasons. Popular Choice was chosen by likes or 'reactions' to the album of entries that still appears on www.facebook.com/woodreview

It's our pleasure to now announce and congratulate the award winners for 2017 along with the teachers who supported them!



Best Design

Xylem plus Phloem Console,
Jack Taylor, Year 12
The Kings School, NSW.
Teacher: Jayden Taccori

Jack aimed for a distinct yet 'simple' look, however the construction was complex with compound tapers and a wrap-around honeycomb feature which took months to design and prototype. 'It was an incredible project that I loved creating, and whilst everything went wrong at some point, it taught me a lot about problem solving.



Darren Oates: All the hard work to produce a quite unique table top was worth it. I also like the contrast between the dark and light timbers. The legs are quite a complex design which would not have been easy to get to the final product.

Linda Fredheim: A really considered and interesting piece that successfully weaves a number of design elements into one beautifully made object that combines contrast and asymmetry with function and decoration.

HARE & FORBES
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bandsaw, value \$902,
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com.au



Best Use of Native Timbers

Drafting Table and Stool, Jasmine Wellings, Year 12, St Peters
Catholic College Tuggerah, NSW. Teacher: Michael Wellings



Stainless steel tilt mechanisms permit various angles to be used while seated and standing. Thirteen species of native hardwoods were used, some processed from slabs. Black pigmented resin fills the gaps in the parquetry top which is finished in a glass resin.

Darren Oates: I like the design of the table and also the stool that goes with it. There is some nice joinery and the stained glass effect in the top is pleasing.

Linda Fredheim: This piece highlights Australian timbers in a fun and playful way in an object that is itself designed to allow the user develop and resolve their ideas before venturing into the workshop.



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Best Hand Skills

**Semi Hollow Electric Guitar,
Arlene Schmidt, Year 12,
St Ives High School, NSW.
Teacher: Sean Champion**

Over 300 hours were spent handcrafting moulds and templates to shape the guitar's arched front and back, along with some difficult joinery. Almost the entire guitar is shaped with curved timber. Even the fretboard has a curve with a 12° radius for smooth playing.



Darren Oates: *As a past instructor at Sturt School for Wood who has had students make musical instruments, I know how much hand work would have gone into this guitar, and the end product is a simply beautiful and stunning piece.*

Linda Fredheim: *Beautifully crafted and finished, showing a range of processes.*

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FROM OUR JUDGES

Linda Fredheim, Tas

www.lindafredheim.com.au



It was such a pleasure to look at every one of the 99 fabulous projects submitted for this competition by the talented year 11 and 12 students and their teachers. The range of work was so diverse and it was fantastic to see timber being used in so many ways. I enjoyed seeing and reading about the decisions made, the techniques used, the disasters averted and the pleasure that the completed work gave. I even picked up a few handy techniques from the videos!

After two days of reviewing and re-reviewing all the entries I had over 30 favourites in my 'shortlist' and couldn't see how it would be possible to give just four awards. Everyone's work was excellent in some way, and I would have loved to have been able to touch, use and admire each of the pieces from every angle.

In the end a few pieces stood out from the rest based on the photos and information that we had, but really every student and teacher should be congratulated for an outstanding effort.

Darren Oates, NSW

www.darrenoatesfinefurniture.net



Judging this competition was a real pleasure, though having said that it was also an extremely difficult task. I was amazed by the number of entries, and with the overall quality. There are some really incredible woodworking

teachers in the high school system in Australia and some major pieces that I would not have thought possible in a school environment.

Many entries showed intricate joinery and some employed techniques that I myself have never used. At the beginning of the year when students approached their teachers with the project they want to make I'm sure there may have been some doubts raised, but it is great to see they have guided their students through difficult times to produce a piece that would make the school proud.

I would like to thank all the students who pushed themselves and also the teachers who guided them into producing an amazing collection of work for a competition that I really do hope will be here for many years. It is great to see what the young mind can produce when challenged, and how hard students are willing to push themselves to reach their final goal.

Popular Choice

Mobile Butchers Bench,
Jack Wilcox, Year 12,
St Marys College, Broome, WA.
Teacher: Michael Lake

This mobile bench was constructed from recycled single use pallets. Various heavy duty joining techniques were used including loose tenons and dovetail joints. The top is a drop fit to enable easy maintenance and easy delivery to the kitchen. Two long drawers are built into the carcass for storage.

Vice, turning and carving tools, value \$383,
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Highly Commended, Hand Skills

Circular Coffee Table With Drawers,
Jarvis Mumford-Day, Year 12, Dulwich
High School of Visual Arts and Design.
Teacher: Isidoro Felman

Judges' comment:

A complex and interesting piece with wooden hinged lids and rotating compartments that all appear to fit together very neatly.



Marquetry Hall Stand, Declan Harding, Year 12, Mackillop College.
Teacher: Daniel O'Dell

Judges' comment: *Declan has used incredibly complex joinery and a lot of processes to produce an object with a very, very secret drawer.*



Highly Commended, Design

Dressing Table and Make-up Desk, Gabriella Bombara, Northern Beaches Secondary College, Freshwater Campus, NSW.
Teacher: Ben Percy

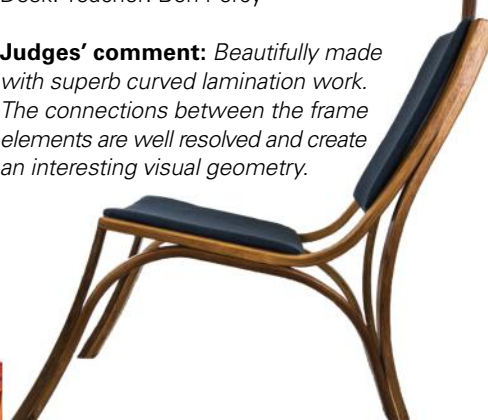
Judges' comment:

Simple but elegant lines have resulted in an elegant and functional desk using a minimum of elements combined with some subtle detailing.



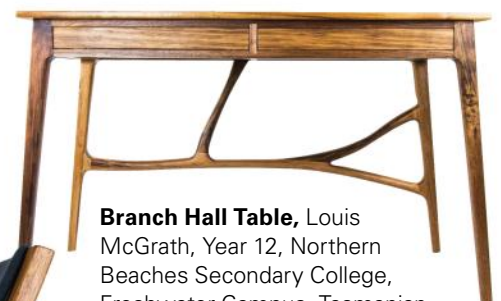
Occasional Chair, Jordan Pepper, Northern Beaches Secondary College, Freshwater Campus. Tasmanian Blackwood Writing Desk. Teacher: Ben Percy

Judges' comment: *Beautifully made with superb curved lamination work. The connections between the frame elements are well resolved and create an interesting visual geometry.*



Branch Hall Table, Louis McGrath, Year 12, Northern Beaches Secondary College, Freshwater Campus. Tasmanian Blackwood Writing Desk. Teacher: Ben Percy

Judges' comment: *An elegant piece that uses natural forms in a refined and considered way. Beautifully crafted with great joinery from the hand shaped mortise and tenon joints.*



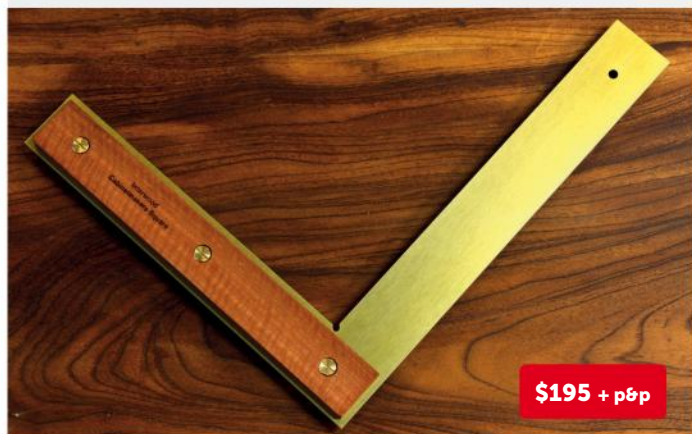


New Interwood Cabinetmakers Square

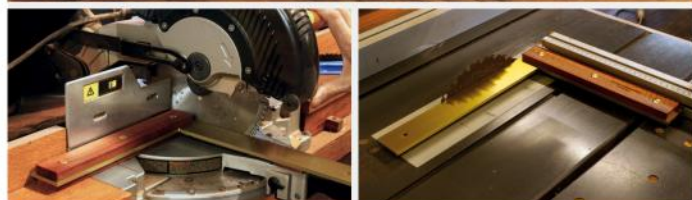
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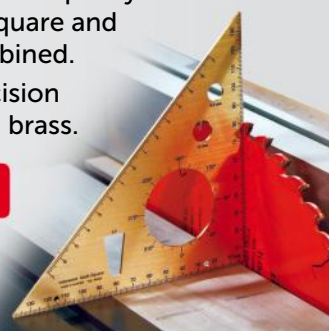
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Max Maltby (left) and Ted Synnott work together finishing a piece for the exhibition to take place the next day.

