

AUSTRALIAN

# Wood

REVIEW

105

## ANYTHING BUT SQUARE

Michael Fortune



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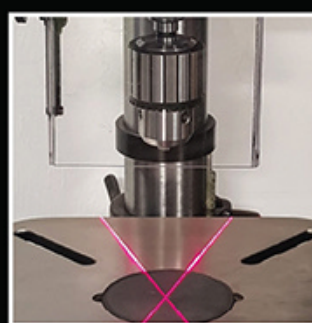
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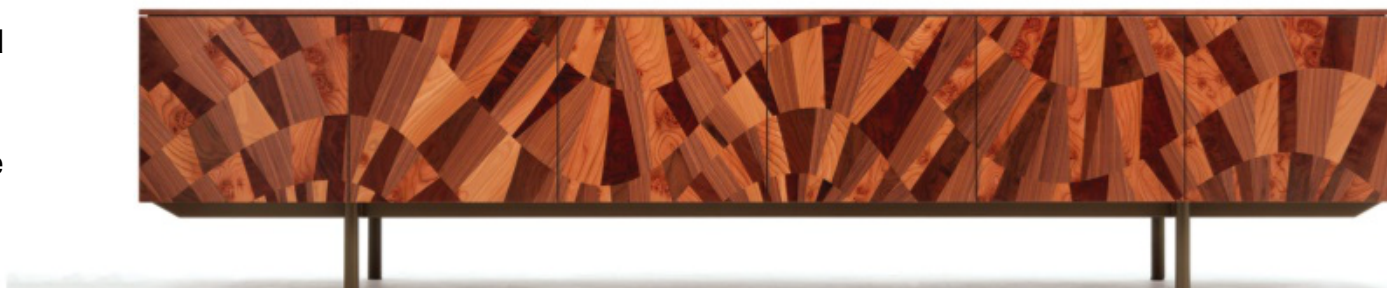
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The humble tape measure is a core tool for woodworkers. Raf Nathan looks at some of its distinguishing features.



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# Editor's Letter

## Putting your work out there

The idea of gaining feedback, the focus of Adam Markowitz's article, can be a two-edged sword. We might want to know what others think of our work, but are we prepared to hear the truth? Your friends and family will generally love what you do regardless, that's what they're hopefully there for.

Honest feedback can help but also cause ructions. Who do you blame? The giver or the receiver? Insensitivity versus oversensitivity? Ego versus ego? Mutual respect and objectivity should be key to making it work.

David Upfill-Brown was quoted in *AWR#82* in a profile written by Richard Raffan: 'My first solo exhibition in 1976...was a real eye-opener. I didn't mind the few encouraging reviews, but I definitely did not enjoy some harsh critical observations. The lesson I took from this was that when you put your work out there and so yourself, you must be prepared for harsh criticism'.

So what's the message? Listen to feedback, take it on board, but don't let it rock your world, stay on your own path. If you put your heart and time into your work it's more important to believe you have done your best, and only you will know that.

Anyone who puts their work out there gets my vote, even if in my opinion some things about it could be different.

## Making design happen

If you've ever wondered how a maker with an international reputation brings complex designs to life, Michael Fortune's story is in this issue to give some insight. Using skeleton structures that support and cradle the workpiece, he can determine the angles, curves and even twists required. This doesn't mean we can now all go down to the shed and make an incredibly complex piece (in many ways it's a good argument for getting a teacher), but here at least we can see there is a process. Read Michael's story from p.29.

No matter how many dovetails and 'correct' proportions you throw at a piece, you may still not be happy with the result. Know the rules, but know also how to play with them – that's the theme of Bryan Cush's article 'Breaking the Golden Rule' this issue which offers some strategies for developing your own designs.

## Women woodworkers

For years I've fought against the notion that women woodworkers as a group need highlighting for reasons other than the interest, quality or innovations that their work may present. Historically however women woodworkers have been and still are a minority group, despite the fact there are many prominent women woodworkers.

When I spoke to Leslie Webb for the story on p.64, I was interested to learn about how she got started in her career and also about her design process, but I also asked her about 'the woman thing' and whether it had affected her self belief. Overall, I found her all her comments insightful.

Some time after speaking to Leslie I learnt about the exhibition *Making a Seat at the Table*, see p.76. The work of 43 North American women makers, currently on show until January 18, 2020 celebrates not only a vibrant collection of work, but also a shift in attitudes and directions.

## Don't forget to vote

Just a reminder that Popular Choice voting for our Student Awards opens December 13 – just head to [www.facebook.com/Woodreview/](http://www.facebook.com/Woodreview/)

Wishing you a Happy New Year, and by the way, stayed tuned for 2020, we have some exciting news to announce!

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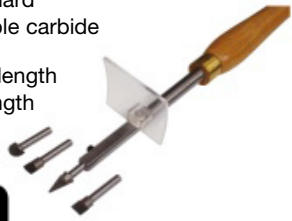


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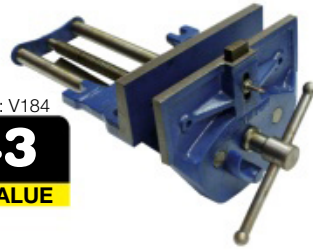
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## For Measuring and Marking

By Neil Erasmus

Most furniture designer makers are suckers for tools, devices and machinery – sometimes even for quaint or exotic fare that we seldom need or use. The range of things I need to make the furniture I offer my clientele is broad, however three tools that I regard as ‘must haves’ and that together cost under \$100 are my 2mm clutch pencil, a dedicated Swiss-made Geddes sharpener, and a JIS 150mm steel rule with stop. My Caran d’Ache pencil, designed in 1929, bears the name of its inventor.

Accuracy is a universal requirement in a fine furniture practice, and this trio gives me all I need to transfer a number in my head directly onto wood in the form of a fine point, or a small line – with an accuracy I’m guessing to be 0.2mm.

### Caran d’Ache Fixpencil

Two millimetre clutch pencils are readily available at art suppliers and stationers in a variety of brand names, and are mostly supplied with built-in sharpeners that barely perform. Caran d’Ache pencils come in a range of colours and carry 130 x 2mm leads that are available in the normal range of graphite grades. As with most clutch pencils, the lead is advanced or retracted by pressing down on the end. Without the pencil holder, the lead on its own is also handy in cramped spaces for transferring dovetail pins to their corresponding tails.



A sharp pencil and an easy to read rule are indispensable in Neil Erasmus’s workshop.

### Geddes Sharpener

As we all know, accuracy is directly related to how sharp the lead is. Sharp pencil leads blunt quickly and need to be quickly and efficiently maintained. The iconic Geddes sharpener is one of those simple but brilliant designs and consists of only four parts. At the heart of the device is an abrasive conical ring around which the extended pencil lead travels. Sharpening with it is as simple as extending the pencil lead about 10mm from the tip of the pencil and sliding it into the hole in the ball on top of the device, then rotating it two or three times to get a needle-sharp point. The lead grindings are contained within the sharpener and emptied out by simply unscrewing the base. No other sharpener comes close in terms of efficiency.

### JIS Steel Rule and Stop

With a brain filled with numbers and a sharp pencil in hand all that’s now needed is a measure. The excellent range of JIS stainless steel rules form the backbone of my measure and mark system, none more so than the smallest 150mm rule which sits alongside my pencil in my apron chest pocket.

A small adjustable stop converts it into a handy mini combination square that gives it a myriad of uses. What sets these rules apart is that both edges are finely but clearly marked in whole millimetres rather than one edge in half-millimetres, which no one on the dark side of sixty can make out. In addition, every 50mm calibration is marked in a bold red number in accumulated centimetres – a very handy quick reference. Another nice feature is that these rules have a clever little kink in the end to lift the tool to help pick it up – so thoughtful in an essential tool.

*Neil Erasmus is a furniture designer/maker in Perth, WA and also teaches woodwork. See [www.erasmusdesigns.com](http://www.erasmusdesigns.com)*

*Caran d’Ache pencils and Geddes sharpener from [www.cultpens.com](http://www.cultpens.com)*

*JIS rules from [www.japanesetools.com.au](http://www.japanesetools.com.au)*

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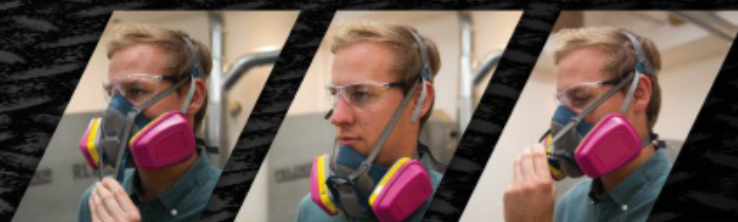
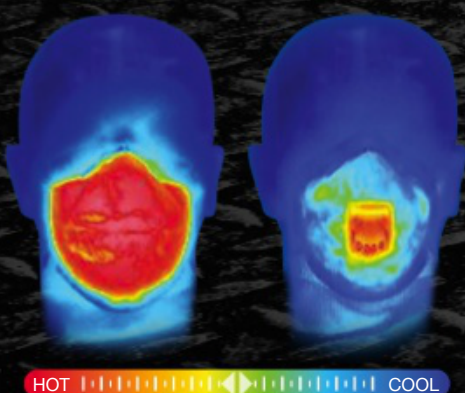
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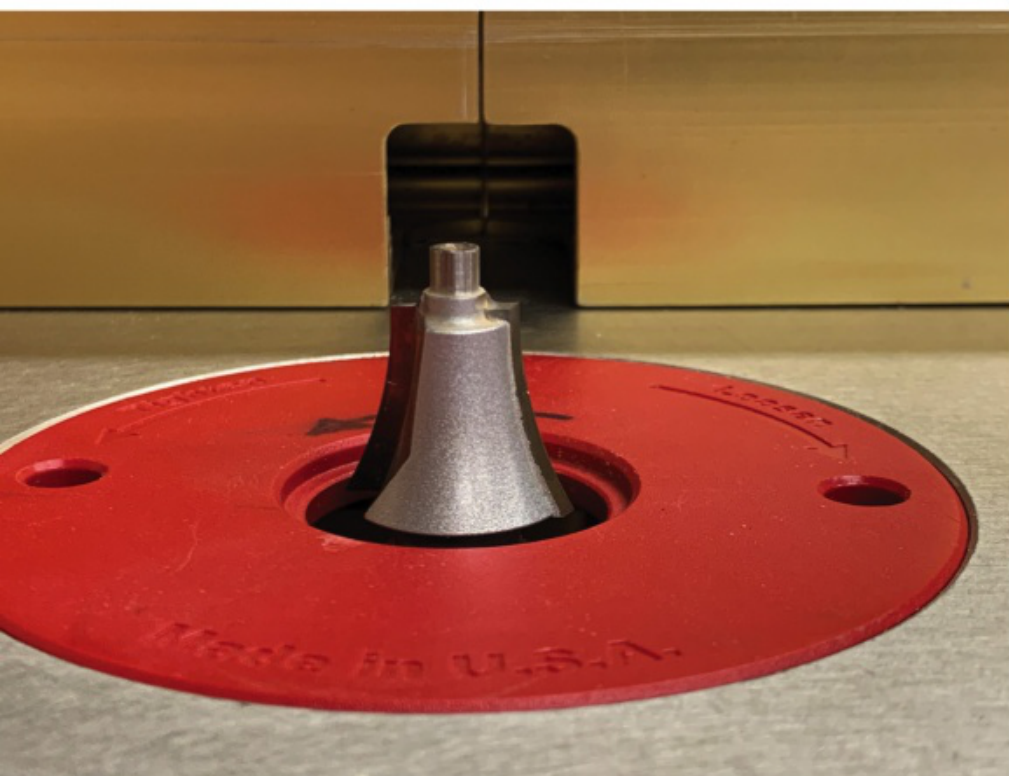
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**From top:** With fine and coarse teeth the Shinto rasp can quickly shape wood regardless of grain direction.

Infinity Tool's Queen Anne router bit can produce a subtle curve.

Bench Dog's Push-Bloc grips surfaces well.

## My Everyday Users

*By Kelly Parker*

We are constantly inundated with ads for new tools and gizmos that manufacturers claim we can't live without. It can be hard to wade through the hype and know if a tool will be truly useful. The following items have proven themselves time and time again and have become go-to tools in my studio. I use them on almost every project. And best of all, they are inexpensive!

### Shinto Saw Rasp

I love my Shinto rasp! Most of my furniture components are highly shaped. Once I remove as much of the waste wood as possible with power tools, the first hand tool I turn to as I start refining the parts is my Shinto.

It looks quite barbaric with all of its teeth bared, but it removes material quite quickly. And, unlike a spokeshave or plane, it doesn't really care about grain direction. It has fine teeth on one side and coarse teeth on the other. I typically use the coarse side because it's so quick. The marks left behind are easily removed with a card scraper. It can also be used to shape non-ferrous metals if you lubricate the teeth with paraffin wax.

I prefer the model with the inline handle rather than the one with the knob in the middle which gets in the way and puts the pressure of the tool in the wrong place. To protect my hands and my work I wrap the end with a couple of strips of tape.

### Queen Anne router bit from Infinity Tools

I have a strict 'no 90' policy in my shop. That means there are no 90° edges on anything I do and every edge gets some sort of profile. What I love about the Queen Anne bit is that it is such a gentle radius and I get a defined hard line at the top and bottom surfaces, which I prefer to a bullnose profile.

Before I found this bit I was buying the biggest round-over bits I could find, but even those radii were smaller than what I wanted. Plus that was a lot of steel swirling at 12,000rpm just so I could get a gentle profile. I tend to use mine without the bearing, instead aligning the cutting tip to the fence on my router table. This gives me a bit more control of the profile.

### Bench Dog Push-Bloc

I find that most push paddles with the rubber on the bottom don't live up to their task. They often slip, creating a dangerous situation. Additionally, because of their design you have to push down to get any purchase, which means you are putting pressure on the infeed table when jointing. The folks at Bench Dog have come up with a gecko-like rubber that actually grips whatever I'm jointing or routing. I feel confident that their push paddles won't slip during use. I've also modified mine so that I can extend a 'foot' when I would like the extra security of a hook.

*Shinto rasp from [www.japanesetools.com.au](http://www.japanesetools.com.au)*

*Queen Anne bit from [www.infinitytools.com](http://www.infinitytools.com)*

*Bench Dog Push-Bloc from [www.rockler.com](http://www.rockler.com)*

*Kelly Parker is a furniture designer maker who lives in Kansas City, USA. Kelly appeared on the cover of AWR#104 and wrote an article about boxmaking. Learn more at [www.woodsongstudio.com](http://www.woodsongstudio.com)*





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## Hafco PT-254S Planer/Thicknesser

*Reviewed by Raf Nathan*

This is quite a robust machine weighing in overall at a hefty 182kg. It comes assembled, bar attaching the fence and some knobs and levers. With its full metal box construction and heavily ribbed planing tables it runs vibration free and relatively quietly.

Best of all, it has a quality 44 tooth carbide-tipped spiral cutterhead. Combined with the 5 metre/minute thicknesser speed, this cutterhead gave a superb finish on cranky blackwood and myrtle, both of which are difficult timbers to plane smoothly.

At 1100mm long the planer tables are sufficient for a machine of this size. The cast iron thicknesser table is large and supported on a large centre column. Capacity is a full 250mm in planing width and 190mm in thicknessing height.

The fence is aluminium and appeared flat and straight, it's not a great fence assembly but does offer easy adjustment and set-up. Certainly I was able to achieve straight and square surfaces on the test wood I machined. Depth of cut adjustment is positive with its large grip wheel, although the depth gauge is way too simple. Likewise the height gauge for thicknessing is just a metal pointer running over a ruler. An aftermarket digital height gauge would be a good investment to mount onto this machine.

Changing from planing to thicknessing is where most combination machines fall a little, either being very slow or



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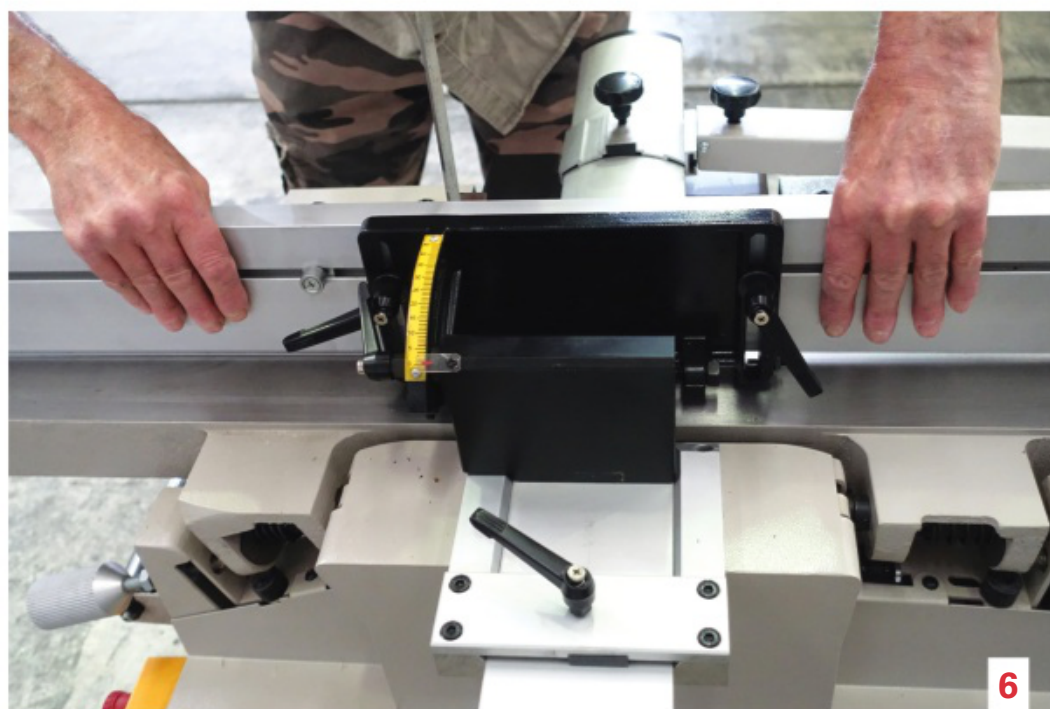
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5. The cast iron thicknesser table is large with 190mm height capacity.
6. The fence assembly offers easy adjustment and set-up.

somewhat fiddly. This is no exception, firstly the guard is swung up and over and then the fence must be removed completely. Once this is done however it's straightforward, swing both tables up and lift the dust chute and you are ready to thickness. Overall it was a 40 second job to change machining modes. There are micro switches to prevent accidental start-up during changeover.

There is ample power available from the 2.2kw (3hp) motor that sailed through the hardwoods I test planed. As mentioned it gives a great finish on various grained hardwoods. There was snipe at both ends of the wood thicknessed so you can expect to have to tune this machine in by way of the adjusting bolts. To be honest any machine

at any price may need fine tuning as part of the initial installation. I am not saying this is good but do allow some set-up time which can be very time consuming. Accuracy across the width of planing was pretty well perfect.

Dust extraction was very good connected up to an extractor with the 100mm outlet. There is a main on/off switch and a secondary stop button at the thicknesser feed side.

This is a price-driven machine to an extent and that is why I guess the fence and some fittings are light duty. It is not a refined machine but look at the price for a powerful machine with a quality spiral cutterhead! Thicknessing is definitely is this machine's main strength. You would pay thousands more for a European-built machine of similar capacity.

*Review machine from Hare & Forbes Machineryhouse, [www.machineryhouse.com.au](http://www.machineryhouse.com.au)*

*Raf Nathan is a Queensland based designer maker.*



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## ProDrill Press Table V3

*Reviewed by James Brook*

All drill presses come with a metal work table and mostly this is sufficient for the majority of your drilling work. I say mostly because for large workpieces or repetitive drilling you may need to bolt on a larger work table made from ply or MDF and possibly rig up a shopmade fence system.

But if you want something better than this with greater accuracy then consider one of these aftermarket drill tables. The base is a large 600 x 400mm section of melamine-faced MDF giving ample support for pretty well all drilling jobs. The melamine is hard wearing, but a hard laminate would improve the work surface.

The base is pre-machined to accept the supplied T-track fittings and the kit comes complete with two T-track clamps, metric scales, sacrificial inserts and best of all, a 915mm long aluminium fence and two flip-stops.

You can fit this to all drill presses, although you will need to add your own ply or MDF packer for the table to clear the winder on the drill press. Having said that, I mounted it to my drill press easily without a packing board by offsetting it slightly. If you have one of the popular Bosch PBD40 drill presses, a \$13 fixing kit will make fitment seamless and simple to remove if needed.

Once installed this kit is a great addition to any drill press. The large table makes things so much easier with its extra support whilst the clamps make for safer and more accurate drilling, particularly for



**Above:** The Prodrill Press Table kit comes with with fixings, clamps, flip stops and sacrificial inserts. The metric scales are not shown but fit over the T-tracks and fence.

smaller pieces of wood. The fence with its two large clamps is fast and easy to set up and the flip-stops are perfect for multiple drilling jobs. The table itself is Australian made and most of the extra fittings are from Woodpeckers in the USA so all up it oozes quality. I liked it a lot. Priced at \$245 the system should pay for itself quite quickly.

