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Wood

REVIEW

110

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YEAR AWARDS
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SEE PAGE 22

NATHAN DAY

Crafting a Career

The Marquetry Art of Olivia Faire

TESTED

- BOSCH GKS CIRCULAR SAWS
- HAFCO CHISEL MORTISER
- FELDER THICKNESSER

HOW TO

- BLACKWOOD TRAY
- SLIDING DOOR CABINET
- PENCIL GAUGE PROJECT
- CHOOSING THE RIGHT MACHINES



The Devil is in the Detail.



1.

2.

3.

1. Veritas 1/2" Chair Devil

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2. Veritas 7/8" Chair Devil

Code: 05P33-51

3. Veritas 1-1/4" Chair Devil

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From his home in Bergamo, Vasko Sotirov travelled across Italy for 'a journey into the elegance of a chair'.

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UK marquetry artist Olivia Faire uses wood and other materials to create subtle imagery inspired by nature and the built environment. Interview by Rick Knopke.

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A solid wood construction with doors that slide required allowances for movement, and ways to balance strength with lightness. A project by Raf Nathan.

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Achieving a streamlined design for a blackwood tray involved a series of set-ups, processes and jigs, explains Andrew Potocnik.

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70 What I Learnt Making Historic Varnishes

Shane Orion Wiechnik describes how recreating medieval recipes for varnishes helped him gain a better understanding of materials used for finishing.

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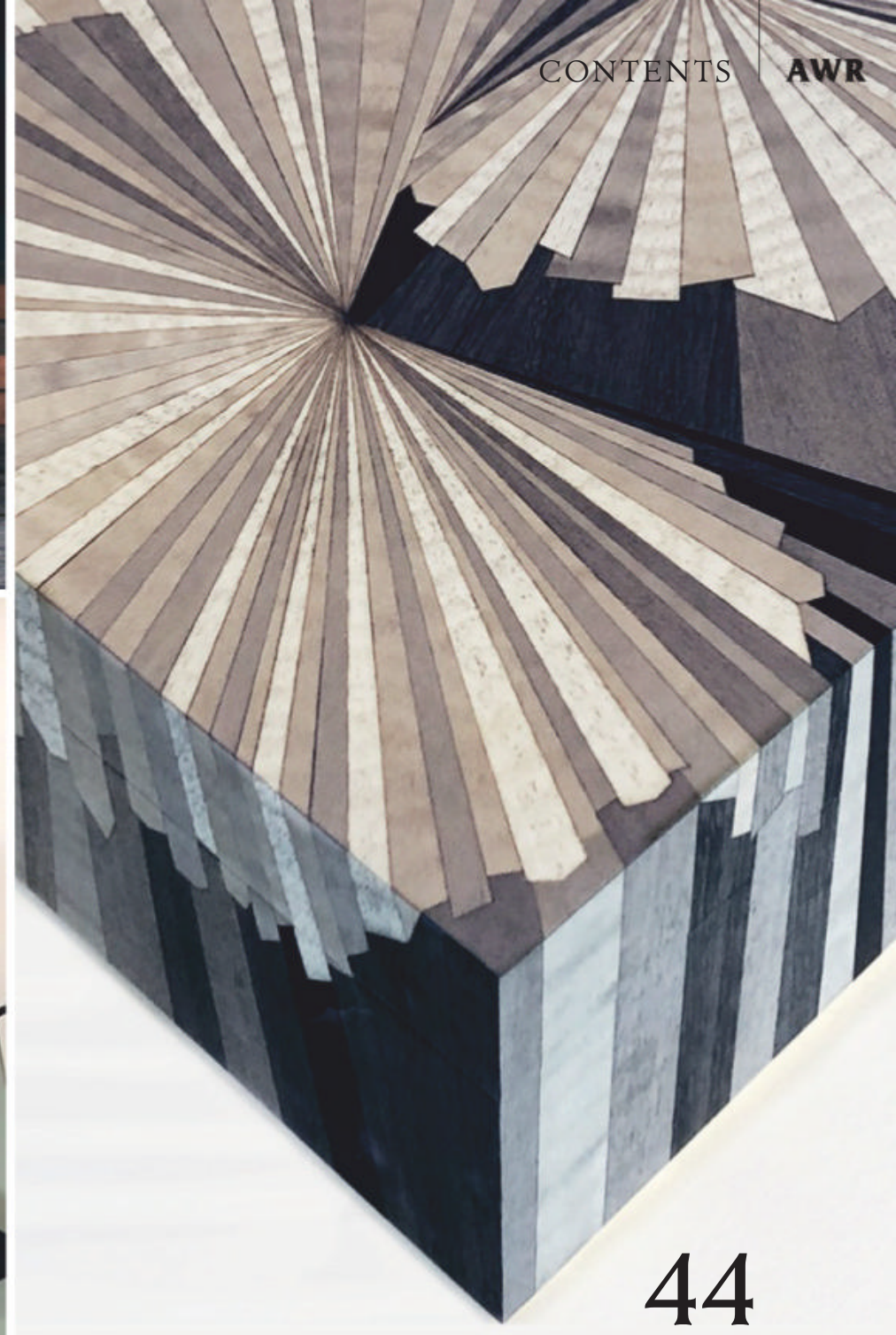
Vic Tesolin explains why you should choose machines to match your needs as well as your budget.



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Editor's Letter

The journey forward

We live in a world of ironies – we may be grateful that 2020 is over, but the pandemic is still with us. Small-scale woodworking has proved to be an ideal isolation pursuit. Keeping their distance, makers have learnt to connect through a variety of online platforms, forums and workshops. While some industries have been hit hard, I've heard several reports of suppliers experiencing best ever sales figures.

Resilience, persistence and perhaps above all, adaptability, are qualities that seem to carry some individuals and industries through. This applies in no small measure to the maker featured on our cover.

Fifteen years ago Nathan Day wrote an article for this magazine about his experiences as a trainee in the UK Edward Barnsley workshop. He had just returned home to West Australia and was on the cusp of a new direction as a furniture maker. Judging by his social media and the range of jobs he now tackles, you might imagine it's been plain sailing. Speaking to him recently was an opportunity to take up the story from where we left off. It was interesting to hear how it had definitely not been a straight path to the top, and more so that in 2020 he had been flat out with orders, see p.32.

Fashion and fine woodworking

A background in fashion design is not the normal prerequisite for a fine woodworker, however it makes perfect sense on viewing the exquisite marquetry created by UK maker Olivia Faire. Australian furniture designer and marquetry artist Rick Knopke has a keen appreciation for her work, and asked her a series of questions which reveal the techniques she uses, along with some of the things that inspire her.

Recreating the past

With the convenience and reliability of modern finishes at hand why would a maker bother to recreate medieval formulas? Shane Orion Wiechnik is a conservator and furniture maker who did just that in order to better understand his materials. We're not recommending that you follow his path, but you can benefit from reading about the insights he gained, see p.70.

Maker of the Year 2021

Last year our inaugural Maker of the Year awards were hailed as an outstanding success. As the entries from Australian and New Zealand woodworkers rolled in we were treated to an ongoing visual feast that was featured on our website and in our social media.

Entries for Maker of the Year 2021 are now open, and with an even larger prize pool – \$20,000 in cash and goods are on offer! MOTY 2021 is proudly presented by Carbatec, Australia's premium specialist woodworking supplier who in turn represents a host of leading brands. Huge thanks go to Carbatec, Felder Machinery and Whittle Waxes for sponsoring this initiative.

This year our overall Maker of the Year will once again be chosen from Australian and New Zealand entries, however we've also opened this competition up to world with an appropriately named World category.

All the details are now on our website which is also where you can enter. We look forward to featuring your work. To find out more, head to www.woodreview.com.au/moty2021

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COVER:

Nathan Day in his workshop in Vasse,
Western Australia.

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Savanna Bloomer

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- ERIN
Staff Member

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Top: Bosch's GKS 18V-68 GC Professional BITURBO is a heavy duty saw with a brushless motor rated at 1800 watt.

Above: The smaller GKS 57G 165mm (6-1/2") cordless circular saw is light yet powerful.

Bosch Cordless GKS Saws

Reviewed by Raf Nathan

The Bosch GKS 57G 165mm (6-1/2") diameter cordless is a great little saw. I particularly like that it's reasonably light at around 3.5kg, depending on the battery you have in it.

It's light enough to be used easily, yet powerful for most jobs in the workshop and on site. With 57mm depth of cut it suits all my workshop sawing needs.

It's perfect for sawing boards to length, dimensioning panel materials, or any job when you need a quick cut. With a shop-made crosscut jig it is perfect for sawing framing, flooring and wood products.

If you purchase a guide rail, available in a few lengths, you can use it as a portable panel saw and get a nice clean cut across panels like benchtops or tables.

Interestingly, when I bought this saw it was \$350 skin only, but that price is now \$260, so it just keeps getting better. The motor sits to the left of the blade so for balance it suits right-handers, but there is also version with the motor to the right. This is a highly recommended power tool with a six year warranty.

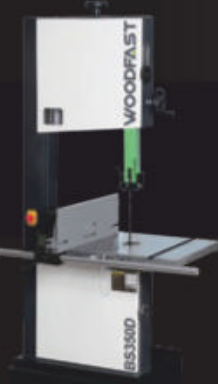
If you want more power for say regular deep ripping in hardwood, then for that you need its big brother the GKS 18V-68 GC Professional BITURBO circular saw. This is a full sized 184mm (7-1/4") diameter heavy duty saw with a brushless motor. Bosch rate it at 1800 watt so it's equivalent to a corded saw in power; that's more than 2hp by the way. Final weight will depend on what battery you install but it's at least 4kg so it's similar to a corded tool in that aspect.

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BS250B 10" 0.5hp Bandsaw RRP **\$539**

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BS350C 14" 1.5hp Bandsaw RRP **\$1349**

The BS350C bandsaw features several unique innovations that promise enhanced accuracy and ease-of-use. It is more effective, accurate and easier to use than any other machine in its class.



BS350D 14" 2hp Deluxe Bandsaw RRP **\$1899**

This is a premium 14" bandsaw with features including powerful 2HP induction motor, dual speed cutting, 330mm depth of cutting, round bar fence rail and two-sided fence, solid frame and one-piece table trunnion support design.



BS450A 18" 1ph 3hp Deluxe Bandsaw RRP **\$2599**

This heavy duty saw with square column welding and enhanced body structure, includes a kick-off Emergency Stop and Foot Brake system, as well as micro switched doors, making this saw ideal for home, school and workshop users.



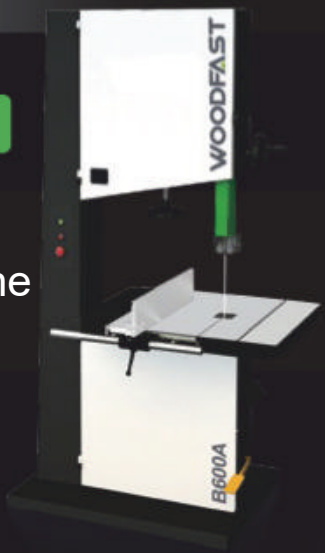
BS500A 20" 3ph Industrial Bandsaw RRP **\$3650**

Sharing the same essential design and features of the BS450A, the BS500A steps up in capacity and power featuring a 3ph 3kw (4hp) high torque motor and heavy duty cast iron wheels.



HB350A 1ph 3hp Sawmill RRP **\$3495**

Featuring 3hp power, an extremely solid bed rail and soft touch rack and pinion head travel, milling logs just became more efficient. The HB350 offers users a well-engineered sawmill with the ability to mill logs up to 40cm x 1.5m in length.



BS600A 24" 3ph Industrial Bandsaw RRP **\$4550**

The BS600A 24" 3ph 4kw (5.3hp) is the top saw in our range. Added stiffness to the steel saw frames is achieved with an even heavier box-style welded spine to withstand high tension from up to 35mm resaw blades.

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It is very well built with sophisticated features like thumb activated rise and fall, and full electronics control. The simple rise and fall operation makes it a fantastic plunge saw. There is a depth ruler, although it has no pointer. For ripping it's unstoppable, and you can plough through any sort of hardwood up to its maximum cutting depth of around 68mm. It comes with a 20-tooth blade, although I upgraded to a Diablo blade with 40 teeth which is fractionally slower on ripping, but gives an almost polished cut on endgrain.

Bevel adjustment is quick and simple with a lever and knob to lock it in place. The electronics enable a choice of six speeds plus there is an Eco mode which apparently saves 30% on run time. I just use it at number six which is max power. The display also shows battery life. You can link the saw to your phone as well if that is your thing.

Battery choice is critical I think and there are new high output ProCore batteries to choose from with ratings up to 12amps; more amps means longer run time although they are not a cheap purchase. While optimised for these batteries, earlier 18 volt batteries work fine.

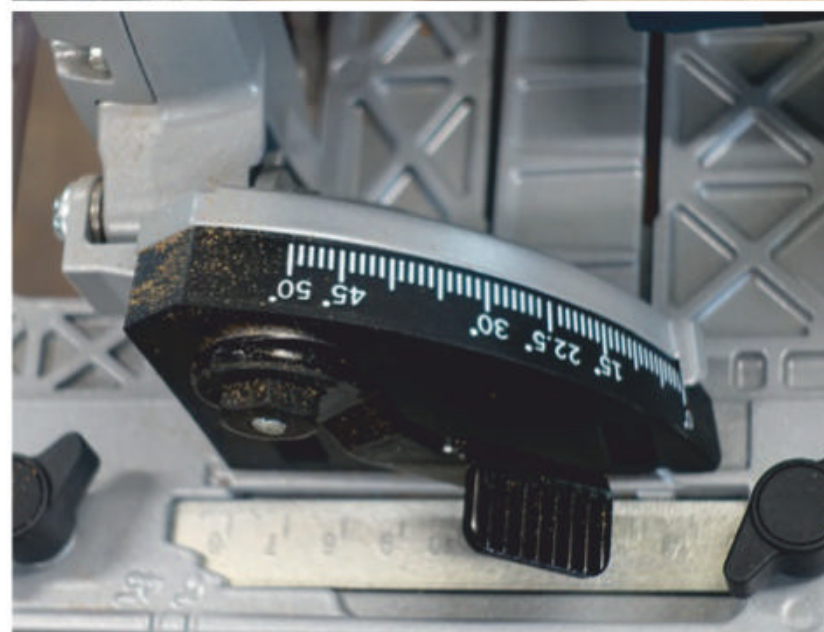
With a Bosch or other branded guide rail or track it becomes a portable panel saw ideal for sink installation or trimming decking. The motor has a brake and the blade stops spinning quickly on trigger release. The standard sized dust outlet has indents to hold it at different angles which is a nice helpful detail. As is the six year warranty.

Now you can sell off your corded saw and happily use this saw as your go-to tool for all your carpentry and building work.

Photos: Linda Nathan

Raf Nathan is a furniture designer and maker who lives near Brisbane. Email: raf@interwoodshop.com.au

See www.bosch-pt.com.au



From top: Thumb activated rise and fall makes the BITURBO a fantastic plunge saw. Full electronics control enables six speeds, while the Eco mode saves on run time.

High output 12 and 8 amp ProCore batteries aren't cheap, but more amps means longer run time. The saws will still run fine with earlier 18 volt batteries.

The bevel angle gauge is simple to operate with a knob to lock in place.



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Top: Showing the supplied gauges for setting the protrusion of the setting screw.

Right: When the magnet releases the tension is set.

EZtension Gauge

Reviewed by Damion Fauser

Setting the tension on your bandsaw blade correctly is crucial to optimise performance. Many woodworkers rely solely on the factory settings on the tension meter of their machine for this task, but in my experience there is no guarantee that this setting is accurate to begin with.

The EZtension bandsaw blade tension gauge aims to eliminate this inconsistency. It is a simple and well designed device that uses two mounting magnets spaced symmetrically either side of a protruding setting screw. The gauge is simple to use – it is mounted onto the side of the installed blade with both magnets in contact. As the blade is slowly tightened, the reducing flex in the blade contacts the central setting screw with increasing force until one of the magnets releases from the blade. At this point the blade is considered correctly tensioned.

The tool is well made and comes supplied with an allen key for adjusting the centre setting screw, along with a set of spacing devices to set the correct protrusion for varying blade widths. These are all conveniently stored in the body of the gauge itself, which can be simply left attached to the blade at the end of the session, where its bright orange colour will serve as a visual cue to re-tension the blade prior to use.

The spacing devices come with setting for blade widths from 1/4" (6.35mm) to 3/4" (19.05mm) in 1/8" (3.2mm) increments. Blades wider than 3/4" are therefore not accounted for with this device.

The ingenuity of the magnets leads to what I consider to be the primary limiting factor with this gauge – it has been designed and calibrated for use with carbon steel bands only. The varying magnetic, tensile and ductile properties of the bands used for BiMetal (and many carbide-tipped) bands are different from those of carbon steel blades and this tool is therefore not accurate on the higher quality blades. When I contacted the manufacturer about carbide-tipped blades, I was informed that it is the onus of the user to check whether the band of their blade is carbon steel or BiMetal.

A clever device, this tool is available from the manufacturer for an extra shipping charge of US\$14. I see this as a tool for those who are happy to run carbon steel bands.

Review tool supplied by EZtension, www.eztension.com

Damion Fauser is a Brisbane furniture designer/maker who also teaches woodwork classes. Learn more at www.damionfauser.com



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Felder D963 Thicknesser

Reviewed by Damion Fauser

I've owned one of these machines for nearly three years and I absolutely love it. This standalone, floor-standing thicknesser from the Felder stable is a seriously capable machine that adds significant productivity to my business.

With a cutting width of 630mm, I use the full capacity of this machine for processing whole workbench tops and dining tabletop halves, greatly speeding up production. The available cutting height is 3.0–300mm. The ability to cut down to 3mm without a supplementary sled or table base is a significant advantage over many other thicknessers on the market. The maximum height of 300mm means I'm able to dress the edges of wide boards for tabletops through this machine with astounding accuracy and resulting in glue-ready edges straight out of the machine.

Fitted standard with a 120mm cutterblock featuring Felder's proprietary system self-aligning knives, I optioned mine with the Felder Silent-Power spiral cutterblock. This, combined with the large diameter of the block, means the cut surface is astounding, requiring zero further work for glue-line surfaces and very little subsequent surface preparation for finishing.

The machine comes standard with a 7.35kW (10hp) motor and I have found that it doesn't even blink even under the toughest loads, but it can be powered up with an option of a 10kW (13.5hp) motor.

Speed control is infinitely variable between 4–16m/min and cut depth ranges from 0.1–8mm. This allows me to process stock with incredible speed. I hog waste with deep cuts at high speed and then finish with a shallow cut of between 0.5–1.0mm at the slowest speed, resulting in super fast and clean work.

Cut depth is adjusted by the electrically-driven bed, with fast movement and a fine control in 0.1mm increments. Actual cut depth is shown on the digital display, which means it is very easy to replicate precise dimensions if you need to make a replacement component, for example.

Optional is the Digi-Drive module, which allows for automatic and pre-set cut depths to be entered, saving time adjusting manually.

The bed rises and falls on a set of four trapezoidal spindles, and longitudinal guides integrated into the side of the machine chassis absorb the pressure that is put on the outfeed side, ensuring that the thicknessing table is guided with incredible accuracy. I've processed full-width panels down to 3.0mm with astonishing accuracy and cut quality right across the panel.

Waste management is via a 160mm outlet and, when fitted with a sufficiently powerful extractor, extremely effective. I have mine plumbed to a dedicated Felder AF22 machine.

Segmented infeed cauls prevent kickback and allow for ganging of components, spring-loaded pressure bars maintain smooth and consistent contact with the table and twin

outfeed rollers ensure even the widest components progress through the machine consistently. The grind on the table is exceptional but like all quality steel tables requires some lubrication with extended use.

Optional fittings include an infeed roller bar and an outfeed extension that rises and falls with the table surface.

The price shown is for a machine optioned the same as mine, and will accordingly vary. This is an exceptionally capable machine that has added significant capability to my workshop. I cannot recommend it highly enough to anybody who requires a large thicknessing capability.

More information from Felder Group Australia, www.felder-group.com/en-au

Damion Fauser is a Brisbane based furniture designer maker who also teaches classes in woodwork. See www.damionfauser.com

\$25,150



Felder D963, shown here with Digi-Drive, an option not included on the author's machine.

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Hafco M-25 Hollow Chisel Mortiser

Reviewed by Neil Erasmus



There are bigger, heavier and more powerful hollow chisel mortisers around, most of which hail from the heyday of post WW2 British woodworking machinery excellence, but for the fine furniture maker, the Taiwan-made Hafco machine doesn't disappoint. The last statement is a rare one coming from me, as I have always been suspicious of the quality of any woodworking machine not designed and built in Europe.

This machine is a little gem. It's a smallish, robust machine that has been around for many years and comes with well-engineered, separate dovetail-guided XY tables and plunging head. The castings and machining of all its components appear to be substantial enough, done with care, and work flawlessly. It comes complete on a stand that serves as a convenient storage cupboard and also has a backward sloping dust chute to which extraction may be attached.

The head to which the chisel and motor-driven auger are attached has a plunge of up to 125mm, and can also be mounted in various vertical positions to cater for a big range of thicknesses or widths of wood. In addition, the table's clamp can be placed in three positions to cater for material up to 160mm wide. The 516 x 168mm clamping table has a stroke of 255mm but this can be limited with easily adjustable stops behind the table.

The left/right travel is by the handwheel which operates a rack and pinion under the table, while fore/aft travel to position the fence relative to the chisel is set by simply pulling the same wheel out to engage a lead screw. This is a very clever design that avoids the common problem of skewing.

The chisel's downward travel includes an adjustable bar and clamp to limit it to suit mortise depth. The machine comes standard with two reducing bushes to accommodate a range of chisel sizes and brands, while the auger is chucked in a standard Jacob's chuck attached directly to the motor, which is more than adequate for even the biggest chisel sizes – 25.4mm in softwood and 19mm in hardwoods.

The plunge lever features a rather nifty spring-loaded spline attachment that allows the user to re-position it to suit either a push or pull motion. It is weighted to counter the heavy head to ensure a lightweight feel. The lever offers ample mechanical advantage to make big cuts, or to ease the burden of production work.

I have owned one of these machines for many years, and it has always lived up to my expectations. Most of the schools I have taught at here in Australia and also in the US have identical units, and they have all held up remarkably well to ample use and the occasional abuse.

All three dovetailed ways allow for smooth, slop-free travel, and the vibration free 0.75kw direct-drive motor is capable of heavy work and runs at a speed that is ideal for this kind of cutting, delivering burn-free mortises in hardwoods. It should go without saying that sharp chisels and bits are a must too! This machine is easy to set up, and stays that way. For mortises in the face of boards that suit carcass construction, I have made a simple platform that clamps on to, and over the 93mm high fence.

To sum up, I would be lost without this one machine that delivers a result that can't be differentiated from a good hand-cut mortise. It will work relatively quietly all day long, creating little dust, and produce crisp, accurate mortises.

Hafco machinery is sold by Hare & Forbes Machinery House. Learn more at www.machineryhouse.com.au/W345

Neil Erasmus is a furniture designer maker based in Perth, WA.



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Cyclone Power ▲

Laguna dust extractors are now available in Australia from Carbatec and the features on these heavy-duty, premium build machines made in Taiwan make them worth considering. Offering the cleanest air of all, the P-Flux3 cyclone dust extractor is powerful at 3hp (2200w) 15 amp and 2250cfm. HEPA filtration is 100% of one micron particles and 94% of particles down to 0.4 micron. There's on/off remote control, three dust ports and the unit conveniently sits on castors.

www.carbatec.com.au

Product news

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

Meet the Ambassador ►

New on the scene, the Harvey C200-30 tablesaw is an entry level cabinet tablesaw with an up-to-date design. Features include a 27" x 40" cast iron table, cabinet-mounted cast iron trunnion, plug-in quick-release blade guard, riving knife system, rip Master T-square fence with high-low aluminium fence plate, cast iron handwheels, mitre gauge and built-in upper/lower dust ports with dust collection hose. With the Harvey brand, the aim is to offer affordable, well made and solidly built machinery. Available from Gregory Machinery.

www.gregmach.com



◀ Safer Ripping

Hafco's RG-190 ripping gauge makes repetitive ripping of thin strips safer and easier. Made from heavy duty aluminium extrusions, the gauge locks securely in any 3/4" x 3/8" mitre gauge slot. The built-in scale is designed to facilitate fine and accurate adjustments. The ball bearing holds the stock firmly against the fence, allows smooth feeding and makes repositioning a simple operation. Available from Hare & Forbes Machineryhouse, the gauge has a depth adjustment up to 135mm and can be used on bandsaws and tablesaws.

www.machineryhouse.com.au

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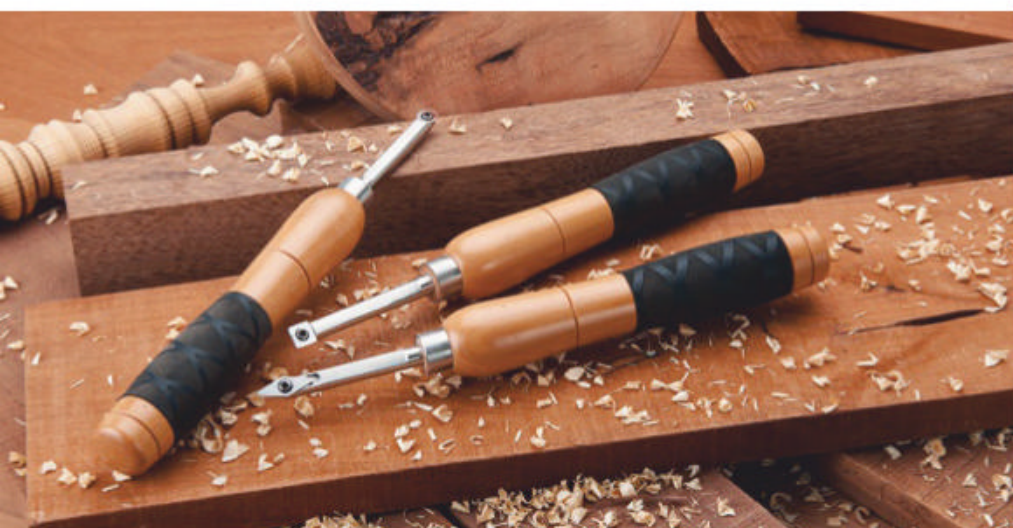
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◀ Tips for Pen Turners

Of interest to pen turners is this three-piece carbide replaceable tip turning tool set. The tips are extremely sharp and easy to replace on their 8mm solid stainless steel tool bars. The replaceable carbide insert on each tool is rotated to expose a sharp cutting edge by loosening the T15 Torx head screw and rotating the cutter. Made by WoodRiver and available from Professional Woodworkers Supplies, the set has ergonomically designed beech handles with rubber grips. The set includes round, square and diamond tip profiles. All three tools are around 330mm in length, ideal for pen turning.