The Graduates

In 2017, full-time students at New Zealand's Centre for Fine Woodworking took away much more than new hand skills. Story by Linda Nathan.

It can take guts to take a year out to start a new career. Investing in yourself is not cheap either, but then again how expensive is it to be miserable or feel lost within your own life?

It was unusual in 2017 that the seven full-time students at the Centre for Fine Woodworking were all men. Not so unusual that their ages and life experiences varied widely.

If you want to pick a place on Earth that resembles woodworking heaven, head to Nelson, New Zealand. Flying in, you'll see from above a sandy coastline curling around from Golden Beach to Nelson's deep turquoise harbour. Known for its thriving artisan culture (and also the hop plantations which fuel the Kiwi craft beer industry), Nelson is also a popular holiday destination.

A short drive out of town, nestling behind the magnificent gardens of a heritage-listed home, the Centre for Fine Woodworking is housed in what was once a commercial cabinet shop. It's a large timber building with delineated

areas for bench and machine work. For the full-time students however, the serenity of its pastoral setting is left at the door, as for those who crave it, the trajectory of learning in this place can be intense.

This year, David Haig, an internationally acclaimed designer maker, led a teaching team which included local makers Thorkild Hansen and Lou Fuller. In the final months, David Uphill-Brown travelled from Australia to teach full-time at the school as well. All-in-all, a star cast.

I visited the school two days before its graduate exhibition opened at Refinery Art Space in Nelson and saw the finishing touches that were taking place within an atmosphere charged with excitement. Several students had woodworking experience prior to starting the course, however some had literally never even picked up a chisel. Looking at what they achieved I'm pretty sure you'll be as amazed as I was.

Furniture photos: Daniel Allen

Learn more about the Centre for Fine Woodworking at www.cfw.co.nz

Ted Synnott, 23

The youngest of the cohort, Ted Synnott claims his reasons for doing the course differed from the others. Two years studying marketing at university was a 'waste of time' and an aim to bolster an interest in graphics and design with 'hard skills' that would allow him to make physical objects took over.

Before starting the course friends and acquaintances had questioned his decision. To many people traditional skills can seem outdated. 'What are you doing that for?', they had asked.

Ted had literally never picked up a chisel before. Was that a concern? 'I was pretty worried', Ted said. 'They'd said you can do (the course) without experience, but it was pretty intimidating walking in on the first day and seeing all the tools.'

Wood appeals to Ted but he's 'not a wood fanatic like some of the others'. The skills to work wood seemed the best to acquire, although later on he may learn to weld and is keen to design for production.

Ted may have felt daunted at the start but in the end his confidence won out. 'Anyone can pick up a skillset and we're a testament to the fact you can be an absolute novice and go on to make work of a reasonable quality', he said.

Reflections? 'I had an unrealistic expectation. I was naïve and didn't understand how long it took to make everything.'

Ted is now working with a fine furniture maker in his home town of Auckland.



Clockwise from top right: Ted Synnott, *Chest* in European beech, *Undressed* side table in Victorian ash.



Max Maltby, 25

After completing a university degree in England, Max Maltby went to Japan for a year and thought about the next step in his life and 'somehow woodworking cropped up'. That, along with good memories of working on a farm in New Zealand some five years prior, led to enrolling in the CFW course.

Like Ted, Max had never done any woodworking before. 'I was pretty much fresh off the boat to be honest', he said. There was pressure in terms of the build-up, saving up for a year in preparation, but that was outweighed by the excitement of entering a new phase.

'I think everyone's had a pretty transformative year,' said Max. 'We're all in different stages of life, but at the same kind of moment – everyone's looking for something. Some are sick of "working for the man" and want to do something for themselves. And now it seems I'm going to try and pursue woodworking. I'm going back to England in January and will try to find an internship or a job there.'

Max rates the teachers highly. 'David Haig is probably one of the nicest guys I've ever met and he's got 35 years of experience under his belt. It was also good because his specialty is steambending and once I saw that I was hooked. I like the experimental side of woodworking. I want to see how far you can go with the material, transforming a crazy idea, and then figuring out how to actually do it.'

David Upfill-Brown was 'a buzzy dude, full of beans – and taught me that nothing is impossible, you just have to sit down, work it out and try it, and if that doesn't work try something else.'

Last word? 'For me it was more about learning the processes rather than the finished piece.'



Clockwise by Max Maltby:

Upstanding L'Orange Table, American walnut – the legs have a twisted compound curve, each with a 30-piece lamination. Constructed with David Upfill-Brown, it took three weeks alone to build the forms. *Aztec Gold* blanket chest in walnut and ash, *Double Bend Bob Chair* in walnut and elm, *70s Yoni Hall Table* in maple, sycamore and kauri.





Robert Godoy, 37

Born and raised in Japan, Robert Godoy is from the UK, but more likely a true citizen of the world. He moved to New Zealand four years ago, around the time he became interested in woodworking.

Before woodwork Robert was a digital producer, managing teams who produced a range of video games, websites and apps. He left Japan when he was 18 to complete a degree in architecture in the UK, which gives him a background in technical drawing and digital design.

Encouragingly and astounding for many, Robert is another who had no hand skills when he started the course. Did it bother him? 'I wasn't afraid when I applied', said Robert, 'and I was fed up with sitting in front of a computer screen, reading and sending emails to people. In the end I thought I could find myself in four or five years sitting at the same desk, or try something different.'

What was the hardest thing to learn? 'Patience', said Robert. 'Waiting for glue to set, oil to dry, and I'm always thinking there must be a faster, easier way of doing it. But most of the time no, the correct way is to take your time and do it properly.'



Clockwise from far left: *Trillion Tripod*, American cherry; Robert Godoy; *Floating Back* chair in walnut and leather; *PB1* in walnut and maple; *J-Chest*, ash and walnut; *Ki-O Table*, walnut and bubinga.



Clockwise, work by Josh Knox: *Coastal Armchair*, oak, braided rope and copper; *Sea Chest* in oak, jarrah and cedar; *Side Table* in walnut, sycamore; *Echinoidea Pendant Lights* in walnut and sycamore.



Josh Knox, 38

Grown up in the Caribbean and then living in West Australia, Josh Knox has an accent that confounds – most conclude he's from Britain! Josh had considering doing the CFW course for a few years prior, and New Zealand was always in the plan.

Five years ago, after 15 years as a commercial diver in the oil, gas and pearling industries, Josh then lived his dream, bought a boat in Florida and sailed to Nelson. 'It's a big investment of money and time and it took me a while to make the decision', said Josh, agreeing that commitment had driven the others too. 'Everyone has really pushed themselves within the restraints of time and skill.'

The teachers have been 'stellar', he said. 'It's been really fun learning. You get three woodworkers in a room and you'll get six different answers on how to do something. It gets hectic with seven different projects going, and they've got to be able to jump from one to the other'.

Chairmaking was the hardest area tackled. 'I never knew it was that much work to sit down', joked Josh, referring to the numerous structural considerations.

Working with others could be the next for step for Josh, who said that with so much to learn he doesn't expect to start off on his own right away.





Clockwise: Lance Palmer working metal. Chair based on Michael Fortune's design in sycamore, matai and ebony.

For his *Egyptian Inspired Hall Table* in sycamore and wenge, Lance turned then steambent the legs. The 'lotus' supports are each glued up from ten segments.

The European beech workbench was Lance's final take-home piece and is fitted with a restored patternmakers vice as well as tail and front vices: 'I wanted unlimited clamping power.' *Dovetail Chest* had subtle curves and was a rich confection of figured timbers including sapele mahogany, mahogany and wenge.

Lance Palmer, 44

A self-proclaimed graduate of 'the university of diversity', Lance Palmer presents as complex and driven. With a successful career in the building industry behind him, Lance was living the so-called dream, but came out of an early retirement to study fine woodworking.

A perfectionist, Lance feels that he has reached a new level of detail. He had carpentry and cabinetmaking but not fine woodworking skills. An innate ability to 'make connections with skills instantly', resulted in a phenomenal level achieved during the course.