The review kit came with two knuckle clamps which at \$70 each can provide some extra holding power.

*Review drill press table from Professional Woodworkers Supplies, [www.woodworksupplies.com.au](http://www.woodworksupplies.com.au)*

*James Brook is a regular contributor to Australian Wood Review magazine.*



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# Product news

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



## Get Square ▲

The ProSquare 4 Set-up is a 17mm thick square that sits flat on the table and is thick enough to align the fence with the fixed rail. It's precision machined from type A bonded plywood and gives a simple and affordable solution that will speed up MFT track saw and other set-ups. At 594 x 394mm it can also be used as a large assembly square. It sells for \$92.50 from Professional Woodworkers Supplies

[www.woodworksupplies.com.au](http://www.woodworksupplies.com.au)

## Old Fashioned ▼ Convenience

The benefits of old fashioned hide glue are its long open time, low creep and long-time reversibility. The old way meant mixing, heating and stirring in pots and containers, but this ready to use formula may offer convenience as well. Available from Titebond resellers.



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**[www.lie-nielsen.com.au](http://www.lie-nielsen.com.au)**



## ◀ The English Curve

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**[www.carbatec.com.au](http://www.carbatec.com.au)**



## ▲ New Mini Pro

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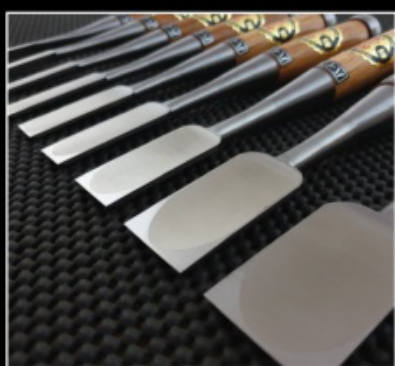
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# Presentation Trays

As a centerpiece, these trays are perfect for displaying fine timbers as well as serving food. Story by Raf Nathan.

The first coat of oil highlights the colour and contrast of the figured blackwood and celery top pine.



For many years I have been making various sized trays. Wood can be the star of your design, or you can use less featured woods to showcase your joinery. Over the years I've made many one-off trays and also produced production runs that have sold in galleries and shops.

One of my original lines was about 300 x 140mm and I called them 'sushi' trays. They are still reasonably popular and have morphed over time into slightly different designs and sizes. The project here however is for a larger unit that can be used as a centrepiece or large tray.

### Breadboard ends

Going back hundreds of years, traditional refectory style tables often employ what are called breadboard ends that give a very clean look to the design. The end caps cover the endgrain of the main panel but still have allowance for the panel to move across its width with moisture changes.

Personally I like breadboard ends but do find them quite challenging to build. For a tabletop you can have a small tongue and groove to locate the panel and end cap, and then use multiple large tenons that fit in wider mortises in the end caps. The panel is glued in the middle only with the outer sides free to move, yet restrained by the pins fitting in slots in the tenons. You can also offset the pin a little so that it draws the two pieces together in a technique that is called draw-boring.

Given that this is only a small tray in comparison to a large table I have stripped back the construction but still have the outer tenons restrained with pins in slotted holes. The domino tool was used here.

### Preparing the timber

I've had the figured blackwood used here for a few years, odd pieces crying out to be used. Celery top pine is



a favourite wood and makes a nice contrast to the dark blackwood.

The first step was to machine wood for the panel but leave it a little thicker and longer than the final sizes would be. The two pieces of blackwood used are 125mm wide with 5mm wide celery top pine glued

at the sides and down the centre. All the wood is 18mm thick.

The panels were assembled, and after the glue had dried, they were planed down to final thickness, in this case 16mm. At this point the end caps were also machined – these are 55mm wide and 16mm thick.





Next the panel was fine sawn to length at 390mm. The end caps were sawn to 265mm long which is the same as the width of the panel. The process of joining the breadboard ends to the panel is shown step by step in the photos.

#### Photo 1

Lay the panel and end caps out flat. Position the dominos and mark where the mortises will be made with the domino tool.

#### Photo 2

The end caps were clamped to the bench and the mortises cut. The two outside mortises were made wider to allow for wood movement.

#### Photo 3

Corresponding mortises were next cut with the domino tool in the panel ends.





#### Photo 4

The dominos were then glued into the panel. The caps were then dry fitted on to the dominos in order to mark where the holes for the pins (dowels) would be. In this case I used Miller dowels made of American walnut to match the colour of the blackwood. You can use common dowels or even use Japanese wooden nails. You can also get a dowel plate (i.e a metal plate with differently sized holes) and make your own dowels. Matching the colour of the dowels to the panel helps the look.

#### Photo 5

With the end caps dry fitted you can now drill holes for the dowels on the drill press. Note: only the outer dominos are pinned. The centre 'dowel' or 'pin' you can see in the main photo on p.24 is a small piece of dowel glued into a 5mm deep hole that is later sawn off. This was done purely to add an extra detail as it looks better.

#### Photo 6

You can see in the photos the dowel holes are a bit elongated – I did this by wiggling the wood on the drill bit. This means the pin will hold the domino in place but allows sideways movement for wood moisture changes.



#### Photo 7

It's very important to plane the end caps a tiny bit just in the middle. This is to give a slight 'spring' to the joint between the cap and panel. What happens is that on assembly the centre is glued and a clamp applied to pull the cap in tight. The 'spring' ensures the ends remain tight.

#### Photo 8

I used a block plane to add a small chamfer to the end caps. Keep it even by taking the same number of strokes on each side. The chamfer is applied

here because over time the panel and cap will move slightly and the chamfer will hide any movement.

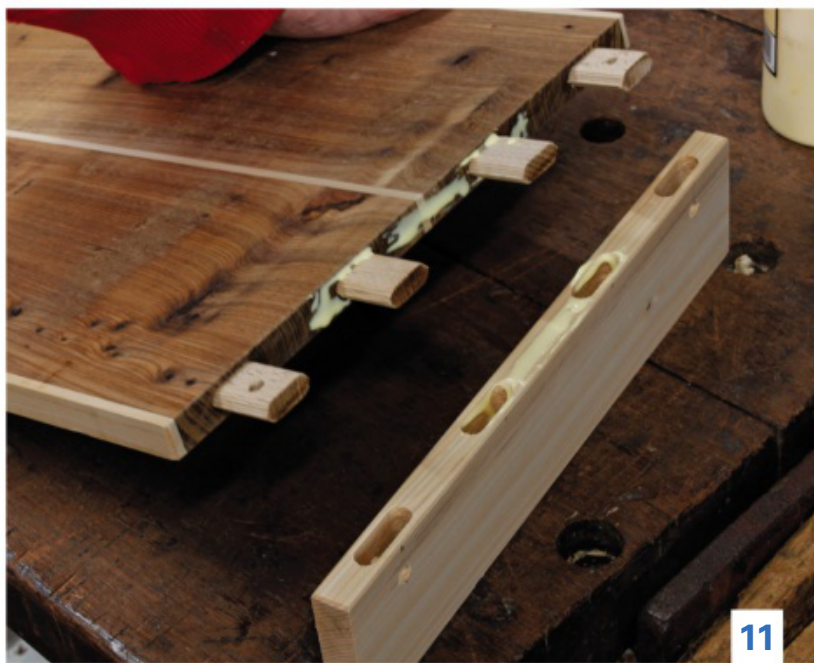
#### Photo 9

The same block plane was also used to chamfer the ends of the panel. Plane from both direction towards the centre to avoid blowing out the grain on the ends.

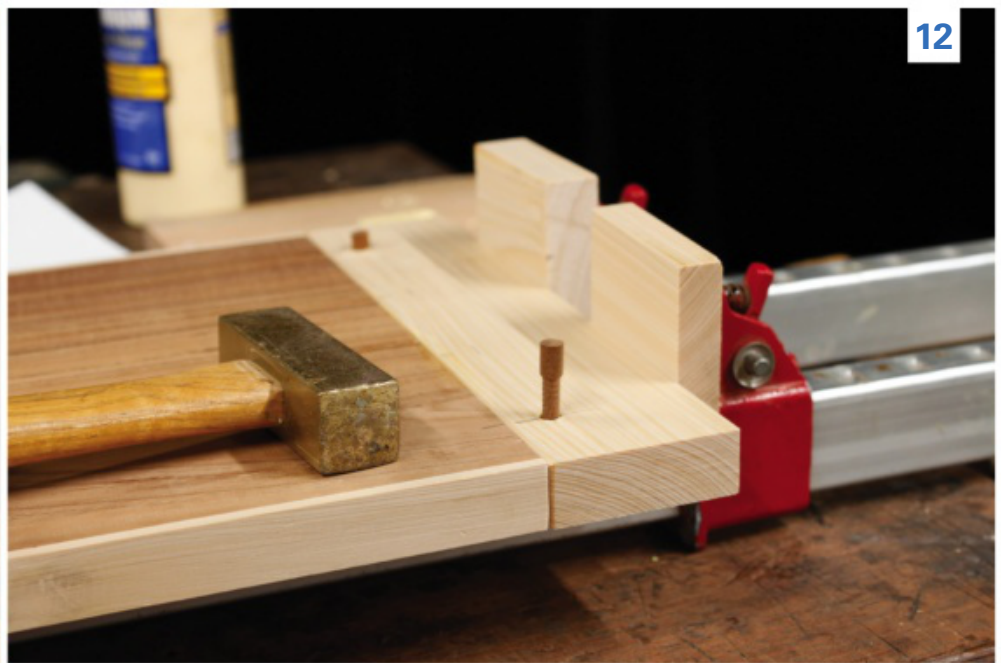
#### Photo 10

Almost ready to assemble with glue. Clear a space and get all the things you need together: glue, clamps and rags to clean up any squeeze-out.





11



12



13



14

#### Photo 11

Lets glue! Note that glue is only applied in the centre of the panel

#### Photo 12

Clamp everything flat and true. I applied glue for the pins in the end caps but ensured that the glue did not contact the domino because we want this to be able to move. At this point you can see that the pin in the middle of the end caps has not been added yet. Once again these were added purely for visual effect.

#### Photo 13

Making things in batches is an efficient use of time. It didn't take much longer to machine up wood for three trays than it would have for one. Here you can see three trays all glued up.

#### Photo 14

I used a birdseye figured blackwood for one of the tray panels and this needed to have small holes filled. For this I used a water based putty. You may need to adjust the colour of the putty although for this tray I used an 'ebony' colour to match the small knot holes in the blackwood.

The final polishing was done using a hardwax oil, although as always the choice of polish is up to you.

*Photos: Raf Nathan*



*Raf Nathan is a woodworker and tool designer who lives near Brisbane. Email: raf@interwoodshop.com.au*



# Anything But Square

**Michael Fortune describes the technique of creating endo- and exoskeletons, support structures which enable the construction of furniture with curved and angled components.**



Michael Fortune cutting a curved support for his *Geneva Sofa Table* in his workshop in Ontario, Canada. Michael's ability to create curved and angled furniture and the jigs used in thereof is legendary.

**M**achines and even hand tools are most comfortable creating flat surfaces at right angles to one another. Blades, fences, and tables do tilt but the starting reference is always 90°.

Most technical drawings used to describe an object work with the same principle, there's a front, top and side view all at right angles to one another.

When furniture and the various components are no longer at right angles and begin veering into curved or angled forms the construction certainly becomes more challenging.

Formulas or computer programs for calculating compound inclines are available but I avoid them because the resulting numbers still have to be tried, often more than once, to the part or machine or hand tool surfaces.



1. *Chair Number One* is one of Michael Fortune's best known designs. This photo shows the endoskeleton used to construct it.
2. Chair Number 101 – almost 500 of these chairs have now been made using jigs and skeleton supports.
- 3, 4. The author's *Clarkson Chairs* were a private commission designed from a plan view drawing of the seat which led to making the endo-skeleton shown. These structures are glued rather than screwed together.



Working with wood is often a subtractive process so I like to get it right first time around. I am often using steambent or laminated parts, so it's not practical to just get another piece of wood.

Instead I've come to rely on a method that takes advantage of the predisposition of our tools and ourselves, to reference from 'square'. I use this approach for one-off furniture or furniture that I may reproduce in the future. The platform and skeletons are not always required again because the jigs that have been made can be used on their own.

## How this works

Everything we make can fit in an imaginary crate. If the crate is sitting perfectly flat, i.e. dead level and all the sides are square to one another then the 'crate' can be used as the reference for measuring any angle or joint within. If it is an actual crate it will be in the way and you can't see the surfaces or joints you wish to create. To get around this I make the crate into a frame like structure I call an exoskeleton.

With some objects an exoskeleton is not useful but an interior structure, an endoskeleton, still based on 'square' may be more appropriate. The skeletons are always made in a manner that allows them to be disassembled and altered as necessary once the design begins to take shape.

An important part of either method is working from a centreline. Early on I make the decision to only measure





the left or right side, if both are measured they will inevitably be slightly different. That will undoubtedly complicate the construction. Even if the object is asymmetrical these lines or planes can be created anywhere and will be useful references.

Making the platform level gives you the option to put a plan view drawing of your object on it and drop plumb lines from any point to the drawing. This is an accurate way to determine if your furniture is twisting or leaning in an unforeseen way.

Having used this method for decades to create curved and inclined planes in my furniture I have come to the conclusion that the time I spend upfront making the endo/exo structures is easily recovered in time saved fussing, fitting or remaking parts. Even prototype projects are made this way, just not as exact. But it does give me a heads up when I'm making the real thing.

## Making chairs

Most dining chairs will fit on a platform 800 x 800mm. This reusable platform is constructed on a stable base that can be anchored to the floor. I recommend the top be made of 25mm thick MDF or two pieces of 12mm ply glued together.

The surface should be at a comfortable working height; for me (height 1775mm) that is 600mm. The platform surface is adjusted to dead level with four 8mm hanger bolts. The adjusting nuts are below the surface so they are never in the way. Use a level diagonally to level the platform. A centreline runs down the middle and is surrounded by 50mm grid lines.

For chairs, the height of the endo or exo skeleton depends on the chair and where the complicated joinery is. Sometimes it's a combination, an exoskeleton for the back and a short endoskeleton for the seat and arms.

While the platform and base remains the same the skeletons can be quite different. A common, and very important detail is the centreline that moves in three dimensions from front to back, up and over the skeletons. All measurements are made left and right from the centreline but only the measurements from one side are actually used. They will undoubtedly be slightly different (the nature of working with wood). If the dimensions and angles are different sizes the project will begin 'tilting in the wind'.

## Chair Number One

This chair was first designed in 1979 with the view that I would continue to make them in the following years. I'm approaching 500 of these chairs. Again nothing is square or even straight – except the jigs that were made to hold the curved parts. The joinery for the curved crest rail, rear seat stretcher and lower stretcher is all square or parallel to the centreline of the chair. All of the compound angles were picked up from either the endoskeleton or the platform.

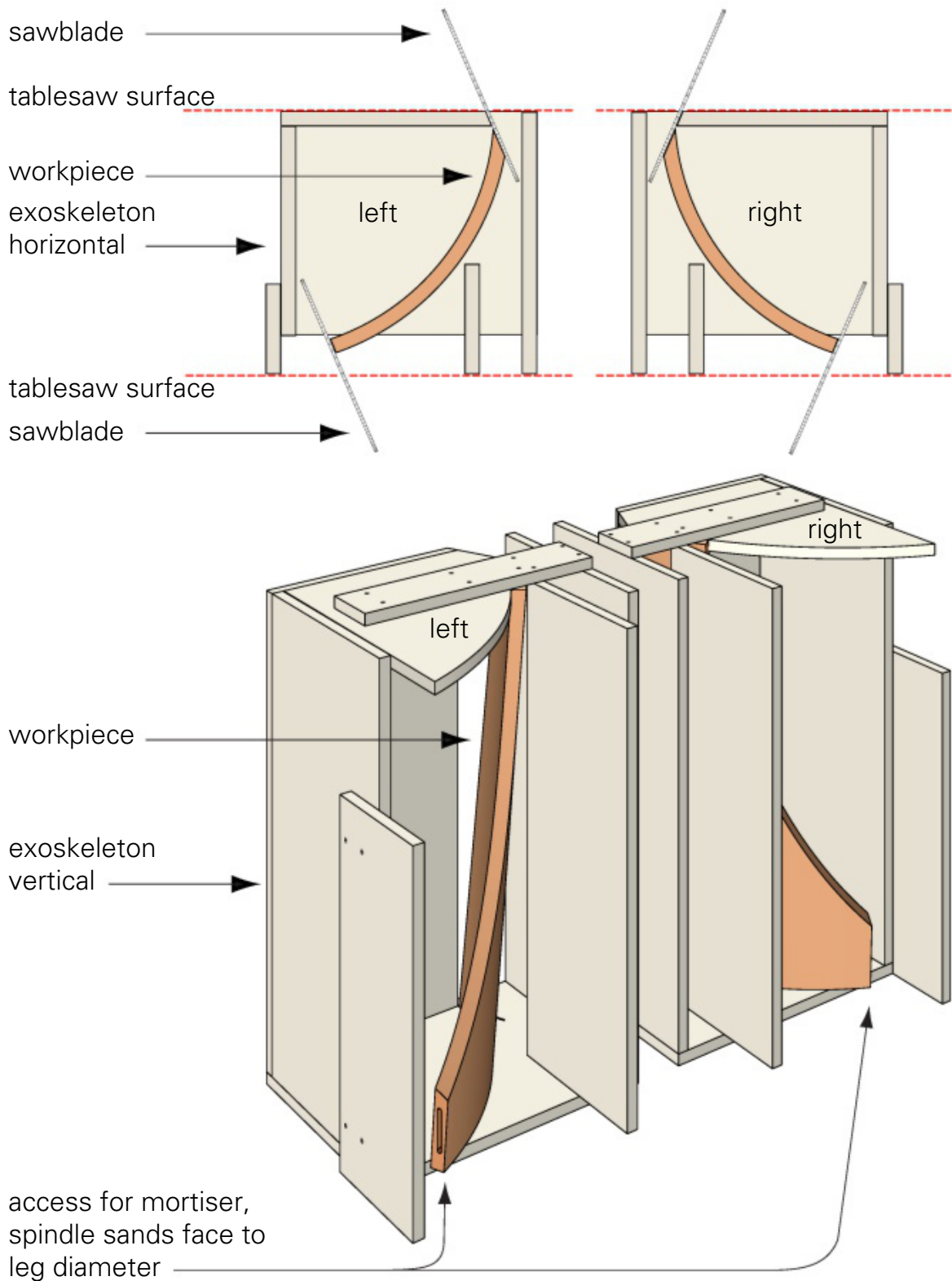


A series of left and right square boxes were made to hold the parts in a manner that routers and drill presses could create the joinery. Using the resulting jigs to cut the various joints for a set of twelve chairs makes short work of the fabrication process. That gives me the time to enjoy hand shaping every surface on the chairs.

## Clarkson Chairs

The first chair prototype for the *Clarkson Chairs* was started with a marginal plan view drawing of the seat to give the splay of the seat frame as it related to the centreline. That led to an endoskeleton that positioned the steambent seat frame and front legs. It was positioned by using the routed out hole in the plywood that later supported the upholstery.