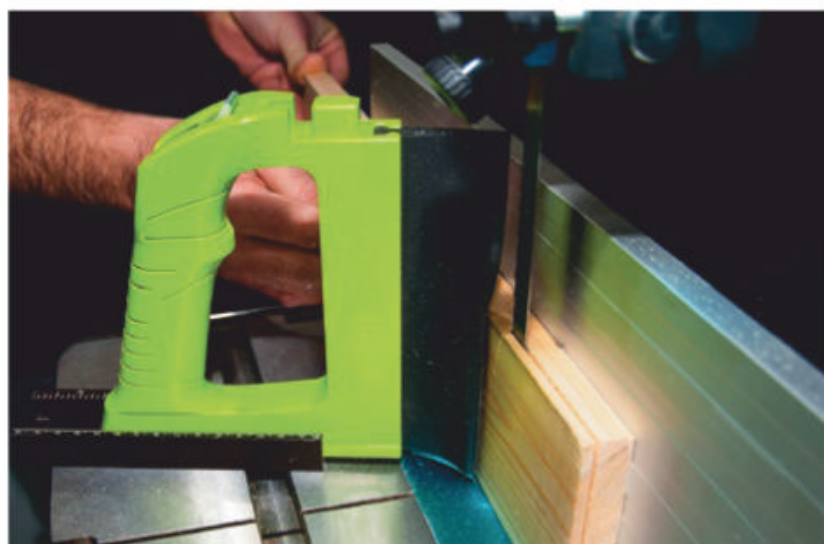
www.woodworksupplies.com.au

New Carving Tools ▶

New Japanese carving tool brands are now available locally from ProTooling. Kawasei chisels come in paulownia boxes priced from \$310–500. The EI-5 is a lighter set suitable for fine detail work and relief carving. The Makoto-5 is a shirogami (white) steel bent neck gouge which can be used for spooncarving. Nori-10 fully forged chisels have a steel handle wrapped in bamboo and can be used for lighter relief work through to medium level carving.

From Seigen is a range of 12 chisels with bent neck gouges, triangle, round, flat and pointed cutters suitable for light to medium duty carving and detail projects. Hiro Masui's 9-piece set comes in a canvas roll and includes kiridashi (marking knives), multiple gouge shapes, a mini saw and a file.

www.protooling.com.au



Feathers that Flex ▲

Added safety and efficiency are the benefits of Bow Product's GuidePRO feed tool for the bandsaw. The flexible silicone feather allows for variation in applied pressure, and adjusts to variations in shape and thickness of material. The end result is that consistent pressure is applied along the leading edge, enabling a controlled feed and a cleaner cut.

A mitre cam twists to position – pressing the locking lever then sets the tool for safer and better cuts. Available online and throughout Australia and New Zealand from Carbatec.

www.carbatec.com.au

Truly Square Ends ▼

One of the most critical steps in turning quality pens is squaring the ends of pen blanks to provide a perfect, gap free mating surface for pen kit parts. The Whiteside pen mill has a sharp, 19mm diameter carbon steel trimmer head for squaring blanks and pilot shafts that cleans excess glue from inside the brass tubes. The set includes 7mm, 10mm, 25/34" and 27/64" reamers and is also available as a carbide tipped barrel cutter.

www.woodworksupplies.com.au





The New Heavyweight ▲

The WL3040A is the latest heavy lathe offering from Woodfast. A 3hp motor, high quality inverter and electronic bed extension enable safer and more manageable turning of plus-size work. This is a heavy duty lathe with a massive 794mm swing and maximum 1016mm between centres, and when extended handles large-scale jobs. Cast iron components and solid construction provide stability and minimal vibration. The electronic bed extension minimises machine footprint when not extended.

www.woodfast-group.com



◀ Lift, Lock, Load

Carbatec's Lift n Lock fixed base router lift is designed to permit fast and accurate cutter adjustments from above the table, and lock securely into place afterwards. Without the need to operate locks, remove or replace routers, set-ups can stay set up.

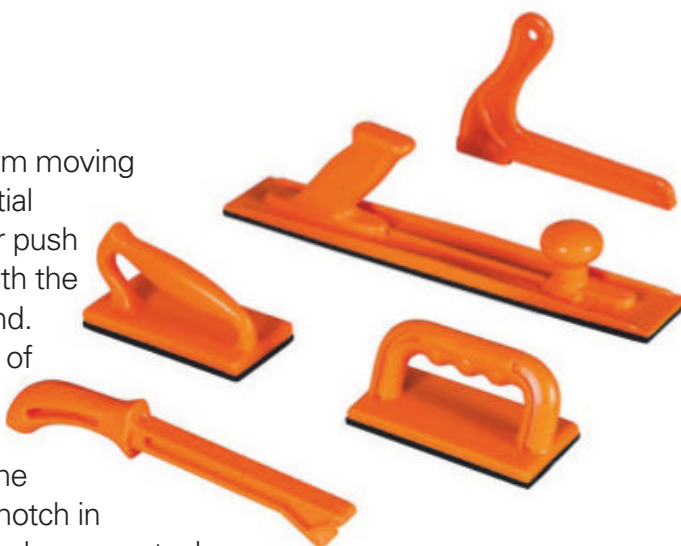
Upgrade Carbatec Compact and Pro Router tables or fit to Kreg and many other router tables. Carbatec's router power unit is designed to work with the router lift and can also be used on some CNC machines that require a full-size fixed base router.

www.carbatec.com.au

Hands Off ►

Keeping your hands well away from moving or rotating sawblades is an essential woodworking rule. Push blocks or push sticks are designed specifically with the aim of preventing accidents in mind. Well priced at around \$27, the set of five safety guides shown here is suitable for use when machining timber. Use two push blocks or one large unit on jointers, while the V-notch in the push stick makes it easy to feed narrow stock through a tablesaw or bandsaw. The saw guide applies pressure front and rear to make cutting thin stock safer on the tablesaw. The PSK5 kit is available from Hare & Forbes Machineryhouse.

www.machineryhouse.com.au



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Making a Pencil Gauge

Developing your skills in accuracy will reward you with a useful tool you can hand down through the generations. Theo Cook shows how to make your own pencil gauge.



The author's completed pencil gauge in Burmese padauk.

The pencil gauge is often overlooked, but for me, it's an essential part of the woodworking toolkit. I use it for marking out almost all my woodworking joints prior to using the marking gauge or a scalpel.

I'm a teacher at Robinson House Studio furniture school and students often ask

to use my pencil gauges, so we decided to teach them how to make their own.

You could buy a new or secondhand marking gauge and modify it, but for me it's all about the satisfaction of making your own.

An extra advantage is that you can choose your own timber. For my

pencil gauge I used Burmese padauk as it's very hard and looks great too. When choosing the timber I recommend a hard wood in a dark colour – lighter coloured woods tend to get dirty with handling.

In the following pages, the numbered photos and steps will show you how to make one for yourself.

Fig 1. Components not to scale

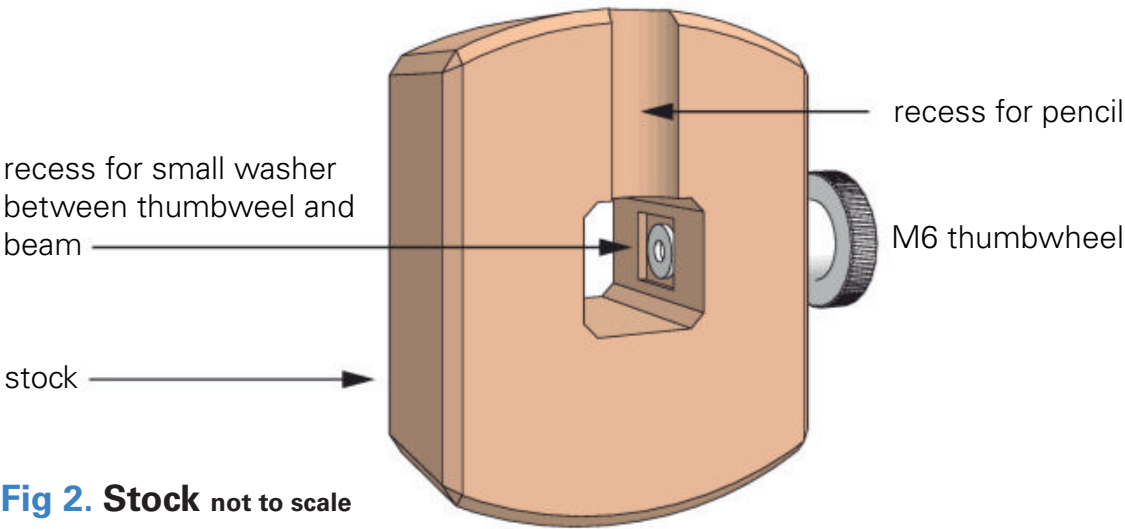
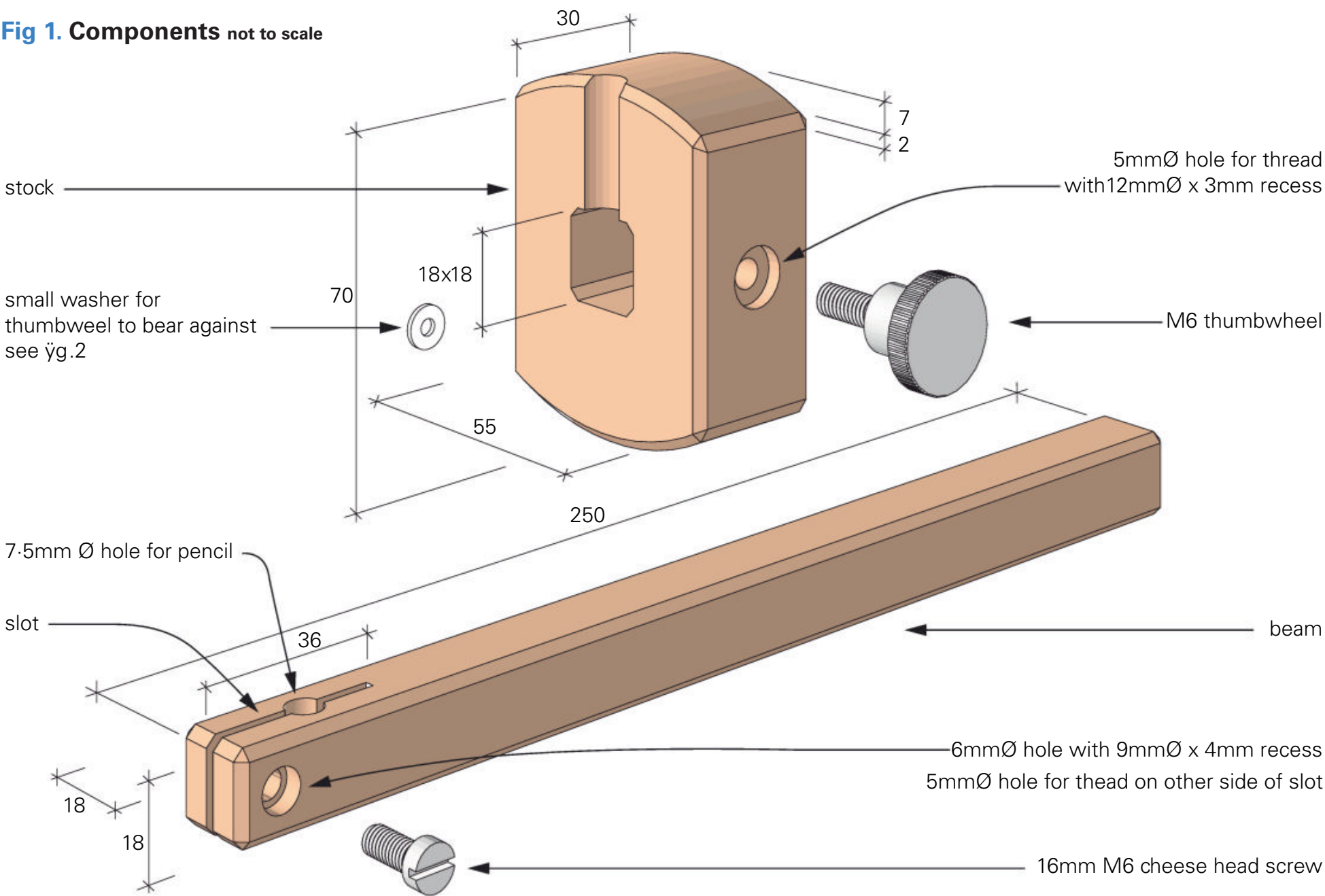
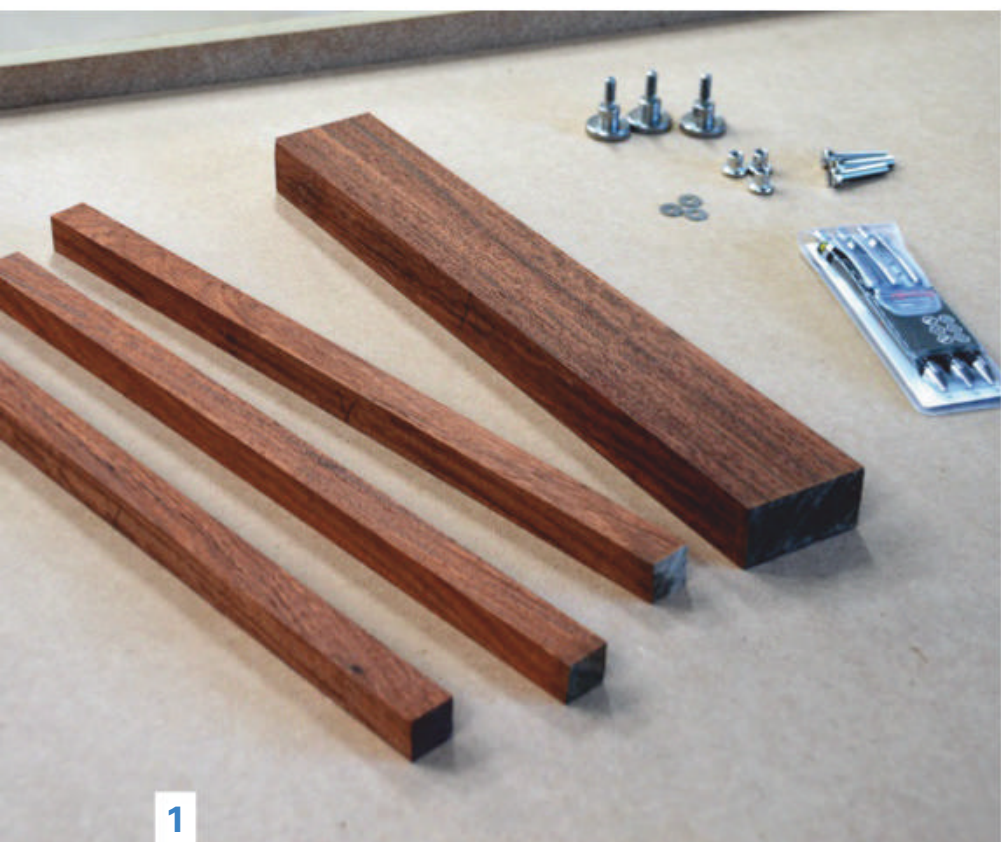


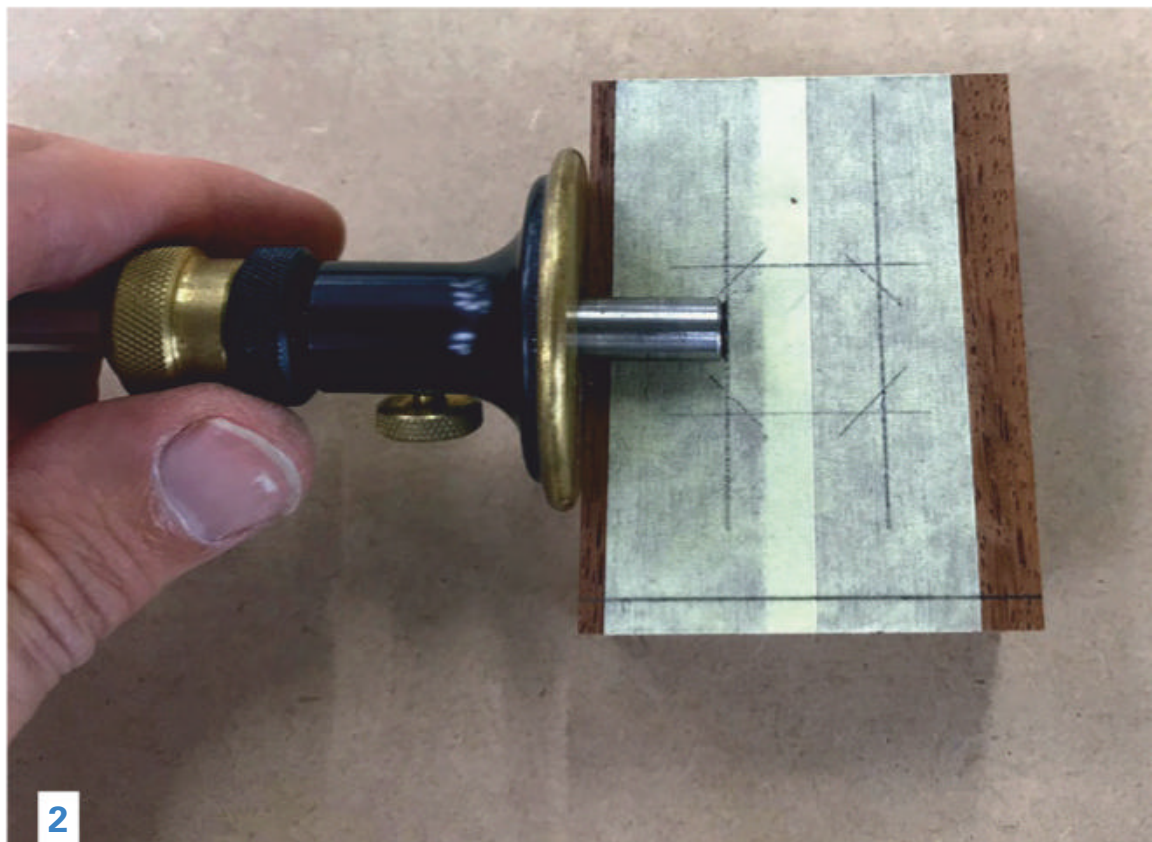
Fig 2. Stock not to scale

COMPONENTS (MM)				
	QTY	LENGTH	WIDTH	THICKNESS
Beam	1	250	18.2	18.2
Stock	1	70	55	30
HARDWARE				
Thumbscrew with M6 thread				
M6 cheese head screw (approx. 16mm long)				
Automatic pencil				
Small M6 washer				