The hardest thing to learn though, Lance said, is to be easy on yourself. But there's no question in his mind about putting in the required effort, or re-doing things if need be. 'When you're building something fine, with timbers that have been growing for hundreds of years, they deserve to be honoured with the highest level of craftsmanship.'

Although he will sell his work, Lance says he doesn't really want to make a living out of it. 'For me furniture making is to be an enjoyment and a pleasure. From my past experience money tends to tear down the enjoyment, pleasure and passion of things.'

Last word: 'I never thought that 1mm or 1° of an angle could ever be such a large tolerance.'



Clockwise from right: Vanya Smythe, *Epiphany Table*, matai and totara. *Flying Heart Hall Table* in walnut.



Vanya Smythe, 51

A short conversation with Vanya Smythe will take you around the world and forward and backwards in time, and yet he is a highly focused individual.

Growing up he attended seven schools in seven years, and now has several careers behind him. 'When I crashed out of school I became an electronics technician at TV New Zealand, then a sound engineer. Then I crashed out of that and spent 15 years in Australia in industrial sales, then set up my own company.'

By 'crashing out', Vanya explained that much of his life had felt 'haphazard'. 'I guess I've never really known what I was doing, just had vague general directions.'

For Vanya, the year at the CFW has been one of the best of his life in terms of relationships and self development,

which is not to say that he hasn't loved his development of hand skills and working with wood. 'I came here trying to expect nothing. Before this I was travelling around the world as a design engineer of DC power systems for a global corporation, but I don't seem to be able to go back to that.'

In 2018 Vanya will work with CFW founder John Shaw, who 'has agreed to take me under his wing and mentor me'. Future plans include setting up a gallery which he intends to run on a communal basis. 'It's not about money, I'm just looking for a basic income.'

Vanya's *Epiphany Table* was a tour de force of design and construction made possible by the input of tutors David Haig and David Upfill-Brown. With an avowed interest in esoteric ideas and Jungian symbolism, it seems likely that the title of this piece is very much about his own journey at the school.

Clockwise, work by John Wild: *Hall Table* in matai and sycamore, *Linen Chest*, matai, kauri and cedar; *Writing Desk*, matai, kauri, black maire, silver beech and cedar.



John Wild, 75

It's hard not to first mention the distinguished career of John Wild, former Judge of New Zealand's High Court of Appeal, and it was fitting that he spoke on behalf of all the students at the opening of the graduate exhibition.

Having already completed three short courses at the CFW, his was a well considered decision which in no way belies the commitment required to sign up for an intense eight month course. At his stage of life John is not planning to go pro, but to create furniture for his family.

Hints of the inspiration John draws from Scandinavian furniture are apparent in the hall table and writing desk he completed during the course.

What inspired him most during the course? 'The creative, demanding and beautifully executed furniture made by my six fellow students, encouraged by our super tutors'.

What was the hardest part? 'I still struggle with the techniques for sharpening to perfection planes, chisels and other furniture making blades. There seem to be as many opinions on this as there are furniture making tutors!'

The best part? 'Somewhat to my surprise, I greatly enjoyed designing the pieces of furniture we made towards the end of the course. I found the transition from an initial rough concept to detailed working drawings an exacting and satisfying discipline.'





Trimming Long Veneers

Darren Oates shows how to trim long lengths of veneer in preparation for stitching.

About 10 years ago I was commissioned to make a large dining table that required using two metre long red cedar veneers that had to be stitched together.

Up until then I used to clamp my veneers between two straight pieces of hardwood and run a flush trimming router bit along them to prepare the edges for gluing. The

size of these veneers precluded that method, so I came up with another way.

My panel saw has a 2.6m stroke so I would be able to cut veneers long and straight enough up to this length if I was able to secure them properly. The way I did this was to place a piece of cheap substrate on the sliding table the same length as the veneer to be

cut, place another piece on top of the veneers, and then somehow clamp everything down.

I used the panel saw auxiliary fence to clamp down one end of the substrate and modified an old F-clamp to hold down the other. I cut about 100mm from the end of the F-clamp bar and then welded on a piece of metal sized to slide in the panel saw mitre track.



Left: Cutting long veneers on the sliding table panel saw with heavy items positioned to weigh down the clamped substrates. The blade cut depth is set to cut through the lower substrate and halfway through the upper.

Top: To trim veneers on the panel saw all that was needed was chipboard and a clamping method.

Above: The modified F-clamp.

Then it was a case of sitting weights onto of the centre to hold down the remaining substrate. I used what I had at hand which was my two dry chemical fire extinguishers and a 20 litre bottle of glue, and since they worked so well I have not bothered going out to get something specially made for this. If you had some old railway track lying around then this would be perfect.

Provided the track on my panel saw was nice and straight, and the veneer securely fastened to the sliding table, I knew I would then be assured of a dead straight cut.

The blade cut depth is set so it will cut completely through the bottom

substrate, through the veneers and halfway through the top substrate.

If you place the veneers in the order they were cut from the log, it won't matter if your blade is not set exactly at 90°. For example if it is at 89°, when the veneers are opened up to bookmatch, one edge will be 89° degrees and the other will be 91°, still a total of 180° for a perfect flat match.

In the photo above I'm about to make the cut and you can see how the veneers are sandwiched between the substrates. With everything clamped at both ends there's no worry of them moving so I can push down on the top substrate as it is passed through the blade.

This method has achieved invisible joins on long veneers, even on paler timbers where joins are generally hard to conceal. I have been using this method of preparing veneers for stitching for eight years and now use it for shorter lengths as well as long ones. You can also gang up veneers – I have cut up to 12 in one go, so this method is a real time saver as well.

Photos: Darren Oates



Darren Oates is a furniture designer and maker in the Hawkesbury, NSW. Email darrenoates@gmail.com

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A Totally Turned Table

Andrew Potocnik shows how solving one problem can lead to two solutions.

A while ago I was asked to create a totally turned hall table. Turning an elliptical top was a challenge which could only be solved safely by adding sacrificial material to create a circular blank to avoid spinning a propeller shaped piece of wood, which is not a safe method of working. This presented what seemed like a golden opportunity for making the top for another table at the same time.

On either side of some blackwood (used for the first table) I added feature grade mountain ash (*Eucalyptus regnans*), a timber native to the south-east of Australia. This was filled with nature's footprints – gum vein, knots and insect contributions. The table would celebrate

these hidden features, even though extra effort would be required to fill voids, secure cracks or simply re-think the layout of components.

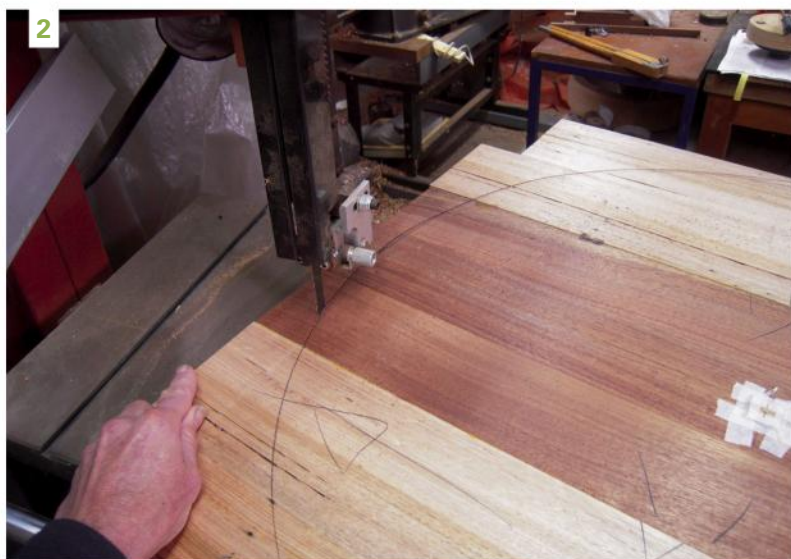
With all material glued (**photo 1**), a circle of 750mm diameter was cut on the bandsaw (**photo 2**). This was now ready for mounting on my Stubby lathe so I could shape the underside of the tabletop to a smooth flowing curve (**photo 3**). To hold the disc I simply pushed it into place between a carrier mounted to a faceplate and clamped it with the tailstock centre. After sanding through to 320 grit, the sides were bandsawn off (**photo 4**).



The completed table made from recycled and featured mountain ash.

Inner edges of the mountain ash were planed smooth and straight on my buzzer so they could be glued together and an insert of figured blackwood added to create visual contrast. I didn't have a piece long enough, so sections of mountain ash veneer were inserted between the ends of each piece. This led to another problem in the lamination process; how to ensure all edges were aligned after both pieces were joined with the veneer in place (**photo 5**).