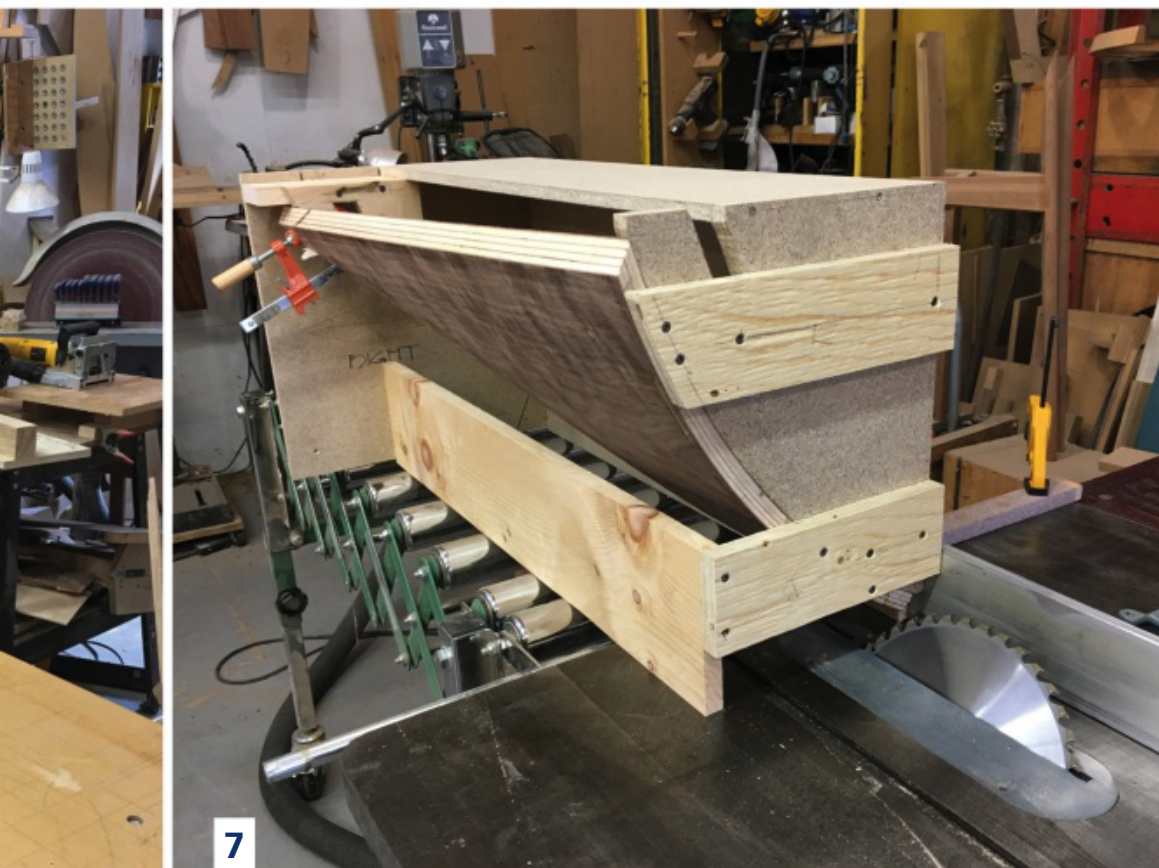




- 5. Angles for the flowing lines and curves of the *Bird's Wing Table* were determined through the use of both endo- and exoskeleton structures.
- 6. The skeleton structure starts with supports screwed to a platform marked with 50mm grid lines.
- 7. The halves of the exoskeleton double as tablesaw cradles for cutting their long mitres at angles which vary according to their tilt.
- 8. Showing the side panels for the *Bird's Wing Table* supported by two halves of an exo skeleton.
- 9. Cutting mitres on the centre panel, once again using part of the exoskeleton as a cradle on the tablesaw.

**Left:** Plan view and constructional diagrams for the *Bird's Wing Table* skeleton supports show how the vacuum formed panels are both angled and twist.



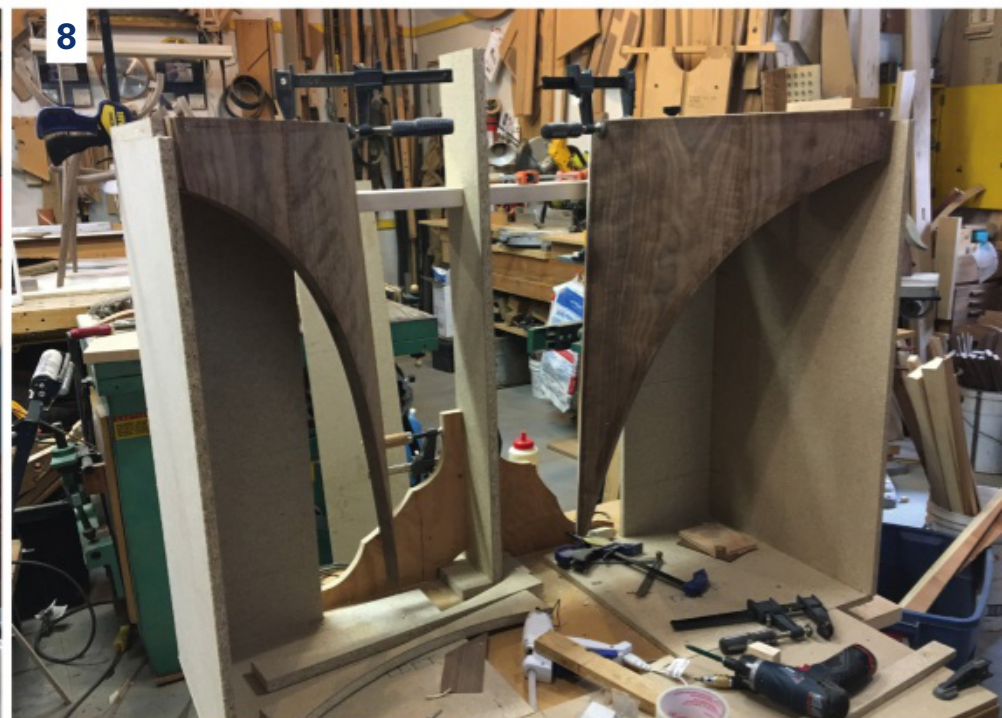


The top of the endoskeleton tilted back at 5° to make the seat more comfortable. The bent seat frame splayed away from the centreline and the legs canted back 3°. An angled plywood interior floating tenon provided the necessary strength for this critical joint. The curved front stretcher was doweled to the inside of the bent seat frame so it did not interfere with the existing tenons joining the seat to the front legs.

The angles for the front stretcher were taken right off the endoskeleton and cut on a drop saw. The back was a vacuum formed compound shape that had to attach to the rear of the bentwood seat frame. Both shapes were anything but square. To solve the problem the holder for the chair back within the exoskeleton slid forward as the various surfaces were hand shaped until a perfect fit was made. Trying to mate the surfaces without the controlled movement provided by the exoskeleton would surely mean the back angle would not be consistent from one chair to the next.

## Tables of all types

Tables are made in all sizes. The platform should be larger than the object by at least 250mm all around. This allows for attaching an exo framework should it be necessary. Originally I made the platform as a custom item for each table. Experience showed me that most side tables would fit on a platform 800mm wide and 2300 long. Dining tables often used a platform 1500 x 2500mm. Whatever the size of the platform it has to be a reliable, stable and level surface. Again the workable height off the floor should be about 600mm.



The actual height of the endo or exoskeleton is determined by the design of the table which should take into consideration the base that supports the top. Most frequently my skeletons come up to the underside of the top. Cut-outs or add-ons accommodate the structure that makes up the base.

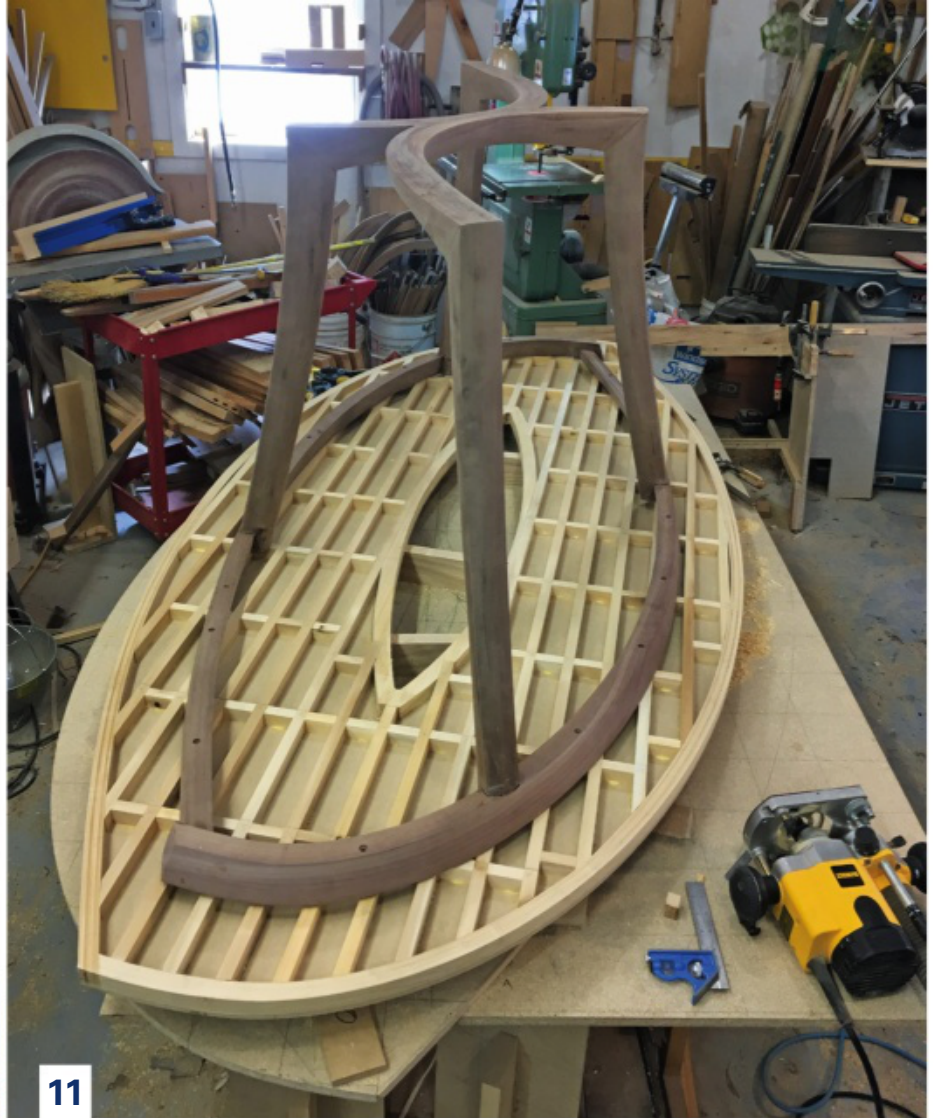
## Bird's Wing Side Table

This table was made by joining three curved vacuum formed panels. All were the same radius. An exoskeleton located the curves and held each in a manner that I could

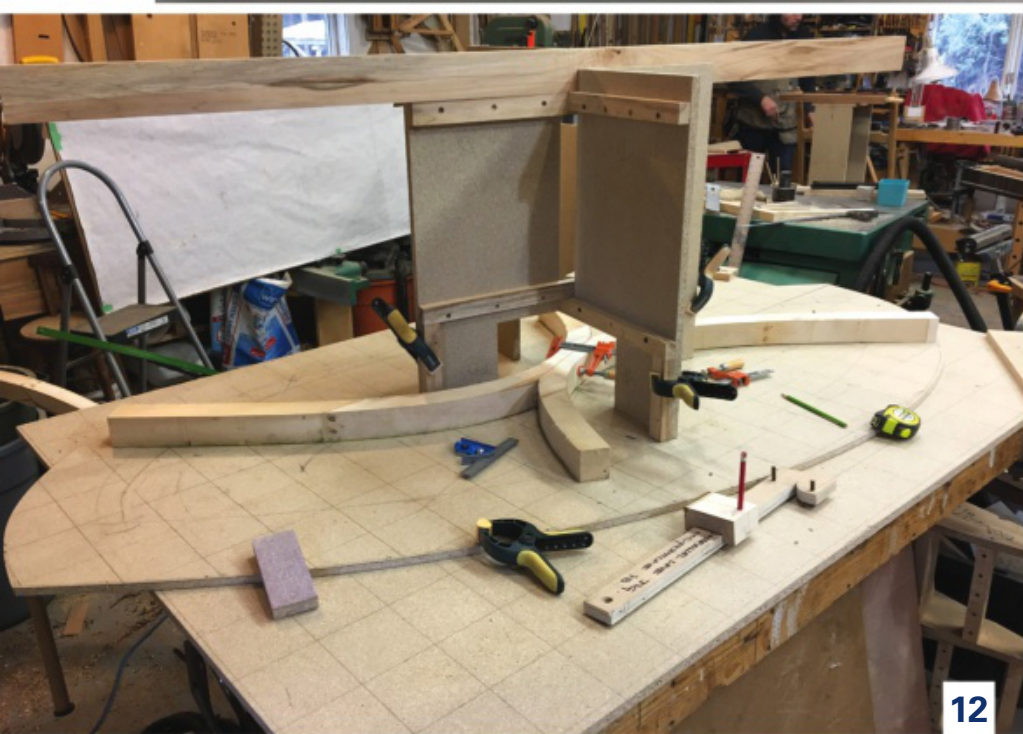




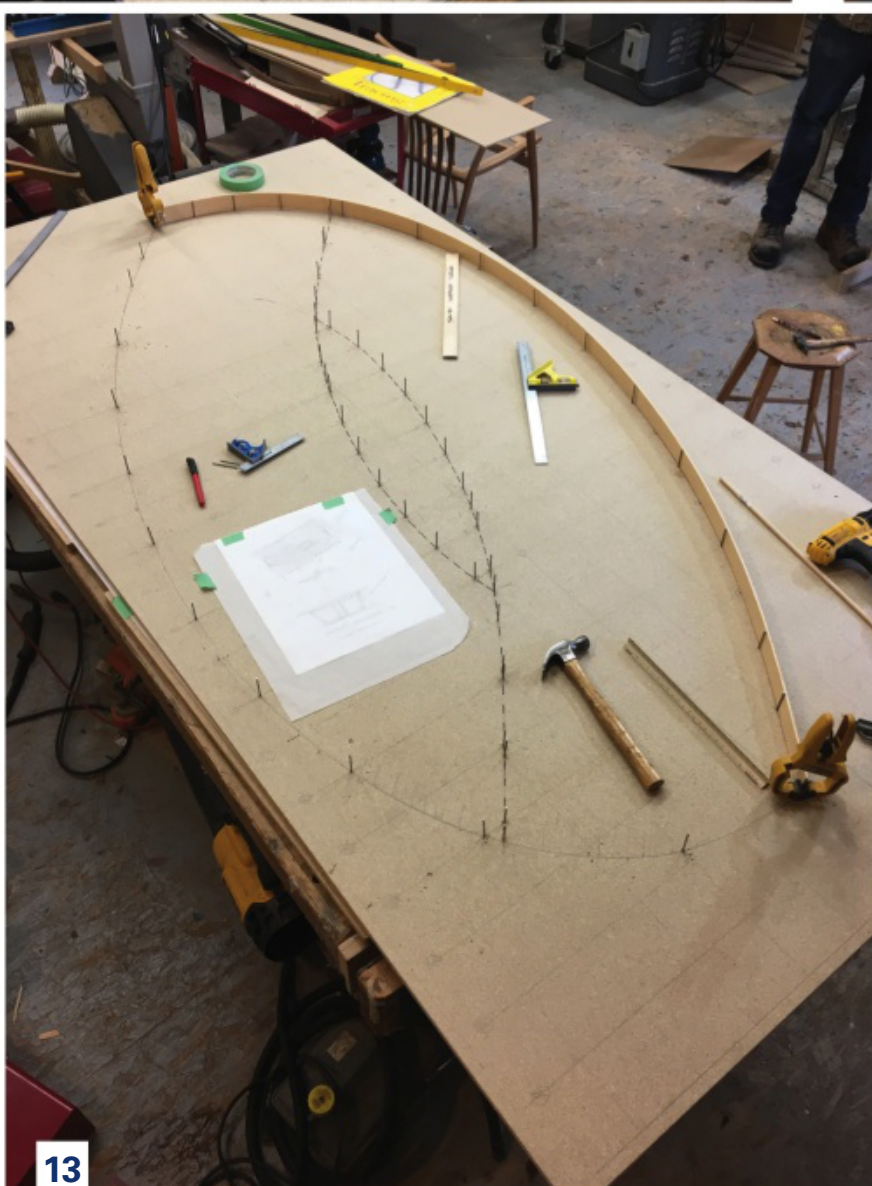
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12



13

determine the angles for joints cut on the tablesaw. Using the centreline to measure the symmetrical intersections was very important for this piece. The rear curve was perfectly upright but as soon as tapers were cut on either side it meant the joining side parts were tilted.

Tablesaw jigs were made to cut the long mitres. The size of the jigs and the angle of the tablesaw cut were determined by the measurements taken from the exoskeleton. The top of the exoskeleton was flat, important because the underside of the top installed later was flat. A flush cut saw was used on the top of the exoskeleton surface. Two layers of tape keep the saw slightly off so any imperfection could be block planed.

The joint faces and mortises between the front legs and the side curves were also done with the curves trapped in the exoskeletons. Biscuits were used here for the joinery. The angles for the clamping cauls came right off the endoskeleton.

## Leaf Dining Table

The top on this table is a rather unusual shape, the centreline here is at an angle which is symmetrical from the points at either end. The table was drawn full size on paper which was taped to the platform.

Every shape or joint was measured from that centreline which in turn was plotted on the platform. I used a piece of thin straight-grained wood to draw the curves. That said, it would always bend differently every time I used it. The grid on the platform gave me the ability get perfect symmetry to the diagonal centreline.

The curves on the floor are steambent walnut, 50 x 65mm thick. The apron was about the same dimension but the



14



10. The *Leaf Dining Table* has a steambent walnut frame and torsion box top veneered in figured sycamore with marquetry detailing.
11. Showing the almost complete base and torsion box top understructure.
12. Diagonally opposite and identical 'legs' were steambent and joined with angles lifted directly from the exoskeleton.
13. From a full size drawing every shape and joint was measured from a centreline and plotted on the exoskeleton platform.
- 14, 15. *Geneva Sofa Table*. Catenary curves for the central support were drawn from a suspended chain and once again full size drawings were used to produce the support skeletons shown.

angled cross-section shape was bandsawn after the wood had set. I steambend solid wood in a manner that gives me identical parts exactly to the form that I have made.

Diagonally opposite legs are identical in shape and joinery. I only had to figure out the joinery on two not four because the endoskeleton provided that level of accuracy. I rarely knew any numbers for various angles because I lifted the angles right from the exoskeleton with the adjustable bevels and moved the bevels to the drop saw. A test cut was made to confirm the angles before cutting into the expensive walnut.

## Geneva Sofa Table

There were two centrelines on this project, one for the front view and one for end view. Both provided critical measuring points. I started with a full size drawing because all of the curves required bending forms.

The endoskeleton helped me relate the shapes and curves that were located on the floor with those that were attached to the tabletop. The curves all converged in one place so it was important to locate them precisely.

## Why I make things

I design and make furniture from the perspective of wanting to explore forms, details and techniques that I would like to know more about. When I'm sketching ideas I am looking for new forms that interest me, not those that I already know how to do.

Each piece I make is part of a puzzle for me about the furniture making, the joyous reality is the puzzle will never be completed, there's always more to learn.

*Diagram redrawn by Graham Sands*



Michael Fortune is an internationally renowned Canadian furniture designer maker and also a highly regarded teacher. From January to February 2020 Michael will conduct an open studio and masterclasses at the Centre for Fine Woodworking in Nelson, New Zealand. Learn more at [www.michaelfortune.com](http://www.michaelfortune.com)



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# Through a Contemporary Lens

**Rick Knopke is an accomplished furniture designer maker whose work transposes the art of marquetry into a modern vernacular. Linda Nathan asked Rick about sustaining a career in woodworking, about mastering skills, and about applying new technology to traditional processes.**

*During your 45 years producing high end cabinetry and furniture you say you've had no press or media exposure to speak of and in fact have never sought any. You've also stayed out of the network so to speak. Why have you chosen to keep what some might say was a low profile?*

During the first thirty or so years I was responding to the needs of the market, making stuff that people needed rather than wanted. I found work in what is now called an organic way – personal connection and referrals from previous clients – so the need for other types of exposure was not there. Self-promotion is a minefield, and with the work I have been doing lately, which would benefit from greater exposure, I have preferred to proceed without the help of the media. I not only like but need to work in a long interrupted stream; experience has shown me that that is the only way I can accomplish what I want to do. Building a profile requires time and effort, and I have not made that effort. This is largely because I am at the end of my working life, there is no tomorrow.

*Furniture making is a notoriously difficult realm to make a decent living in. How did you manage to establish your clientele and create a sustainable career? What are your guiding principles in this regard?*

I came to Western Australia in late 1979. Within two years I had joined forces with two other people, one a salesperson and the other an administrator, both of whom wanted to enter the industry I was already familiar with. Together we rapidly built a sound business, first in shopfitting and then shortly after in office fitting. The State economy at that time was very robust and there was, we found, an endless supply of low-hanging fruit. This situation was an anomaly, if you weren't here at the time you would find it hard to believe. Incredibly, these conditions were replicated during the mining boom a decade or so later, so I fell on my feet there. Currently, our local economy is less distorted, but I conduct and sustain business as I always have; the guiding principles include having a strong personal relationship with the client, having a flawless product and creating an interesting, positive experience around the







transaction. This last point is value adding which requires little actual effort, but pays a large dividend. I learned early on that a smile, direct eye contact and a firm handshake go a long way.

*You started your career in the traditional manner as an apprentice but gave that away after a couple of weeks. Why was that and how did you then acquire skills and gain employment in the industry?*

I dropped out of tertiary study, so I was already a lot older than the typical apprentice. I was also an independent type with well-formed ideas of what constituted a reasonable proposition. Without exaggeration, the man charged with training me knew nothing despite how well he had talked at

my initial interview with him. The plan for me was not going to include anything meaningful.

I immediately quit and went to work for another local cabinetmaker who wanted reliable steady employees but could not offer an apprenticeship. I'd been fooling around in my garage for years as a kid and managed to learn all or most of what there was to learn within a year or so, since they were working at a fairly rudimentary level. The proprietor wanted me to run his business, with six employees, while he went to England for a holiday, so I had his confidence. More to the point, his confidence gave me confidence, but I didn't think I was ready to do as he asked.