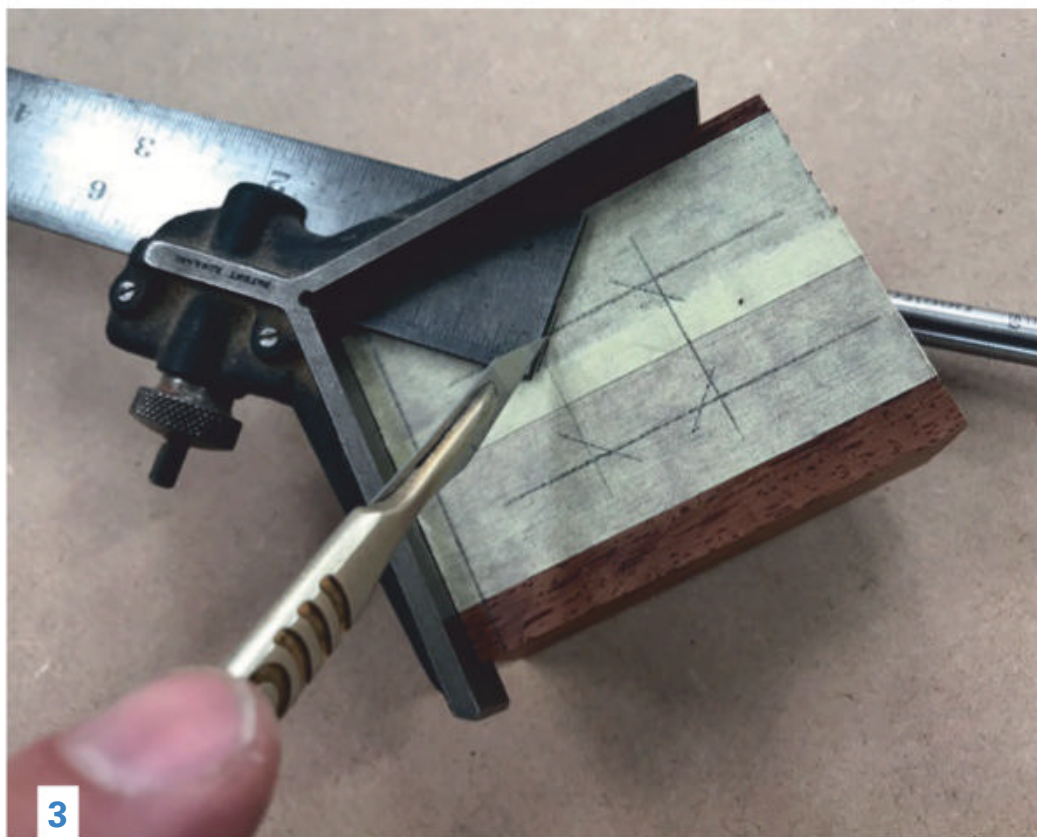




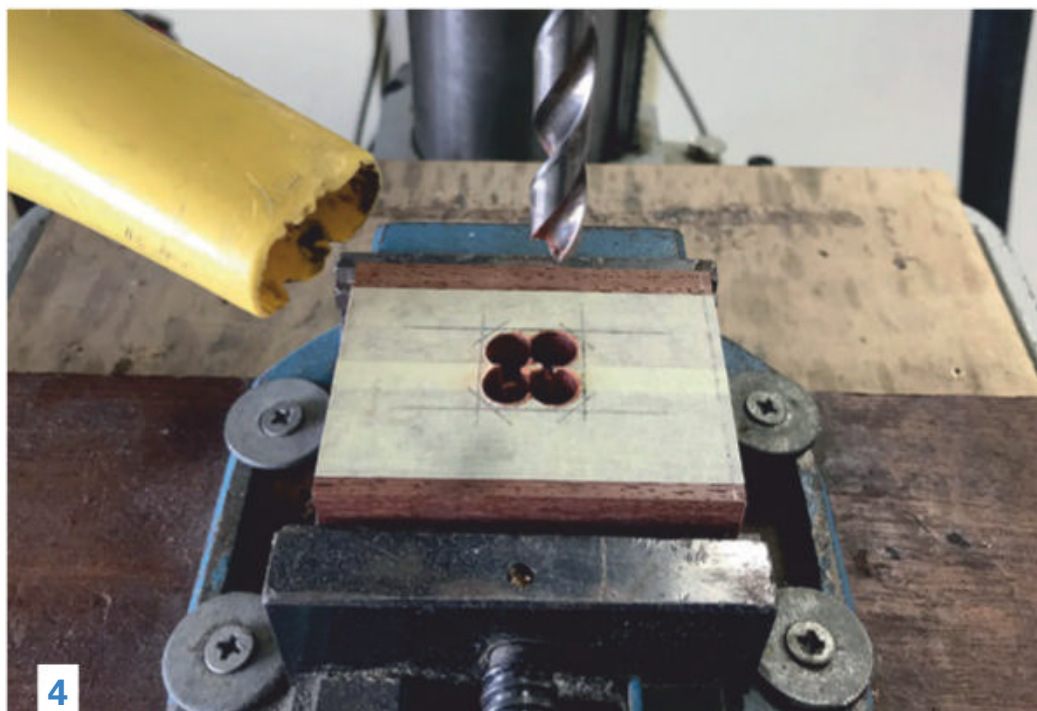
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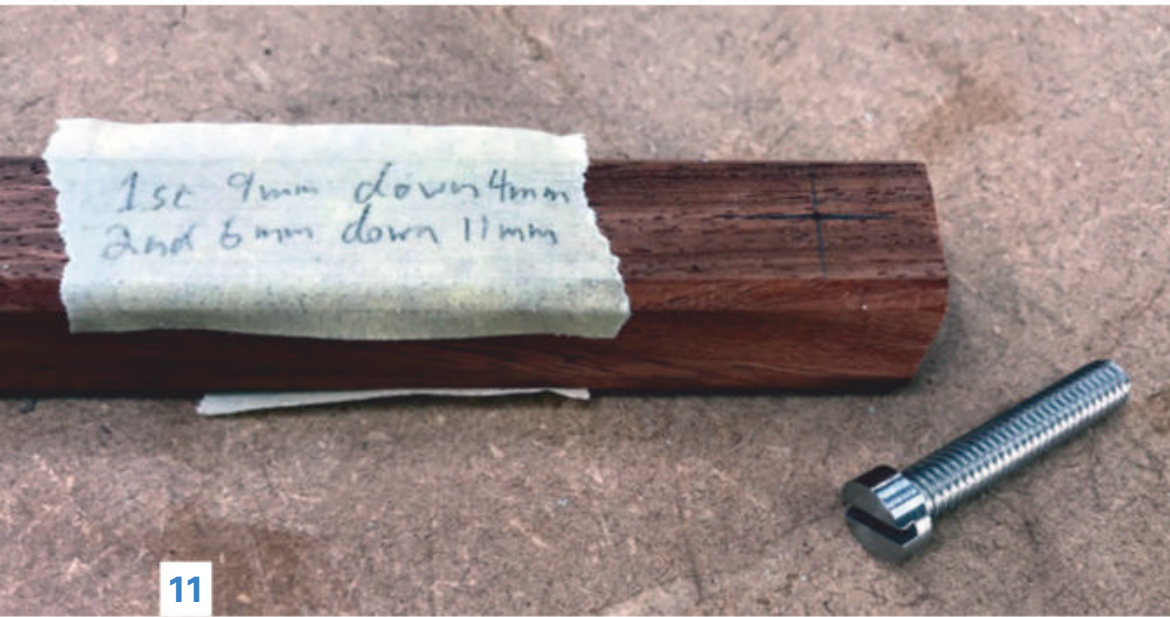
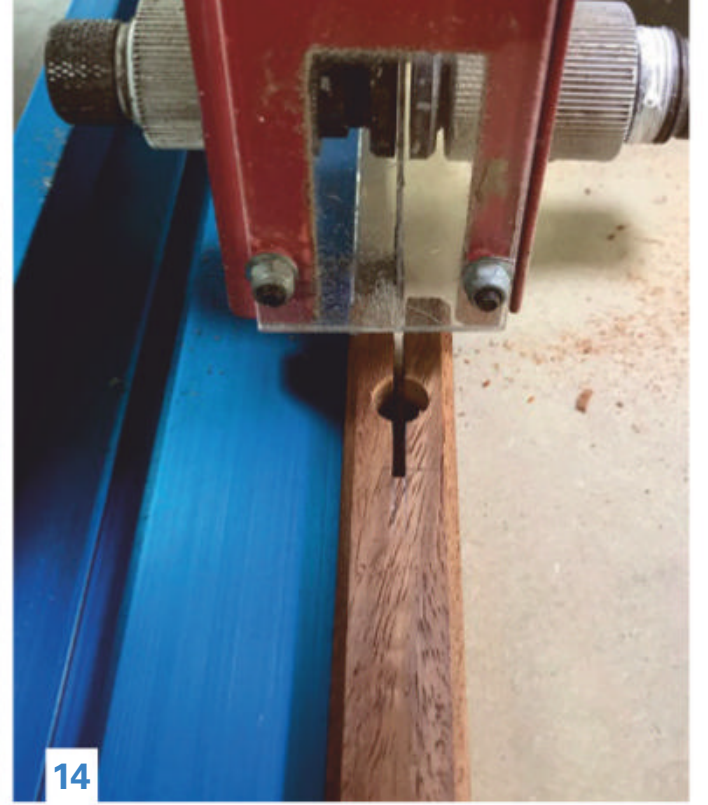
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Step by step

1. Cut out and plane your wood until it is flat and square. I'm making three gauges here as you can't have too many tools!
2. Mark out an 18 x 18mm size hole with 45° corners on the stock. Using masking tape is very useful on dark timbers to ensure the lines are clear. Use a marking gauge to score the parallel lines. Make sure not to cut right into the corners as this needs to be at 45°.
3. Use a combination square and scalpel to score the lines to be chiselled to later.
4. Drill out the waste in the hole, making sure to only drill down halfway to prevent break-out from drilling all the way through. I used a 7.5mm drill bit.
5. To speed things up, I used a router to clean out the remainder of the waste, but you could do this by hand using a chisel on both sides.



6. Chisel to the lines you made using the marking gauge and scalpel. Make sure the hole is 90° all the way through.
7. Plane the beam on a shooting board to match the hole at 90°, then use a 45° jig on the shooting board to get an accurate fit. This is the reason you have made the beam 18.2mm and the hole at 18mm – so you have material to plane down to fit.
8. Test the fit of the beam through the stock to make sure you haven't got any high spots.
9. Mark out where you need to drill for your hardware – on the stock and the beam.
10. Measure your hardware so you know what holes you need to drill and which drill bit size to use.
11. To reduce the risk of drilling the wrong size hole, make a note of the drill bit size and depth of hole that is required. This image shows the beam.



12. In this photo you can see how the hole should look on the stock after drilling.

13. Mark out where to drill the hole for the pencil. Make sure you measure your pencil to find the correct size for the hole. The hole should be exactly the same size as your pencil. I would use a spur centre wood drill bit for this hole, and the same for the other holes.

14. Mark out and cut the slot in the end of the beam. This can be cut on the bandsaw or by hand. This gap will allow the pencil to be gripped tightly.

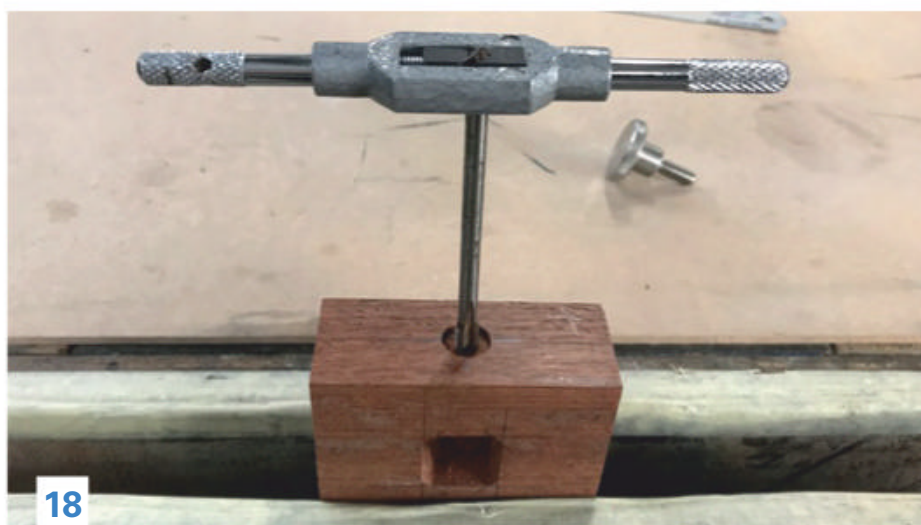
15. Put a piece of sandpaper around a ruler to sand inside the cut you



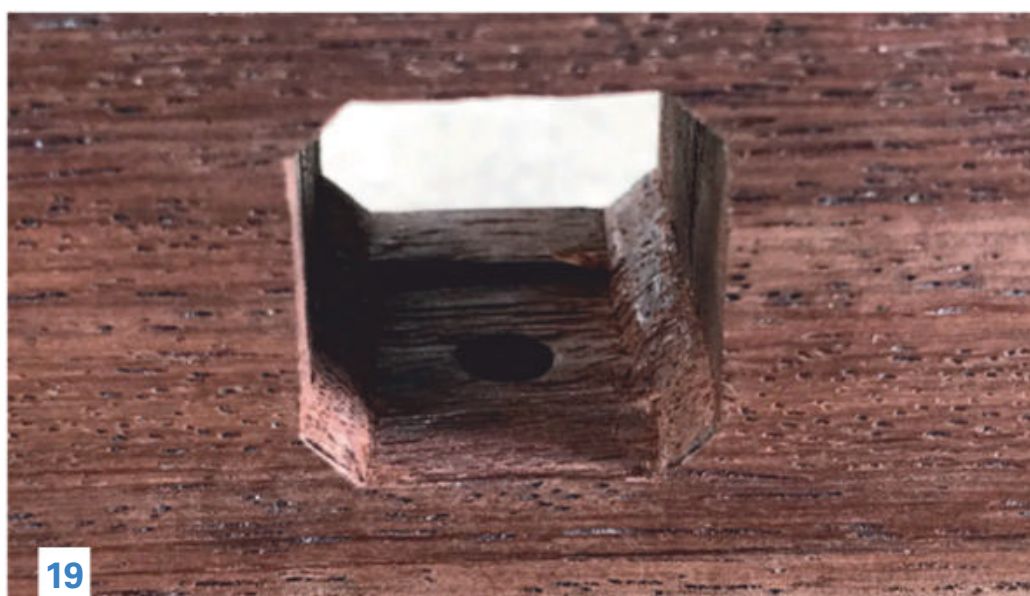
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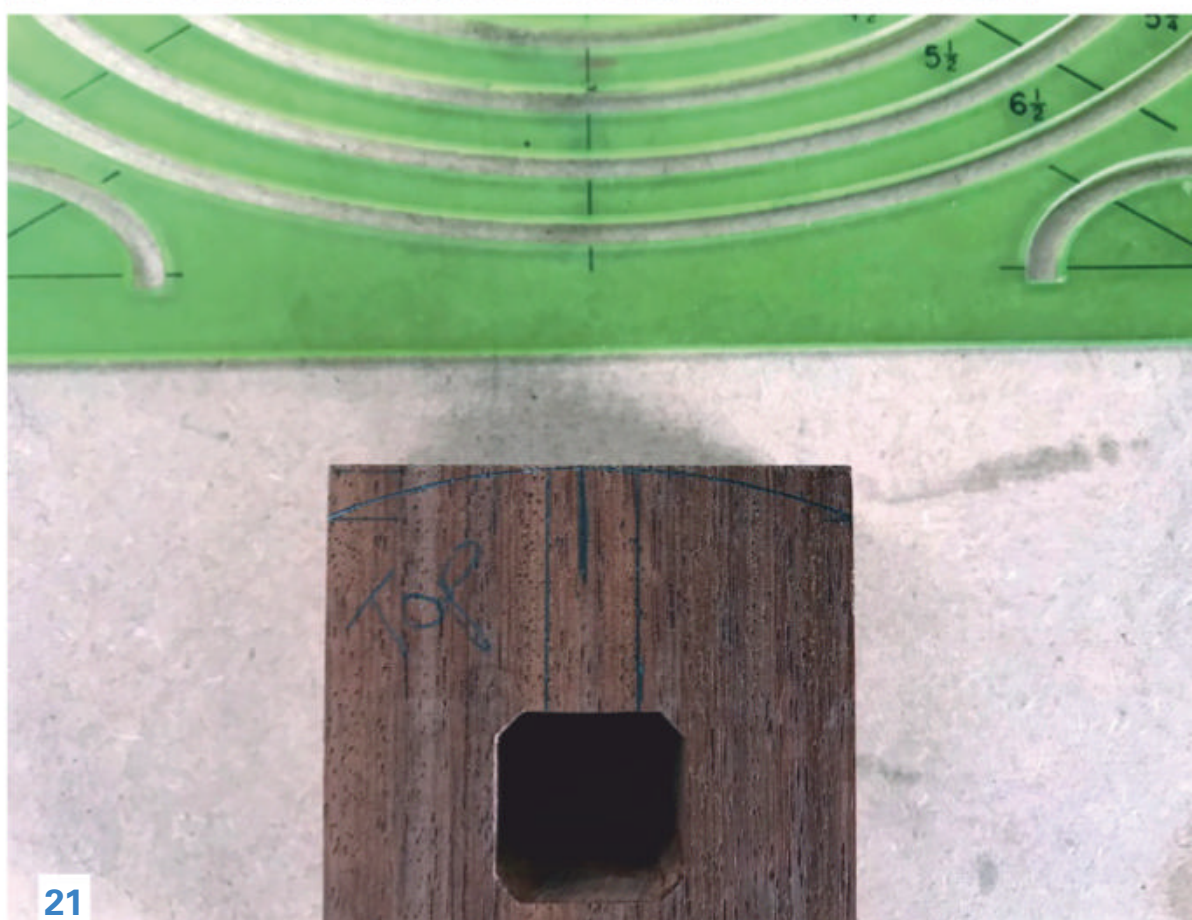
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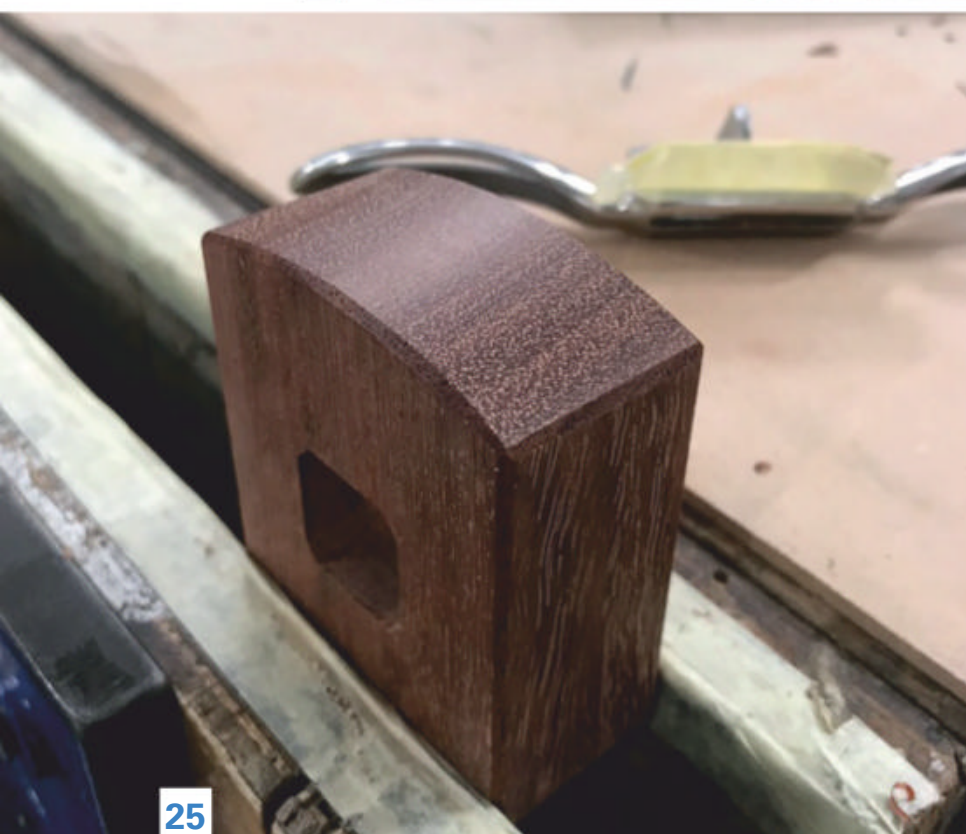
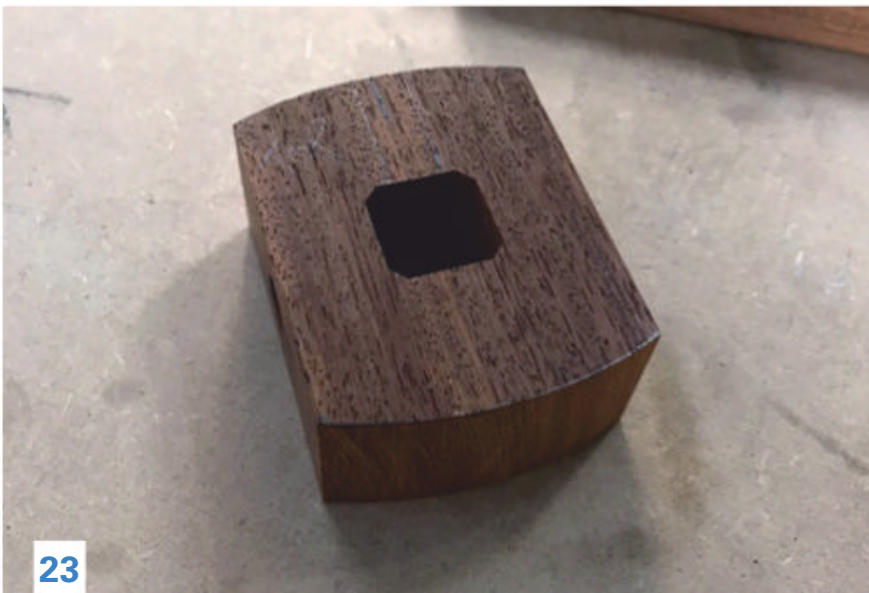
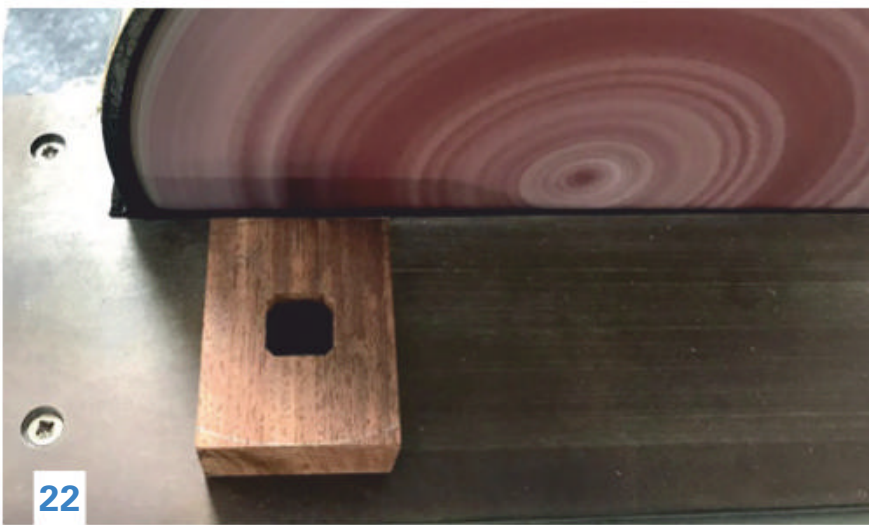
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just made. This will make for a smoother surface.

16. Sand the beam all over, but be very careful not to over-sand it, as then it won't fit in the stock very well.
17. Find yourself an M6 tap to cut the thread in the beam.
18. Cut the thread and then test the fit.
19. A recess needs to be chiseled out from both sides to create a step.
20. The recess is required so the washer sits flush. The washer will ensure the thumbscrew doesn't wind into the side of your beam when you're using it.



21



21. Mark out the two curves on the top and bottom of the stock.
22. I sanded these curves on the disk sander.
23. Your stock should now look like this.
24. Mark out and chisel the half-round slot for the pencil on one side of the stock. This allows the pencil to get closer.
25. Mark out where you need to put the 45° chamfers on the stock. These should be 2mm and can be seen on **fig.1**. You can use a spokeshave or a block plane to do this. Sand the stock.
26. It's time to put the finish on. I used Osmo oil satin clear 3032. I usually apply two to three coats.

The processes described here are simple, however it's the care and accuracy you undertake them with which will reward you with a tool that will in turn help you get good results with your woodworking.

Photos: Theo Cook



Theo is senior tutor and vice-principle at Robinson House Studio Furniture School, London, UK, see www.robinsonhousestudio.co.uk

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Crafting a Career

For leading West Australian maker Nathan Day, building a sustainable career in woodworking has required perseverance and adaptability. Interview by Linda Nathan.

Nathan Day is one of Australia's most high profile furniture designer makers, producing his own range of designs for retail, and also working to private commission and commercial briefs.

In 2006 he returned to West Australia from the UK after a one year traineeship at the renowned Edward Barnsley workshop. In AWR#57, some 15 years

ago, Nathan wrote about his experiences there and the skills he gained. I spoke to him recently and asked him if his career had gone the way he expected and what were some of the milestones.

You were already working as a furniture maker in Australia before spending a year at the Barnsley workshop, however you said that time was about refining hand skills and developing more

precision. Did those traditional skills take you forward once you returned home? What did you do after Barnsley?

In my mind they absolutely did. I felt like I took a massive leap forward in that year. I thought I was a good furniture maker before I got there, but the reality was I had a very niche skill set that badly needed expanding. My goal was always to be a furniture

Nathan Day with one of his *Araluen* tables. The design was created in response to a client brief for a table with a visually light aesthetic and legs that 'rolled off the top'.
Photo: Savanna Bloomer



maker first. I needed to know that any idea I dreamed up, I could build.

I came away from the Barnsley workshop with a lot of confidence and a lot of inspiration. I didn't know anything about running a business but felt sure the work would speak for itself and that was enough.

I rented workshop space with another furniture maker in Yallingup and started designing and making pieces and trying to sell them from the showroom at the front of the workshop. I thought what I was doing was pretty special, but I couldn't sell them. I lasted 12 months before I went out of business. It coincided with the GFC in 2008, which some people suggested

contributed, but I wrote it up as not paying attention to the market and went back to the drawing board.

The work you were making for galleries was different to the work you're producing now. Where did you learn your design skills?

I don't have formal design training. I was inspired mainly by furniture makers in the US and the UK. I owned books by Sam Maloof, John Makepeace, Wendell Castle and MC Escher. I designed pieces that incorporated techniques I wanted to try. I wanted to show off my making skills as well, but not in a traditional woodworker kind of way. I wasn't applying decoration, or dovetailing

everything, more like engineering curves and creating thoughtful intersects between components. A lot of this I can credit to the Barnsley workshop and the ethos of the English arts and crafts movement.

How would you define your aesthetic? What do you strive for visually?

Throughout my apprenticeship, I was making mostly chunky jarrah furniture. When I started designing for myself I wanted to produce pieces that were visually lighter and more elegant, but still with good structural integrity. At the moment we are producing pieces that express the texture and flexibility of timber and we're also utilising laminating



techniques and torsion box construction to achieve long spans in our tables. It's about creating an elegant, minimal aesthetic through highly technical furniture making.

You said that making for galleries was 'a fail'. Why was that, and what did you do next? Did that work?

When I started my business I was producing most of my work on consignment and putting it in galleries to sell. All the upfront cost of the pieces is yours and you are basically hoping that the gallery can sell it. But I was finding pieces would sit in galleries for months and months, and in order to sell them I'd just have to keep dropping the price to the point where I was not even covering the cost to produce them. It was an unsustainable model. I moved away from that and went down a retail route. Retailers purchase floor stock up front and then take orders. An upfront investment on their part meant they were motivated to sell them. And it worked beautifully. Virtually all our work is now made to order.

Later on at the Midland Atelier you were working within a community of makers. You said you changed your business model. How did the new direction come about?

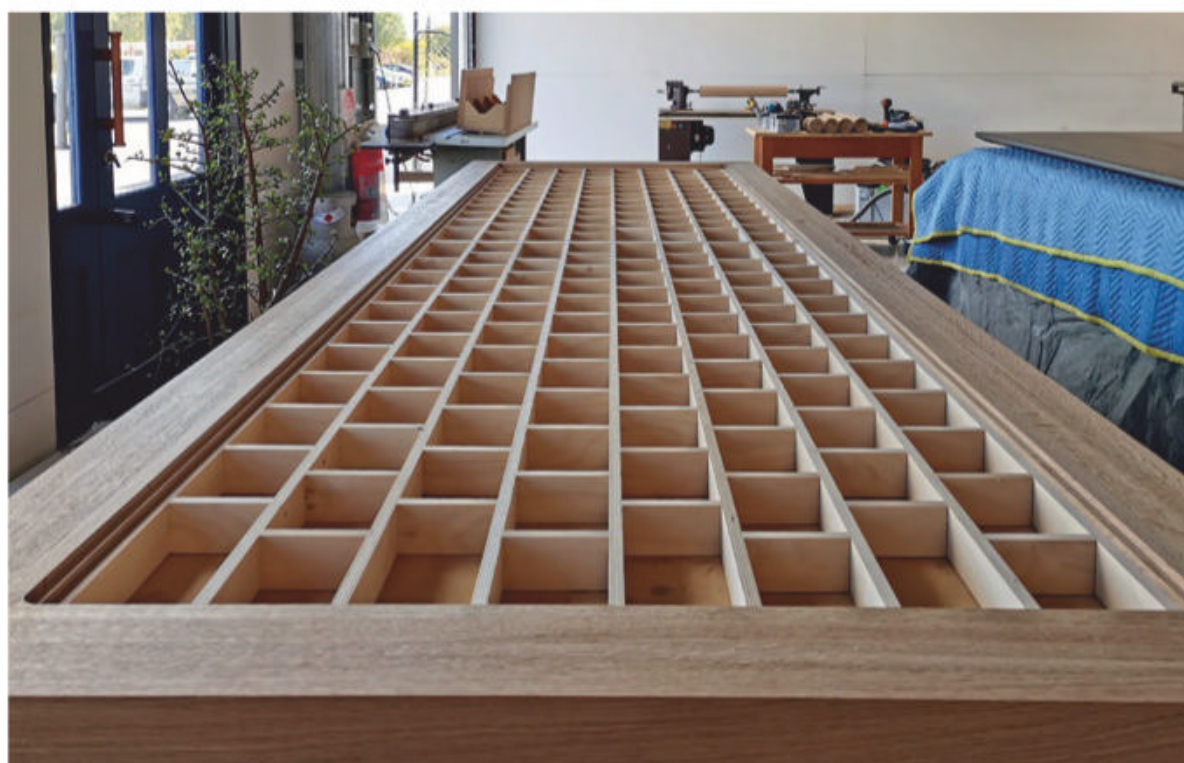
This came about through discussions mainly with Jon Goulder. The approach that I was taking wasn't working and I needed a new direction. Jon suggested approaching retailers instead of consigning to galleries. It made so much sense – when I finished up at Midland that became my sole focus.