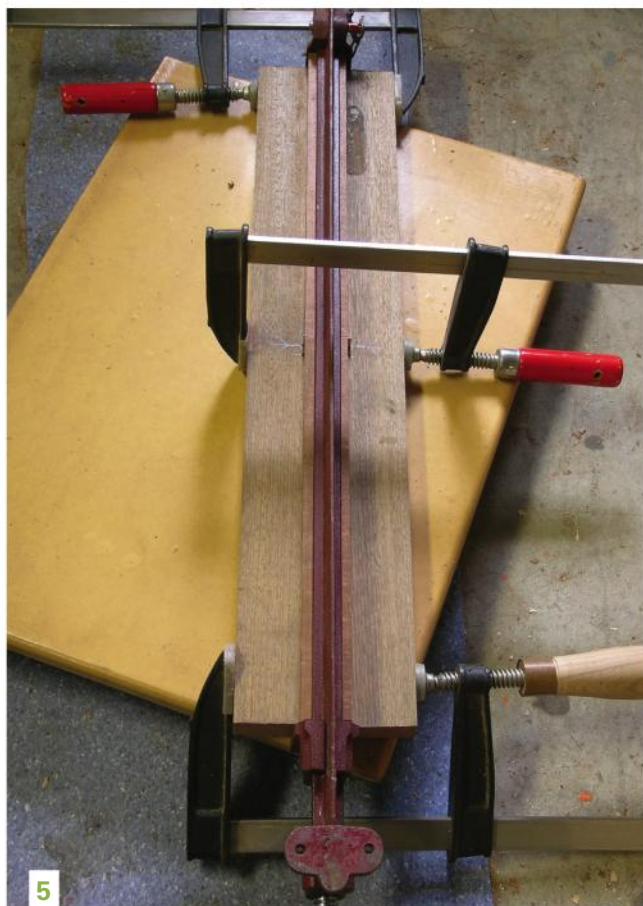
For the glue-up I cut two formers of MDF to match the radius of the tabletop so the sections could carefully be aligned. Four sash clamps were used to ensure the 'top' surfaces would be flat (**photo 6**).



CUTTING LIST (mm)

PART	QTY	WIDTH	THICKNESS	LENGTH
Legs	4	640	40	40
Rails	2	220	42	19
Rails	2	350	42	19
Top: 490 x 690mm				
Overall table height: 675mm				
Gap at top of legs: 15mm				

1. Mountain ash was glued up with the blackwood to make a panel large enough to cut a circle from.
2. After glue-up, the circle was cut on the bandsaw.
3. The underside of the tabletop was turned on the Stubby lathe.
4. After sanding through to 320 grit, the mountain ash sides were sawn off on the bandsaw.



5

5. Gluing up the figured wood and veneers that would form the centre of the tabletop.
6. Two formers and four clamps held the assembly in place during glue-up.
7. Stock for the legs was machined to size and marked out for turning.
8. The legs were turned from square to tapered ends.
9. The rails and legs were mortised and loose tenons fitted.
10. Joinery completed and ready for assembly.
11. Ply packing was used to help square the legs and rails during glue-up.
12. The two rails were joined with cross-halving joints.
13. The author in his workshop. Solving construction issues can lead to new designs.



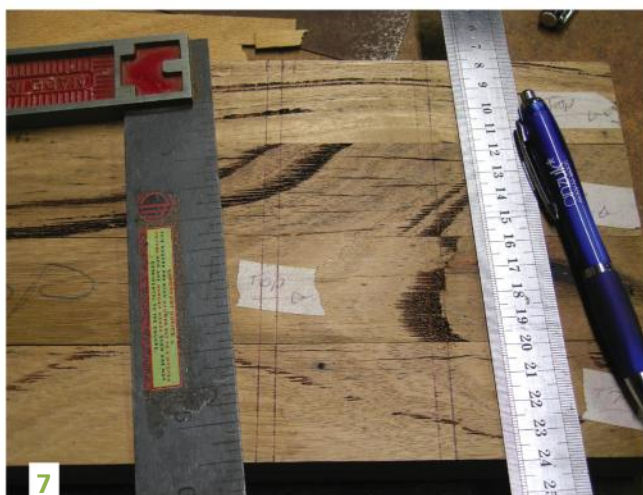
8



6



9



7

Once dry a pull saw was used to trim away excess blackwood, followed by a plane and then scraper, before filing and sanding to blend all surfaces on both the curved underside and profile. Some scraping was all that was now required prior to final sanding. With the top complete, a coat of wipe-on, wipe-off polyurethane finish was applied.

Creating the understructure required accurate cutting and machining of leg material, starting on the tablesaw where material was ripped to just over 40mm square then buzzed and thickened to size ready for dimensions to be marked out in preparation for turning (**photo 7**).

Mark the centre of the square end of each leg by drawing diagonals – where the lines cross is centre. I relied on my chuck to close down and hold the other end centred, while



I turned each leg from square to a tapered end (**photo 8**). Gum veins and imperfections were secured with cyanoacrylate glue prior to sanding.

Tops and bottoms of pommels (transitions from square to circle) were cut with a skew while the remainder of the leg was trimmed down to a final 18mm diameter. The flat area provided a surface where joinery for the crossed frame could be cut, to which the tabletop would be attached to create a 'floating' top.

Rails for the frame were machined to 42 x 19mm, cut to length and docked at 2° on my dropsaw before a trial assembly so any final tweaking of proportions could be made.

Cross-halving joints were hand cut in the rails (yes, turners do own squares, chisels and hand saws, we just don't know how to use them correctly!) before mortises were cut into both rails and legs to receive loose tenons (**photo 9**).

Excess material was cut from the top of each leg and hand shaped prior to final assembly (**photo 10**). I like to finish all components prior to assembly, once again sticking to the foolproof wipe-on, wipe-off method. This also helps if you have any glue squeeze-out during the assembly process. Legs were lightly clamped to a stiff board of plywood to ensure they were parallel before a quick grip clamp pushed the legs and rail into place (**photo 11**).

Once the two pairs of legs had dried, glue was applied to the cross-halving joint, which was then clamped and allowed to dry. Four aluminium pins were cut and holes drilled for joining the top to the frame (**photo 12**).

I was happy with the result – and it just goes to show that solving one problem can lead to two successful outcomes.

Photos: Andrew Potocnik

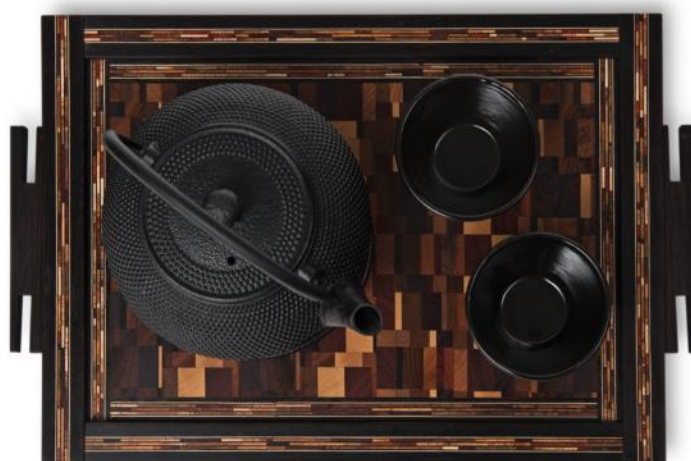
Andrew Potocnik is a wood artist and woodwork teacher who lives in Melbourne. Email andrewpotocnik@telstra.com





The Essential Ocha

Benjamin Reddan's award-winning tea set required the making of endgrain veneers.





A 'world within a world' was Benjamin Reddan's concept for *The Essential Ocha*, a finely crafted tea set he designed to eventually reside within an as-yet unmade cabinet which will further extend its purpose. Last year the tea set took out awards for Best of Show and Popular Choice at the Victorian Woodworkers Association's Double Take in Wood Exhibition.

Boxes sit within boxes separated by serving trays which function as canvases to create 'art within art'. Storage cavities under the lift-out trays are spaces for housing tea diaries and other paraphernalia.

With internal boxes and parts that lift out by means of handles and magnets, and parts that open, close and shift, the idea was to elicit involvement and interaction with the user. *The Essential Ocha* is thus dedicated to the art and ritual of tea making.

Benjamin credits design inspiration from the endgrain chopping boards made by MTM Wood (Russia) which play on ideas of optical illusion, and also the puzzle boxes made by Kagen Sound (USA) which often feature Japanese yosegi art.