**Above:** *Fish Cabinet*, shades of black and grey depict a school of fish.

**Left:** *Take Five AV Cabinet* with wave patterned marquetry in two cuts of walnut and Carpathian elm.





I quit, got in my old beat-up car and drove to Melbourne, which was like going to another planet without leaving Earth. I'd never been there and knew no one; I was being entirely impulsive. It was the first of many cliffs I was to throw myself off. I applied for and got a job with an exhibition display firm, kept my eyes open and my mouth shut and learned fast. Six months later I went to work for a shopfitter specialising in upmarket retail and I was away. I was never asked for my qualifications nor judged by any measure other than performance on the job, and I made a point of fitting in socially as anyone would do.

*You mentioned that learning skills was 'a process of self-examination' and that 'your commitment is tested at every turn'. Can you expand on that? What would you say were the most important things to observe when attempting to develop skills or achieve mastery?*

When anyone is starting out they're coming up against a lot of things all at the very same time. First, you're learning how to work. I don't mean the specifics of your craft, I mean you're learning how to apply the energy and time you have in an ordered, disciplined way. You have to get this right, because you're going to have to sustain your effort.

Second, you need motivation. While in Melbourne during the 70s and unsure of my next move, I encountered Paul J Meyer (Google him) whose definition of motivation is 'the progressive realisation of a worthwhile achievable goal'. This was a pivotal moment for me. I followed his methods, listed the pros and cons of my goals, and produced a refined list which formed a framework for me to work within. I have continued to add to and refine the list, and I have remained motivated.

Third, you have to be fearless in proceeding with your plan. Complacency is death; if you feel it coming on you need to find the deep end of a new area and throw yourself in. If you think you've arrived, you haven't arrived. If you examine your needs and identify your weaknesses you'll know what to do to rectify your shortcomings. The commitment



**Clockwise from top left:** *Lizard Cabinet*, maple, cherry and Karelian birch; *Malvina Cabinet*, two cuts of walnut and Carpathian elm; *George Cabinet* (full view and detail), walnut and Carpathian elm; *Lizard Sideboard*, ebonised poplar, silky oak and silver ash; *Noone Cabinet* in furmed eucalypt and stained beech.







thing? See above; if you get on top of those things, you're committed, and getting on top of them will test you.

*You went out on your own in the 80s after moving from Melbourne to Perth. What was the scene like for a maker in those days?*

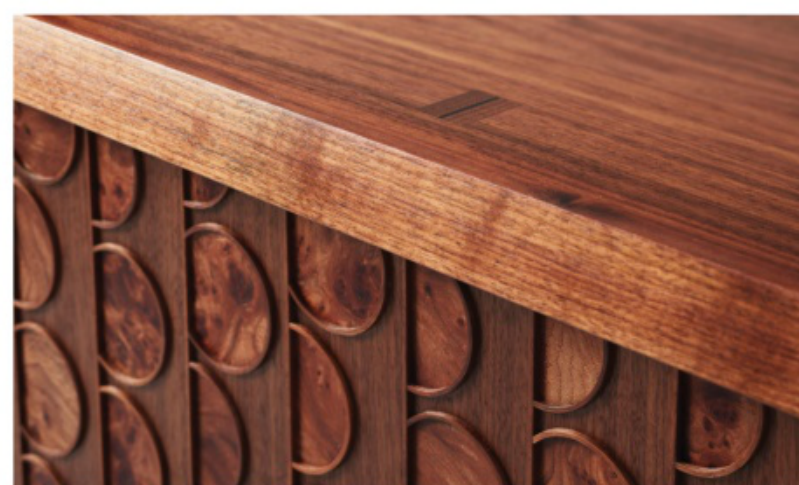
When I arrived, the first independent furniture maker I encountered was Greg Collins, who has now been gone some time. He was doing some nice work, as was Michael Lanyon. A fairly robust local manufacturing scene was being gutted by the removal of tariffs on imports. That was decades ago.

The Australian scene has been revived by a new generation; I hope that collectively it survives long term, that the young men and women currently working in the field will have the opportunity to grow old doing what they love. I'm in a position to know that what was possible in the past is generally not possible now. The good news is that the converse is also true.

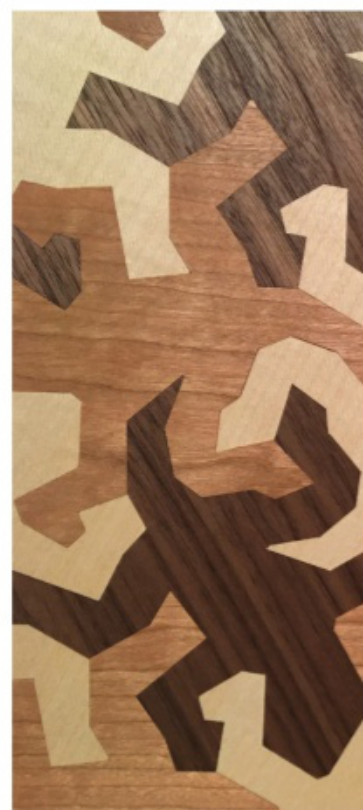
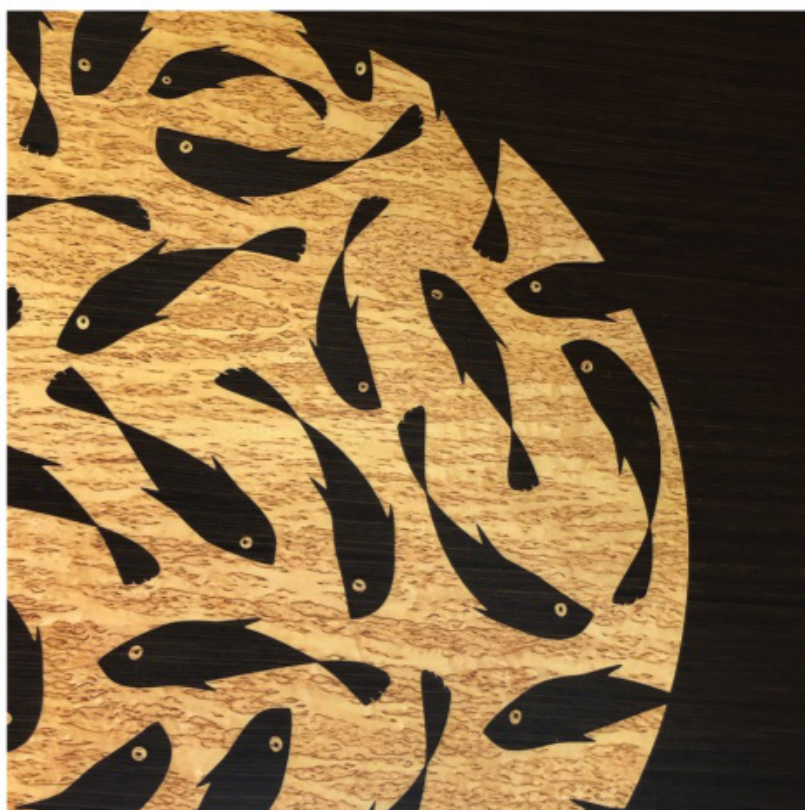
*When and why did your work take a new direction, most notably with the marquetry that now sets it apart?*

By the early 1990s my relationship with my business partners was beginning to fail. I'd become financially secure, I had three thriving children and the impending need for at least another ten years of steady substantial income to see them through to independence. I started a new business with my wife as partner, and this vehicle has served us well.

After fifteen years of further consolidation, I was ready to break out again. I travelled for a while and then spent a few months experimenting with veneer and learning about CNC programming and so on. During these few months, I had time to reflect on everything I'd done to date. I'd assimilated my experiences fully and realised that after thirty years of practice my head, hands and heart were well







Detail views of Rick Knopke's contemporary marquetry designs show many influences, from prehistoric rock art through to pop art and Escher.

connected, that I had something I wanted to say, and that I wanted to say it with marquetry. As Arthur Seigneur\*, whose work I admire enormously would say, I wanted to look at a traditional medium through a contemporary lens.

*What do you say to people who challenge your use of CNC as being 'inauthentic'?*

Authentic means 'of undisputed origin; genuine'. The work fits both descriptors. There is no way you would mistake what I'm doing for hand-cut, sand shaded marquetry, which can be lovely. What I am doing simply could not be done without CNC, period.

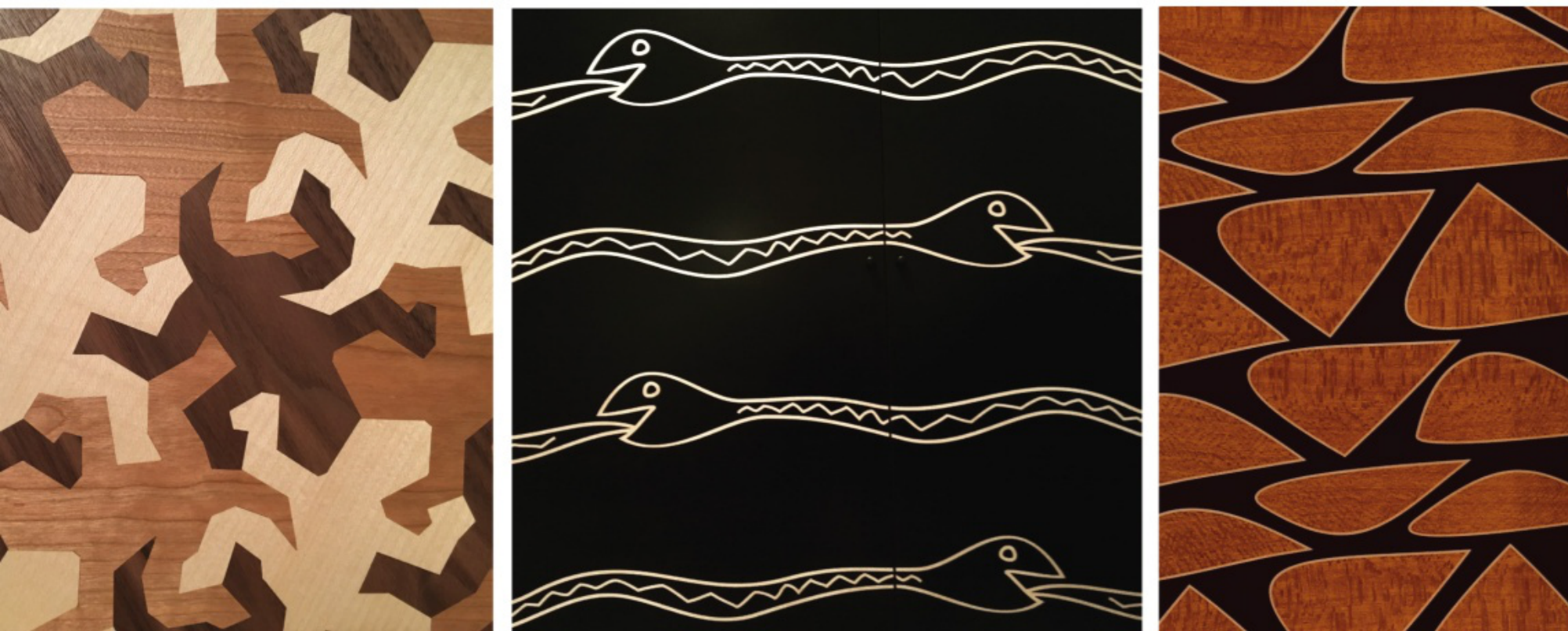
*You're obviously a perfectionist and pretty driven...?*

Yes, I'm as driven as you can be, but I'm also very loose. I've worked on my mental practice all along, because you can't get there being tight. You can only achieve your objectives by being loose and by being willing to lose it all, which you may. Everyone's experience will be different. Ideals are just that, ideals. They are to be reached for, periodically pulled apart and re-examined in the light of current circumstance. I've never gone to the edge over some disappointment, although I know where the edge is.

*What do you mean by being loose?*

Perhaps fluid would be a better word. You've got to simultaneously care and not care, to be right on top of detail and process without doing it with an obsessive attitude. A concert violinist will have made millions of bow strokes before he or she makes the cut, each stroke ostensibly like the last but always with an incremental improvement in control, one stroke at a time. It is helpful to take a similar approach if you're a maker. The endless sanding, the potentially dull repetitive steps, identify them as your bow strokes, your way up. Stay loose, enjoy it, it's your life.





*How do you feel other people regard your work?*

Broadly, I don't know. Several people whom I regard well have made positive comments on my Instagram posts. The people who buy the work clearly like it and Gallows Gallery, the West Australian gallery which represents me reports that the response from the public is positive. The sales are certainly there. Whether the arbiters of taste or informed critics regard it positively is something I've yet to hear.

*Your marquetry designs show many influences, from prehistoric rock art through to pop art and Escher. How do you define your style and what is it you are trying to convey in your work?*

I'm not sure there is a style there to define. I am myself a mid-century artefact; all the wonderful and not so wonderful stuff of the twentieth century has formed the bedrock of my life experience. I'm not a creature of the city; I was born and raised and came to early adulthood in the wilds of Far

North Queensland, a truly amazing place whose influence has never left me. The natural world is something that I am very familiar and comfortable with. What I am trying to convey is the energy and vitality I feel as a result of a lifetime of shovelling lots of different types of grist into my own mill.

*What would be the most valuable advice you could give other makers, both amateur and professional?*

If it is not serving you or sustaining you, let it go.

*Photos: Robert Frith*

*\* Arthur Seigneur is a French-born straw marquetry artist who lives and works in Sydney.*

*Contact Rick Knopke via Instagram @rick\_knopke  
Rick Knopke's work is available through Gallows Gallery, Perth, WA. See [www.gallowsgallery.com/rickknopke](http://www.gallowsgallery.com/rickknopke)*







# The Midi with the Most

**Not too small, not too big, but just right. Andrew Potocnik went in search of the goldilocks solution for an all-rounder lathe.**

If you're new to woodturning and looking for a lathe to get you started but also keep up with demands as your skills and exploration of turning develop, a 'midi' could be just what you're looking for. Alternatively, you may just be looking for a back up lathe that doesn't take up too much space but has the oomph and features of a full size lathe – in this case the midi could also be the solution.

## What is a 'midi' lathe?

Nowadays the line between definitions can be blurred either by

the capacity of the machine and its overall size, as well as the marketing of retailers, so here's a summary of what my research found.

A midi generally has a swing of at least 300mm, distance between centres somewhere in the 400–500mm range, and many features of a full sized lathe such as #2 morse tapers and a standard thread size that will accommodate chucks and faceplates suited to full sized lathes. In addition, the footprint of these lathes takes up much less space and they can be

mounted directly to a bench or a dedicated stand.

A midi-lathe will have a single phase motor somewhere between 3/4 and 1hp that can be plugged into a standard household power point. Its capacity enables turning of decent sized bowls and other faceplate items, and anything up to a coffee table leg between centres. Weight generally falls in the 50kg range, so the machine has enough weight to sit firmly on a bench, but can also be moved by two people. Most midis also have extension beds available



| TABLE OF COMPARISON |                                                   |                                                   |                                         |
|---------------------|---------------------------------------------------|---------------------------------------------------|-----------------------------------------|
|                     | HAFCO WL-14V                                      | WOODFAST WL1220A                                  | JETJWL1221VS                            |
| Between centres     | 400mm                                             | 510mm                                             | 455mm                                   |
| Over bed            | 350mm                                             | 320mm                                             | 320mm                                   |
| Speed range         | 450–3850 rpm                                      | 250–3850 rpm                                      | 60–3600 rpm                             |
| Motor size          | 3/4 hp DC                                         | 3/4 hp AC                                         | 1 hp DC                                 |
| Spindle thread      | M30                                               | M30                                               | 1" x 8                                  |
| Pulley steps        | 2                                                 | 3                                                 | 3                                       |
| Quill travel        | 50mm                                              | 90mm                                              | 60mm                                    |
| Tool rest diameter  | 25mm                                              | 25mm                                              | 16mm                                    |
| Tool rest length    | 150mm and 300mm                                   | 200mm                                             | 150mm and 250mm                         |
| Finish              | Generally very good, but sharp edges on ways      | Excellent with no sharp edges                     | Very good with no sharp edges           |
| Adjustment          | Locking levers are large enough to tighten easily | Locking levers are large enough to tighten easily | Small locking levers are only 55mm long |
| Footprint Approx    | 200 x 1000mm long                                 | 195 x 940mm long                                  | 230 x 770mm long                        |
| Weight              | 46 kg                                             | 60 kg                                             | 55 kg                                   |
| RRP inc GST         | \$572                                             | \$1099                                            | \$1349                                  |

that will give you the length of a full size lathe, and electronic variable speed is almost expected of any lathe these days.

### Choosing a midi

If this set of parameters applies to your needs, where do you go from here? First, you'll need to be clear on what you want to make, how much space you have available, and how much you're willing to spend. Don't forget that your decision needs to take into account how long it will be before your interests outlive the lathe's capability. There are lots of cheap secondhand lathes on the market, but few quality ones because these are snapped up by people who know exactly what they want, and often these lathes sell without being advertised.

### The trials

For this review three lathes currently on the market were trialled and similar

points of comparison were applied. The Hafco was trialled in-store over a three hour period while the Jet and Woodfast were loaned to me to put to work on projects I was working on at the time to see how they perform in daily use where practicality and ease of operation are pivotal in deciding how effective a machine is.

It is important to stress that although each lathe has the capacity to run in reverse this is only for sanding purposes, and whenever a faceplate or chuck is used, a grub screw must be tightened to prevent the faceplate or chuck from unwinding itself from the spindle. Personally, I never use this option and did not include it in this trial.

### Making a choice

Each of these lathes has strengths. I had reservations about aspects of each lathe while setting up, but

once accustomed to the machine and its quirks, I found that they all performed well when used within their limits.

Decision making is based on personal needs so you need to be clear on what you plan to make and this will determine the swing or distance between centres you settle on. Capacity of the motor and its torque also need to be considered, but budget is usually what determines the final choice – just try not to let that limit future development of your exploration of turning. Evaluations of each machine are presented on the following pages.

Photos: Andrew Potocnik



Andrew Potocnik is a woodturner, wood artist and woodwork teacher who lives in Melbourne. Email [andrewpotocnik@telstra.com](mailto:andrewpotocnik@telstra.com)





## Hafco WL-14V

The Hafco fits within the parameters of a midi lathe as described and ticks all the boxes with #2 morse tapers in both the spindle and tailstock, a generous swing of 350mm and the shortest distance between centres of the three lathes trialled. In my opinion it sits at the lower end midi / higher end mini lathe scale, but during trials, it proved to be a competent machine.

It's powered by a 0.55kw / 3/4hp motor with a two-step pulley drive and speed ranges from 450–3850rpm (revs per minute) printed on the machine. In use the dial showed approx 4200, but did not settle on a single reading, but changed up and down. Access to the pulley and belt is sufficient to make changing the belt position easy; however there isn't a method of maintaining tension on the belt.

Setting up for trial I found that the saddle and tailstock slide easily and all parts lock firmly. I noticed a bit of looseness as the tailstock slid along the ways, but when locked in place

both centre points of the drive spur and live centre met perfectly, so there wasn't any need for concern. I also found that edges of the bed are somewhat sharp, which could be an issue when picking the lathe up whilst moving it, however this could be rectified with a file.

Mounting a 200 x 40mm blank to the supplied 80mm diameter faceplate I used the headstock handwheel to wind the faceplate into position, and then engaged the spindle lock which is quite large with deep knurling that makes it easy to use, even if your fingers aren't quite as nimble as they used to be.

In use I found the 25mm / 1" tool post provides plenty of support with a little bit of flex when pressure was applied at the ends of the 300mm toolrest, however, the toolrest performed sufficiently well. Both the 150mm and 300mm toolrests have a groove for your index finger to slide along, but they could do with some dressing to remove rough spots.

Turning the disc at 2400rpm, I noticed a drop in speed of about 200rpm according to the dial, and 400rpm on a heavy cut, so light cuts are better. I didn't test the same cuts on the lower belt setting, but found the lathe was more than capable of driving a heavy scroll chuck, it's just resistance that is an issue. I also found that when sufficient hand pressure was applied to the handwheel, the lathe could be stopped; however, when turning a 100mm diameter piece of pin oak between centres it provided ample torque and power to shape the wood with ease.

This lathe runs smoothly and quietly with negligible vibration and has the option of an extension bed to increase distance between centres by 650mm to 1050mm, so when selecting a suitable lathe for your needs, you need to consider your needs, but at \$572 this lathe offers lots for the hobby turner and is worthy of serious consideration.