How did you manage to get your range into a retail space? Did you have

Left above: Nathan Day's *Ernest Pendant Lights* are made in batches from steambent timbers which are twisted and left to dry for a week before fitting with LED lighting.

Left: Five of Nathan Day's table designs are torsion box constructions. Resawn veneers are stitched and layed over a solid timber frame with a hollow plywood core.

Opposite: Showing the leg to top joinery for the *Araluen Table* along with the *Araluen* table and *Kinross* chair complete in walnut.



to change your production methods and the way you worked? Did the handcrafted ethic carry over?

My longest standing retail relationship is with Zenith interiors. They are a large company with showrooms through Australia, New Zealand and Asia. Actually my sister started working for their Perth office when she graduated from uni in 2014. Within six weeks of her starting there, she had the state manager down in my parents' garage with me discussing ways that we could do business together.

I thought this would be virtually impossible, being a one man band working in a garage and supplying a massive company like Zenith. But I developed a small collection called *Wonton*. Initially this was just a coffee table and side table with a pentagonal leg profile and a unique four-way mitre join.

Roughly 12 months after the first *Wonton* table, Zenith invited me to expand the collection and took it on nationally in 2016. That was a

real turning point for the business. Initially Perth, Adelaide and Sydney purchased showroom pieces. There was a period when this was all kicking off that I worked seven days a week for six months straight. It was really intense. I had a couple of my friends from Midland working with me by this stage as I was starting to get a lot of private work as well.

Moving into a large factory space in 2018 seems like another turning point. Did you have to scale up your production and employ people?

I was working out of my parents garage for four years (including six months at Midland) and had to move out as I was making too much noise. My dad found me a storage shed at a local winery and the owner was happy to lease me one end of the shed (140m²).

I was stoked to have the extra space and it was certainly needed, but the business kept growing and I'd say we outgrew that space after 18 months. At one point there were five of us in there. We did some



awesome jobs there – 40 tables for Apple head office in Sydney, three large scale boardroom tables and a suite of furniture for Longitude 131 at Uluru to name a few. But it was cramped and inefficient. When I was approached to take on a commission of 21 large scale tables for a government project in Joondalup I started looking for another space.

I decided to buy an industrial property and build a new 400m² workshop. It took my wife and I to the edge financially. We literally scraped together every cent we had to complete the build and relocate the workshop. And this was all before Joondalup had even been confirmed

– the job was progressing but I didn't have a purchase order, let alone a deposit. We put it all on the line and luckily it came off. That job kept seven furniture makers busy for four months. To date it is still the biggest job the workshop has taken on. It was a great success and paved the way for a series of large scale commissions in 2019.

Speaking of scale, the three and four metre long tables you seem to specialise in must require quite a bit of engineering. They're very sleek. What's going on under the bonnet with those?

I have five table designs that are constructed as torsion boxes. Essentially they are a solid timber frame with a

hollow core normally constructed from plywood. We skin these structures with thick veneer lay-on sheets that we make by re-sawing solid timber and stitching the leaves together. We then vacuum press the entire structure. The larger tables are pressed in a custom vinyl bag that we load with a forklift. As far as I know it's completely unique and quite a sight to see.

The twisted pendant lights you make are elegant, and intriguing from a woodworking point of view. How do you make them?

We prototyped these for Hillam Architects nearly four years ago and produce them in American ash, American walnut and Tasmanian blackwood. We steam them for two hours and twist them in a purpose made rack. They stay clamped in the rack for at least a week to dry before we can finish them and fit in the LED lights.

Do you need to take on batch work from others to keep the wheels moving? Do you mostly do commission or retail work?

We don't act as a manufacturer for other designers. We only build what I've also designed. We build our own products in batch runs. We've had orders of 20 or 30 tables at a time (coffee tables and meeting tables) for commercial projects. These



Above: *Wonton* tables in progress.

Below: Coffee table and stool from the *Wonton* range, Nathan's first design collection that has been added to over the years.

Opposite: *Froxfield Table* showing a detail of its joinery. 'The design is a modern interpretation of the original Barnsley hayrake tables. A lot of my work is still influenced by English arts and crafts furniture, although visually it may not reflect this.'





projects are great for the business and great for training apprentices as well. If you have 100 legs to sand and detail, you get good at it. You also get efficient at it.

We take on custom design work as well. We've made plenty of custom dining tables, coffee tables, drinks cabinets, chairs, benches, beds etc. Some we may never make again. Some we might do custom versions of and others become key products that we will make over and over. If I were concentrating only on one area, say private commissions, the business would be quiet and inconsistent. But taking on commercial projects as well as private residential work, custom design and also wholesaling and distributing through select retail outlets, the workshop has been constantly busy for at least six years.

How has the pandemic and lockdowns affected you? You said things went quiet and then 'from 0-100 in an instant'.

That was such a strange time. In early 2020 we had multiple projects either on hold or cancelled. The prospects were looking grim. I had three employees at the time whose jobs were all in jeopardy. Everyone was stressing out. But we qualified for JobKeeper and that kept us going.

We took the opportunity to do a bunch of jobs that previously had been low priority. We made sample boxes for our retailers, re-organised the workshop and did some product development. I also chased work pretty hard through this period. I followed up with every person who had enquired about furniture in the previous six months to see if they wanted to go ahead. Anyone who hadn't actually said 'no thanks', I checked in with. I picked up a small amount of work, and then Zenith booked us a great job doing custom bench seats for the Shepparton Art Museum. Shortly after that Kerry Hill Architects got us to do a suite of pieces for a large scale residential job and then we just got completely bombarded with enquiries and our lead time blew out. We put it down to people not going on overseas holidays and spending more time at home so they were updating furniture. It was amazing! We employed another furniture maker and put on a second apprentice. It's the first time that we have gone into January with at least the next three months booked out – 2020 was a wild ride.

If we speak to you in another 15 years time where do you see yourself?

I'd say the business will be similar. I've got no ambition of becoming



a furniture factory. The type of work may transition and I'd like to do more sculptural pieces but at a glance the business will probably look quite similar. We will continue to be selective in the work we take on and I'd like to not be working 60 hours a week. Ultimately I'd like to just be concentrating on design and product development for the workshop. Beyond that – doing woodwork as a hobby would be nice.

Photos: Nathan Day

Learn more about Nathan Day at www.nathandaydesign.com.au and @nathan_day_design

A Sliding Door Cabinet

A solid wood construction required allowances for movement, and ways to balance strength with lightness. Story by Raf Nathan.



The completed cabinet in silky oak was stained to match the client's existing furniture.

This smallish cabinet was a recent commission designed to support a TV and house a collection of DVDs along with a DVD player. Silky oak was used throughout, however the client specifically wanted it stained to a light brown to fit in with existing decor.

It's a solid wood cabinet so there are certain ways it can be made. Provided you make it correctly there won't be any issues with timber movement as the grain of the sides and the top runs in the same direction. This means all the wood can move the same way. For this piece I glued up panels to make the top, sides and shelves.

A strong back

The DVD player that would be housed inside the cabinet would need good ventilation and so the carcass was designed without a back. Without bracing such as plywood on the back, the design may have been weak in regard to longevity. If the cabinet was banged hard or dropped it could rack and break the joints. In other words without a back it would not be triangulated.

To strengthen the piece I added what I call 'plant-ons' to both the front and the back. These also make the vertical element of the design of the piece much

wider. There is also a piece of wood fixed under the top at the rear. These components are all well glued in place.

Saw and plane

First job was to select the wood, dock my chosen boards to rough length, and then machine them to final dimension.

Gluing up the panels from narrow boards I used a yellow glue and had clamps on both the top and bottom to even out the pressure and avoid cupping of the panel (**photo 1**).

Where possible I'll make panels to the final desired width at glue-up. Having said that, if the panel was dry fitted to

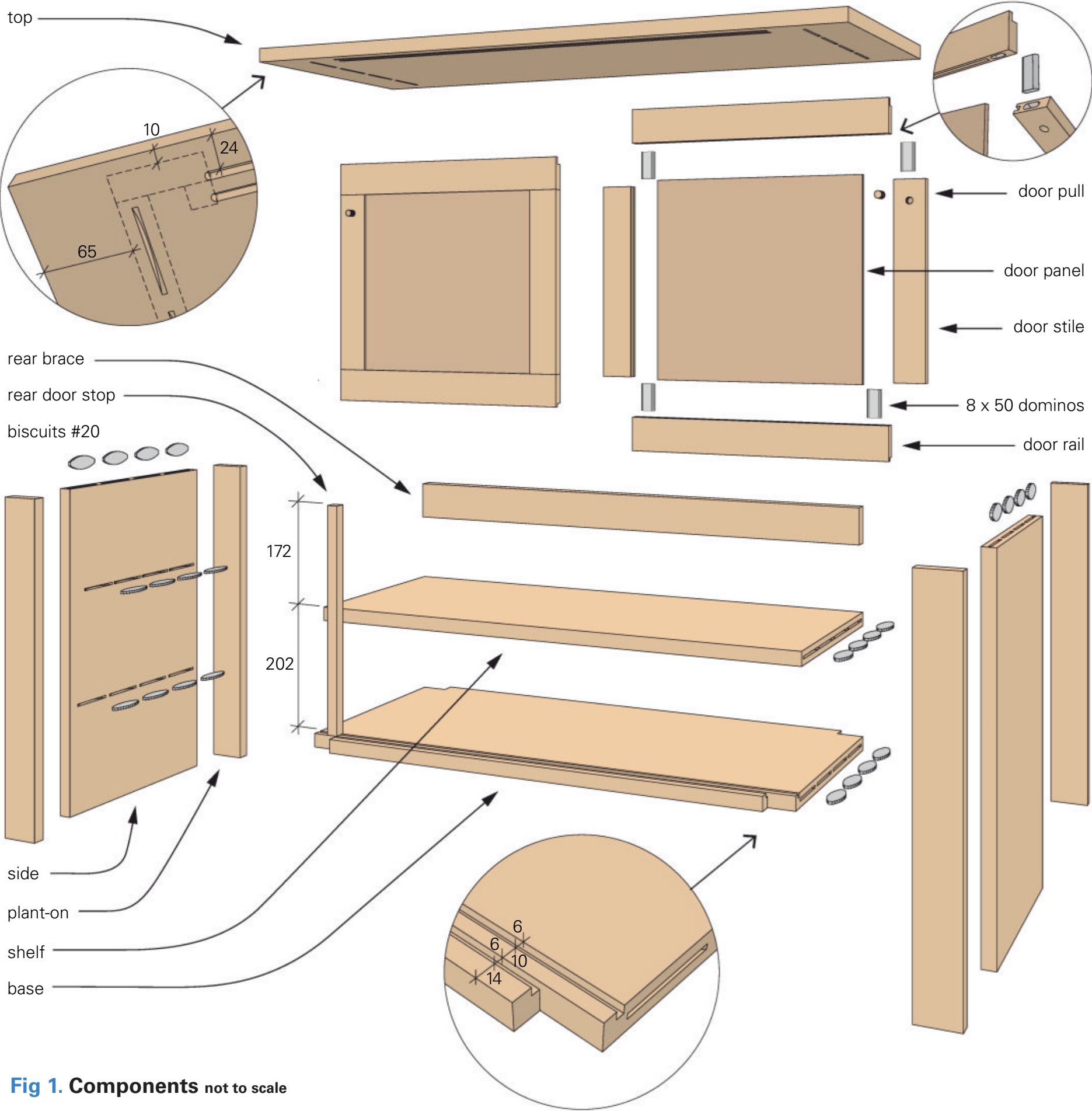
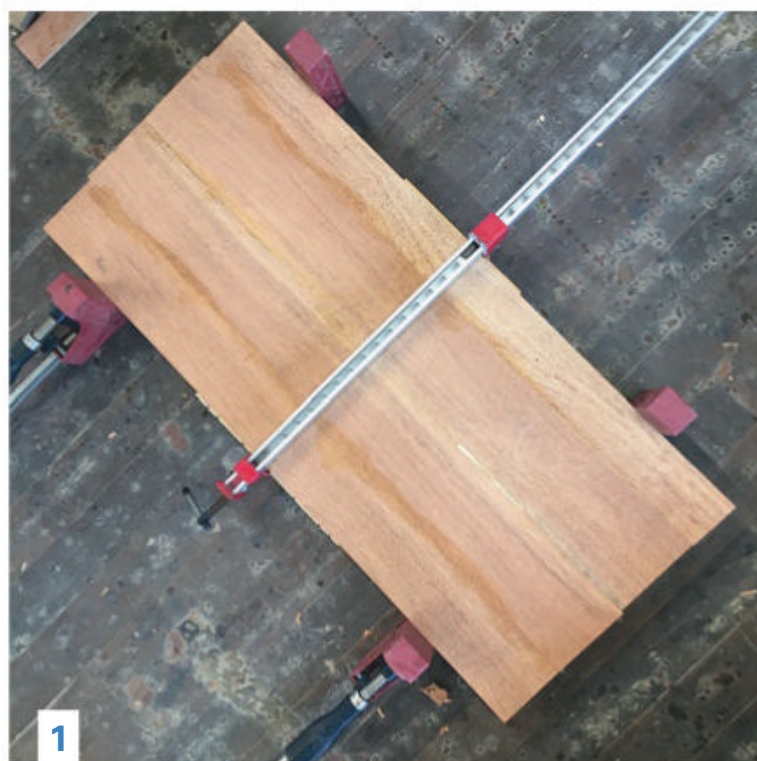


Fig 1. Components not to scale



CUTTING LIST (MM)				
PARTS	QTY	LENGTH	WIDTH	THICKNESS
Top panel	1	1000	400	22
Side panels	2	578	340	22
Base	1	816	380	22
Shelf, approx. width	1	816	310	20
Plant-ons	4	578	66	20
Rear brace	1	816	60	22
Doors	4	392	50	15
	4	282	45	15
Door panels, approx.	2	314	294	6



1. Use clamps on both sides of the panel to even the pressure and avoid cupping.

2. Grooves for the doors to slide in were routed in the base and top panels with a 6mm diameter spiral cutter.

3. The grooves in the underneath of the top were made slightly deeper to allow the doors to be lifted in and out.

4. Cleaning up the check-outs on the internal shelf for the plant-ons. Another piece of wood was clamped on to give more support for the router plane.



say 300mm wide it will probably be 300.5 or so after the glue is applied and has dried; it depends how accurate you want to be. Let the glue dry overnight.

In spite of how careful you might be lining up each board you'll have some variation and a few high points. You can hand plane these flush and then I usually use a random orbital sander or a belt sander to flatten and smooth the panels. At this stage I would sand up to 120 grit. The next process is to dock the panels to final length. I have a small tablesaw with a sliding table for this.

Time to groove

With the panels sawn to final length the grooves for the sliding doors to slide in were milled in the base panel and top. A 6mm diameter spiral cutter in a small router was used for this (**photo 2**). The

grooves in the underneath of the top were made slightly deeper (**photo 3**). It is deeper so the door can be lifted right up into the groove and then swung forward for removal and insertion.

The placement of the grooves is obviously critical, and this is dictated by the thickness of the door and how much set back you want for the doors from the front edge.

The doors are 15mm thick and the groove is 6mm wide with the grooves 10mm apart so the doors can slide past each other with a millimetre to spare. In this case the grooves are 4mm deep on the lower shelf but 8mm deep in the top panel.

Making the joints

At this stage the check-outs for the

front and back plant-ons are made in the base. I sawed most of the waste away for the notch, and then cleaned it up with a router plane. In **photo 4** you can see how I clamped another piece of wood to the base to give more support for the router plane.

For all the jointing in this cabinet I used a biscuit joiner. In my opinion biscuits are perfectly adequate for this type of construction. The largest #20 size biscuits were used, and as you can see in the photos, I fitted as many biscuits as possible across the width of each board (**photo 5**).

For test fitting, before insertion you can place some biscuits on your bench and hammer them to compress the wood. This will let them slip loosely into the slots – later when glue is

applied they will swell up and become tight (**photo 6**). I used new biscuits for the actual glue-up however.

With the panels cut to length, notches made and grooves routed, the panels can be given a sand again, at this stage I would go to 180 grit. Now is the time to double check all measurements and do a dry test fit. Make sure that the shelf is set back from the front enough for the doors to clear it. I know this from an unfortunate past experience.

Glue-time at last

The base, shelf and sides can now be glued together. In **photos 7** and **8** you can see pieces of paper between the clamp cauls and the cabinet. This is to make sure that pressure is applied in the centre of the panel as well as the edges for a good strong glue joint.

Ensure all is square before the glue starts to set. I am using a large 360mm cabinetmakers square to check while also trying to get the base notch lined up neatly with the side edge (**photo 9**).

The next day the clamps can be removed and the cabinet prepped to receive the plant-ons. For this the notch and side panels need to meet flush. Use a chisel and square to get these flush and true. The plant-ons can be simply glued in place, providing of course they fit neatly in the notch. Keep the outer edges flush. I don't sand this joint yet as I want to keep the pencil marks on the sides that I made when I cut the biscuits slots earlier.

The top can be fitted to the cabinet now. I sat it in position on the sides and marked where the biscuits needed to be placed. The biscuit slots were cut and I then sanded the underneath face of the top panel. Glue up is straightforward as shown in **photo 10**.

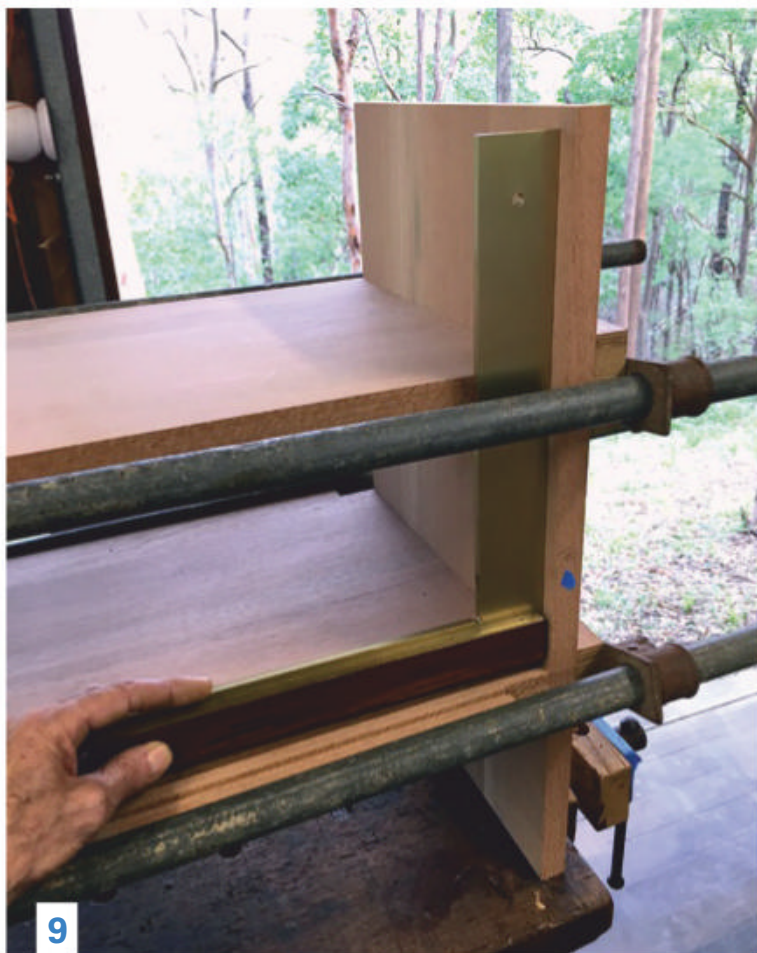
When clamps are removed the outside of the cabinet can be sanded up to 180 grit or higher and all edges chamfered.

Bookmatching the door panels

Now that the cabinet is assembled the



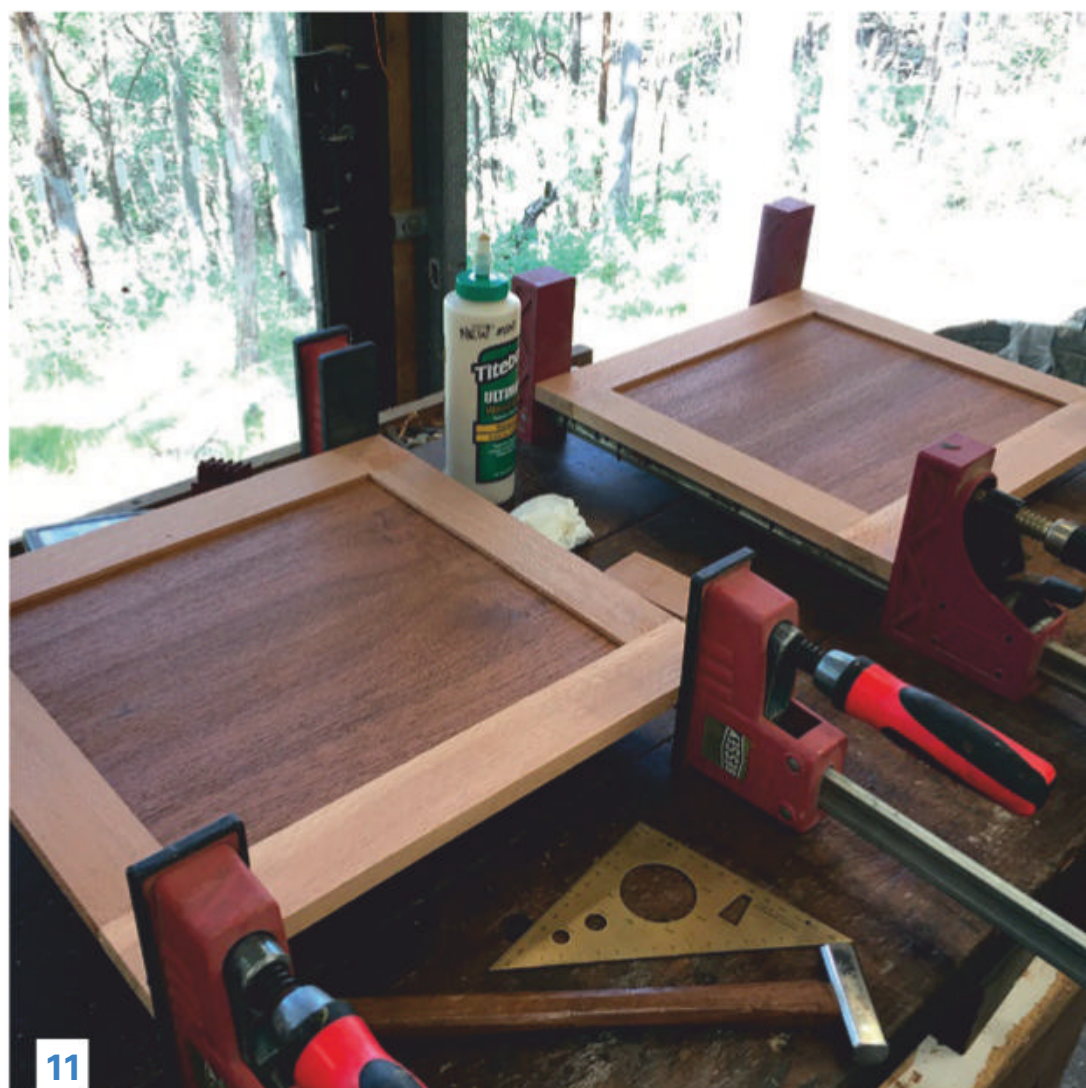
5. For the joinery, size #20 biscuits were used across the width of each board.
6. Hammer the biscuits to compress them for test fitting, later when glued they will swell in the joints.
7. First stage assembly. After a test fit, the base, sides and internal shelf are glued.
8. The pieces of paper under the cauls were there to show me that even pressure across the panel was being applied.