1. After colour and grain matching sections of wood were sorted for the first endgrain glue-up.
2. Various glue-ups have now been sawn into strips and cleaned up and flattened on the drum sander, in preparation for the next endgrain glue-up.
3. Mixing and matching strips for endgrain veneer.
4. Smaller endgrain pieces were cut into thin (oversized) veneers on the bandsaw using a T-fence which acts as a pivot bar. If you see light through the face edge and the fence you know you're going off track.
5. Panels were cut into smaller pieces on the tablesaw before slicing them on the bandsaw. Bandsaw marks were taken off in the drum sander however endgrain veneers tend to buckle from the friction heat. To counter this the sanded veneers were weighted down onto the cold cast iron saw table to draw out the heat.
6. Trimming jig, here used for squaring endgrain veneer leaves.
7. Gluing on wenge edgings.



Yosegi technique sees the creation of patterned veneers from natural coloured edgegrain glue-ups. The veneers created for the tea set were sliced from endgrain glue-ups.

The technique of endgrain veneering is seen in antique cabinets but commonly using one species rather than many. For the tea set Benjamin first carried out various experiments and trials with different timbers, adhesives and finishes. As a result, Tightbond I and III, polyurethane and epoxy adhesives were used, while quartersawn sections and floating panel constructions were found to be preferable.

As shown in the photos, numerous glue-ups are required to create the rich patterns achieved. Not only were endgrain assemblies created, but also panels from 3mm ply with birch plywood used as a substrate. The aim was to create smaller laminates to keep panels more balanced. Recycled merbau from pallets and M10 stud pine were also used.



Timbers used include solid jarrah, wenge, merbau, rock maple, Tasmanian oak and blackwood, padauk, spotted gum, Western red cedar, redgum, American beech and pine. Wenge and maple veneers were used for the inlay banding.

Handles and pulls were all handmade and several operate by means of concealed rare earth magnets. The tea set was finished with three coats of Danish oil and wax.

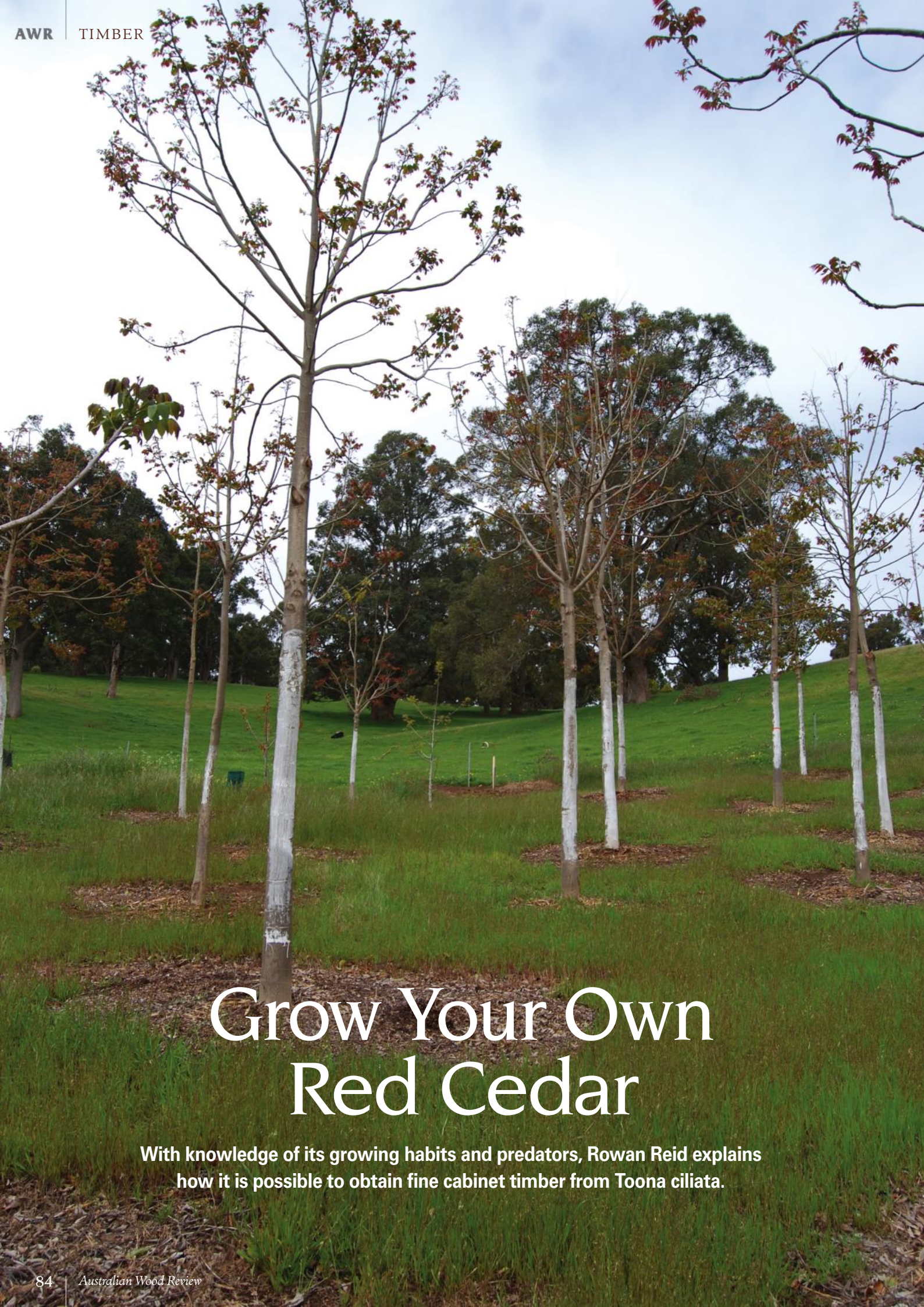
Main photos: Vicki Petherbridge

Process photos: Benjamin Reddan



Benjamin Reddan is a designer maker in Healesville, Victoria. Get in touch via [Facebook.com/soulbespoke](https://www.facebook.com/soulbespoke) or Instagram @benjaminreddan.

8. Machining lid and base rebates and inlay housings.
9. Showing the profiles of inlay housings.
10. First stage in machining housings in lids.
11. Final tray glue-up with inlay, stringing and housings.
12. Gluing up the main box body.
13. Gluing in inlay into tray box lids.
14. Tray box assemblies.
15. Fitting tray boxes to the tea box.
16. Key mitre slots were machined in a cradle on the tablesaw.
17. Housings and floating tenons machined for the wedge latches.
18. Insetting magnets and cover plugs.
19. Inlays were fitted into lock wedges.



Grow Your Own Red Cedar

With knowledge of its growing habits and predators, Rowan Reid explains how it is possible to obtain fine cabinet timber from *Toona ciliata*.



Once classified as a distinct species, *Toona australis*, our Australian red cedar is now recognised as a local variant of the Asian red cedar (*Toona ciliata*). In its natural habit, large red cedar trees are usually only found in the coastal areas of New South Wales and Queensland, but the species may be much more tolerant than its rainforest habit implies.

There is a red cedar growing in the Albury Botanical Gardens which is now 104 centimetres in diameter! The largest planted red cedar on the National Register of Big Trees is in the Adelaide Botanical Gardens; Australia's driest capital city. First recorded as being present in 1859, the tree has a clear trunk up to about six metres and was more than 120cm in diameter in 2010.

While nineteenth century gardeners were planting red cedar in city gardens, foresters in New South Wales and Queensland were trying to establish it in plantations on some of the best tropical rainforest soils. They failed spectacularly.

Their problem was the Asian cedar tip moth (*Hypsipyla robusta*). The moth lays its eggs on the tree's leading shoot and the larvae burrow into the stem causing dieback of the leader. The insect rarely kills the tree but it does

cause the release of secondary buds just below the original leading shoot resulting in a multi-stemmed tree.

Repeated attacks cause multiple deformities destroying the form of the tree for timber production. The difficulty for growers, even those well away from any affected trees, is that the moth appears to have learnt to sense the chemicals produced by a healthy red cedar tree as it puts on a spurt of height growth.

Once inside the stem, the insect is impossible to control using contact insecticides. Even systemic chemicals have shown limited value, particularly in larger trees. Research is exploring the potential of using artificial pheromones to trap the male moths, or at least make it hard for them to find their females – a method that is commonly used to control codling moth in apple orchards – but so far scientists have been unable to unravel the complex chemistry of the attractants released by the red cedars.