*Review machine supplied by  
www.machineryhouse.com.au*





1. The Hafco WL-14V ticks all the criteria for a midi-lathe.
2. All these extras are part and parcel with the lathe: #2 morse taper drive spur, spanners, drift or knock-out bar and faceplate.
3. Showing the 300mm long toolrest along with amply sized locking levers on the saddle.
4. The supplied live centre is quite large in comparison to what you'd expect, but it and the solid locking lever works well. On / off buttons and variable speed control are
5. This machine has a smoothly finished handwheel that is easy to grip. The flip-up cover enables easy access to pulleys when more torque is required. The spindle lock is conveniently located for quick engagement.
6. Speed ranges and pulley settings are easy to negotiate on the WL-14V.



\$1099



## Woodfast WL1220A

I have to confess that I've used this lathe previously and thought highly of it, but it wore different colours and branding. The Woodfast has the same construction I was already impressed with and features an upgrade in motor and electrics.

With a distance of 510mm between centres, you can easily turn coffee table legs, while the swing of 320mm allows turning of large bowls and discs where, for safety purposes, it's best to add support with the tailstock. Here you have a generous 90mm of travel in the quill, which allows plenty of space to manoeuvre the saddle and a 200mm toolrest just where you need it for safe access in hollowing processes.

The tailstock and saddle slide freely and lock firmly. The main locking levers are large enough to handle

with ease and smaller spring-loaded levers are 75mm long making them easy to grip and tighten or loosen. Handwheels on the headstock and tailstock are 80mm in diameter and cleanly finished, which for me is very important especially on the outside of the headstock as I frequently use it to stop the spindle once the lathe is turned off.

At the tailstock end, there's no need for a drift or knockout bar to remove the live centre, just wind the quill back far enough and it will self-eject. I found that it took a bit of effort to make this happen the first time, but from there on in, I simply needed to remember that it was an available option.

When using lathes for spindle work, you aim for a high rpm and torque isn't such an issue unless you're

turning large diameter spindles, but when working on pieces with a large surface diameter (such as bowls), rpms need to be lower and torque higher. However while turning a 200mm diameter x 50mm thick disc of blackwood on the second of three pulley settings I felt there was a slight drop in drive when applying heavy cuts, but the reading did not reflect this. I didn't think of changing to the lower pulley setting at the time because I was happy with how the lathe performed.

For me, the unfortunate part of the power of this motor is that when switched off it took a bit of time for the spindle to stop spinning, in which case I like to use the handwheel as a brake, but that also took a bit of effort. On that point, I tried to stop the lathe while it was running,





without success – there's plenty of torque in this motor.

There were a couple of extra things I liked about this lathe. Readings on the speed dial are steady and don't bounce around with a range of 250–3850 rpm. Magnetic catches on doors make access to the drive belt and three stepped pulleys simple and take minimal time. The M30 spindle thread brings it into line with most contemporary full sized lathes so there isn't an issue when changing faceplates and chucks from one lathe to another.

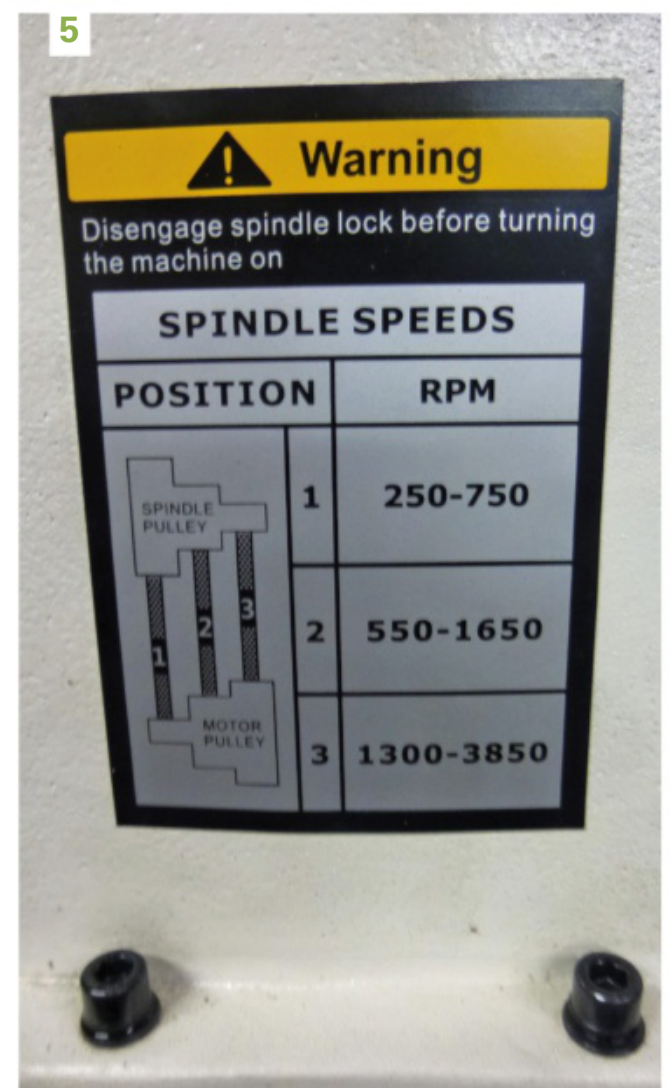
Extra features are the reverse function of the motor which has already been discussed, a 24 point indexing on the top pulley and capability of adding an extension bed for longer spindle work.

Safety is paramount in the workplace, and it should not be taken for granted in the home workshop, so an improvement I'd like to see is a pronounced stop button to enable an easy switch off.

*Review machine supplied by  
www.woodfast-group.com*



1. The Woodfast WL1220A has the largest between centres capacity. The main locking lever on the saddle is substantial, unlike the smaller one. The release and adjustment mechanism for changing pulley settings is the best I've seen in ages.
2. Locking the tailstock in place is easy due to the large lever, but other levers at this end are rather undersized. Switches are easy to operate and best suited to right-handers.
3. Two toolrests and an extra tool holder accompany the faceplate and spanners supplied.
4. Access to both pulleys is ample, so it's easy to change belt settings.
5. Showing the pulley settings and speeds available.





## Jet JWL 1221 JS

On first viewing the profile of this lathe looked very close to the Hafco lathe; however on closer inspection it is a far beefier machine with an incredibly wide bed, wider than many full sized lathes, including my workhorse machine.

I'm told the design engineers wanted to create a genuinely 'midi' size lathe, rather than a slightly larger mini lathe. This additional breadth was built into the unit to increase its stability and weight, thereby reducing potential vibration or movement on a benchtop. They were aiming to achieve a rock solid mid size lathe, with a comparable turning experience to that of a quality full size unit. This was preferred to simply going longer in the bed as it would start to creep out of a mid size and into a short full size lathe. Not only has the bed been widened to 170mm (about 20mm wider than most beds), the head- and tailstocks have been widened to match.

Straight out of the box my first question was: why aren't all tools

needed for setting the machine up provided? No allen key to loosen the grub screw on the faceplate, nor a screwdriver for screws that hold the pulley cover in place. Provided paperwork states the lathe has a M30 spindle thread, but this isn't what's on the lathe. I finally worked out it is 1" x 8 whitworth which is not a common thread these days.

The lathe is powered by a larger than usual 1hp / 0.73 kw high torque (according to literature) DC motor, so to trial how it would respond to heavy work I mounted a 180mm block of green redgum between centres and roughed it down. To gain extra torque I changed the belt to the slowest pulley speed and the lathe handled it well. There was a slight drop in speed under heavy cuts, but nothing too significant – I couldn't stop the lathe. The speed dial reading did bounce around at about 20rpm, which isn't a real issue, but it would be nice to have a consistent reading.

I had initial reservations about how stable the 16mm toolrest posts would be; however, they provided ample support due to the high collar of the saddle, even on the 250mm toolrest, but both need dressing to enable smooth travel of tools. The finger groove works well when using an underhand grip, but it too needs dressing to perform at its best. Overhand grip of tools was comfortable on both toolrests when using either scrapers or gouges.

The main locking levers are large and solid enough to lock the tailstock and saddle in place, but smaller levers are on the light side of 55mm length (20mm shorter than the Woodfast), even though they still allow for sufficient tightening. Considering generally older people buy these lathes, this may be an issue if you have restricted hand function. Likewise the lever on the tailstock handwheel is fixed and only 8mm diameter, which could also cause difficulty for older fingers.





The 80mm diameter headstock handwheel is easy to grip and slow the lathe down when it is turned off but the indexing locking pin's location takes getting used to. I found it often got in the way, and being spring-loaded it cannot be locked into place to carry out two-handed operations, hence you only have one free hand to carry out any other necessary tasks.

The lathe has a 24 step indexing guide and probably the most effective system for releasing the motor to enable belt changes and then locking it back in place to provide optimal belt tension that I've seen on any lathe.

With a 320mm swing and 455mm between centres coupled with ample torque, this lathe has plenty of positives, even if there are some fine details that you can address yourself to make the lathe perform to a higher level.

*Review machine supplied by  
[www.carbatec.com.au](http://www.carbatec.com.au)*

1. The Jet JWL 1221 JS has a wide bed designed to add heft and stability.
2. The 80mm dia headstock handwheel is easy to grip and slow the lathe down when it is turned off.
3. Spanners, drift, faceplate and centres accompany a solid 25mm toolpost which provides sound support for the toolrest.
4. Large locking levers along with a substantial toolrest and saddle support are strong points of this lathe.
5. A generous overlap in speeds from one step to the next provides plenty of speed variation.
6. A solid tailstock also has a large winding lever that enables quick advancement of the quill.





# Breaking The Golden Rule

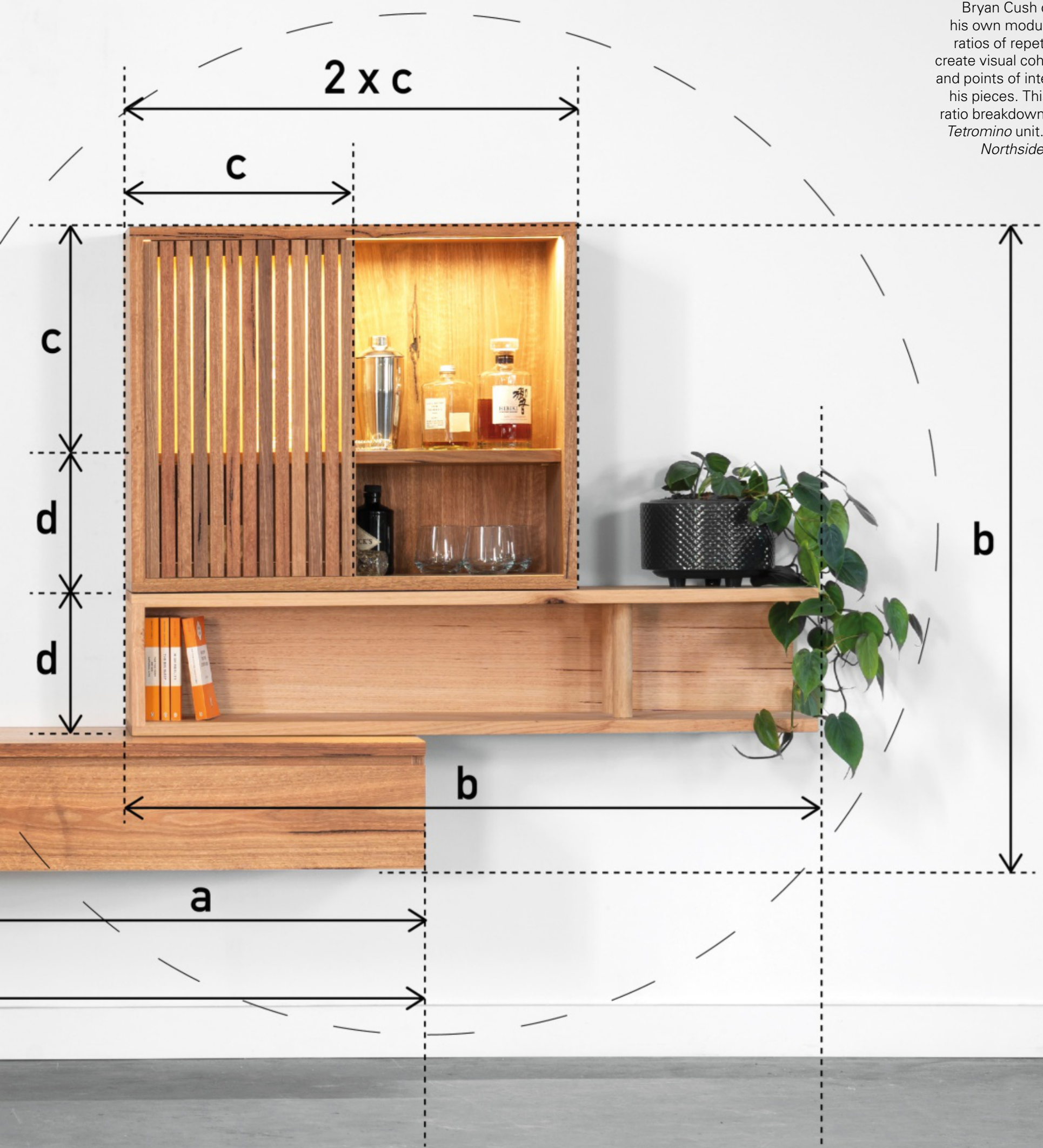
Know the rules, then challenge them in order to create your own unique work, says Bryan Cush.





## OFFSET KEY POINT OF INTEREST

While the so-called 'Golden Ratio' might be a rule worth breaking, Melbourne designer Bryan Cush creates his own modules and ratios of repetition to create visual coherence and points of interest in his pieces. This is the ratio breakdown for his *Tetromino* unit. Photo: Northside Studio





**From below:** Useful as an initial design tool: conceptual modelling to test a form for John Wardle architects' *Somewhere Other* Venice pavilion.

An example of an offset, non-symmetrical 'stitch' detail on the author's *Sudare* cabinet. Photo: Bryan Cush



From Da Vinci to Le Corbusier. From Mozart to human DNA molecules. The Golden Ratio (1 to 1.6180339887) has been referred to as anything from 'God's fingerprint', to the pure mathematical formula to defining beauty. I however, have always remained staunchly in the camp that good art and design should challenge us rather than simply conform. It is therefore important to study and understand 'rules' such as the Golden Ratio so that we can learn how to challenge, and ultimately break free from them to create unique work.

From the outset, let me make it clear that this article is not an attempt to debunk the Golden Ratio or Fibonacci sequence as being the stuff of myth, legend or pure coincidence. This piece instead reflects my personal experience of why I have found the ratio to be unnecessarily restrictive in the way in which we design 3D objects such as furniture. It is totally irrefutable that the human eye is drawn to various forms of symmetry, repetition and scale, but I dispute the notion that designers should be educated to follow a single ratio to achieve balance and composition in their work.

Scrolling through the thousands of online composite images of the Golden Ratio spiral diagram overlaid onto the Mona Lisa, Vitruvian Man, corporate logos and cutaway sections of seashells, it is obvious there is widescale evidence for the ratio being a potential driving factor behind their appeal. However, while the overlay spiral diagram may work on flat, two-dimensional paintings and graphics, once it is projected onto a 3D form, that is when I believe it can become slightly problematic. It negates the fact that we rarely experience 3D objects in a true, flattened elevation view, but instead it is always with constantly shifting levels of perspective and view angle. The skewing effect of perspective might be reduced in the case of large, monolithic architecture such as the Pantheon which sits in vast open spaces. However, it certainly becomes a factor with pieces of furniture due to the reduction in scale and viewing distance which will rarely provide a true elevation.

The main issue I have with the Golden Ratio is that I find 1 to 1.6180339887 just a bit clunky for my own personal taste. It might be predetermined to work as a good baseline and starting point but to my eye it just feels too conservative.

At some point as a designer, you develop your own eye and beliefs about proportion and scale. My work tends not to conform to any strict ratios, but instead





The design for Bryan's signature *Ostberg* bench shows how key points of interest can be offset and a non symmetrical approach used. Photo: Jo Cush

**Below:** An early sketch concept for the *Ostberg* bench.

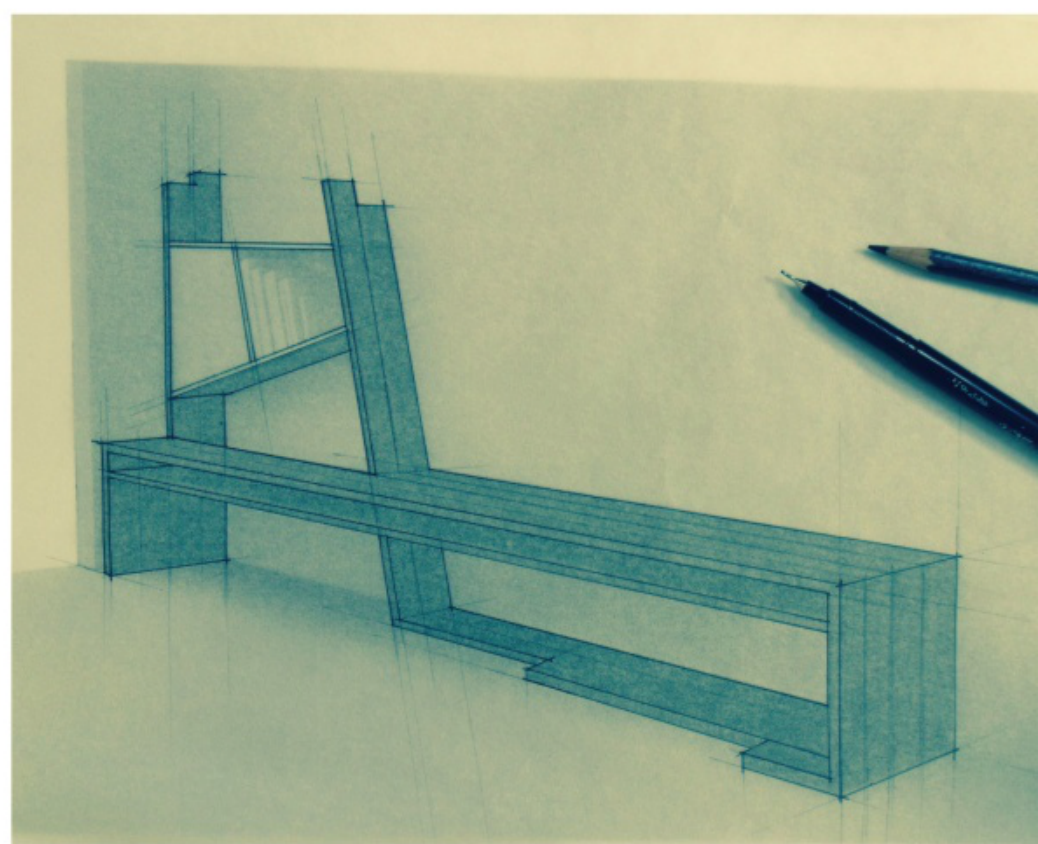
features various modules of related lengths which repeat and reappear in different areas of the composition.

An analogy for breaking the boundaries of standard ratios hangs on the walls of our living rooms. Flatscreen TVs follow 16:9 screen ratio but in cinemas the format enlarges to 2.35:1. The widescreen ratio increases the dramatic effect of landscapes in cinemascope but the cinema goer's brain also subconsciously recognises that the ratio is something foreign to their everyday experience. It makes them sit up and grabs their attention. I don't want my furniture design to feel familiar and safe like that home TV screen, I'd prefer it to try to push towards more cinematic qualities.

### So what is the alternative?

The tutoring during the formative months of my first year of architecture school was heavily focused on analysing and attempting to understand how space can be sculpted using compositions of basic 2D shapes. This has stuck with me in the way I approach design today. We'd explore the relationships between shapes using simple figure-ground diagrams or cardboard cutouts. Do they enclose, shelter and protect? Is there tension or a quiet harmony between them? What positive or negative spaces have been created?