9



10



11

9. Before the glue sets check everything for square and make sure the base is flush with the plant-on.
10. The next glue-up. The top and plant-ons are test fitted, then glued, clamped and left overnight to dry.
11. The door panels were bookmatched and pre-finished with tinted hardwax oil before gluing into their frames.
12. Once dry, rebates for the sliding doors were routed.
13. The client wanted to match existing furniture so a tinted hardwax oil was used.

exact size of the doors can be computed. The panels were prepared first as they need to be stained and polished prior to door assembly. Solid wood door panels will move across the width and if not pre-finished any shrinkage can result in a very noticeable line where unpolished wood is seen at the door frame edge.

The panels are a main feature so I decided to bookmatch them. A thick piece of 150mm wide silky oak was sawn in half, the board opened, machined and then glued together. I am not saying the bookmatch is beautiful but it does have an interesting pattern.

With the glue dry, the panel was thickened down to 6mm, sanded and stained to final colour with a tinted hardwax oil. I didn't polish the lower edge or the endgrain near the corners. While the oil was drying I had time to prepare the door frame.

Making the doors

Key points for the doors are that the grain in the rails flows across the width so the one piece of wood was cut in half to achieve that. To keep a consistent width visible in the door frame the rails are 50mm wide, as 4mm will be lost in view on each side as it sits in the groove.



12



13

The stiles (the vertical pieces) are 45mm wide. I have the doors meeting at the middle with the stiles overlapping.

The door frame joints were made with dominos. If you don't own or want to own a domino power tool, dowels would be acceptable for this joint and these require only a drill and jig to drill the holes. Just ensure the dowels themselves are a good fit in the holes.

A groove was made in the inside of door frames to accept the bookmatched panel using the same 6mm router cutter used for the grooves in the panels. The small router was again used for this, taking a pass over the wood from each side resulting in about a 6.3mm wide groove that leaves a bit of room for movement.

I did a dry fit of the door frames with their panels in place first. Everything was then prepped and the completed doors glued up flat and square (**photo 11**).

Over the years a panel may shrink in thickness and start to rattle in the frame, quite annoying. To prevent this, I applied glue to the lower edge and around 60mm up on each panel side when

gluing it in place. Besides preventing any rattling, another benefit is that this strengthens the door as a unit. At least this is my personal approach.

After the glue is dry I spend time getting all the joint faces flush and level using a plane, straight edge and sander.

Doors that slide

The finished doors still need more work. They need to have the tongue formed that fits into the grooves, top and bottom. The tongue at the top of the doors is larger so it can be lifted up into the deeper groove in the underneath of the top. The same router with a fence is used for this operation (**photo 12**), although I do clean the rebate up afterwards with a shoulder plane.

Close the door

No matter how good your maths is the door will still need planing and fine fitting. My way is to have the bottom of the door and the inner edge of the rebate both making contact with the groove base and the top edge. As the wood wears away from being slid along over the years it should still slide and wear evenly. I find it takes quite a while to carefully remove, plane and re-fit the door to get a sweet fit.

The right side door stops at the inner edge of the plant-on, however the left door needs an extra gap-filling piece of wood glued to it to act as a stop. This is a length of 18 x 18mm silky oak glued on inside the plant-on.

There is also a rear brace glued under the top panel to stiffen it. The cabinet was made to support a TV so there will be some weight.

For door handles I used two oak Miller dowels. These are glued in place with the edge hand beveled.

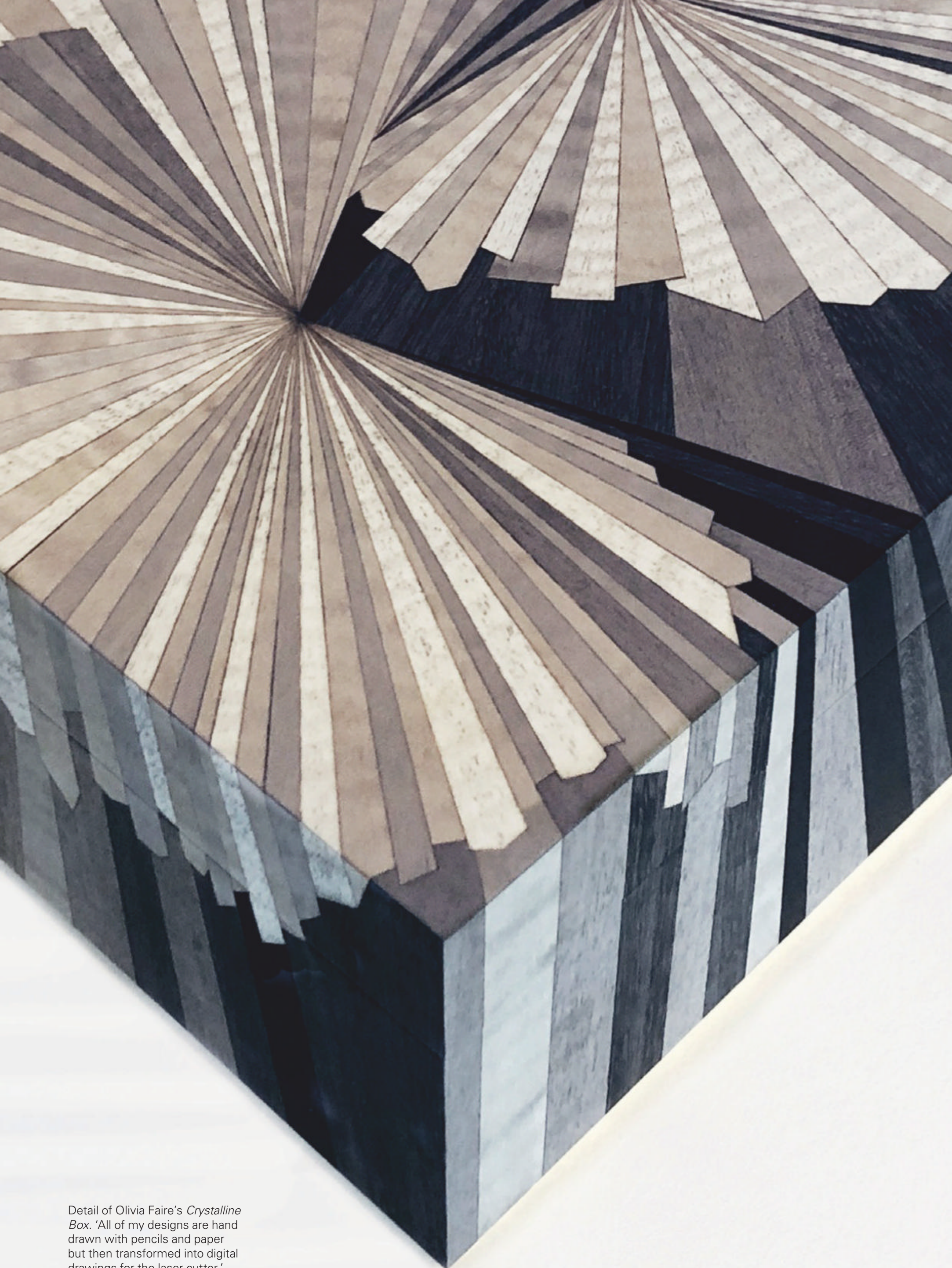
Last and least

What can be the most important job takes the least words to describe. Much time was spent polishing and buffing the whole piece with hardwax oil (**photo 13**). The internal surfaces received two coats while the outer ones received four coats. Carnauba wax was last applied for a final sheen and silky smooth feel.

Photos: Raf Nathan



Raf Nathan is a furniture designer and maker who lives near Brisbane. Email: rafinathan@hotmail.com



Detail of Olivia Faire's *Crystalline Box*. 'All of my designs are hand drawn with pencils and paper but then transformed into digital drawings for the laser cutter.'

Illusions of Movement and Depth

UK marquetry artist Olivia Faire uses wood and other materials to create subtle imagery inspired by nature and the built environment. Interview by Rick Knopke.

I became aware of Olivia Faire a couple of years ago when one of her fans in the UK sent me a photograph of an example of her work, a marquetry bird. It was striking in every way; the design, selection of materials and masterful execution.

Olivia was raised in a creative household, her mother a couturier and her father an architect. She completed a BA in Fashion Womenswear at Central St Martins in London before she took up her interest in marquetry in earnest. Olivia works from her studio in the UK, from where she talked to me by telephone.

When were you bitten by the marquetry bug, and how did that come about?

I became aware of marquetry during my childhood, being willingly dragged around many museums and beautiful houses all over the world. I just found it fascinating, the labour-intensive nature of it. I thought that the work and effort was worthwhile considering what it accomplished – I loved the minutiae.

I just had the idea that I wanted to make the willow table; it was really out of the desire to make the idea that I started. I'd been hunting for something that could give a lasting sense of joy, of longevity to somebody, something that could be

passed down. I'd been disillusioned from doing the fashion course; it just felt so wasteful to me. There's so much purpose and incredible craftsmanship that goes into fashion, but it wasn't my outlet. It was through the process of making the willow table that I became completely hooked on marquetry. I realised how much scope there is in this craft.

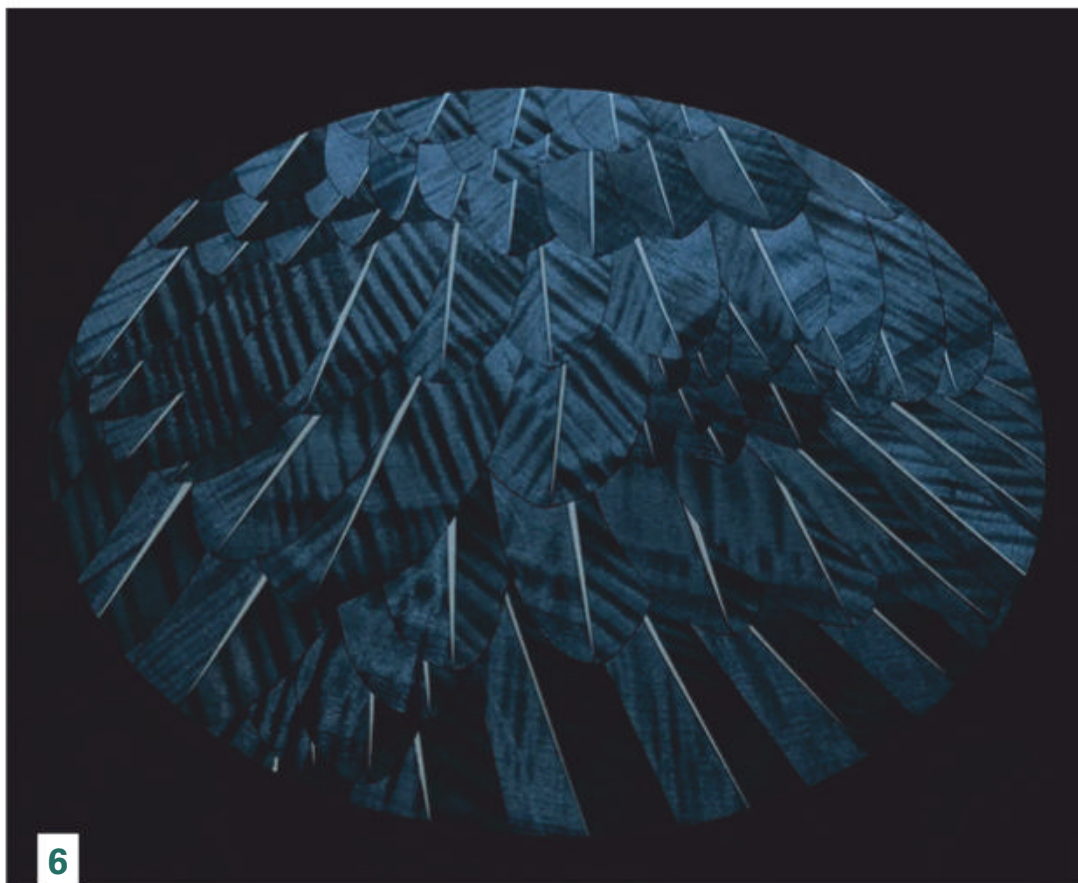
Did the suite of skills you developed during your studies at Central St Martins prove in any way to be transferrable to the world you're engrossed in now?

Yes, it was very transferrable. They knew at my interview that I wasn't going to do fashion, they said that to me, but they



Above: Good lighting and sharp blades: marquetry artist Olivia Faire at work.

Left: An in-progress view of a box featuring a *Crystalline* series pattern.



This page: Olivia Faire's *Feathers* series will be launched later this year.

Opposite from top: *Robin in Flight*. 'Striking in every way; the design, selection of materials and masterful execution' – Rick Knopke.

'The *Thorn Clutch* was the bag that started it all. This design formed the basis for my early prototypes. (Sawing) is the most terrifying part of the bag making process as there is no erase or quick unpick...'

were just interested to see what I would do. I had incredible tutors and they just kept pushing the ideas. Everything that I learned there I still practise today, but in wood. I'm still using the pattern cutting and the way of thinking that you would use to produce fashion.

How long had you been making marquetry before you formed the idea of parlaying your interest into a career path?

When I started, I didn't have the know-how, I was teaching myself since I didn't have the money to do a course. The idea for the *Thorn Clutch* arrived early on and I started considering how I could make everything work for me. I started making the bags because I didn't have the skills to make boxes to the level expected of a luxury box (I do now) and I thought I'd do something totally 'off book' which no one could say was wrong, because it hadn't been done before.

Through doing the bags I acquired the skill to start making boxes. Thoughts about the viability of a career in this field didn't affect my determination to *have a career*. In the last couple of years it's become a viable thing for me to do full time. The bags have become a calling card to show what I can do with design. Right now I feel that I'm at the very

beginning of what I can produce and what I will produce.

Have you found ready acceptance of and interest in your product in the marketplace?

Yes, I have; it's been very gratifying. Initially it was considered too 'craft' to be luxury fashion and too 'luxury fashion' to be craft.

Maintaining a social media profile takes time and effort, but the benefits of doing so are not easy to determine. Your Instagram page is as well crafted as the work you make and tells your story in an engaging way. Has social media been an effective way for you to reach your market?

Yes it has. Incredibly, so much has come out of Instagram, the word of mouth which comes from that, it's led to connections. It's a slightly mad thing and I'm really grateful.

At what point did you decide to start using a laser cutter in addition to the other veneer cutting methods you employ?

I started that after my first piece. I've self-funded my whole studio; each time I received payment I'd think, 'there's the laser cutter' and so on.

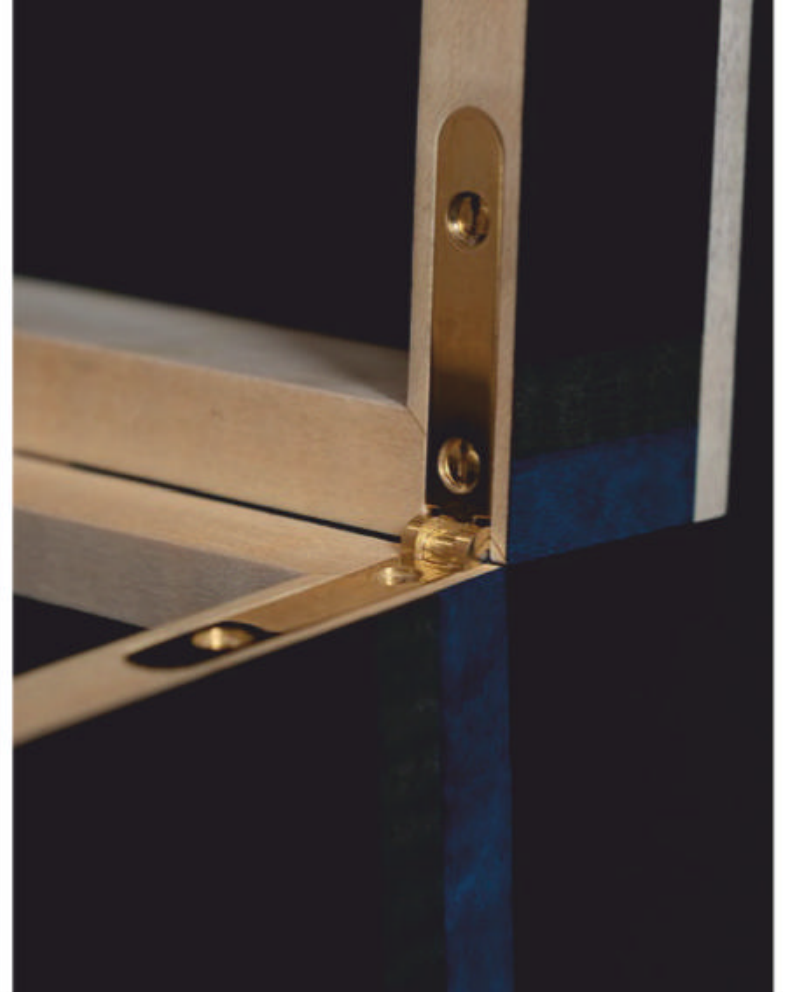
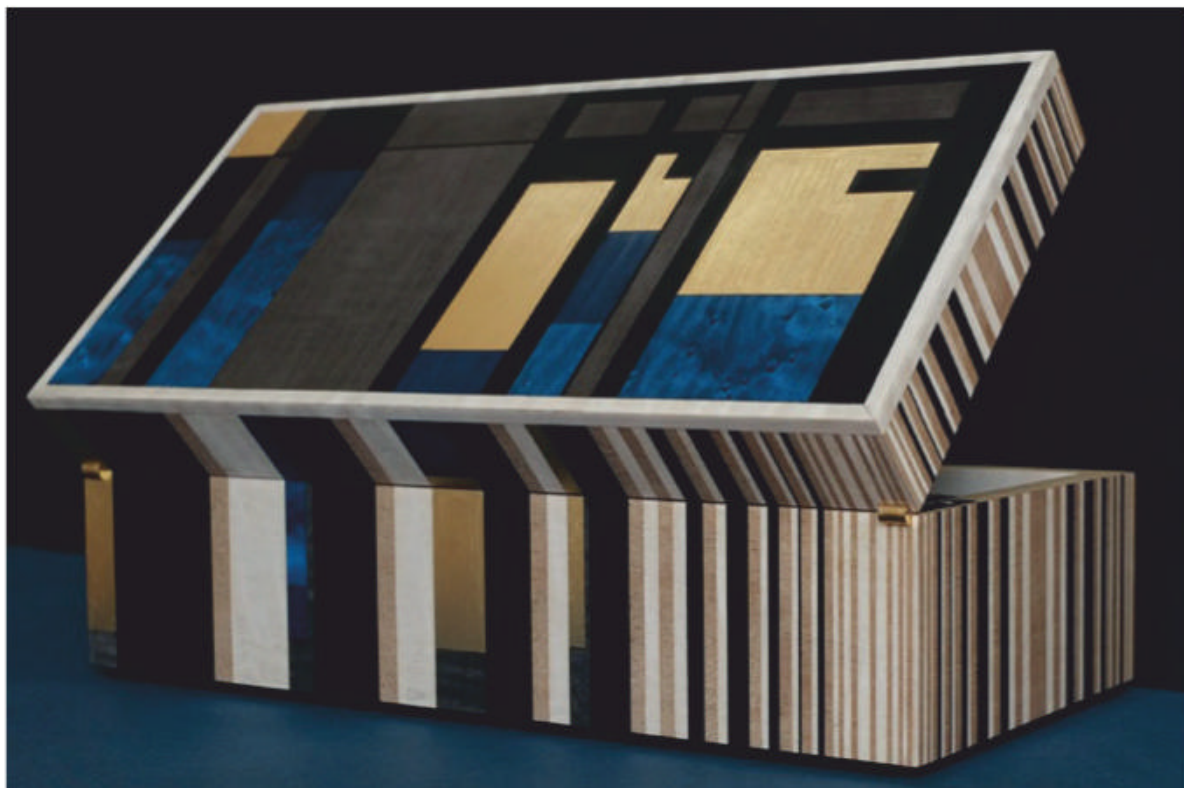
I'm fascinated by your use of garlic skins in your work. Is there a story behind that?

You know how happy accidents happen. I was struggling to create butterflies' wings and doing it in wood just seemed so heavy. I went away to cook, to cook out my frustration I suppose. The garlic that I had, I broke open and inside the skins were just electric pink, just so exactly what I was looking for. They had that delicacy and other-worldly quality that I was hoping for and they reflect like mother of pearl, or silk.

What are the major sources of inspiration for you in your work?

I'm hugely inspired by modern architecture and geometric shapes; I really love the jarring worlds of sharp lines and natural forms. I quite like trying to design to create a feeling with the veneers so that instead of there just being a beautiful surface, it has a life, its own presence. I find huge excitement





in taking the wood to a place where it probably shouldn't really be.

There's certainly an almost magical dimension to marquetry, to what can be conjured with simple materials.

Yes, I feel like I've finally made friends with the veneers. I feel like that would be a nice way of putting it, because they respond to everything, any slight change in moisture or temperature. Trying to

tame them, I think we've had a lot of arguments over the years. Now I think we're talking exactly the same language and I feel like I can really bring to life exactly what I'm imagining. When I see a piece of wood, I see its design and the design I want to make with it. It's working both ways now; instead of me trying to force a design out of a certain piece of wood, I feel like I'm getting a conversation going with the timbers and that's really exciting.

I'm also using reclaimed timbers, both because I enjoy the idea of breathing life into things that would otherwise have been burned or discarded and because it's a very savvy way of being able to make work. For the first time I'm actually able to choose veneers and really design freely as opposed to just having a veneer and trying to force any design I might have out of it, so it's a really exciting time for me to have that freedom to explore what's actually possible.

Would you please talk a little about how you get your ideas into concrete form?

All of my designs are hand drawn with pencils and paper but then transformed into digital drawings for the laser cutter, there's a two-stroke process there. I really love the digital stage; I feel like it puts a totally new eye on things, like the difference between painting somebody's portrait and taking their photograph. It flattens your mood a bit in exciting ways and I can make changes there too, but I really love having the initial freedom of the hand drawn otherwise I think everything would get far too tight and involved in the geometry of everything.

Do you have the urge to work at a larger scale?

Absolutely, I am just about to launch my first collection of tables.

Above: After making bags and clutches, Olivia Faire acquired the skills to make luxury boxes like the *St Pauls Box* shown.

Right: *Blackbird Tote*, part of Olivia Faire's *Manderley Collection*.





This feather marquetry design uses varying grain orientations to create the illusion of movement and depth within the piece. To further enhance this effect, I have been custom dyeing the veneers subtly different shades before cutting. I have found this creates a striking effect when the table is in both hard and soft light.

You can learn more about Olivia Faire's work through her website www.oliviafaire.com See also Instagram @oliviafaire

Photos: Olivia Faire

Rick Knopke is a West Australian marquetry artist and furniture designer maker who was profiled in 'Through a Contemporary Lens', AWR#105.



Above: Cutting willow pattern segments for her signature *Willow Leaves Table* and *Willow Leaves Marquetry Box*.

Left: *Allium Clutch*, so named for the garlic skins used for the butterfly wings. Showing also the segments before assembly.





Vic Tesolin in his workshop.
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needs as well as your budget.

Pick Your Apprentices Carefully

Make sure you pick the machines that will do the lion's share of the work for you. Vic Tesolin explains why you should choose machines to match your needs as well as your budget.

Not many of us have the luxury of unlimited space or money, so the majority of us have to think carefully about the machines we bring into the shop. As efficient as a machine can make certain operations, the reality is they take up valuable square metres and it's not just the machine that takes up the room. The real space hogs are the in- and out-feed areas the machines require for processing timber. Since not every woodworker has the space or money to buy every machine, it pays to be judicious about it.

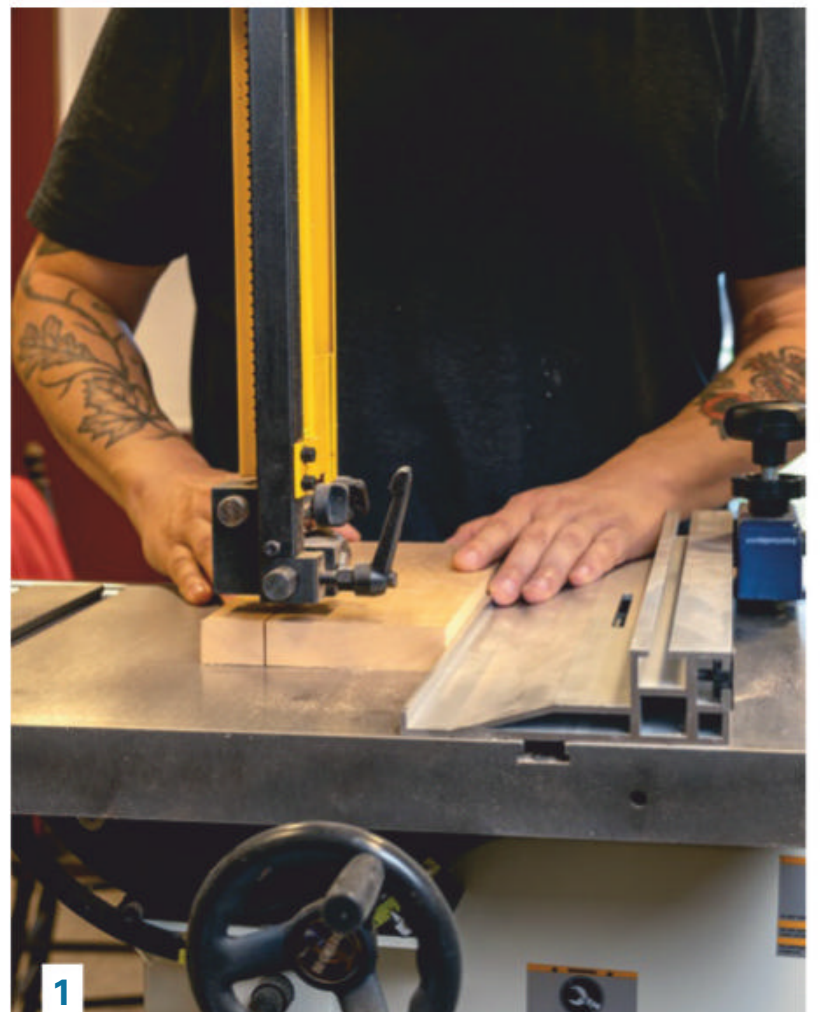
For years I've referred to my machines as my apprentices because they are valuable and help to complete the tasks that I don't necessarily want to spend my time doing. While I know how to flatten boards or reduce timber thickness by hand, it's not my favourite woodworking activity. Cutting joinery and putting the final surfaces on are more exciting for me, so I leave the drudgery to the reliable apprentices.