The presence of large, straight red cedars growing alone in mixed species rainforests led to the suggestion that planting the trees under a canopy or in mixed species plantations may reduce the incidence of attack.

Young red cedars are shade tolerant and height growth can be as fast

Main: These young, high-pruned, red cedar growing on a farm in Western Australia were white-washed to reduce the risk of sunburn.

Above left: This red cedar in the Albury Botanical Gardens is over a metre in diameter.

Above: Tip moth damage to this young red cedar tree has resulted in a secondary leader.

under a canopy as it might be in full sunlight; often better if frost or dry winds are a problem. However, diameter growth under shade is restricted, leading to tall slender trees. To achieve sawlog size, the trees would need to grow up through the canopy into full sunlight, as it often does in a rainforest, or the competing overstorey would need to be removed.

I planted my first red cedars on our Victorian tree farm in 2006. I had no idea how they would perform. Fortunately, we don't have the tip moth. Last year I finished pruning one of our ten-year-old red cedars up to eight metres. It was perfectly straight.

My stem pruning regime involves removing all the branches up the stem every winter to a point where the trunk diameter is about 8cm. This will ensure I produce knot-free wood from the trunk. The final pruned height will vary depending on how well the trees grow. Being so valuable I would be happy to achieve a three or four metre pruned log, any more is a bonus.

To ensure I grow a quality log I only prune straight trees. Red cedar is a phototropic species; meaning that the leader will tend to grow towards the light. In a rainforest, this allows the tree to bend towards any small gap in the canopy. That's fine for survival, but the resulting bend in the stem reduces its value for timber.

Fortunately, I've found that red cedar coppices well so if a young tree is malformed, I just cut it off at ground level and grow a new trunk. I now only plant red cedar in full sunlight or the light shade of a eucalypt canopy. In both cases, I'm achieving good straight growth on most stems.

Growing red cedar in full sunlight has its own risks including, surprisingly, sunburn which can occur late in the dry season. The damage isn't evident at first but as the cambium dies, the bark peels off leaving a long thin scar down the western side of the tree.

Friends in Western Australia are growing red cedar on their farm near Bridgetown. I visited in early spring last year as their trees were just coming into leaf. They had painted the stems white. Walnut growers do the same to their trees to reflect the heat off the trunk.

I don't know if the cedar tip moth will ever reach our farm. Given the changing climate and increasing interest in growing the species in Victoria, it probably will. Meanwhile, I'm planting as many red cedars as I can, testing how the species performs on a range of soil types, from our best alluvial creek flats to our heavy wet clays and free draining sands, and in mixtures with different species.

It seems to do well on our heavy clay soils. I am now confident I can maintain a diameter increment of about 1.5cm per year which suggests I might be harvesting 60cm diameter logs at age 40 years. But, to do that I will need to provide an average spacing between mature trees of about 12m for the canopy to spread.



The author's ten-year-old red cedar after the final pruning lift which will ensure an 8m branch-free log.

But what of the wood quality of a fast-grown, red cedar? Whilst there is little scientific research available, there is some experience. A plantation on the Atherton Tablelands was thinned in the 1990s and the timber sold at auction with promising results. Whilst the sapwood of the fast-grown trees was wider than that found in a similar sized native forest tree, the wood density and colour were encouraging.

Like English oak, *Toona ciliata* is ring porous so the wider the growth rings the higher the wood density. Keith Bootle implied as much when he wrote of red cedar in his book *Wood in Australia*: 'Fast-grown timber seems to have at least as good, probably better, mechanical properties than the average material from large logs'.

Australian red cedar has been grown in plantations overseas with mixed results. The timber harvested from a

plantation in Hawaii was rated poorly due to problems of growth stresses and knots. Red cedar is a hardwood so, like a eucalypt, it will develop tension wood in tall, skinny trees. Had the plantation been thinned and pruned the trunks would have been larger in diameter and clear of knots.

Red cedar is a promising option for farmers outside the natural range of the tip moth. It's ironic to think that the future of this valuable tropical Australian native timber might be on farms in Victoria, South Australia, Tasmania and Western Australia.

Photos: Rowan Reid and Digby Race

Rowan Reid is a forest scientist with over 30 years' experience growing special timbers on his farm. He has written many books including 'Heartwood: The art and science of growing trees for conservation and profit' and hosted over 10,000 visitors to his farm. Contact him via www.agroforestry.net.au

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Plane Blade Geometry, Part 2

Clearance angle geometry is rarely written about, but crucial to handplane performance. With the aid of cardboard cutouts, Terry Gordon shows why.



Unless you can force this worn curved surface down into the wood to allow the edge to re-engage, this plane will not take a shaving. In practice you may have the strength to make this blade take a shaving on a narrow piece of softwood but you would struggle to make it cut a full width shaving on a harder piece of wood. Most likely, before you get to this stage, you would assess the blade as blunt and resharpen. But in essence you will have resharpened because you have lost clearance and not because your blade is actually blunt.

Photo 3 shows a sharp blade profile using a 30° bevel with 30° of clearance above the wood. This plane will work very well as it has positive clearance.

Photo 4 shows the same blade but when it is blunt. A small negative clearance angle has developed and the plane's performance will be starting to degrade because of this. But by starting with 30° of clearance the blade is basically blunt at about the same time the blade loses clearance so you have maximised the life of the edge before you need to re-sharpen.

Comparing the plane that started with 12° clearance to the plane with 30° clearance, you can see for the same amount of planing the lower clearance angle plane will have its performance degraded by loss of clearance about three times faster than the high clearance angle plane.

The important concept to take from these profiles is: the more clearance angle you start with, the longer you can plane before the constantly changing blade edge develops a negative clearance, which in turn will degrade plane performance. If your blade edge becomes blunt at about the same

Last issue we saw that as a blade edge wears away in use you get a curved surface around the original sharp edge. Here we'll look at how the worn curved surface between the blade and the wood affects plane performance.

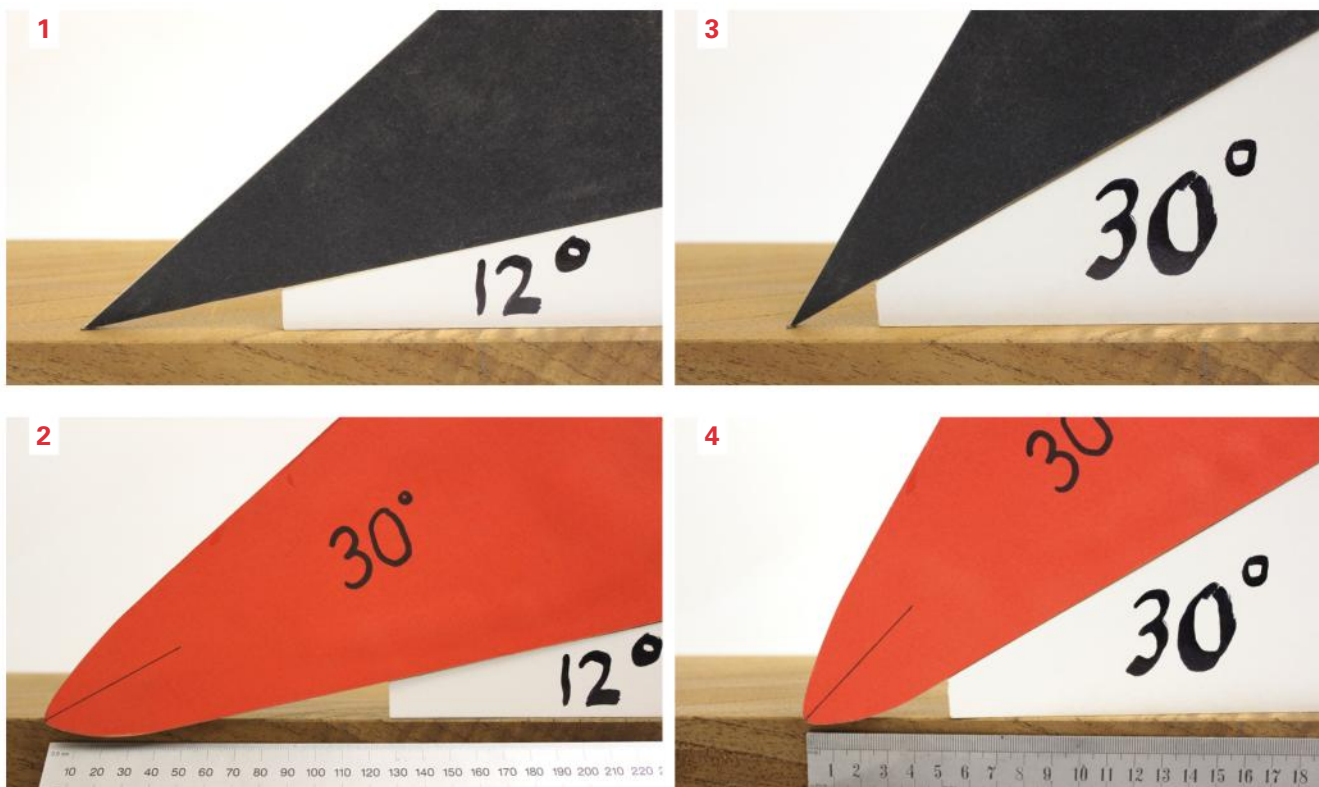
The angular space between the blade and the wood being planed is called clearance angle, and we need positive clearance (any angle greater than zero) until the blade is blunt.