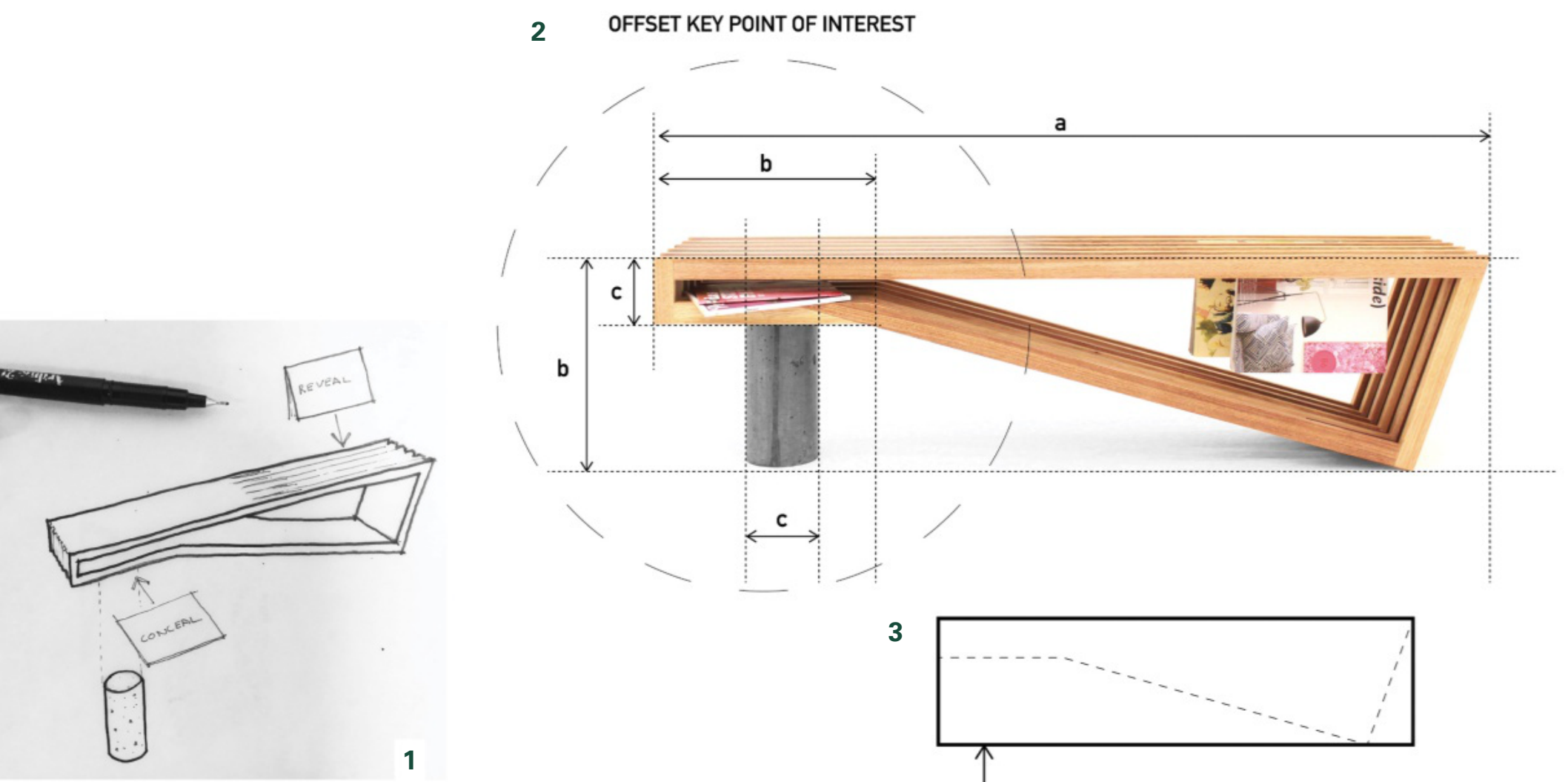
In the early 2000s, when I commenced my studies, it was still an era when CAD technology was primarily viewed as a documentation tool rather than for testing conceptual designs. The generation of ideas was still developed in sketchbooks and further explored through physical model making. Today all my



furniture spends considerable time being tweaked and documented in a computer, however I still rely on the old-school teachings I received to generate that initial spark and concept.

Classical Greek and Roman architectural ratios, orders and proportions were drummed into us at university but we were also taught that if we wanted to break a rule, we shouldn't just creep past a ratio by 1%, but rather, shatter it by 1000%. If you wished to make something appear tall, then make it bloody TALL! Narrow its base. Extend the height. Elongate the form using slender, vertical, linear elements. I have found that utilising this approach results in a more elegant and poetic piece, rather than a safely proportioned one.





## Strategies for Design

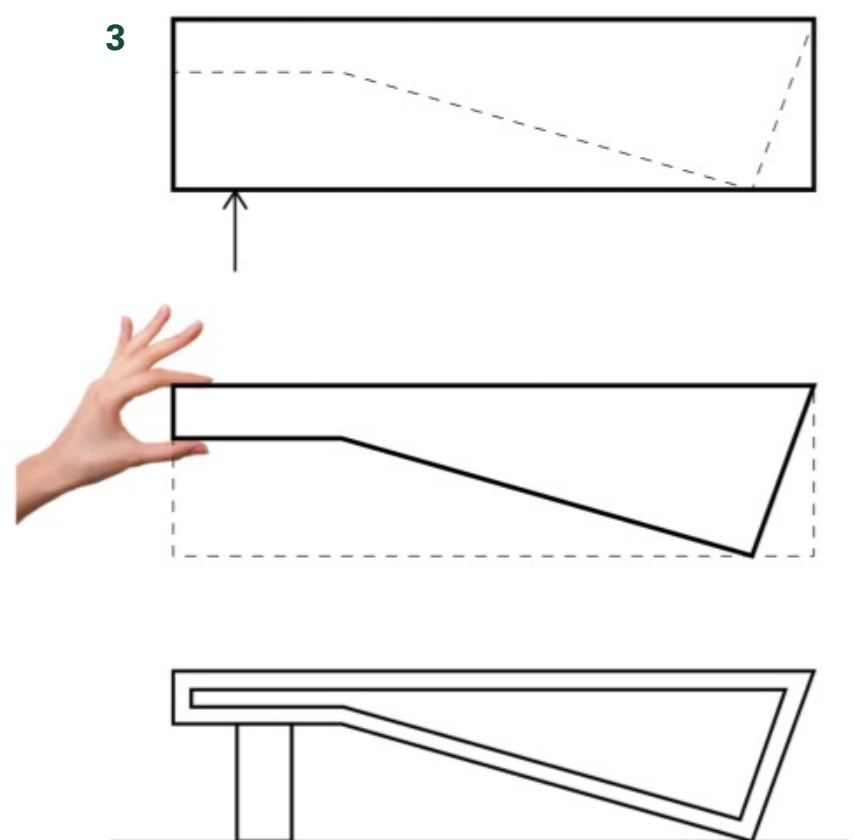
**1. Diagramming.** Popular among architects to help convey complex ideas in bite-size, easy to understand sketches – a good example to have a look at online are the iconic diagrams that Danish architecture firm BIG (Bjarke Ingels Group) create for every project.

A great exercise to test whether you have achieved the right balance between immediate impact and coherent design language is to show your concept design to someone for 10 seconds and then ask them to do a quick diagrammatic sketch of what they just saw. If they can't sketch it, it is either too cluttered, too complex or, worst of all, just not memorable enough.

**2. Dynamic manipulation.** Once you have created a basic composition of shapes and forms that you are satisfied with, try applying dynamic manipulation factors to the arrangement. Twisting. Pinching. Folding. Bending. Snapping. Tilting. The use of emotive and descriptive adjectives as part of the sketch design process can subtly drive the piece to become more dynamic at a subconscious level.

**3. Off-centre focal points.** I tend to avoid simple mirrored symmetry in my work unless I want to emphasise a powerful centralised feature in the piece. I find that by offsetting counterpoints of interest it encourages the viewer's eye to be naturally drawn, allowing them to fully explore the piece. Consider the way a photographer applies the 'rule of thirds', where the subject is always offset away from the centre of the image. The simple act of offsetting a gum vein or feature in the timber, in an otherwise symmetrical piece, can act to improve the aesthetic balance.

**4. Layers of complexity.** Think of your work as a multi-layered design that reveals more of itself when viewed from different angles and distances. Avoid it becoming a one-trick pony by offering to reveal something more upon a second viewing. Whether that is an interesting structural detail, or a hidden nook – keep them coming back for more.



1. Bryan Cush's concept sketch for his Pinch bench.
2. Ratio breakdown for the Pinch bench. Photo: Bryan Cush
3. The concept of dynamic manipulation is shown on the Pinch bench sketch.

**5. Physical model making.** I cannot stress enough how useful rough, conceptual model making (as opposed to finely crafted) can be early on in the design process for resolving issues that aren't making sense in a sketch book or a computer. Just use whatever materials you have at hand – corrugated cardboard, timber offcuts, grab a hot glue gun and get making. Design solutions often reveal themselves just by the act of using your hands to sculpt a 3D form.

**6. Avoid over-researching other furniture designers.** Being inspired by other designers is fine, but be careful not to fall into the trap of replication and ending up creating homogenised work. To avoid this I tend to look towards other disciplines such as sculptors, architects, artists and even chefs.

*Bryan Cush is a former architect and furniture designer maker. Last issue he was profiled in 'a A Sense of Place'. His business Sawdust Bureau is located in Melbourne. Learn more at [www.sawdustbureau.com](http://www.sawdustbureau.com)*

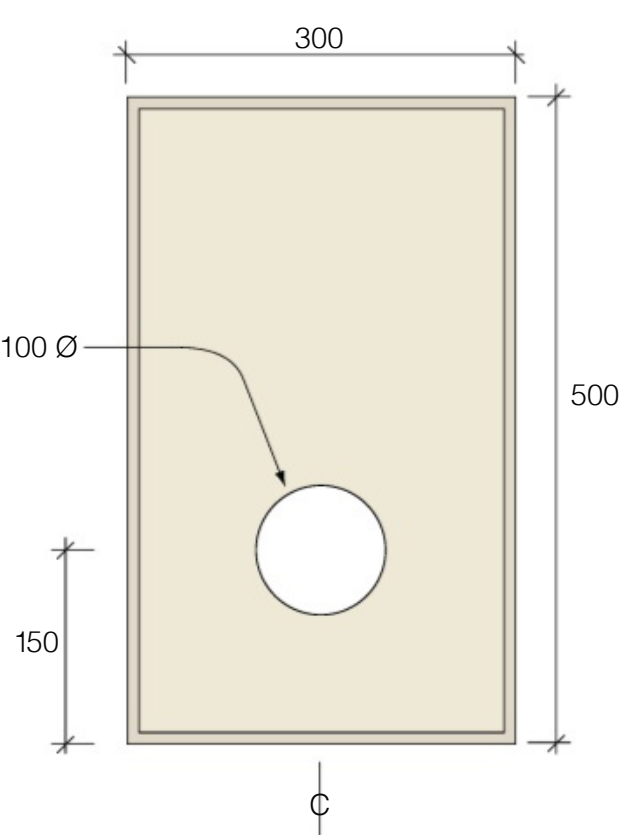
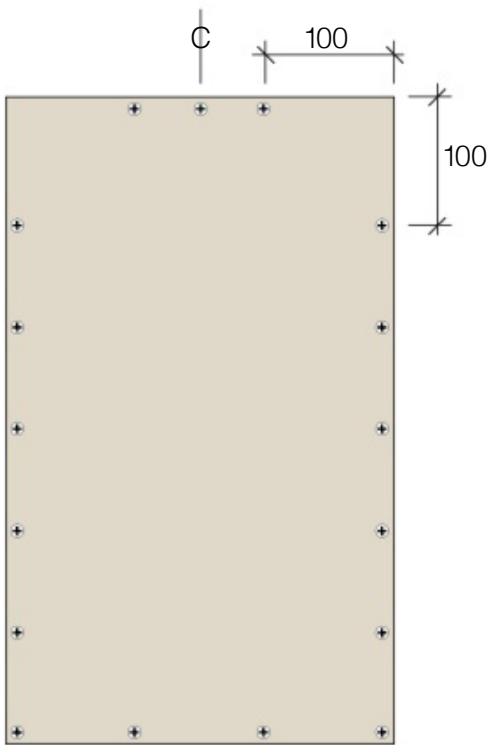
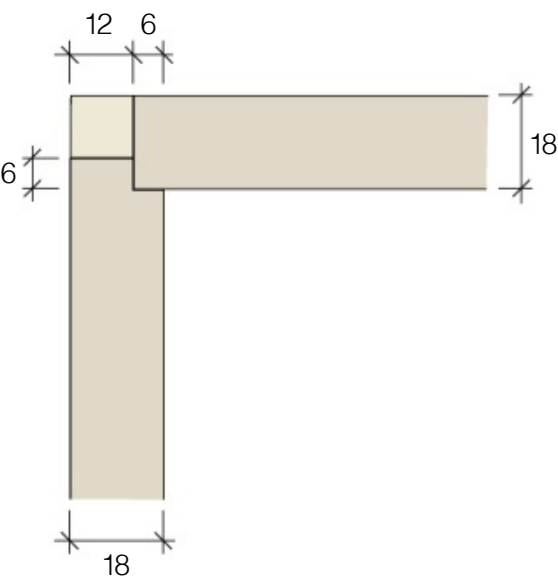




# Build A Cajon Drum

A fun project for the woodworking musician. Story by Vic Tesolin.





**Fig.1** Detail and dimensions mm not to scale





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1. Any 18mm sheet stock will make a good cajon, as long as it's veneer core.
2. Rout the shallow rebate.
3. Glue and clamp the box together.
4. Parallel jaw clamps work best for keeping things square.
5. Check that the box is square before the glue sets.
6. Chase the rebate to make sure is clean and square.

at least 6mm in diameter to create the rebate required for the joint. You may get the urge to use a rebate bit with a guide bearing but I recommend a fence and straight bit instead because you can accidentally have the bearing slip around the end which will ruin the rebate. At first blush, the rebate likely doesn't look big enough but once you add the hardwood bandings the connection becomes extremely solid. Make sure that your parts are marked out well so you put the rebates in the right spots (**photo 2**).

Glue up the box components with PVA glue and sturdy clamps (**photo 3**). Again, when you look at the joint coming together, it's not going to look like it's enough but later in the build we will fix that (**photo 4**). Once you have the clamps in place it's imperative that you check to ensure the box is square (**photo 5**). Especially considering that the bearing surfaces for the joinery are so small. I find parallel-jaw clamps do a good job at helping to keep the glue-up square.

Once the glue is dry, you can install a 12mm straight bit into the router with fence and set it up to chase the rebate that was made when you glued up the parts. Doing this just ensures that everything is square and any glue squeeze-out is removed, creating a clean and square rebate to receive the solid wood bandings (**photo 6**).

Now you can mill up the hardwood to use for the banding for the corners and for the back of the cajon (**photo 7**). This hardwood will bolster the

There are many traits that woodworkers share, whether it's attention to detail or outside-the-box thinking. I've noticed over the years that many woodworkers are also musicians of some sort and so it's not a surprise that sometimes these two worlds can collide. This cajon is a fun little project for a woodworking musician to add to their instrument collection.

The cajon's roots are from Peru and the name means 'box'. This drum is designed to sit on while you play, and a simple YouTube search will yield hundreds of videos on how to play one. You can always use a beat to back your music and with the addition of a remote pedal, you can even play this drum while playing another instrument.

## Start with a box

I've made these cajons out of various sheet goods in the past. This time I went with cabinet grade black walnut (*Juglans nigra*) plywood with a veneer core and curly sugar maple (*Acer saccharum*) for the bandings. Any plywood and hardwood combination will do the trick for this project so feel free to check out different options. This is also a good project for clearing out the never-ending pile of offcuts in your shed. There is some freedom when it comes to the size of the cajon, but I have settled on 500 x 300 x 300mm for the overall size. You can start by breaking out the plywood (**photo 1**).

Next, use a router with a fence mounted with a straight bit that is





7. The hardwood makes the joints stronger and hides the veneer board layers.
8. Tape can be a convenient and hard working clamp.
9. A sharp plane makes short work of flushing.
10. Cut the length to size with a flush cutting saw.
11. Butt joints are perfect for this application.
12. Use a caul to add more clamping pressure.
13. A small shooting board and block plane are helpful for trimming small pieces.
14. Use a marking gauge to extend the rebate lines.
15. Square up the rebate to accept the back.





joint as well as hide the laminations in the plywood. The corner pieces need to be square and oversized by about 0.5mm so that they are guaranteed to fill the rebate. Also, leave them a bit long (2–3mm) so that you don't accidentally make them too short. We will trim them flush in a later step.

### Cue the band

Now you can glue the corner bandings in place using PVA glue and I use masking tape to secure them in place (**photo 8**). What you see here is a 3M product call 233+ and the beauty of it is that it has great tack but doesn't pull up wood fibres when you remove it. It also has a good amount of stretch so you can use it as a clamp by pulling it taught before sticking it down. I go through rolls of this stuff in my shop!

Remove the tape once the glue is dry then sharpen up your favourite block plane. Set your plane for a fine cut and begin reducing the thickness of the banding until you are flush with the plywood. Keep an eye on your progress (**photo 9**). The commercial veneer found on this type of plywood is only about 0.6mm thick so it doesn't take long to burn through it. Also, be sure that you are not accidentally planing a taper on the hardwood. Once they are flush to the sides, use a flush-cut saw to trim them to the proper length (**photo 10**).

Flip the box over so that you can start to apply the banding on the back edges. This banding only serves to hide the plywood laminations so it's only 2mm thick and the width of the ply. Start with the short runs first then fit the long pieces last. I don't like mitres because they are fussy and aggravating so I don't use them. You will see a small amount of endgrain as a result of using butt

joints, but at 2mm thick it will be hardly noticeable (**photo 11**).

I use the same tape method as the corner banding, but I add a caul on top of the banding to provide more clamping force. Clamping pressure radiates out at around 30° from the point of force so adding the caul means I don't have to use too much tape (**photo 12**). With the two short lengths done, fit the long pieces between them and glue them in place. Use a shooting board and block plane to sneak up on the fit so you get a pleasing result (**photo 13**).

### Install the back

Now you have to let in the back. Use a router mounted with a rebate bit that has a guide bearing. I used 6mm Baltic birch plywood which was slightly oversized (6.4mm) and so made the depth of the rebate 7mm and a width of 9.5mm. This technique will leave the corners rounded so you'll need to square them up. The easiest way to do this is to extend the lines of the rebate into the corners using a marking gauge (**photo 14**). Then with the lines extended, you can follow up with a chisel to remove the waste making a square corner (**photo 15**).

Measure the back from rebate to rebate to figure out the size of the Baltic birch, in my case it was 502 x 305mm. Test fit the back into the rebates then locate the position of the sound hole. The sound hole will allow sound and air to escape from the cajon. Locate the hole according to **fig.1** and cut out the waste. The diameter of the hole is 100mm and I happened to have a hole saw that fitted the bill. You could also use a small router with a trammel arrangement. Be sure to use a scrap piece of wood under the cut to make a clean exit hole (**photo 16**).





- 16.** A sharp hole saw will make a clean hole in the Baltic birch.
- 17.** Take off the corners so the cajon is comfortable to sit on.
- 18.** Tack the back in place while the glue dries.
- 19.** Step off your screw locations with a set of dividers.
- 20.** Drill your pilot hole and countersink at the same time.
- 21.** Rubber feet will protect the bottom of your cajon.
- 22.** Rub in an oil finish for a close-to-the-wood look.
- 23.** The finished cajon is ready to play.





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## Putting things together

Now you can prep the cajon for finishing. Sand all of the surfaces to 220 grit and ease the corners so that it's comfortable to sit on (**photo 17**). You can also sand the back and ease the edges of the sound hole. Place a bead of PVA glue in the rebate, drop in the back and tack it in place with a few brad nails (**photo 18**).

I used a piece of 3mm lauan mahogany door skin for the tappa (the part you strike to play). I've tried other materials for this part and have found this to be the best sounding. Once you have the lauan sized, place it on the cajon and temporarily attach it using tape. Then place blue tape around the perimeter of the tappa. This will allow

you to make a mark 9mm from the edge all the way around to place your screws without having to mark on the tappa directly.

There is no set number of screws to use or a particular spacing. The only thing you will want to do is leave the top corners free from screws, so that when you hit those spots with your hand while playing, you will get a 'slap' sound. I did however use a set of dividers to make the screws equidistant (**photo 19**). Now you can drill the pilot/countersink holes. Leave the blue tape in place for this operation, it will protect the tappa from the usual burnish marks made by a drill bit fixed with a stop collar (**photo 20**).

Finally, I added some rubber feet to

the bottom of the cajon (**photo 21**) and rubbed on an oil finish (**photo 22**). The cajon is now ready to play (**photo 23**). There are many accessories available for cajons from foot pedals to clappers and cymbals. You can also add snare wire into the interior to change the sound but I personally like the clean sound without it. Now you can add a beat to any tune and add 'percussionist' to your CV.

*Photos: Vic Tesolin*

*Vic Tesolin is a furniture maker and also a Lee Valley Woodworking Partner. He lives in Canada and teaches workshops all over the world. Learn more at [www.victesolin.com](http://www.victesolin.com)*





# Science and Art

**For Leslie Webb, woodworking was the perfect synthesis of maths and science with creativity. Interview by Linda Nathan.**

*You have said that you didn't choose furniture making as a career, that it chose you. Were you already a maker? How did you discover woodworking and then decide that was your path?*

I had taken some art classes, but didn't think of myself as an artist or a maker (that term wasn't in our lexicon back then!). After high school, I attended Bowdoin College, a small liberal arts school in Maine. We were required to take classes in

many different areas, regardless of major. I didn't know exactly what I wanted to do, but I thought it was going to be something in science because I really enjoyed those classes in high school. And then I started taking art classes. I loved making something with my own two hands, yet I couldn't see myself as a fine artist.

I felt I needed to choose between science and art, but neither felt

exactly right. I decided to take some time off from college. I got a job as a nanny, and it was Robert, the father of the family, that introduced me to woodworking. One morning at breakfast, I was flipping through a Thomas Moser catalog, and I offhandedly said that I thought it would be cool to be able to make furniture because it is useful, but you can make it beautiful too. He told me he didn't know how to make furniture, but he did have basic





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carpentry skills, and if I wanted to learn, he was willing to teach me.