First the bandsaw

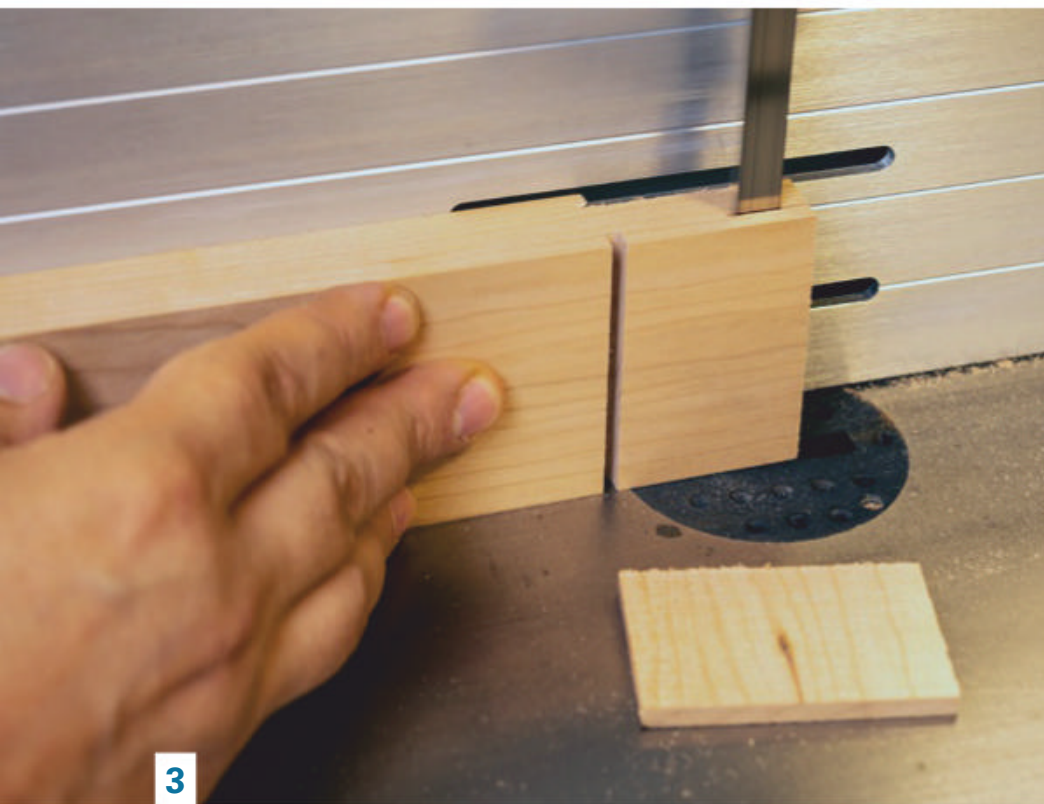
Let's start with a machine that I think is the most versatile of them all, the bandsaw. At the heart of the tool it's pretty simple: two wheels (one powered, one idle) with a band of teeth linking them together. Many people think this machine is for cutting curves, but that is just one of its tricks. When I studied furniture making at Rosewood Studio, we were encouraged to always rip wood on the bandsaw instead of the tablesaw. Ripping this way is much safer than on a tablesaw because the risk of kickback is non-existent.

One of the most important features on a bandsaw is a reliable rip fence. Not only is this essential for common ripping tasks but it is also helpful when resawing. My bandsaw can handle 300mm of timber under the guides which allows me to bookmatch tabletops or slice my own veneer if I have a particularly nice piece of timber. The relatively thin kerf of a bandsaw blade will also yield more usable wood instead of sending it up the dust collection chute.

Since the bandsaw rips so well, it also makes the perfect tool for cutting the tenon half of a mortise and tenon joint. When the rip fence is used, you have a perfect set-up for cutting the cheeks centred on your part by simply setting the fence, making your first cut, then flipping the part 180° to cut the second cheek. You can even cut the shoulders cleanly by using a mitre gauge in the slot to make precise cross-cuts.



1. Ripping at the bandsaw is the safest way to cut with the grain.
2. A great way to economise on timber is to resaw it into thinner boards.



3. Making tenons on the bandsaw is simple to do.
4. Mobile bases on your tools allow you to reposition them easily for more in and out-feed space.
5. Having a jointer/planer combines two core machines into one footprint.
6. Instead of having a small jointer, use a jack plane to flatten one face and true one edge.
7. Thicknessers can really save dimensioning time and the portable versions take up little space.

All of this functionality is built into a compact footprint that doesn't take up a lot of space. You still need to consider in and out-feed area, but if you add a mobility base, the bandsaw can easily be repositioned to allow for the space required. You can even wheel it outside for some woodworking al fresco! I reckon that the bandsaw purchase should come before the tablesaw. However, if you work with a lot of plywood, then a tablesaw is quite handy and could be a better first apprentice. Personally, I use a track saw to work with sheet stock. I find it much easier to bring the saw to the work rather than the other way around.

Next, jointer or thicknesser?

This could be taken as a silly question with many of you thinking 'of course you would get the jointer first'. We all know that when you are processing timber, you need to get one face flat and one edge true to start. Those then become your reference surfaces for the other processes that follow. You would be correct to say that, but hang on for just a minute. What if you have a board that is 200mm wide and your jointer is only 150mm?

It's this problem that left me jointer-less for many years. I told myself that I wouldn't get a jointing machine if it was any smaller than 250mm because the timber I routinely use is wider than the smaller 150mm machines could handle. I still got flat faces and true edges without the machine because I have a jack plane.

A jack plane can easily flatten boards 250mm wide, and with time and experience, you can flatten up to 400mm. It does take a bit of practice, but the same can be said about the power jointer. Once I get a true surface and edge with the plane, I can easily slide it into a thicknesser to bring the other face parallel with the reference surface. Thicknessers can be found as benchtop tools that can handle just over 300mm which is normally more than enough for most woodworkers.



Even though jointing operations are the first step to milling timber, I always advise people that the thicknesser should come before the jointer if space or money are a limiting factor. When you consider that a stand alone 150mm jointer can start at around \$1000 but a jack plane (even a premium model) is half that price, the choice is clear to me.

That being said, I recently invested in a combination planer/thicknesser for my shop which reduced the amount of tool footprint. This machine satisfies my desire to have a jointing function of 300mm with the same capacity for the thicknesser. My workshop is about 30m² so this eases the crowding quite a bit. Price can be a limiting factor when it comes to this machine, but if space is your main concern a combo machine is something to consider.

The team

The five apprentices that are the most important to my work are the bandsaw, thicknesser, jointer, and finally the track saw and tablesaw. I also recommend that you purchase them in that order if buying them all at once is not possible. If you don't work with sheet goods then you can forgo the track saw and likely the tablesaw. Now I know there are many other machines that are available out there, but these are the core machines that I use for every project.

When all is said and done, the key to buying and using machines is considering whether they earn their keep in the shop or not. For me, if a power tool or machine doesn't dramatically speed up a process in the shop then I will not spend the money. When space or money is a consideration, it pays to weigh out your options. It's no fun to work in a workshop that is crowded with tools, and saving a bit of money on machines leaves more money in the coffers for timber.

Photos: Vic Tesolin



Machinery suppliers

Beyond Tools

www.beyondtools.com

Carbatec

www.carbatec.com.au

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www.machineryhouse.com.au

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Gregory Machinery

www.gregmach.com

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Woodworking Machinery...Plus

www.woodworkmachinery.com.au



Vic Tesolin is a furniture maker who lives in Burlington, Canada. His new book 'Projects from the Minimalist Woodworker' will be available soon. Learn more at <http://victesolin.com>

Paolo and Gabriele Levaggi, the two brothers that inherited the company from the previous generation of Levaggi brothers.

Opposite, l-r: Two generations of brothers, Italo and Ettore Levaggi with Paolo and Gabriele Levaggi. Ettore is Paolo and Gabriele's father. *Photo: Regina Recht*





The Brothers Levaggi

From his home in Bergamo, Vasko Sotirov travelled across Italy for 'a journey into the elegance of a chair'.

There's a place in north-west Italy, where the mountains meet the sea – a little city called Chiavari. Located in the Liguria region, it is home to one of the pinnacles of Italian design, the *Chiavarina* chair. Born at the beginning of the 1800s, and kept alive by the skilled hands of passionate artisans, it is today the protagonist of a small family based business by the name of *Fratelli Levaggi* that was founded some 60 years ago. I had the opportunity to visit recently and want to tell you about them. 'Them' because *Fratelli Levaggi* literally means the Levaggi brothers.

A real life legend

For quite some time now I have really wanted to see one of their chairs up close. The beautiful photos and videos you can find online teased my curiosity about the elegant

proportions and the famous overall lightness. As you know, some things have to be seen in real life to fully contemplate their real character.

As I parked my car just outside the showroom and put my eyes on the displayed *Chiavarina* my mind was blown away. Let me be very clear, this is not some kind of business advertisement – this is my impression of the exceptional creations of some fellow artisans.

Delicate proportions, sinuous lines and graceful appearance, all put together into a chair. The almost perfect relationship between the shape and size of every single component is striking. The way the chair occupies a space and integrates within it so naturally is incredible. It's that point of design where there's nothing to add

and nothing to subtract, and from a structural point of view it's obvious how function dictated form, and in an outstanding manner as well.

At that point I really had to get out of my car and meet Paolo and Gabriele Levaggi, the two young brothers that inherited the company from the previous generation of Levaggi brothers. While talking to Paolo about the business and how his uncle managed to make it function more than 60 years ago, I had a closer look at the different chair models displayed in the showroom. And yes, probably 'inherit' is not the best word to use, as the two young craftsmen earned it with hard work and dedication since they were little kids.

Many chairs, stools and armchairs are handcrafted in their workshop, but all share the same amount of attention

to detail and elegance. Some are the same, or almost, as they were two centuries ago; others incorporate new ideas. There have been a few collaborations with designers, but also natural interpretations by knowledgeable artisans.

The *Chiavarina* chair is really hard to improve I'm told. Its appearance comes from a complex relationship between aesthetic choices and structural necessities, sustainable thinking and uncompromising craftsmanship. The structure is slender, yet strong and flexible, and every part is refined to the extreme. Even the seat plays into its physical integrity and is woven directly on the main structure of the chair. The

result is incredible and as you pick it up for the first time...speechless. It weighs just a bit over a kilogram and that's not because they use some kind of lightweight timber. But let's get to the real deal and visit the workshop.

Workshop dreaming

Do you believe in magic? Well, as I stepped foot into the production area I fell in love. It's not a huge place with perhaps a 200 square metre rectangular footprint, but it's permeated with a beautiful soft eastern light coming through some large windows. A big bandsaw claims an important central place where timber is cut to rough shape. A jointer and a planer are the other two large machines.

If you can manage to take your eyes away from the spectacular display of six decades' worth of templates hung on one of the walls, you'll also find a tablesaw, a few sanders and other bits here and there. That's until you go deeper into the shop and get to the lathe area. A big vintage pattern lathe sits at the end, sharing the space with a bunch of traditional woodturning lathes and a few racks of semi processed chair parts. Everywhere there's a myriad of templates, chisels and other hand tools, all neatly organised.

Local species and select trees

Did I mention the smell? Oh, I'm not sure if it was because I love the sweet ash smell, but the whole space was pervaded by it. Apparently that was strange because ash is not used as much as the other two main woods that the Levaggi chairs are usually made of, beech and wild cherry.

Speaking of wood, at the entrance of the workshop, there's a discrete storage of rough timber waiting to be processed, and even here there's a lot to be said. Paolo told me they use only locally sourced timber, carefully selected and patiently air dried.



Left: Fratelli Levaggi's *Campanino* chair is named in honour of Guiseppe Gaetano Descalzi who was nicknamed 'il Campanino'. Like their other chairs, it epitomises the minimalistic elegance and structural integrity of the *Chiavarina* design. *Photos: Paolo Levaggi*



The search for the best material is so important that sometimes, when possible, they actually go in the Ligurian hinterlands and choose the best tree trunks. Beech and wild cherry are the main choices, but also ash, walnut and maple.

The criteria for selection goes deep – even exactly where a tree grew matters. If it grew at the bottom of a valley it may not be the best choice because it tends to have softer, less resistant fibres. On the other hand, a hillside tree might also not be a wise choice because it may have been stressed by strong winds and have grain that's difficult to work with, and a tendency to twist, cup and move. Another shockingly cool detail that I learned is that in the past, when it was still economically possible, trees were cut following lunar phases. That has to do with the amount of sap in the tree making the wood drier and less susceptible to decay and infestation. Crazy, right?

But let's get back to the shop tour because just as I thought it was over, Paolo brought me to the remaining spaces. One is dedicated to assembly and the other to finishing processes – everything still very organised and neat. A couple of workbenches, a dedicated glue-up station, and again many details for me to get distracted by.



At the core of the Levaggi craftsmanship is the need and desire to create something that will last. Every joint is fine-tuned to be as perfect as possible, every component is cut so the grain aids maximum strength. Testimonial to that are many old chairs that are still being used today.

Young and old

The Levaggi company surprised me in many ways but especially in how young all the artisans are. In fact the whole business philosophy is very young too. I'm talking about the online presence and their open-minded attitude. Artisans once jealously kept everything secret, and here I was given an opportunity to see the behind the scenes.

This page: Fratelli Levaggi use select air dried timbers from local species sourced from the Ligurian hinterland and sawn to their specifications. 'Sustainability is not a trend or a marketing claim for us, but has always been our usual way of working', says the company information sheet.

Throughout the workshop can be seen a myriad of templates, components and hand tools, all neatly organised.

Photos: Vasko Sotirov



The *Chiavari* chair design dates back to the 1807 creation of Chiavarian cabinetmaker Giuseppe Gaetano Descalzi. It has long been considered an Italian design icon with a reputation for being the world's lightest chair. It has inspired generations of designers and notably Gio Ponti with his *Superleggera* chair. Photo: Matteo Carassale



But why keep working the traditional way? Why not use fast and efficient CNC machines? Well that's because a step in that direction would take away what is special to their product, the craftsman's hands and sensibility. That is the special attention that every single piece of wood is treated with. And once again, to obtain such light and strong constructions, a deep understanding of the raw material is needed. Sometimes things just have to be experienced to be understood, and the Levaggi chairs have something really special that goes beyond the technical data.

Individual processes

But let me tell you more about the process. First the wood is carefully selected according to the components being made. Rough shapes are traced from templates and then bandsawn. The trick here is following the natural flow of the grain, so if the template has a curve in it, they will try to find a part of the board where the grain takes a similar path. This is very important not only for the aesthetics of the finished piece, but especially for the strength of that component.

As Paolo pointed out, they create the minimum amount of waste possible, but not for the sake of economy. In fact the cost of the time invested into this perfect template arrangement is often greater than the cost of the material. The Levaggi optimise the raw material because this is one of the ethical values passed down from the previous generation. Badly selected grain can cause future problems as one component of a completed chair can move and dramatically change the geometry of the piece. In fact Fratelli Levaggi also offer a repair service for old chairs and showed me an example where the back legs had changed shape, resulting in a different curvature.

After bandsawing, components are processed further on the jointer and planer and then, depending on the design, take different paths. Shapes are refined with sanding machines or may go to the lathe. Batch production is efficient and reduces drastically the time needed to set up every single job.

The company makes no more than a few hundred chairs a year but every single one is hand made. What's striking is the standard of precision they stick to, even for my critical eye. No compromises are made.

Perhaps one of the ways they manage to be time efficient and still maintain excellent quality is by matching the natural predisposition of each artisan to certain jobs. Each chair is made by all of their hands at some point of the production process. Oh and don't tell him, but Paolo actually confessed to me that Gabriele is better than him at the lathe.

When all the parts for a single piece are ready, it's time to cut the joinery and glue everything up. A combination of horizontal mortiser and hand tools such as chisels, files and rasps make for a precise job. A piece of furniture you sit on everyday for many years is subjected to a lot of stress.

Perfect joinery is a must and the guys here know that very well. I saw them



Above and left:

'Perhaps one of the ways they manage to be time efficient and still maintain excellent quality is by matching the natural predisposition of each artisan to certain jobs.' Each chair is at some point handmade by everyone who works there. *Photos: Vasko Sotirov*

compress the fibres of tenons prior to glue-up. That leads to an extremely secure joint once those fibres swell back again inside the mortise. Hide glue is used here mainly because as they explained, it's strong and it's also very convenient to be able to clean any squeeze-out with hot water.

At this point the *Chiavarina* needs a seat, and typically Viennese cane is woven onto the frame by local women artisans in what is apparently a very time consuming process. Finishes are applied only at the end to ensure a perfect result.

It was fascinating to see inside the Levaggi shop, to talk to amazing

artisans and be inspired by a successful family business that keeps alive traditions and the true value of the handmade product.

Learn more about Fratelli Levaggi at www.levaggisedie.it and Instagram @fratelli_levaggi_chairs



Vasko Sotirov is a craftsman based in northern Italy. Obsessed with details, he designs and creates boxes and artworks using mostly manual tools.

He is convinced that the hands are able to translate emotions into objects which have a purpose beyond functionality. Learn more at vaskosotirov.com and Instagram @vaskosotirov

Hollow Chisel Mortisers: Use and Maintenance

The key to these machines is knowing how to set them up, and how to sharpen their tooling. Story by Neil Erasmus.



Machined mortises, or deep slots, can be made square or round-ended. The latter are made with rotating cutters fitted either to hand-held routers or dedicated, oscillating slot-mortise machines. These slots are created very quickly through multiple, shallow plunges while simultaneously traversing, with depth and end-to-end stops adjusted to the dimensions required.

Traditional, square-ended mortises are either cut by hand or by machine, using either a chain or hollow chisel mortiser (HCM) (**photos 1, 2**). The plunging head of the HCM consists of a hollow, square chisel into which a special drill bit called an auger is fitted (**photo 3**). It holds the fixed chisel in place and also a motor-driven chuck that houses the auger.

The length of the auger is smaller in diameter than its nominal size so it fits into the hollow in the chisel – only its end flares out to match the chisel size. Its end has either one or two cutter lips and spurs. Most HCM auger bits are directly-driven from above, some with a blower tube to clear swarf and to cool the chisel.

Essentially, these devices ‘drill’ square holes – the chisel squares the round hole drilled by the auger. A clearing slot on one of the four faces of the chisel allows chips to exit. The wood is placed down on the cast table and clamped to a fence with the built-in clamp. The table travels left to right



2



3

- 1, 2:** Properly set up and with sharp tools, the HCM is a joy to use.
- 3.** The plunging head has a hollow, square chisel which holds an auger.
- 4.** Undo the chisel, then place the coin between the chisel and the holder and then again re-tighten.

and can be finely adjusted and fixed in the appropriate fore/aft position.

Most of the larger woodworking machinery manufacturers built these, notably the older British ones such as Wadkin, Dominion and Robinson. Some older machines doubled as chain mortisers too and were primarily used for heavy joinery work, thus the sheer size and heft of these behemoths.

Tool sizes

The chisels and their matching bits come in mostly imperial sizes starting at 1/4" (6.35mm) and going up in 1/8" (3.17mm) increments up to 1" (25.4mm).

The larger sizes are rarely used in domestic or commercial furniture applications, and require huge leverage on the plunge arm to bite into hardwoods, even with the sharpest chisels and bits. Furniture making applications typically require four chisel sizes: 6.35mm, 7.9mm, 9.52mm and 12.7mm, the 9.5mm being the most common size for chair construction, while the smaller sizes are nicely proportioned for side-by-side, twin mortises.

Setting up the HCM

Setting these machines up to perform at their best is what it takes to realise their usefulness. The first and most important thing is to ensure the

chisel and bit are sharp. I'll cover the processes of fettling and sharpening later. Here's how to set up the HCM.

Get the chisel square

1. Carefully slide the auger out from the end of the chisel and place it down on something soft, then slip the chisel up into the chisel holder, clearing slot facing back, and temporarily lock in place.
2. Next, take a five cent coin or similar spacer, undo the chisel, then place the coin between the chisel and the holder, then again re-tighten temporarily (**photo 4**).
3. Again taking care not to knock the end against the metal table, slide the auger all the way into the end of the chisel and fully tighten the chuck around its shank. Note: some augers are too long to fit properly and all it takes is to cut some off the shank end.
4. Loosen off the chisel, remove the coin, and slide the chisel all the way and fix it in place ready for squaring up. The coin thickness provides enough space between the end of the auger and the chisel to effectively eject swarf and help keep everything cool.

Getting the chisel square with the back fence is one of the most



4

important ways to ensure clean mortise walls, a feature that is so important when cutting decorative through-mortises. Rotate the auger by turning the upper shank area by hand so neither the auger's spur, nor its cutter at the end of the device face backward. We want them out of harm's way for what comes next.

5. Drop the chisel and bit down by pulling down on the lever until the chisel is at the same height as the back fence and leave it there. Now, loosen the chisel from its holder (it can't fall out) and bring the left/right sliding table forward until its



fence just nudges the chisel – don't force it as the chisel can easily bend. Pinch the chisel and fence together by hand while tightening the chisel to its holder, then slide the table back out of the way (**photo 5**). The chisel should now be perfectly square and parallel to the fence, and ready for cutting.

Set the stops

The only other settings required are the stops – end-to-end, and depth. Set the cutting depth by clamping the work in place and eyeing a depth mark on the end of the piece. The chisel head typically has a bar and stop like many older drill presses, and a pair of adjustable stops behind the fence. On many machines the head adjusts up and down to allow for different timber sizes. On some machines the range of movement on the plunge arm may be adjusted by simply pulling it out against a spring and re-positioning on its spline.

Using the HCM

Bear in mind these machines are strictly for solid wood only, and should never be used on abrasive and corrosive man-made boards. Wood to be mortised must be clearly marked out with a mortise or plain marking gauge, square and marking knife (**photo 6**), and the appropriate bit and chisel placed in the machine.

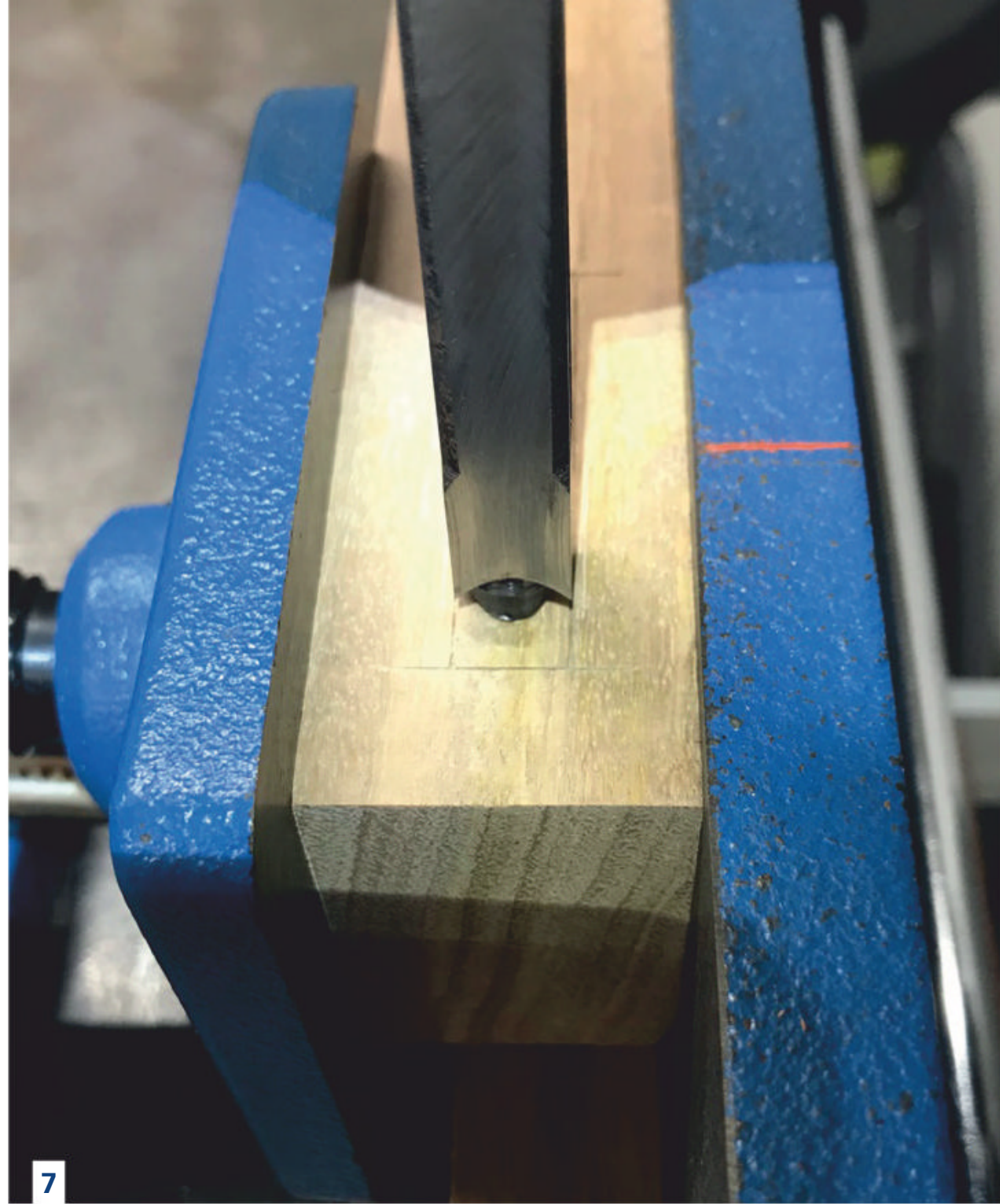
HCMs are designed to clamp fairly large pieces of wood, and dressed wooden props may be required to raise smaller pieces a little so the built-in clamp can engage them properly. An inadequately clamped workpiece may pull free as the head is retracted, so be sure to get this right.