We saw in the bevel angle article that as the blade edge wears the bevel angle geometry is constantly changing. As the bevel angle changes,

so too does the clearance angle. This affects the performance of your plane if the clearance angle goes below zero.

Photo 1 shows a sharp blade profile using a 30° bevel with 12° clearance above the wood. This plane will work very well as it has positive clearance with a freshly sharpened blade.

Photo 2 shows the same blade but when it is blunt. You can see when the edge of the blade (represented by the black line) is in a position to cut wood you have a large curved area below the wood surface being planed, this is what is referred to as negative clearance.



time as it goes to a negative clearance angle, you'll know you started with the optimum clearance angle.

So what does this all mean to the woodworker? If you use planes to do small chamfers, edges and endgrain in softwoods you may have never come across this degrade in performance, simply because you can easily overpower the loss of clearance in these circumstances. If you use planes to smooth large flat surfaces (particularly in harder woods) you will have definitely come across this issue. I hope you didn't self doubt and conclude you were doing something wrong.

Twenty five years ago, when I planed my first large surface which required taking many full width shavings, I was confused about the plane's performance as the blade went from sharp to blunt. At first I was getting nice full width shavings, the plane was easy to push and I had no trouble maintaining a continuous shaving. Then I had to start pushing down on the plane to make it take a continuous shaving, but it was still taking a nice shaving indicating the blade was still sharp. The longer I planed the more difficult it got to take a shaving, so I resharpened my blade.

This was a frustrating sequence of events, particularly when the grain tore as I pushed down harder. I didn't know if it was me or the plane, but in any case I went out and bought a belt sander. This made things worse, but that is another story.

Five years later whilst on a military deployment to Malaysia I was introduced to wooden planes with a higher blade pitch which had 30° clearance angle compared to my original plane which had 15° clearance. These high pitch planes didn't have the issue of having to push down hard to make the blade take a full width shaving even though I sharpened my blades the same way. This was great and I didn't give a second thought as to the why, I was just enjoying my woodwork so much more.

Fast forward to about 2010, I had a wealth of experience in making and using planes but I never really looked into why my first plane performed the way it did, until people started to ask me about the issues I had also as a beginner woodworker. During this time I came across the independent blade testing carried out by Steve Elliot¹ and Brent Beach² and was able

to fully understand why my first plane gave me so much grief, and why the high pitch planes I was introduced to in Malaysia solved my problems. And more importantly, I could explain this to woodworkers having the same issues.

Lastly, here is some practical advice if you plan on making furniture using hand tools. Irrespective of which type of plane you use, if you are getting the desired results for what you are making at the moment then just keep on doing it. Happy days! On the other hand if you take on bolder projects and you start having issues with your plane's performance, then understanding the contents of these two articles will help you move forward in your quest for making your ultimate woodwork project.

See www.hntgordon.com.au for some simple experiments you can do to better understand this concept.

1. See www.bladetest.infillplane.com
2. See www3.telus.net/BrentBeach/Sharpen



Terry Gordon is a toolmaker in Alstonville, NSW. For more information contact him at planemaker@hntgordon.com.au

Wood Diary

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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.

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Dangerous Designs

A competition for Australian designers aimed at the 'pointy end of design'.



Launched in 2016, Dangerous Designs is an online competition created to promote the use of wood and wood products in sustainable design. It seeks to build bridges between designers, manufacturers and marketers to facilitate the commercial production of new designs. There are student and open categories.

It is sponsored by WoodSolutions, an initiative of Forest and Wood Products Australia Ltd and supported by a wide range of professional organisations, including the Australasian Furnishings Association, the Australian Institute of Architects and Planet Ark.

The competition is judged by a panel chosen from leaders in a range of design-related fields, including architecture, exhibition curation, design and publication. Judges include Dylan Brady, Decibel Architecture; Kate St James, editor-in-chief of Universal Publications; Peter Maddison (Maddison Architects); Brian Parkes, CEO and Artistic



director of JamFactory Adelaide and Australian Wood Review print and online editor Linda Nathan.

Entries were evaluated according to set criteria. These included innovation/originality in design, use of wood and wood products (elegance, craft of design) and sustainability (recyclability, carbon footprint, energy replacement). The main awards were announced at the annual Timber Design Awards presentation function in Melbourne, October, 2017. Prizewinners for 2017 are as follows.

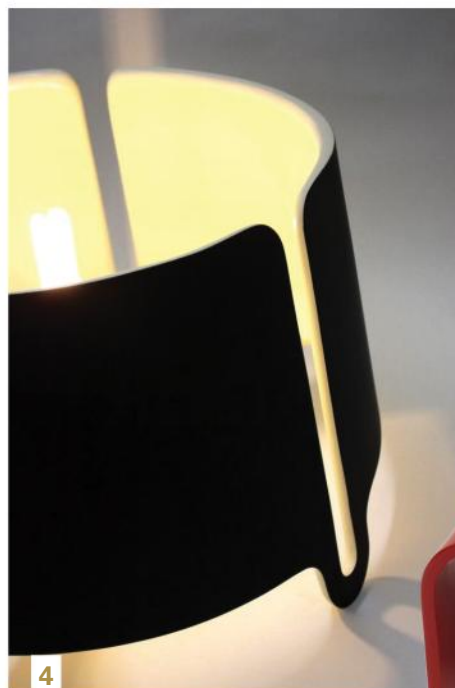
A building design student at Melbourne's Box Hill Institute, **Paul Morgan** won an award for *Laevo Cross-laminated Timber Apartments*. His detailed plan was intended to be a functional solution to a real-world problem – sustainable and lower cost housing. With free-moving floor plates and balcony linings, and a 'generous personality', it was the competition's first round winner.

Cameron Shelton's *Three Floor Lamp* made from bendy ply has a high gloss white interior and matt black exterior. The monochromatic colour scheme and pared back elements portray a distilled, quiet and elegant design solution.

Daniel Tucker was looking to revive a handmade tradition with his crafted and customisable *Walking Sticks*. The aim was also to create a desirable and stylish object. 'Lots of elderly people do themselves harm by not adopting a walking stick or frame. By doing so they can prolong their independence and move about more safely', Daniel said.

Bryan Micallef's *Warp & Weft* stools provide seating that is comfortable and yet challenges the viewer. 'I really wanted to pursue whether timber could look like fabric, especially solid timber', said Bryan. The 'woven' solid or veneer legs and connectors are modular and can be flat packed.

Jeff Thornton won Popular Choice award, as determined on social media. A TAS high school teacher, in 2017



Jeff decided to deepen his training by undertaking the one year course in furniture design and technology at North Coast TAFE, Coffs Harbour. His curvaceous *Gaijin* chair was made from a single sheet of Flexiply with the aid of an elaborate but effective bending jig. Glossy red rubberised automotive paint was used to achieve a 'bright and fun' finish that was also inspired by Japanese lacquerware

Tasmanian designer maker **Geoffrey Cameron Marshall** was awarded the \$10,000 Grand Prize for his captivating *Conus Lighting Range*. Named after the predatory cone snail, a mollusc with a rather beautiful shell that is both spiral and conical, the *Conus* range is visually and structurally elegant and offers pendant, desk and floor lamp variants.

Digital design and fabrication techniques for a component based system allow efficiencies of material use and assembly time. The translucent qualities of Tasmanian oak and other specialty species are highlighted in the radial pattern which is supported by powder coated mild steel, copper, acrylics.