Robert was a painter and made his own frames as well as shipping crates. I began working in his studio a few hours a week. One of the clearest memories I have is cutting my very first piece of wood. It wasn't anything exciting – parts for a crate. I felt this nervous excitement as the sawblade sank into the two by four. Despite my best efforts, a concept that had been hammered into me during my parochial school education – that each of us has a calling – had eluded me. But in those few seconds, it instantaneously shifted into reality. And my life came into focus in a way I never expected. It is hard to explain, but in that moment, I knew I had found my path.

When I think about it now, woodworking does make a lot of sense: there is the math/science side of understanding the material and technical execution as well as the creative design side of things.

*Have you undertaken formal studies in woodworking and design?*

In college I took Intro 2D and 3D design classes, which were requirements for many of the art classes. I find them invaluable today. I tried for a few years to teach myself woodworking, but I just didn't have a lot of access to great resources. This was before YouTube, and I wasn't aware of woodworking magazines. I didn't know any furniture makers or even hobbyists. I knew the quality of furniture that I wanted to make but didn't know how to get there on my own.

From my time in Maine, I was familiar with the Center for Furniture Craftsmanship. When I started looking into formal training, it just so happened that they were starting their nine-month comprehensive program. I applied and luckily was accepted. David Upfill-Brown was the lead instructor, and I am so grateful to have had him as a teacher. Other than the first two projects, you design

your pieces so that is also built into the curriculum.

*What was it like at the CFC in Maine? How intense was the course? Did you ever feel out of your depth? Were other women taking the course while you were there?*

CFC is a very special place. The instructors are so generous with their knowledge and time. It's an amazing opportunity for students to have access to some of the best furniture makers in the world. The nine month course is very intense, though. I literally knew almost nothing when I enrolled (this is not me being humble), and by the end of the nine months, I had an incredible foundation in fine furniture making.

**Main:** Leslie Webb in her Texas studio with her signature *Linda Lou Rocker* in rift white ash with rattan caning.

1. Leslie Webb's *Line Credenza* in white ash is Danish Modern inspired but with contemporary detailing.





Classes are Monday through Friday from 9am to 5pm. Instructors are present the entire time. I often spent evenings, nights and weekends working in the shop as well.

I felt out of my depth the entire time. I had classmates that had been hobbyists for over 20 years. I can't imagine what they thought of me!

The first thing we learned to do was flatten the backs and sharpen chisels and plane blades. I remember thinking, 'What have I gotten myself into?'. I think it was my stubborn refusal to admit defeat that got me through those times of self-doubt. There was only one other

woman in my class of 12. She was much more advanced than I and kept to herself. There were almost no female instructors as well, so it was very isolating and lonely in that sense.

*After Maine were you able to support yourself through making?*

It took a few years to build my business to the point that it supported me. I had the rather unfortunate timing of starting my business about a year before the economic collapse of 2008. I nearly lost everything then. I even lived in my shop for about six months to try to save on overhead expenses (more proof of

that stubborn refusal to admit defeat). I was fortunate to find a hobbyist with a well equipped shop, who out of generosity and kindness allowed me shop access for free. I had orders but not enough to sustain me, so I had a second job too. After two to three years, I was able to quit my second job and build furniture full time.

*You have a great portfolio of designs which all bear the Leslie Webb signature style. What's your general design process? How long, for example, did it take to design your rocker?*

Every single piece I make goes through the same general design process. I begin with hand sketching to explore







2. The *Simple Stool* is one of Leslie Webb's regular production lines. Shown here in white oak with cotton rope weave.
3. The design of Leslie Webb's *Shosh Bud Vases* builds on the idea of a repeated geometric form.
4. Minimalist lines define the *Haven Blanket Chest* in white oak with black walnut stand.
5. Miter Coffee Table in rift white oak.
6. *Stefan Coffee Table*, curly maple and rift cherry. Another answer to the question: 'How else can you support a top without having a leg at each corner?'

and generate different ideas. Once I have a direction I want to pursue, I make quarter scale drawings on graph paper. This is where I begin to dial in proportions. Next I make a quarter scale model, usually out of thin plywood, balsa wood, or matboard. If I am unsure about anything, I will make several versions for comparison.

The models are what I often present to clients, along with scaled isometric drawings. Once I am confident with a version (if it's a spec piece) or I have the client's ok, I will make a full-scale mockup and full-scale technical drawings (by hand), tweaking anything as needed. I usually make mockups from cardboard or sheets of rigid foam insulation, held together with hot glue or double-sided tape. This makes it easy to take it apart if I want to change anything. When designing a chair, I make a mockup using poplar and screws so it can be tested for comfort.

This entire design process usually takes one to two weeks, depending on the complexity of the piece. My rocker took almost double that because figuring out the arc of the rocker was quite difficult. Every time I tried a different arc, it affected the height of the seat,



which had ergonomic repercussions. There was a lot of testing and experimenting that went into it. This all probably sounds very involved and time consuming, but here is the great thing about a rigorous design process: it will save you from making some awful creations. Once you see a full-scale mockup, you know if you got something very wrong or if that chair design is not made for the human body.

*Many makers find inspiration in the organic forms of nature however your work seems more linear and pared back. What inspires you? How would you define your aesthetic?*

I do find nature very inspiring. There is a lot of geometry in it! I tend to interpret organic shapes in a graphic

sense and abstract them in a way that may not be obvious. And, yes, I do love geometry. I'm also fascinated with the idea of taking one single form, repeating it until it takes on a life of its own, and building a piece whose sum is greater than the parts. That is a theme that runs through many of my pieces. My *Carter Entry Dresser* and *Shosh Bud Vases* illustrate this.

I also love thinking about the basic forms of furniture and questioning what springs to mind. For example, when most people think of a generic table, they imagine a tabletop with a leg at each corner. I started asking myself, 'How else can you support a top without having a leg at each corner?'. My *Stefan Coffee Table* and *Miter Leg Tables* are two different answers to that question. Of course, there are infinite answers.





If I had to define my aesthetic, it would be something like the following: take the ideals of the Arts & Crafts Movement and put it in a blender with Art Deco, Danish Mid Century, and the Japanese aesthetic, all filtered through my own perspective.

*Do you have any tips for other makers who want to refine their design skills?*

Take a 2D and 3D design course. Become familiar with the design elements and principles such as texture, space, contour, balance, unity, proportion. Look at more than just furniture – I cannot emphasise this enough! When you see something you like, try to figure out what you like about it. Analyse its use of the design elements and principles. If you do this enough, you'll most likely find you're drawn to the same things repeatedly. This is a starting point for developing your own perspective.

*And on a personal level, have you ever had issues of self belief, in particular in terms of being a woman in a field that is still mostly populated by men. Do*

*you believe that things are changing for women in terms of acceptance?*

I do think things are changing, but it is slow going. I've never equated being a woman in a field dominated by men with women not being good enough woodworkers. So I don't doubt myself in that sense. It's simply a reflection of deeply ingrained attitudes in our culture at large. It is absurd to think that a person's anatomy influences how well they can take a board of wood, cut it into smaller pieces, and reassemble them into a piece of furniture. I think most people would agree with that.

But at some point society decided that women weren't interested or capable of furniture making. No one questioned it, and it became an operating belief that affects who is asked to write articles, who's included in books, who teaches classes, etc. And those, in turn, send a message, intentional or not, to women that they do not belong or are unwelcome in furniture making, which turns off a lot of women from learning these skills. And then it



becomes a feedback loop. But we can change these things. It just takes a little awareness.

*Are there any milestones you can point to in your development as a maker? For example, are there any people in particular who have influenced your work?*

Certainly studying at CFC under David Upfill-Brown. At the end of the course we had exit interviews, and he told me that he thought I had what it takes to make it. Hearing that from someone of his calibre was huge for my confidence. Being a summer intern with Michael Fortune, seeing how a furniture studio operates in real life was instrumental. He taught me not only technical and design skills, but how to interact with clients as well.

*What is your favourite part of the design and making process?*

I love the design phase, dreaming up new ideas, figuring out which direction to pursue. Then refining it while trying not to lose its essence. And finally, deciding how to put





the piece together in a way that will hopefully outlast me. I never tire of it.

*What aspects of making challenge you?*

There is so much to learn, so many specialty skills, it never seems to end. I feel as though I am still and will always be a student, which can often feel like I do not know what I am doing. And then there are the mistakes, which no matter how often you have done something, happen. It's a humbling pursuit.

*What's the hardest thing about being a professional maker?*

Without a doubt, running the business side of things. We didn't learn much about that in school, and it's as important as the technical side. No one tells you that being self employed is like having 50 different jobs rolled into one. And then figuring out how much time to devote to each task daily can be pretty tricky, especially when all I really want is to be in the shop.

*Where do you see yourself in ten years*

*time? Are there any directions you plan to take your work in?*

I'm not a huge long-term planner; every time I have, the universe has laughed at me. I am more interested in teaching than I was when I started out. I would also like to use what little platform I have to advocate for female woodworkers. Recently I've become very interested in seat weaving so we'll see where that goes. Right now, I am just trying to learn those basic skills. There are so many different techniques and materials and patterns to explore.

*Photos: Leslie Webb*

*Leslie Webb lives in Texas, USA. In October 2020 her first solo exhibition will take place at Northern Southern Gallery in Austin, Texas.*

*Learn more about Leslie Webb at [www.lesliewebbdesign.com](http://www.lesliewebbdesign.com)*



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7. Repeated forms have a sculptural outcome in the Carter Entry Dresser.
8. Another view of Leslie Webb's well organised studio.
9. The FAE Mirror in ebonised oak with curly maple plays with ideas of geometry, scale and repetition.



# Conversations in Design

Led by Adam Markowitz, a group forum event for makers to discuss and critically evaluate their work with their peers took place at Wood Dust this year.



In conversation, left to right, Nick Rennie, Adam Markowitz, Darcy Zelenko, Laura McCusker.



**C**onversations in Design was an evolution of the talk I gave at AWR LIVE: Tools for Design in 2017 and the article I wrote in *AWR#101 – Making More of Design*. It has grown out of a perceived blindspot I believe exists in the woodworking community – we'll discuss to the death techniques to improve our making (tails first? pins first? bevel angle? best glue?), but design is never discussed with even remotely the same rigour, debate or frequency, despite being as critical to the success of our work. Woodworkers don't want to go there. The result is that it is not uncommon to see the most intricately crafted, yet rudimentarily designed work. Unquestionably virtuoso examples of craftsmanship...but they're ugly.

Early on in 2019 John Madden approached me to let me know he was running Wood Dust\* again this year, this time at Fab9 – the new maker space in Footscray, Melbourne. Wood Dust is a new event which looks to deliver more of a conference style offering. He'd themed it 'Designer Maker' and wanted me on board to teach a masterclass. I'm not a master of design, but I have trained in design, which seems to be somewhat of a rarity in woodworking.

I don't know if you can really teach a masterclass on design in a day or two. On dovetails, yes. Steambending, sure. Design...that's something that is a personal evolution that needs to be honed over time. There's no little gem of advice that will save you hours of mucking about when you're starting out like 'When cutting with a saw, if you extend your index finger along the length of the saw you'll cut straighter'.

In *Making More of Design* I wrote how there's nothing magical about good design. You're not born with it. It's a skill that you can learn.

Success is certainly subjective – but it is governed by a weight of intellectual, personal, cultural, structural and other influences which are not. Two of the ways I proposed makers could develop design skills were to learn to develop a consistent conceptual method that unifies your design approach, and learn to give and receive feedback. I had already been tossing up the concept of a group forum where people openly discussed their designs, and pitched the idea as an alternative to a masterclass.

## The format

A callout was made for designer makers to submit a piece to be discussed, from which a shortlist of projects would be drawn. The intent was to make this as informal and unthreatening a process as possible. The design school experience of a 'crit-session' can be quite a tense and occasionally upsetting experience

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for students. In an ongoing teaching environment this is seen as a constructive process which allows for growth over time through multiple conversations.

As a teacher you can play bad cop one week and good cop the next. Conversations in Design was a point in time experience, so I wanted it to be as casual and enjoyable as possible. Which is a tough ask when at the end of the day I was asking people to stand in front of their work and explain it to a crowd of their peers.



1. Ross Williamson, *Wodalla CH01 Formal Sitting Chair*, 700 x 600 x 600mm, American oak, kangaroo leather. 'My first foray into chairmaking, I settled on a formal format. The backrest is relatively upright and supportive of the lower back while the arms fall away to provide support without pushing against the user.'  
*Photo: Ross Williamson*
2. Greg Allan, *Levity Tall Cabinet*, 1380 x 600 x 360mm, American oak, ebonised oak, custom made brass spacers and hardware. '...a slender tall cabinet for storing tea or small decorative goods'.  
*Photo: Dave Kulesza*





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3. Dan Barker, *Alana Cabinet*, 1550 x 910 x 450mm, American white oak, fiddleback messmate, glass shelves, mirror panels, shop cast bronze, Warwick wool lining. 'I am largely self taught in my craft. It's fair to say I have now found my passion. Alana was to become my statement piece and a true reflection of my voice.'  
Photos: Fred Kroh

4. Martin Tauts, *Muumi Stools* form a fun and interesting formation when stacked. Solid oak seat with turned Victorian ash legs.  
Photo: Edwina Richards

The work was arrayed in an exhibition style set-up with pieces on plinths, and the group walked through the space to discuss each piece in turn. No microphones, stages or spotlights. In order to guide the discussion and provide some respected viewpoints, I invited Laura McCusker and Nick Rennie to form a discussion panel. I've looked up to Laura's work for a while now for its elegance of design and considered nature of details. Her practice has established itself through

a strong design language, but she is also still very much a maker, so she could talk to the relationship between craft and the design.

Nick Rennie is one of Australia's most established and foremost practising industrial designers. He has designs being produced by major brands locally and internationally, and regularly takes out major design awards. He knows design. I felt that having someone from a non-woodworking background was important to try to provide an alternative viewpoint. Contemporary woodworkers, as the custodians of a craft with an incredibly long history and lineage, often struggle to break out from the well-trodden paths of their forebears, and sometimes it takes an outsider to point out the bleedingly obvious. During the discussion there were a number of points where the panel disagreed and offered opposing viewpoints. This was great – it required the recipient to digest and interrogate the opposing viewpoints and come to their own conclusions.

The event took place over a three hour period, which allowed time for nine presentation slots. Each



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5. Julian Glencross McCartney, *Promontory* bar/liquor servery, 1800 x 700 x 500mm, Gippsland ash and blackwood, Tasmanian blackwood, celery top pine, granite, mild steel, leather. 'The design reflects the memories of a hike my best friend and I took to the Wilsons Promontory lighthouse and nearby beaches in late May 2018. Our vision was of bushland, often scorched by past fires, granite boulder and the calm deep blue ocean.' Photos: Keelan O'Hehir
6. Giorgia Pisano, *Bruco Chair*, 800 x 600 x 540mm, recycled meranti, brass rods. 'Bruco-caterpillar tricks your eyes with its curves and challenges the perception of what's achievable with timber. Inspired by the organic forms found in nature, it's minimalist with its simplicity, but bold and flamboyant with its curves and details. The design is made to be tactile with its twisting armrests.' Photos: Giorgia Pisano



presenter was allocated 15 minutes total – strictly five minutes to describe their work followed by ten minutes of feedback. Feedback was initially lead by the panel members, but then opened up to the other attendees and the crowd. The aim was to try to get several viewpoints.

It is an incredibly challenging ask to summarise a project that often took hundreds of hours of work in under five minutes, but it is actually a good skill to develop. Some stories about pieces are like fishing tales – all the fun is in the telling, and they can meander on for ages without coming to any clear point.

Being able to distill and then concisely describe the key aspects that drove the conception of a piece requires careful consideration. Yes, that compound joint was an absolute doozy to pull off and required several different ingenious jigs, but has it got anything to do with the key conceptual drivers of the design? With what people actually see when they interact with the piece? If not, you've got to leave it out to focus on what really matters in this context. This exercise is also a valuable opportunity

for a moment of structured self reflection which I think makers rarely make time to do.

## The work

Nine woodworkers presented from a range of levels of experience and focus of practice. The diversity of work on display, from one-off pieces to batch products, to experimental prototypes really made for a lively and varied discussion.

### Julian McCartney

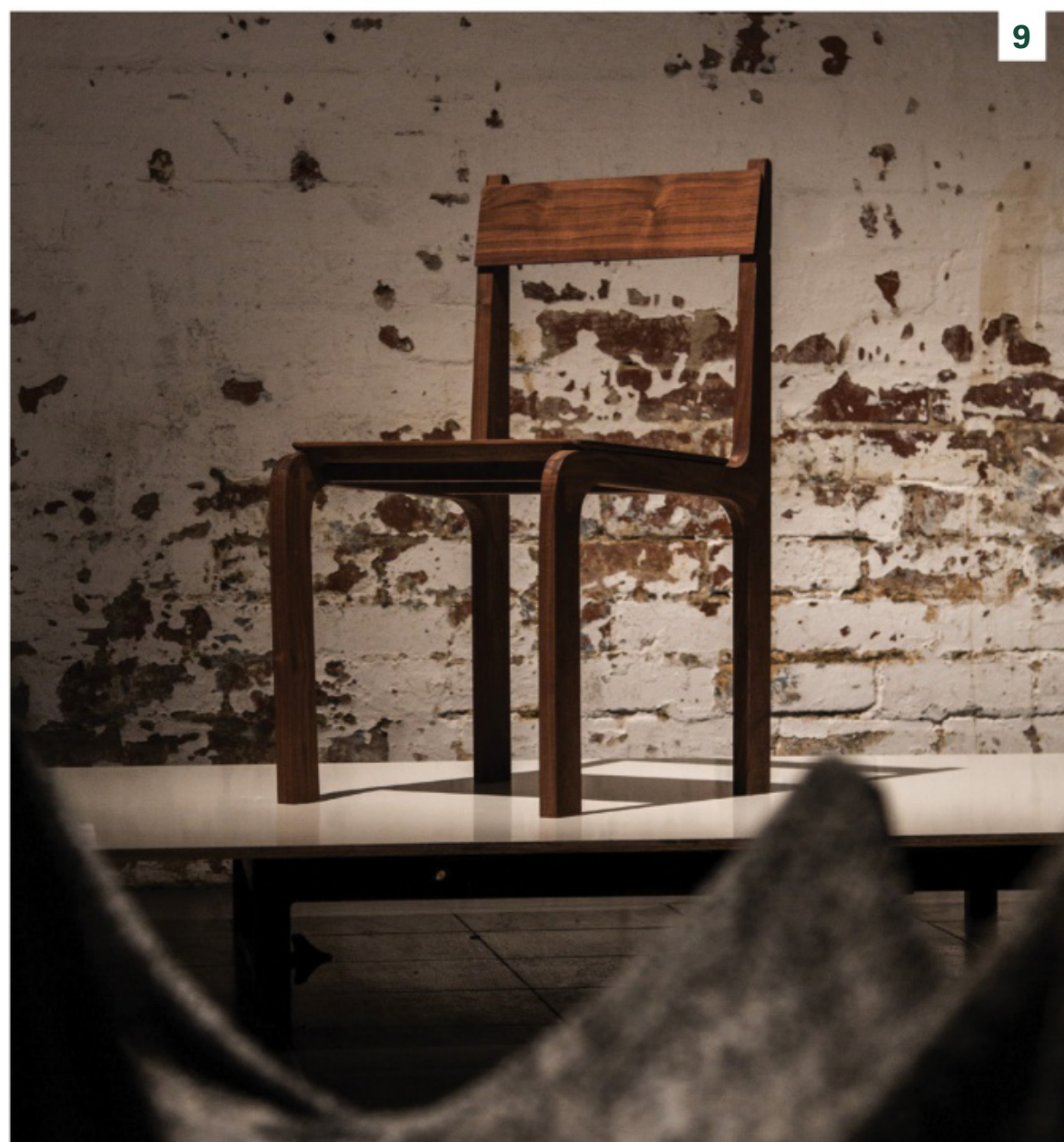
@glencrossfurniture / *Promontory Cabinet* was drawn from his experiences hiking through Wilson's Promontory, with the slatted details referencing the experience of light through trees that stuck with him as a memory of place. A lively group discussion touched on his material choices, as well as the choice of photography for images presented.

**Darcy Zelenko** @darcyz.gh / *Good Chair* is a chair design prototype which attempts to be primarily made through CNC processes. An impressive timber chair for someone who describes themselves





7. Lana Kagan, *Kitchen Stool*, 700 x 400 x 450mm, kauri pine with brass dowel fixings. 'Inspiration came from the stool with a small fold-away step that was in my grandmother's kitchen for as long as I can remember. The intention was for it to be used, sat on, and climbed on.' Photos: Michael Gordon Hill
8. Darcy Zelenko, *Good Chair* 'In looking to design an affordable piece of furniture, CNC technology was used to reduce the labor cost of the finished product, which was partly put back into shifting materials from plywood (a material synonymous with CNC-fabricated furniture), to timber.'
9. Adrian Olasau, *GH Bike Rack* 570 x 210 x 390mm walnut. 'The *GH Bike Rack* is a visually light and conceptually minimal solution to bike and helmet storage that is a beautiful piece of sculpture in its own right.' Photo: Andy Mullens



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as 'not really a woodworker', much of the feedback focused on structural decisions and where the mix between CNC and handmade could be a source of identity for the design.