The depth stop on the plunging head may now be set. If through mortises are called for, be sure to place some sacrificial wood underneath and clamp firmly down to prevent tear-out, or mortise from both faces if this can be

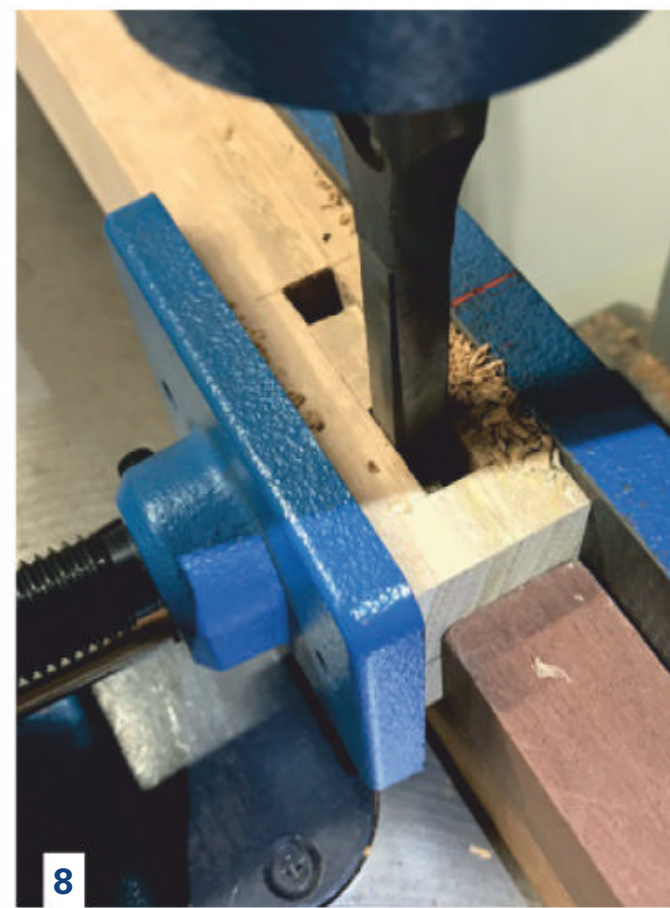
done. After the wood is clamped in place, the fore/aft position of the table is adjusted to the set-out (**photo 7**).

Next, set the end stops and a positioning block to reference your work relative to your mortise width marks. Now you're ready to turn the machine on and begin cutting. Remember that the sliding table must be in position and stationary before entering the wood. It can only end-cut, not side-cut, so start the cut at one end of the layout and slowly plunge the chisel into the wood – too slow and it will burn, too fast and it will resist. A happy medium will soon become apparent.

When plunging I always find that several shallow cuts and quick withdrawals work better, as it gives the chisel a little time to cool down and clear the swarf out the ejection slot in the back, out of view. Never force the chisel into the wood – it will cut at its own pace, and don't allow the chisel to linger inside the mortise



5. Pinch the chisel and fence together, tightening the chisel to its holder and then slide the table back.
6. Lay out mortises clearly with a mortise or plain marking gauge, square and marking knife.
7. After the wood is clamped in place, the fore/aft position of the table is adjusted.
8. Cut the two outer squares then work from one end to the other, overlapping the mortise already cut.



for any longer than you have to, otherwise it will quickly overheat and possibly ruin the chisel and bit.

Once the two outer squares have been cut, the rest of the mortise can be done by working from one end to the other, overlapping the mortise already cut (**photo 8**). It is important to finish the outer squares first to maintain a perpendicular cut – cutting a mortise with a void to one side allows for chisel wander; leaving a slanted cut is a problem requiring handwork to rectify.

Sharpen the chisel

The single most important discipline with the HCM is to know when and how to sharpen the chisels and bits. If this is understood, it is a joy to use – relatively quiet and creating gentle dust – the kind of machine I like when pulled away from handwork. When you are engulfed in wood-smoke, you know you have missed the mark. Sensible storage of spare chisels and bits is a must as they rarely survive a fall on a concrete floor.

Starting with the chisel, I use a diamond impregnated conical bit held in a battery drill to grind the inside reverse cone in the end (**photo 9**). Select a speed that doesn't cause the conical bit to vibrate or jump around in the chisel end – generally quite slow.

Grind away until a neat little burr is evident all the way around and right to the corners of the chisel. Sometimes I find I need to gently dance the drill around in a neat, but smallish circle to get to the very corners – that's fine too. Go through the grits until nice and smooth. If left rough, the waste can't quite slip through this choke-point properly, causing choking and burning, which results in accelerated dulling.

Next, the outside faces must be honed on a perfectly flat waterstone (**photo 10**). I say 'perfectly flat' because doing it on a hollowed one will likely result in a chisel that binds tightly in the wood due to the creation of a bigger 'waist' than the cutting tip. In my teaching

career I've seen too many hollowed waterstones and convex-backed bench chisels for one life. You've got two, maybe three minutes of continuous honing before you need to flatten that stone again – believe me!

When sharpening a new chisel, I always apply extra finger pressure mid-point to actually achieve the reverse – creating a slimmer waist to help avoid the chisel binding in the wood. In fact some chisels, such as the excellent Clico brand, are purposely made like that.

Finishing off this process may require several back and forth actions on the stone and the finest conical grinding bit (held between the fingers) to achieve a burr-less transition at the very edge. Occasionally I have taken a small square file to the inside corners of the chisel to create extra space for shavings to travel freely to the twist of the auger.

Sharpen the auger

The auger requires a little more care



9. To sharpen the chisel use a diamond impregnated conical bit held in a battery drill to grind the inside reverse cone in the end.
10. The outside faces of the chisel are honed on a perfectly flat waterstone.
11. The cutter lip of the auger is filed both at the bottom and on top.



and skill, but anyone can do it. The areas that need fettling are at the bottom tip of the tool and quite small, so a jeweller's loop and good light may be required if your eyes are old like mine. First, clean the entire length of the bit with a pitch solvent as the intense heat generated by these bits leaves a tough wood tar on the surfaces.

Next, I 'paint' the cutter/s and the spur/s at the tip with a permanent black marker so I can visually check and adjust the sharpening process. Before you begin, a word of warning: these augers have a limited number of sharpens in them, so take off only what you must to get it sharp again.

The auger is firmly held in a padded vice, tip facing up, while a small, fine triangular file is used to sharpen both spur and cutter lip. Forward passes only. The cutter lip is filed both at the bottom and on top (**photo 11**) while the spur only gets done on its inside edge. After that a little fettle on the waterstone to remove the burr on the outer edge of the spur is all it takes to complete the job.

Sometimes I have had to fettle the outside of the cutting tip of a new auger to reduce its diameter, when the small lateral movement within the chisel causes the auger to overshoot the chisel's square parameters, leaving a messy-looking mortise. I achieve this by chucking the chisel and auger setup in the machine, but leaving about 20mm of the auger protruding. With the machine running, I offer a small diamond plate up to the edge of the auger tip, at a slight angle to maintain a leading edge. I do this several times until no part of the auger protrudes beyond the chisel.

Properly set up and with sharp tools, the HCM may well become your favourite machine.

Photos: Neil Erasmus



Neil Erasmus is a furniture designer maker based in Perth.

Wood Diary

Diary listings are free. Email to: linda@woodreview.com.au

Note: Listings are current at time of printing but may be subject to change, especially with regard to active COVID-19 restrictions. Always check details with organisers before planning to visit.

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14 FEBRUARY–4 APRIL

The Millennials

Contemporary furniture by Rolf Barfoed, Elliot Bastianon, Andrew Carvolth
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www.sturt.nsw.edu.au

15 FEBRUARY

Maker of the Year 2021 Awards

Wood Review's online and print showcase for fine woodworking presented by Carbatec.
Entries open, information and entry via:
www.woodreview.com.au/moty2021

14 FEBRUARY–17 MAY

Cascade: Furniture by Duncan Young

with Global Arts Projects
Sofitel on Collins Hotel, Melbourne
www.youngfurniturestudio.net

21–24 FEBRUARY

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Who was the Ipswich Woodcarver?

Terry Martin investigates the life and works of Peter Harley.





Main: A picture frame by Harley with themes of motherhood.

1. Gallery Director Michael Beckmann holds a frame from 1917.
Photo: Terry Martin

There is a sense of kinship among woodworkers that is a mix of respect for hard-won skills and an understanding that it isn't necessarily an easy life. For thirty years I have been writing about such people because, as a woodworker myself, I wonder why they have embraced this sometimes unpredictable life. I recently moved to the Queensland city of Ipswich and there I heard a compelling story, rich in mystery and local history, and I soon realised that I wanted more woodworkers to hear it.

One of the first places I visited was the Ipswich Art Gallery and as soon as I entered my attention was caught by a glass-fronted display case containing carved wooden boxes, picture frames and architectural features. My first impression was that it was very naïve work, but I was fascinated by the abundant detail and its Australian themes. This work was originally displayed in a 2009 exhibition titled *Peter Harley: An Ipswich Woodcarver*, and, to my surprise, I learned that Harley had spent most of his life in the Ipswich Insane Asylum.

I wanted to know more, so I met with Michael Beckmann, the Gallery Director, and Alan Rix, retired Pro-Vice-Chancellor of the University of Queensland Ipswich campus, which for a period occupied the beautiful buildings and grounds of the former Ipswich Asylum.

Michael was quick to inform me that, 'The credit for uncovering Harley's story goes to Alan. I am embarrassed to admit that once, when I was having a bad day, I had a phone call from an elderly citizen. She asked if I would like a carved

picture frame by a "patient of the insane asylum" for the collection. I politely said, "No, thank you". She then said, "I'll contact them at the university and see if they want it there".

'I remember thinking it was an odd thing to say, but later Alan told me that a lovely picture frame had come his way and that it had a visual connection with a carved honour board that was still at the campus, so he started looking into it. I was embarrassed because I had already heard of this famed, but anonymous, Ipswich woodcarver. I could never have imagined he had been a patient at the asylum.'

Alan explained that the asylum closed in 1998 and became a university campus. 'Because the whole site is a heritage location, they wanted to honour its important history. A lot of things made by patients were left there and among those was the honour board carved by Peter Harley. Apparently it was made of silky oak from a tree that was grown on the asylum grounds.'

Michael explained that in the late 1970s and early 1980s a number of antique dealers in Brisbane began selling distinctive woodcarvings that they purchased from old houses in Ipswich. Although unsigned, they believed they were made by one person and they called them 'the work of the Ipswich woodcarver'. Michael explains how this was possible: 'When you see a work by Harley it's like recognising an old friend. There are distinct features: certain motifs, the shape of flowers, and how animals are carved'. Alan agrees: 'Yes, his work is distinctive. He had a naïve focus on plants and animals, and



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2. An overmantle from 1921. Post World War I, the dove of peace sits highest.
3. A 1920 overmantle with pastoral themes.
4. A 1925 writing box.
5. A stationery box. Harley probably did not construct the boxes, but carved them extensively.

he was particularly fond of roses. His work represents a style of folk art that we don't have much of in Australia'.

Alan has uncovered intriguing glimpses of Harley's life: 'It's not easy to get information on mental health patients, but what we do have is a fascinating story of a Scottish immigrant who finds himself locked up in an asylum for most of his life. He lived in an institution that had a very bad reputation because of the poor conditions and the primitive treatments, but he managed to achieve many things'.

Harley was born in Scotland in 1873 and died in Ipswich in 1941. He was originally taken into custody in 1907 as a 'lunatic patient' and admitted to the Ipswich asylum in 1908. It is not recorded why Harley was first detained and apparently he was unable to explain his circumstances, but his belongings gave intriguing glimpses into his life. He owned a camera, books of poems by Byron and a copy of *Paradise Lost*, photos of Pompeii, bank books that recorded considerable funds, and valuable mining shares from West Australia. It seems he was well educated and quite well off, but all of his assets were later sold, supposedly to cover the costs of his incarceration.

The first mention in the records of Harley's carving is in 1916: '...spends his time in carving and has carved the honour board for the institution. He has a little box where he keeps all his tools which he locks himself'. The next mention is in 1927: '...well known for his woodcarving'. Alan explains that the asylum tried to encourage rehabilitation, and that woodcarving was a popular hobby in those years, so that may



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have explained how Harley started carving. Also, the asylum had extensive views of the gardens and the asylum's farm, so that may have influenced Harley's pastoral scenes.

With so little information available, Michael has tried to fill some of the gaps: 'They may have had children's books with simple illustrations that were the source imagery for subjects like birds and kangaroos. But it seems to me that he didn't have access to carving manuals because you don't see the symmetrical scrolling and floral work that was popular then. I don't think Harley came here with a background in carving, but it may have been introduced to him as a therapy.'

'When we put together the exhibition you could make sense of it – his simple early efforts and him struggling to do three-dimensional pieces by carving them separately, and then adding them to the work. Then later we see the competent low-relief carving on every side of a box. Alan is right, they're typical of what Americans would call a "folk artist". His motifs are so humble and personal, but there is also a potential connection with the First World War that goes beyond the honour board. A number of boxes are dated within the span of the war and the names on these boxes were invariably of women. Possibly they were given to a widow or a daughter of a fallen soldier to contain possessions that were returned to them.'

Alan mentions intriguing hints of Harley's life before he was confined. 'Because he came from Scotland there are a lot of Scottish elements, such as thistles. There's an interesting feature on one of his mirrors – an open-topped car with two children in it, and the word "dreadnought" carved into it. I'm not sure what it all means, but it probably goes back to his childhood'.

Michael further reflects on Harley's life as a carver: 'I think that if a person has the disposition and opportunity to focus, it is possible for them to create an astonishing body of work.'



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He probably made his own decision to pursue this and, while his work isn't remarkable, it still has a notable presence. I am sure he derived a sense of pride and perhaps even of his missing identity. When you are assessing an artist's work, it is as much about the distance they have travelled as an individual as it is about the final accomplishments'.

With so little to go on, it is risky to assume too much about Harley's life, but there are hints of what might have been in his mind. In one of Harley's picture frames you can see a mare with her foal, a mother and child, and two other women. Was it in response to a commission, or were these echoes of his own yearnings? Also, those few words about the little tool box which he 'locked himself', suggest so much. This indicates that Harley was given the liberty to do this, so he must have been well trusted to be left in charge of sharp tools, and they were obviously of great value to him. We know his work was appreciated by the asylum staff, because some of their descendants still own significant pieces.

Whether Harley personally benefitted from the sale of his work is unknown, but we do know that he had a long and prolific life as a carver. Looking at the peaceful scenes that he created, it seems it might have brought him some peace. We owe a lot to the team who brought his work to the public eye again and Michael is still seeking work by the Ipswich Woodcarver, while Alan is trying to find Harley's unmarked grave in Ipswich General Cemetery. Peter Harley's work is now part of the public record and he is not forgotten.

Photos courtesy Ipswich Art Gallery.



Terry Martin is a Brisbane-based wood artist, author and curator. Learn more at terrymartinwoodartist.com

What I Learned Making Historic Varnishes

I believe firmly that a better understanding of our materials helps us refine our techniques and improve our results, explains Shane Orion Wiechnik.



In my efforts to become a better finisher I found a barrier to improvement that started with just how unapproachable and confusing some finishes can be. Many are industrially produced in ways most of us have never seen, and there are lots of rumours and anecdotes around finishes that are hard to know when to trust.

‘Varnishes’ never appealed to me originally in the way that shellac, oils, and waxes did, partly because of how easy those other materials are to understand. Varnishes seemed an old fashioned and potentially a dated material. This isn’t true however.

What is a varnish?

While the term ‘varnish’ has lost its prominence, the concept is still relevant and useful. Varnish describes any finish containing a resin. Resin is a pretty broad term. It encompasses almost every solid used in varnish making from shellac, to tree sap, to polyurethane, to wax, to epoxy. If it is solid (or semi-solid), has carbon in it, and can stick to stuff, it’s probably a resin.

If the resin is dissolved in a solvent (like shellac in alcohol) then it is called a spirit varnish, and if the resin is mixed with an oil it’s called an oil/resin varnish. As examples, Danish and Scandinavian oils are actually better thought of as varnishes than oils; they simply have a lot more oil than resin in them. Even the newer hardwax oils can be thought of as varnishes, with the resin being waxes.

Learning from the past

While I understand shellac, the oil-resin varnishes have always intimidated me, particularly the modern ones. So, I decided it was time to try to make my own. Making furniture has definitely helped me understand furniture better, so the same should apply here, right? I’m not suggesting you make your own varnishes because there are real dangers – my aim was to learn more about them.

Using modern cooking appliances I figured my balcony was the safest place to experiment¹. In the process, I felt a lot of the mystery surrounding varnishes fade away.

Recipe 1: Theophilus’ Sticky Varnish

- 2 parts linseed oil (by weight)
- 1 part sandarac (by weight)

The medieval ‘sticky varnish recipe’ recorded by the monk Theophilus Presbyter around 1100AD is one of the simplest available². Let’s take a closer look at our ingredients.

Linseed oil

Here we will first notice a familiar friend, linseed oil. There is so much to say about this wonderfully useful material. It is one of four common drying oils in the world (alongside walnut, poppy, and tung), meaning that it will transform from being a pure liquid to being a solid on its own. Most other oils famously don’t do this, which is why they can be used as lubricants. Imagine how unhelpful it would be if your lubricant became solid: zero helpfulness.

Linseed oil is sold as either raw or boiled. In this article boiled linseed oil refers to what is commercially sold rather than what I have cooked.



Main: The author recreates varnishes on his balcony. Heating linseed oil and resins to high temperatures is not recommended as there are risks of fire and vapour inhalation.

1. A portable electric hotplate at an outside location was used for recreating recipes one and two.



The fact that linseed oil naturally hardens and crosslinks into an insoluble solid is something humans have taken advantage of for thousands of years. It really is key to note how important and special this is. Without drying oils, we wouldn't have the Mona Lisa, or easel painting in general. When we talk about oil painting, that oil was most commonly linseed oil. Mix it with powdered pigments and you get paint. Linseed oil can also be used on surfaces that might get regularly soaked with water, including some furniture and anywhere outside. As such, it is the basis for all of these varnishes.

Sandarac, a tree resin

Without sandarac, this is just an oil finish. Sandarac is a refined sap from the cypress tree (*Thuja articulata*) which grows in north-west Africa. Sandarac has the properties of being very hard, shiny, and not water soluble, perfect for furniture finish.

On its own, linseed oil is a matt waterproof finish which is very good at 'penetrating' timber, but it isn't very hard or scratch resistant.

Sandarac can make a spirit varnish but can have poor water penetration resistance and heat resistance. It can also be too brittle, creating cracks or flaking effects. These two ingredients can add a lot to one another when cooked together.

Unfortunately, Theophilus was not the most detailed of chroniclers. The instruction for cooking is a single sentence² which reads, 'When you have placed it over a fire, heat it carefully, without letting it boil, until a third part has evaporated, and be careful of the flame because it is extremely dangerous and difficult to extinguish if it catches fire'.

I decided to use an electric stovetop to avoid the dangerous flame, but this didn't tell me what temperature to cook it at, or for how long. For that, I took some tips from the next recipe.

Recipe 2: Violin Varnish Replication Attempt

- 1–3 parts linseed oil (by weight)
- 1 part colophony, also known as pine rosin (by weight)
- Some turpentine if desired

Yes, I know we haven't finished Recipe 1 yet, but we'll get back to it. This recipe comes from research done recently about 16th to 18th century varnish making³. I wasn't the only one who noticed a distinct lack of clear instructional information about temperature and time in many of these recipes.

My sources found that heating is essential for getting the two materials to properly mix with one another. In their tests, if the heat was too low, or the cook time too quick, the colophony and linseed oil would separate again after cooling.

Cooking also increased the viscosity of the liquid, or made it thicker. Having a very thick/not runny varnish can be very desirable. When applying the finish to an irregular or vertical surface, you don't want the finish to run. Sometimes, you might test whether a finish is done by dripping a drop onto a cold surface and pulling the drip up with your finger to see how long a strand of caramel-like string you can pull from it – 10cm is a recommended length for some varnishes.



2. Heating linseed oil and sandarac. Sandarac is a refined sap from the cypress *Thuja articulata*.
3. The oil was heated for three hours before the resin was added.
4. Sample coating with the linseed oil and sandarac varnish.
5. Getting linseed oil up to 270C. The oil was kept at that temperature for three hours.
6. Combining the linseed oil and colophony produced a rich yellow-amber coloured varnish.
7. Storing the varnish that resulted from recipe two.

Varnish makers of the past were able to make varnishes with different qualities using similar ingredients by adjusting how much they were heated and how long they were cooked. Importantly, 170C is too low for the ingredients to properly mix, and 343.3C is the temperature at which linseed oil could spontaneously combust. With that in mind, I used the following process for both of the first two recipes.

- Heat linseed oil to 270C and let sit at that temperature for 3 hours.
- Cool to 150C
- Add crushed/powdered resin to hot oil over no more than ten minutes.
- Heat to 250C and cook for

minimum of 30 minutes or until desired viscosity is reached.

- Turpentine or gum turpentine can be added to thin, if desired.

The process was surprisingly simple. Using an electric burner and thermometer I could control the heat easily without any danger of an open flame. The linseed oil created a lot of black smoke as it cooked so the outside location and breathing protection were essential.

I aimed for the consistency of a brushing varnish and the results of both recipes were beautiful yellow-amber varnishes that smelled very pleasant. They were thick, and could

be applied evenly. They both coated a wooden surface well and built up a semi-glossy finish (recipe 1 had a higher sheen). They both took about two weeks minimum to properly harden, and even longer to fully dry.

Because of this slow drying time, there were no remaining brush strokes on the finish, but they had collected some dust in the process. In order to shorten this drying time, I tested a third recipe.

Recipe 3: Oil and Copal Carriage Varnish

- 1 Part copal (by weight)
- 2 parts boiled linseed oil (by volume)
- 2 parts turpentine (by volume)



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Linseed oil is a molecule consisting of three connected unsaturated fatty acid chains (like an octopus that is missing five tentacles). Unlike other natural oils, it also has a high percentage of some specific fatty acids with carbon double bonds in the chains. You don't need to know what that means, but it is important. The double bonds will interact with oxygen in the air to branch out and connect with chains from other linseed oil molecules. Imagine our poor three tentacled octopus now has a weird growth coming out of the middle of its tentacles that is binding it permanently with a nearby octopus, and this continues to happen until a whole school of octopi is permanently joined into one large horrific net.

This type of polymerisation is called crosslinking, and it's a naturally occurring process (for linseed oil, not octopuses) that is very slow, but it can be sped up with the addition of metallic driers, or metallic salts, that help encourage this reaction.

This is where we get boiled linseed oil (which is not boiled: *never* boil linseed oil) as well as lead paint. While Theophilus doesn't mention using any metal driers in his recipes, they have been common additions from the 15th century onwards.

Copal, another tree resin

This varnish recipe comes from 1867, specified for use on carriages⁴. Around this time, the resin of choice in Europe and North America had become copal. Copal is technically a tree resin, but rather than referring to the resin of any specific tree, it's a general term for partially fossilised tree resin. Over a long period of time resins undergo their own natural polymerisation process and fossilise into amber. Copals are resins found part way through this process. One of the most popular copals used in the latter half of the 18th century in North America was actually kauri pine resin from New Zealand.

Because copal has already partially undergone a polymerisation process, it is a lot harder and more durable than softer resins. It can be polished to a high shine and is even used in jewellery on its own. This also means it doesn't melt as easily in the warm oil, and so it needs to be melted separately first, and then added to the hot linseed oil.