Learn more about the competition at www.dangerousdesigns.com.au



1. *Conus* pendant in Tasmanian oak by Geoffrey Cameron Marshall.
2. Geoffrey Cameron Marshall, overall winner of the Dangerous Designs competition.
3. *Walking Sticks* designed and made by Daniel Tucker in American walnut and American oak, natural and ebonised.
4. Cameron Shelton's monochromatic *Three Floor Lamp* made from bendy ply.
5. Jeff Thornton, Popular Choice winner.
6. The design of Jeff Thornton's *Gaijin* (foreigner) was inspired from time spent living in Asia.
7. Bryan Micallef's *Warp & Weft* Stool is here made from two interconnecting bends of veneered plywood.



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Traded Value

Backed by an impressive body of work made by Canberra Institute of Technology apprentices, Niklavs Rubenis argues the case for the value of trade education.

Stuff is everywhere... I'm at a loose end here with any other way of explaining it intelligently: every hour of every day we are constantly bombarded with, well, frankly put, more and more stuff. So much so that at times it's hard to find the value in it. Perhaps that's just the product and conditioning of living in a consumerist society where we are all too often content in using something and then simply throwing it away.

Although, if we stop for a minute, and look a bit more closely at some of that stuff, it has a lot to tell us:



our motivations for its design, our culture or society, why we may or may not need it, how it has been manufactured, its geographic origins, materials, what meaning it might hold, why and how we consume it, and where it might end up when we are done with it.

But, from my perspective, perhaps one of the most valuable things invisibly embodied within just about every bit of stuff is a pragmatic and manual skill base – to make anything requires a degree of skill be it through the development of a process or an understanding of how a physical thing might come together.

However, unlike a lot of that stuff we get blasted with every day, to make anything *good* and *worthwhile* takes a significant amount of time dedicated to developing and honing a skill. I would refer to this as a trade skill, a vocation that sits in the background propping up and contributing to our built environment.

Yet like a consumable bit of stuff, trade skills can often be treated in the same way. There are countless organisations, for example, whose business models are solely about consuming students whereas established and genuine training institutions such as TAFEs are consistently under threat of being defunded.

So, what about this exhibition then? Well, it's a showcase of a trade. And what needs to be kept in mind is that trades are a transmission of knowledge learnt and nurtured through a community of practice – a means of contributing meaningfully to our culture and society. Many European countries have been successfully achieving this for eons and even the United States celebrates a national day of making. This is a dedication to those contributing in that sector by highlighting innovative practices born from manual skill sets.



1. Peter Cina, Designcraft. *Make up Cabinet*, American walnut (solid and veneer), mirror glass and brass.
2. Timothy Bishell, J & J Interiors. *Icy Waterfall*, hard rock maple and American walnut.
3. Ewald Bouwer, Thor's Hammer. *Silky Drawer Chest*, silky oak, London plane and Tasmanian oak.
4. Ben Stevens, Capital Veneering. *Reborn Sideboard*, recycled blackbutt, New Guinea rosewood and hoop pine plywood.
5. Jason Pring, Designcraft. *Rubik's Cube Magic*, American walnut (solid and veneer), hard rock maple (solid and veneer), silky oak veneer, brass, plastic and magnets.

6. Mark Zwickert, Infinity Kitchens and Joinery. *Pair of Bedside Cabinets*, American walnut (solid and veneer).
7. Nathan Cummings, ACT Kitchens. *Open Sesame*, hard rock maple, glass and camphor laurel veneer.
8. Oliver Baker, Capital Veneering. *Small Herring Bone*, jarrah (solid and veneer) and Tasmanian myrtle veneer.
9. Phillip Fooks, *Ellwood Detail Joinery*. Tabletop Arcade Machine, grey and red iron bark solid and veneer, toughened glass, flat screen and PC running Mame Emulator program.

In a different way, it has become increasingly acknowledged in schools and universities that building things – developing pragmatic manual skills – aid in solving complex problems. This is about the value of kinaesthetic learning and the capacity to do things in three dimensions beyond a flat screen.

We have known for a very long time that the use of the hand has been fundamental to human intelligence, an interesting fact considering that over the last several decades or so we have shifted dramatically from a predominantly manual labour force to a sedentary one. Should we still be telling our kids that trades are secondary to university, or that they are both equally valuable albeit in different ways?

My point here is pretty straightforward: aside from the exceptionally dedicated individuals and the clear tangible results of quality teaching, exhibitions like this simply serve as an important reminder that skills cannot be consumed and discarded. This exhibition symbolises far more stuff than just the stuff on show.

Photos: Jessica Sainsbury

* A Retrospective Exhibition of Furniture Design by Canberra Institute of Technology (CIT) apprentices was shown at The Canberra Centre in November 2017. The exhibition was featured as part of the annual DESIGN Canberra Festival. For more information about CIT see www.cit.edu.au

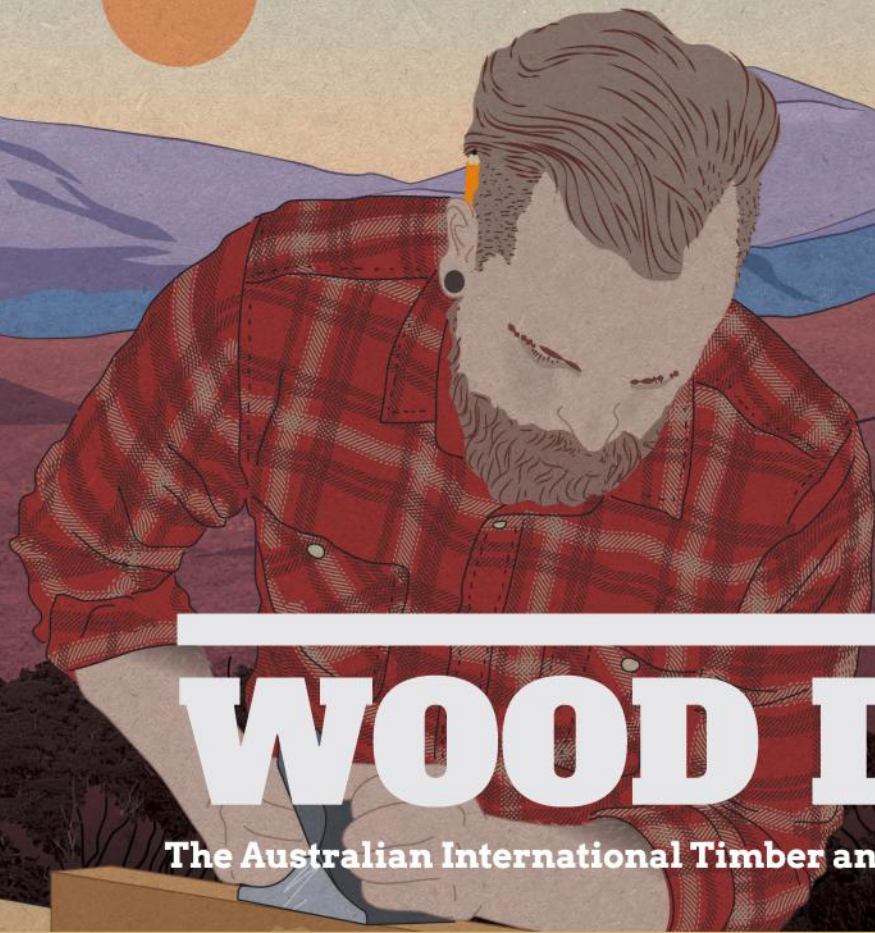


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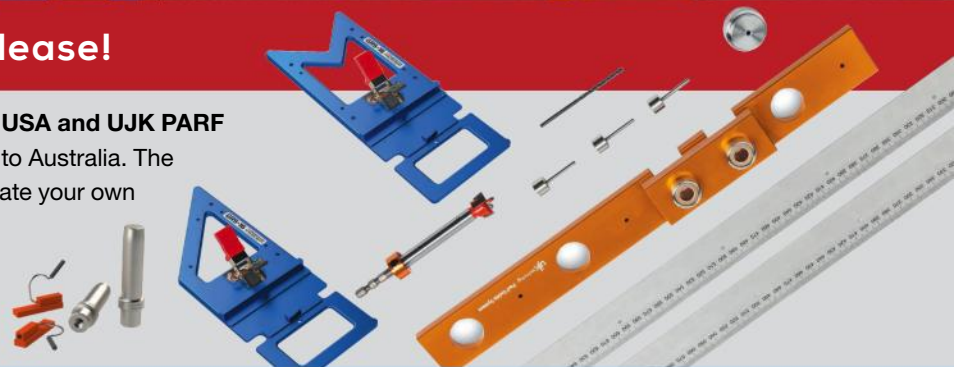
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