For this process. I did as follows:

- Cook copal resin on high temperature until melted and then reduce temperature to stabilise.
- Heat boiled linseed oil to 270°.
- Lower the temperature of the linseed oil and add the copal resin.
- Cook at 240–270° until thicker than desired consistency (3 hours).
- Lower temperature to 170° and add turpentine.

When done, the varnish was as thick as honey and a deep red/green colour. Once cooled, I diluted it 1:4 in gum turpentine to make it brushable.



8. The copal used in the third recipe starts to melt.
9. Adding the molten copal to the hot linseed oil.
10. The next day the resulting copal varnish was brushed on to a sample board.
11. The copal varnish produced had the darkest hue.
12. 'Making these varnishes has undoubtedly made me a better finisher.'



There were a lot of impurities in the copal, so filtering was necessary. The varnish brushed evenly and levelled out nicely on the surface. It was touch dry and ready to sand and recoat in the morning the following day.

After a second diluted coat, it was already building up on the surface and providing a nice durable shine that I couldn't scratch away with my fingernails. My copal and oil had combined nicely to create a strong glossy finish which added richness to the timber.

Chef's notes

The making of varnish changed and advanced with a combination of new technologies and wartime limitation of supplies over the 20th century. Tung oil became more available and was favoured in a lot of recipes. Processes were developed to artificially make normally non-drying vegetable oils harden, replacing linseed and tung in making cheaper paints and varnishes.

Modified natural resins like alkyds were developed as well as synthetic resins like polyurethane and acrylics. In addition to drying agents, other additives were included as well. UV inhibitors for instance help protect the product from degrading or discolouring in sunlight. All of these processes became more exact, more tested and more refined, but fundamentally they remain quite similar in spirit to their earlier counterparts.

Having made my own, I feel a lot more confident in my understanding of all finishes. I can think of them in terms of their materials and making. Does it have an oil and what kind of oil? What resin is in it and what properties will that give it? Is there a higher ratio of oil to resin (making it a long-oil varnish like Danish oil and hardwax oil) or is it more resinous (making it a short-oil varnish like yacht varnish)?

I believe firmly that a better understanding of our materials helps us refine our techniques and improve our results. Not only are the finishes I made going to go to great use on many projects of mine, but making them has undoubtedly made me a better finisher.

Photos: Shane Orion Wiechnik

1. Note: Linseed oil is combustible and heating it is dangerous. The smoke is also hazardous. We do not recommend making your own varnishes.

2. Unfortunately, Theophilus was not the most detailed of chroniclers. The instruction for cooking is a single sentence, see: Theophilus Presbyter, *De diversis artibus* or *Schedula diversarum artium* (ca. 1125). The translation used is Dodwell, C. R. *The Various Arts. De Diversis Artibus*. Oxford: Clarendon Press, 1961.

3. Source 1: Weththimuni, Maduka L.; Canevari, Claudio, et al (2016), *Experimental Characterization of Oil-Colophony Varnishes: A Preliminary Study*. *International Journal of Conservation Science*. 2016 Special Issue 2, p813-826, 14p.

Source 2: Tirat, Sophie & Echard, Jean-Philippe & Lattuati-Derieux, Agnès & Le Huerou, Jean-Yves & Serfaty, Stéphane (2017). *Reconstructing historical recipes of linseed oil/colophony varnishes: Influence of preparation processes on application properties*. *Journal of Cultural Heritage*. 10.1016/j.culher.2017.08.001.

4. Bottler, M. and Sabin, A.H. (1912) *German Varnish-making*. New York: J. Wiley & Sons



Shane Orion Wiechnik is a Sydney based furniture restorer/conservator. He studied at West Dean College in England and works with International Conservation Services and Renaissance Conservation. He is dedicated to preservation of both historic objects and the skills used to make them and currently teaches with Heartwood Creative Woodworking.

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Tray Not So Simple

Simple set-ups, jigs and labelling components were key in the making of this blackwood tray. Story by Andrew Potocnik.

Bringing an idea to a finished piece is about identifying and following a series of steps. You need to establish proportions, thicknesses and the visual weight of materials you plan to use.

Occasionally a client may give you a brief for a commission that inspires later developments of that design. This tray is an example, and although the construction looks simple, some tricky solutions were needed to make it work.

Scaling down material thickness and making the tray narrower and longer was the starting point from where my design developed. Looking at suitable timbers in my stockpile, I settled on back-sawn blackwood, but quartersawn timber would be a more stable choice if available.

Cutting components

Timber was cut from one board to ensure consistency of colour before all components were machined to appropriate thicknesses (**photo 1**).

The base received a 45° undercut on all four sides on my tablesaw. As you can see I don't have a high end machine, but my benchtop saw used astutely gave the result I needed. The mitre gauge was used to cut ends of the board (**photo 2**), while sides were cut using the tablesaw fence (**photo 3**). Cutting ends first ensures any torn grain at the exit of the cut will be eliminated as sides are cut.

Bevelled faces were hand sanded (**photo 4**) and a small lip of about 2mm left at the top of the bevel to ensure a gentle tactile transition between adjoining surfaces. These edges were later 'eased' with 320 grit sandpaper.

The top of the board was sanded to 240 grit with a random orbital sander so the 45° angle sides could be located, measured and cut to size. It sounds like a quick process, but this required many accurate stages of measurement, beginning with establishing a centre line on all

four components (**photo 5**) so they all line up correctly in the final assembly.

Tape trick

It may seem unusual, but I frequently use masking tape as a temporary surface to lay out measurements that are easy to see and won't mark the wood I'm working on, and then it's simply peeled away when no longer needed. In **photo 6** you can see how I label each component to keep track of where sits in the project.

Mitres and holes

Moving on to the 45° angled sides I had two matters to deal with, cutting mitred edges, and drilling holes for pins to hold the sides in place. It would seem logical to cut mitres first and then drill holes, but it is incredibly difficult to accurately drill into angled surfaces, so complete step two before the first.

Centre points for holes were marked with a marking gauge (**photo 7**)



The author's finished tray in blackwood.

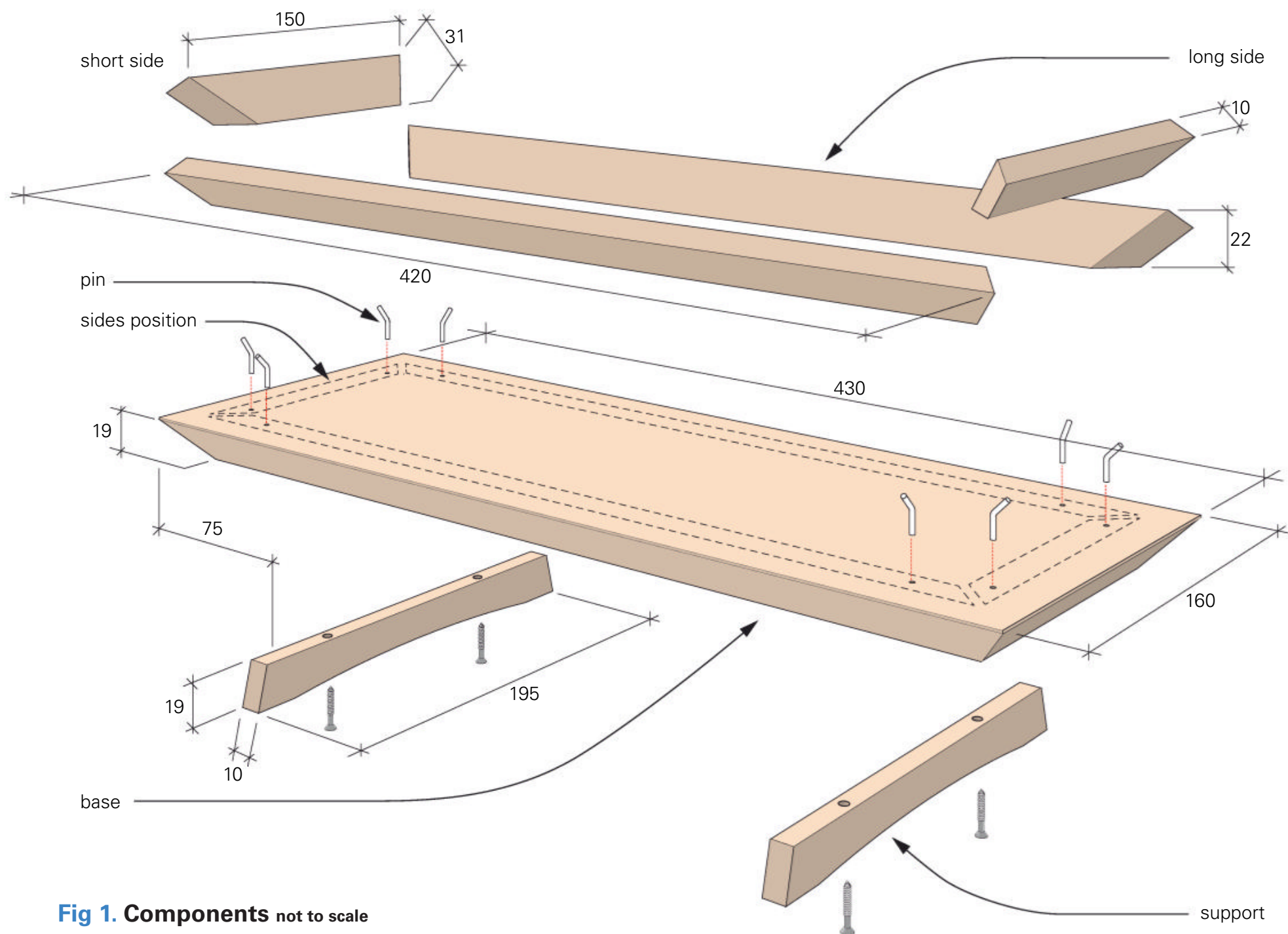


Fig 1. Components not to scale

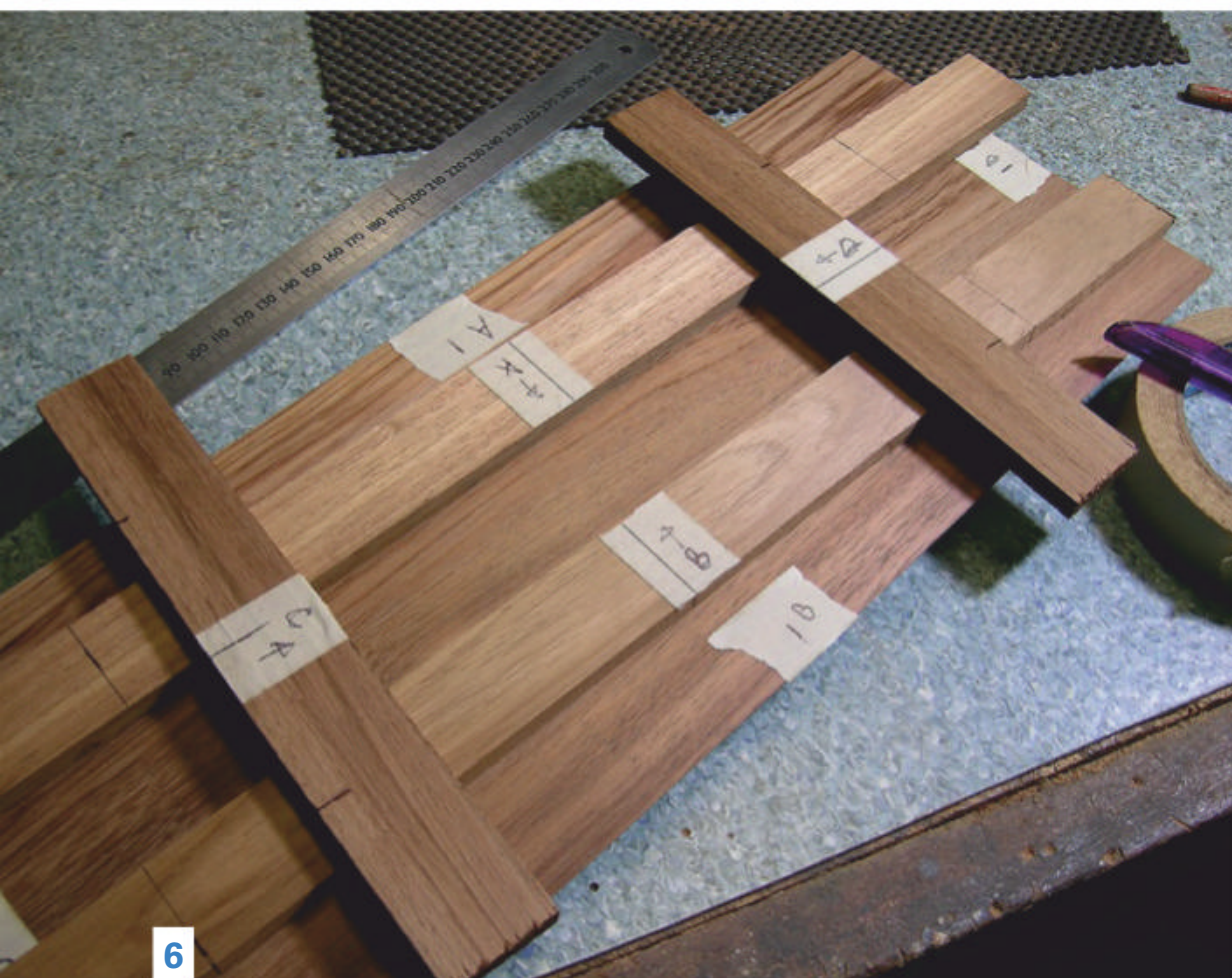
before being drilled at the usual 90° (**photo 8**), and only then were the 45° angles cut on my tablesaw (**photo 9**). These were also planed smooth to eliminate stray saw marks.

A long square section of wood pushed hard up against the edge of the board enabled me to line up the 45° side and mark its inner edge on the masking tape (**photo 10**) so I could use a pair of dividers to mark centre points where holes for the pins would be drilled (**photo 11**). Returning to the drill press, 2.5mm holes were drilled (**photo 12**) which allowed a little bit of wriggle room in case components didn't line up during assembly.

Using 2mm stainless steel pins bent to 45° as a method of connecting sides to the base, I checked to see whether the four sides fitted correctly (**photo 13**), before establishing a 45° centre line



1. Timber machined to size and ready to cut.
2. Cutting ends to a 45° angle on my bench-top tablesaw.



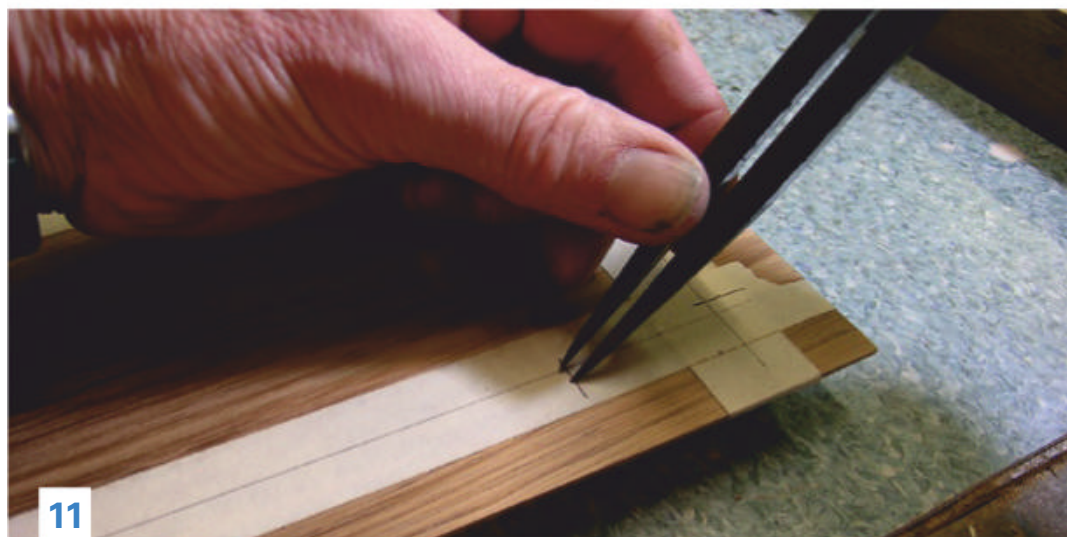
3. Cutting the sides on the same machine.
4. Hand sanding cut edges to eliminate any stray saw marks.
5. Establishing centres of all four sides as a reference point for further measurements.
6. Making sure components don't get mixed up.
7. Marking centres so holes can be drilled accurately.
8. Ends and sides clamped together for the drilling process.
9. The 45° angles were cut on the tablesaw.
10. Marking out on the tray top.
11. Marking centres for hole location.
12. Drilling holes for pins.
13. The 2mm pins are bent to 45° to hold sides in position.
14. Marking out for a 6mm gap on each corner.



9



10



11



12



13



14

on each corner (**photo 14**), so a 6mm spacer could be used to determine where each side was to be cut (**photo 15**). Instead of pins and glue you could also use very fine screws in countersunk and slightly broadened holes to allow for wood movement.

The wisdom of hindsight is a wonderful thing; especially when you have the right jig to complete a process with ease. To produce a compound mitre joint required cutting a scrap block of pine to create a 90° support at 45° to the flat plane of my drop saw (I made this jig by making 45° angled cuts on my tablesaw). Relying on my trusty masking tape to highlight exact locations of cut, I nibbled my way up until I achieved the right length (**photo 16**).

Clamping jig

With all sides cut to correct sizes, it was time to make another jig, one that would hold each side at the correct angle whilst allowing simple clamping pressure to be applied (**photo 17**). I used 19mm thick ply cut to 45° angles that were faced with PVC electrical tape to soften any pressure on completed faces of the sides.

Thinking ahead, I moved onto the supports, or feet, which were cut to protrude about 20mm beyond the base of the tray. A 15° angle at each end works well visually, and a slight curve



15



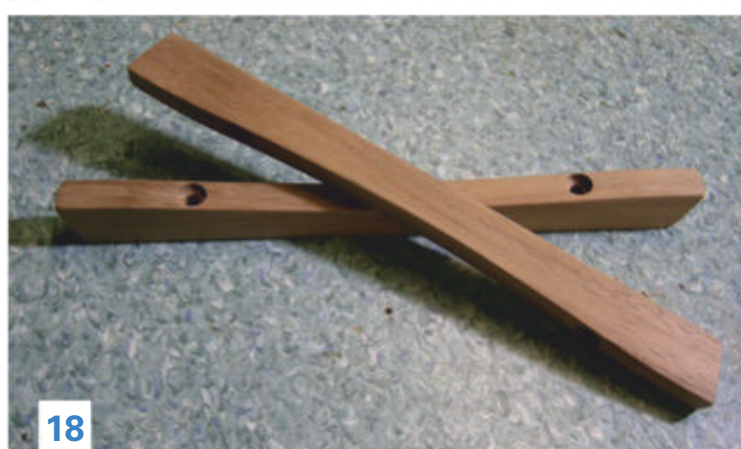
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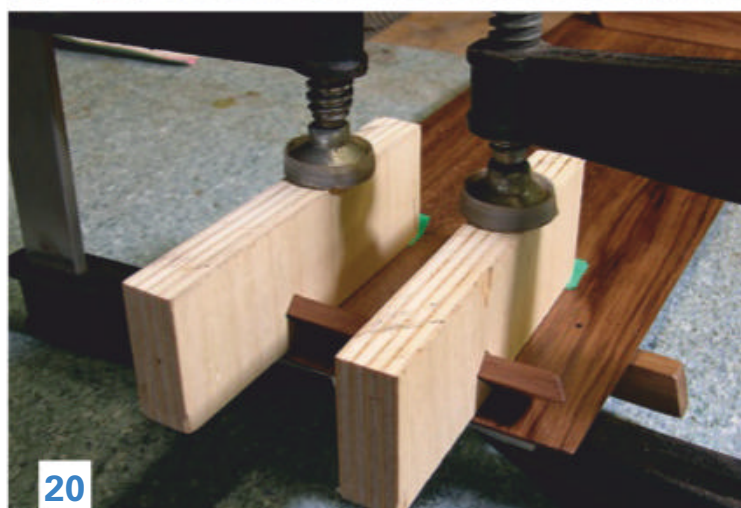
19



16



18



20

- 15. Ensuring the gap is 6mm.
- 16. Cutting compound angles with a carrier on a drop saw.
- 17. Testing a custom cut support which will be used to glue sides in place.
- 18. Feet cut, shaped and drilled to accept screws.
- 19. Marking centres for pilot holes.
- 20. Clamping each side in place as glue dries, one side at a time.

between each end allows for four points of contact on a table. Holes for screws were drilled with a shallow countersink so their heads would be within (**photo 18**). Widen the screw holes along the grain to allow for expansion and contraction of the board.

Masking tape once again helped to return each foot to its correct location after initial marking and subsequent drilling of pilot holes (**photo 19**). In this photo you'll see that some parts were pre-finished. My preferred method is a wipe on/ wipe off polyurethane.

Working my way around the tray, I glued each piece in place (**photo 20**)

until all sides and feet were secured and the piece was complete.

The journey

This project is an example of a construction that appears to be simple, but required problem solving. But if we don't push the boundaries a little, how will we know what is possible as we explore the many qualities of different species of wood as well as the designs we conjure?

Photos: Andrew Potocnik

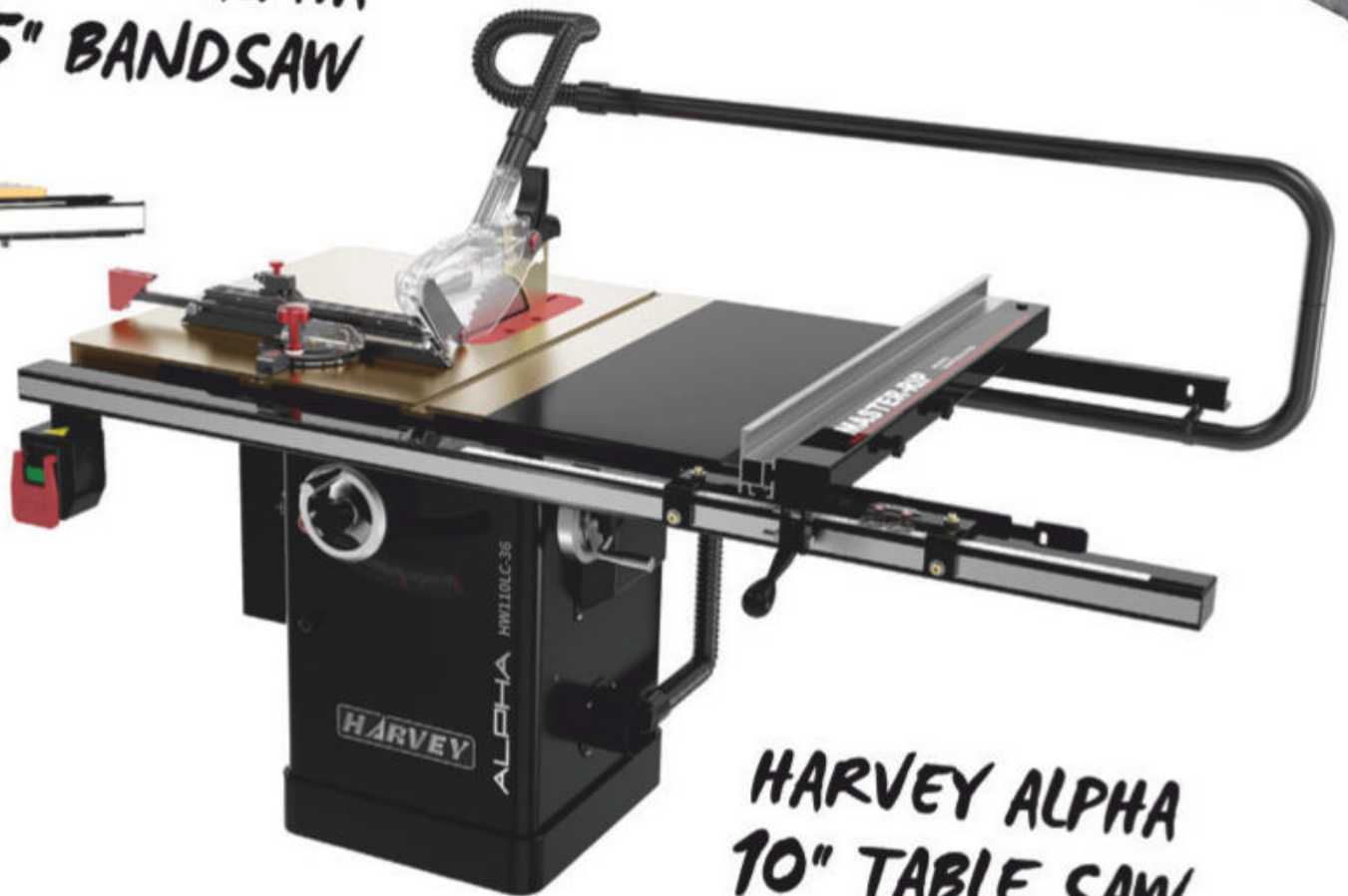


Andrew Potocnik is a wood artist and woodwork teacher who lives in Melbourne. Email andrewpotocnik@telstra.com

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