**Lana Kagan** @lanakagan / *Kitchen Stool* – a lovely little stool, based on a pivoting stool design from her grandmother's house. Brass pin details and curvature gave the piece a contemporary evolution. She felt that the pivoting step wasn't working quite the way she'd hoped, and the group bounced a few ideas around for how to tackle it.

**Martin Tauts** @redblockdesign / *Muumi Stools* Working with Priscilla Tan from Newcastle, these colourful stools are made by a combination of CNC and traditional processes. They are an elegant and lively batch product that offer playful colours and considered details. Nick Rennie in particular enjoyed these stools, and there was an interesting discussion regarding shortgrain challenges and methods for tackling it.

**Adrian Olasau** @olas\_design / *GH Bike Rack* A very elegant and deceptively simple piece with a strong visual language which was well received by the panel and crowd.

**Dan Barker** @bricolagebuilt / *Alana Cabinet* Made for the exhibition Studio Furniture 2018, this finely nuanced whiskey cabinet had evolved from experiments with faceted blocks and included hand cast brass pulls. The photography in particular was lauded for conveying the qualities of the piece.

**Greg Allan** @poolesdesign / *Levity Tall Cabinet* An elegant cabinet with floating boxes, subtly twisting-tapered legs and tambour door – there was a great discussion about the success of his proportions.

**Ross Williamson** @leesinclairdesignco / *Wodalla Chair* This was a carefully considered piece both in structure, design and comfort,





and generated a lot of excellent discussion into its most successful details, and how he might continue to evolve the design.

### Giorgia Pisano

@elettradesignstudio / *Bruco Chair* An incredibly ambitious and wonderfully flamboyant chair, Giorgia initially explained that the brass supports were not part of the original concept but were required to be added during the making process; however it was agreed that this challenge was deftly handled and the material change added to the qualities of the piece.

### In review

I think that most of the attendees came away with some helpful thoughts on the work they had presented – both commendations and some suggestions for improvements. That was a great outcome – but not specifically the point of the exercise.

The real value of the discussion was not to receive a pointer such as ‘perhaps the round-over is too great on this component and inconsistent with other areas of the piece’. Unlike straightening your index finger when sawing to a line, that specific piece of feedback is not something that can be put in your mental toolchest to apply to another project. It’s only really relevant to a single piece. But what it touches on is substantially wider in scope – the interrelation of parts in consideration of a conceptual whole.

The point of Conversations in Design was the conversation itself. It required designer makers to take stock and formulate why they had made certain decisions. To describe what the driving design concept was, and how it had been considered in relation to resolving all the little details and challenges through the making process. To formulate intelligent answers, not to the question of ‘how did you do it like that?’, but ‘why did you do it like that?’

*‘I found the discussion and feedback very insightful. Listening to other makers from different backgrounds talk about their pieces was very engaging and expanded my perspective on my own practices. It was great to have a forum for unbiased critique, because we all have friends and family to provide flattery.’ – Greg Allan*

*‘What I enjoyed the most at Conversations in Design was the story telling part. It wasn’t until the makers talked about their design thinking process that I perceived the objects as having a soul of their own. Also, it was very stimulating to have a panel of established designer makers to give us honest, unbiased feedback. I’d love to take part in it again in the future.’ – Giorgia Pisano*

\* Wood Dust Designer Maker took place in August 2019, see [www.wooddustaustralia.com](http://www.wooddustaustralia.com)

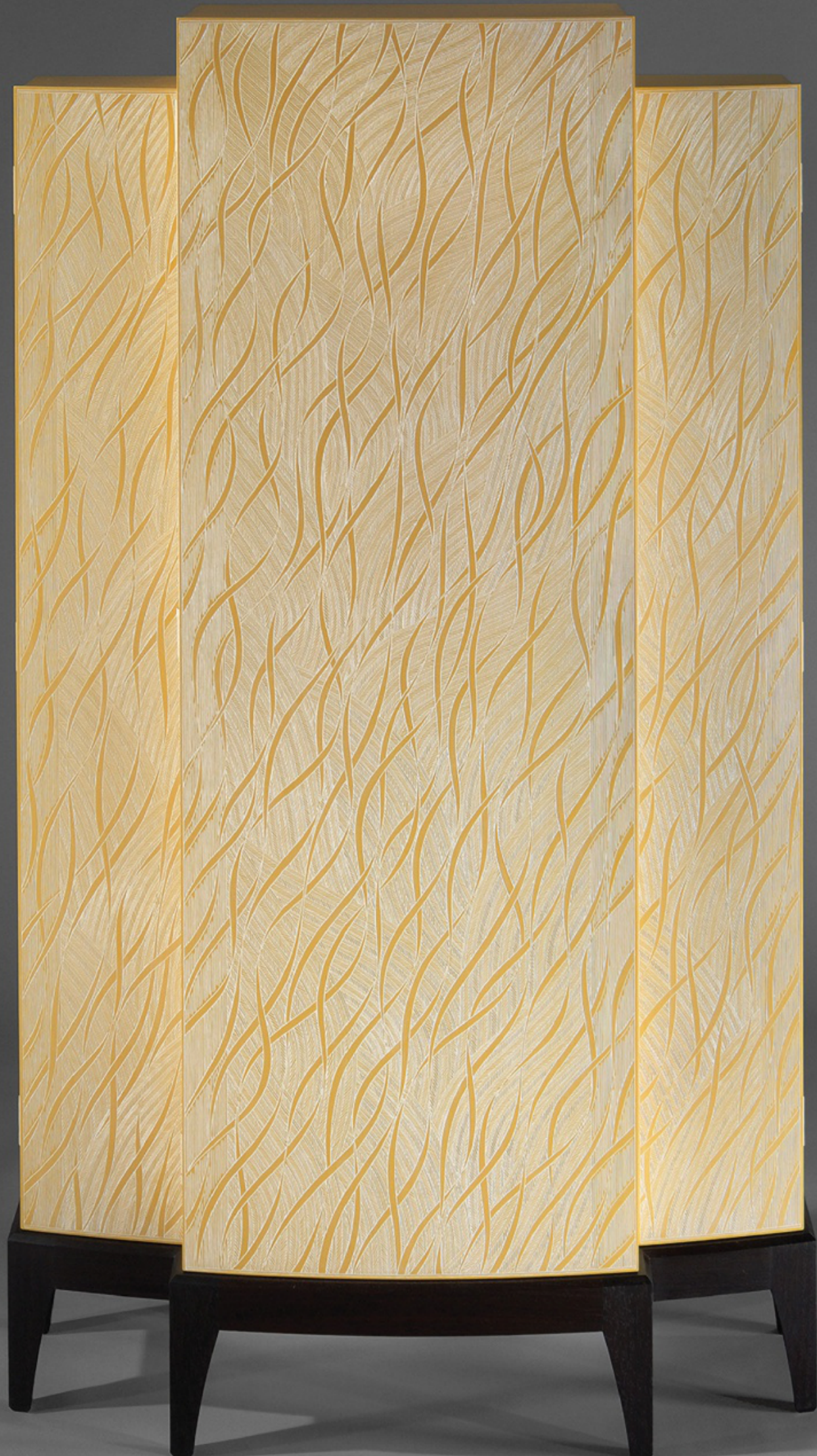


Adam Markowitz  
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# Making a Seat at the Table

Forty-three North American women wood artists and furniture makers presented their work in an exhibition that opened at The Center for Art in Wood in Philadelphia, USA on October, 2019.



Kristina Madsen,  
*Jewelry Cabinet*,  
2008, Cabinet,  
maple, padauk;  
milk painted and  
carved with gesso  
highlights. Photo:  
David Stansbury



The exhibition *Making a Seat at the Table: Women Transform Woodworking* takes place in the year that marks the centenary of women's suffrage in the United States. It's an affirmation of the work of women makers, but it's more than a statement of participation in a male-dominated field, as it seeks to highlight the ways their craft practice impacts their lives and the communities around them.

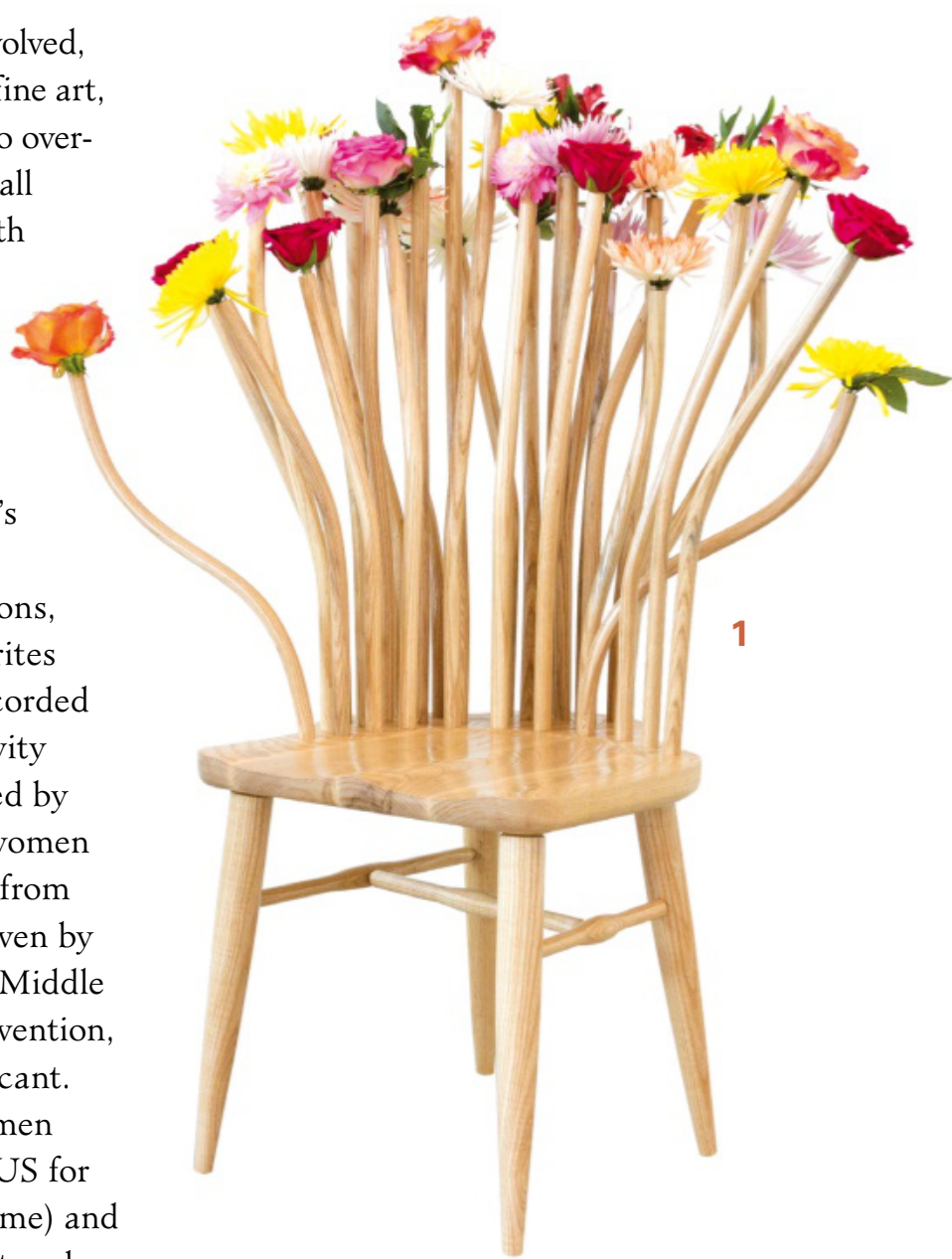
The exhibition was curated by Laura Mays, director of the fine woodworking program at The Krenov School in California, and Deirdre Visser, curator, writer and woodworker. Laura Mays replied to some questions about the exhibition and its significance.

*The name of this exhibition seems to imply that women don't have a 'seat at the table' in terms of representation and influence. Why is it that women need to publicly lay claim to their authority and authenticity as makers?*

The numbers tell the story – women are vastly under-represented in woodworking. In the trades women are about 3% of wood-related workers. But within the numbers are significant differences. Really, the closer an activity is to the trades, the fewer

women are likely to be involved, the closer to sculpture or fine art, the more. And women also over-represent, given their overall numbers, in academia, with several wood programs in colleges and in the US headed by women.

We think that visibility matters: showing women's work and telling their stories. For new generations, for validation, for who writes history and what gets recorded for posterity. For an activity to be so hugely dominated by men for centuries, with women almost entirely excluded from woodshops, sometimes even by law (by the guilds in the Middle Ages), sometimes by convention, is meaningful and significant. We have interviewed women woodworkers across the US for the book (of the same name) and heard tales of harassment and discrimination, sometimes subtle, sometimes overt and even violent. The more women are seen to be working, and doing excellent work, the more comfortable other women will be in these spaces, and the more they can focus on their work.



1. Annie Evelyn, *Windsor Flower Chair*, ash, flowers, glass test tubes. Photo: L. Gnadinger
2. Kate Davidson, *Arc Desk*, 2018, red birch, cherry, paint. Photo: Lauren Mazzotta







*In what ways do the artists who are represented 'expand the edges of the field'?*

We look at where woodworking overlaps and becomes blurred with other activities: particularly fine art on the one hand, and design on the other. Wendy Maruyama and other woodworkers of the Studio Furniture movement of the 80s and 90s introduced the idea that furniture could be personally expressive and that one's identity matters. So, for example, Vivian Chiu, explicitly references her Asian background in her description of her piece, *Blanket*.

'A queer Asian woman interested in ideas of (in)visibility, I use methods of laborious deconstruction and reconstruction of materials to reveal and conceal the female body. Growing up in pre-handover Hong Kong and now living in America, I am aware of the conflicts and commonalities of Eastern and Western cultures, which is a constant source of concern and inspiration in my sculptural practice. My interest in reconciling these conflicting elements stems from my personal struggle with my identity. How do I resolve my queer identity with my conservative Chinese cultural identity? I acknowledge and rectify these oppositions through sculptural objects that express themes of turmoil, confusion and hidden emotions. I use labor intensive methods not only as catharsis to alleviate these psychological narratives, but also to pay a conscious homage to my family's history and toils in factory work.'

On the other hand, makers like Yvonne Mouser and Bowen Liu are working in a design idiom, making small-batch production runs, focused on function and form and the user experience.

Another 'edge' we look at is women who use woodworking primarily or





3. Katie Hudnall, *Spirits Cabinet*, 2012, reclaimed wood. Photo: Michelle Given
4. Alex Clarke, *Baguette Board with Sculptural Dish*, 2019, walnut. Photo: Alex Clarke
5. Emma Chorostecki, *Benjamin Dining Chair*, 2017, white oak, leather. Photo: Emma Chorostecki
6. Gail Fredell, *Tansu Blue*, 2014, dyed red oak, pickled white oak with a blue wash, satinwood, steel hardware. Photo: Mark Johnston
7. Laura Kishimoto, *Yumi Chair II*, 2016, ash and mild steel. Photo: Matthew Staver
8. RH Lee and Would Works, *LA City Blocks*, 2019, beech. Photo: Victoria Wall Harris

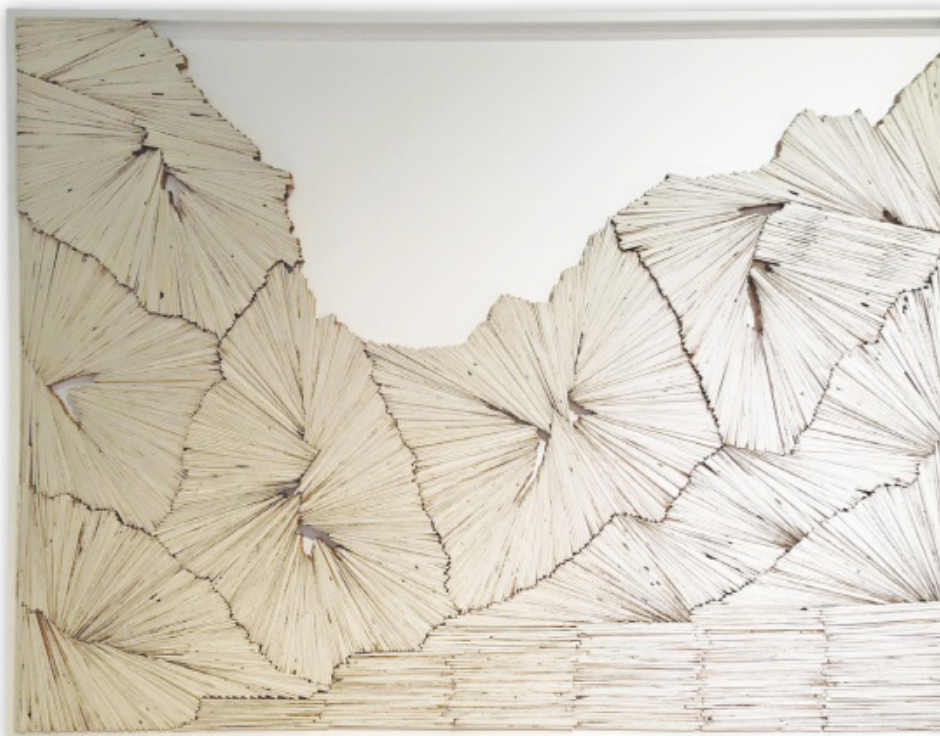


partly for social justice and community work – participatory and empowering. For example Would Works in Los Angeles creates and sells wood products that are handcrafted by individuals who are houseless or living in poverty. When someone is living at the economic margins, they are often preoccupied with the task of fulfilling simple needs that many of us take for granted. Their goal could be a new pair of eyeglasses or dentures, a bus ticket home, or money toward a first month's rent. At Would Works, emerging artisans can finance their goals while gaining work experience, learning concrete skills, and receiving an updated job reference.

The majority of Would Works artisans are women. Through a strong referral program with Los Angeles' Downtown Women's Centre, more than thirty women at transitional moments in their lives have come through the Would Works program in the last few years. Like many women, most of the female artisans in the program had not considered woodworking as a viable employment path. 'This is not a thing women usually do,' says Shirley. 'I never would have thought about doing Would Works if they hadn't approached

me.' Thanks to the Ticket to Work program, Shirley has been able to stay on as a Would Works artisan for a year and has become a natural leader on the shop floor: 'I love my job!...I love making things!'

Woodworking itself is a loosely defined field, in a state of constant change. We suggest that the opening of the door to the 50% of the population which has traditionally been excluded makes a difference. The field is not defined by professional associations and doesn't have institutional gatekeepers: the field is made up by those who participate.





9. Christy Oates, *Facet Chair*, 2014, sapele and maple veneered plywood. *Photo: Christy Oates*
10. Vivian Chiu, *Blanket*, poplar, braided string. *Photo: Vivian Chiu*
11. Leslie Webb, *Linda Lou Rocker*, 2018, ash, cane. *Photo: Leslie Webb*
12. Michaela Crie Stone, *Purse*, maple veneer, leather, brass. *Photo: Michaela Crie Stone*
13. Leigh Dotey, *Steam Cabinet 01*, 2016, white ash, brass, aluminum. *Photo: Leigh Dotey*
14. Sarah Watlington, *Heron Chair*, walnut. *Photo: Todd Sorenson*
15. Jodie Prud'homme, *Third Street*, 2018, Port Orford cedar and ebony. *Photo: Todd Sorenson*
16. Bec Evans, *Bookbox*, 2017, walnut, madrone. *Photo: Todd Sorenson*
17. Sarah Martin, *Wherever Your Treasure Lies*, 2019, mahogany, milkpaint, MDF, basswood, bronze, acrylic paint, graphite, mixed media. *Photo: Steve Mann*



*Can differences can be perceived in works designed and made by women? How are women 'transforming' woodworking?*

We don't think there is a specifically feminine 'look' or approach to woodworking. But we do think that a systemic change in who participates in the field is a transformation.

*To date woodworking has been a mainly male trade or activity – do you, as a teacher and a practising designer and maker, discern a turnaround? Are more women making now and if so, why do they now feel more empowered to do so?*

That is not an easy question to answer: on the one hand, the numbers of women in college courses in woodworking does seem to be increasing (albeit not in huge numbers), but the number of women in the trades is resolutely low and unshifting.

Some men, particularly older men, seem threatened by even talking about the subject of the number of women in woodworking, but I think that younger people, brought up in an era of identity politics and latterly Me Too, understand that seeing someone's identity is important. Gender (and other identity) blindness did not work.







*The exhibition statement notes that as well as being about objects and process it is also about communities built around them. Can you expand on that?*

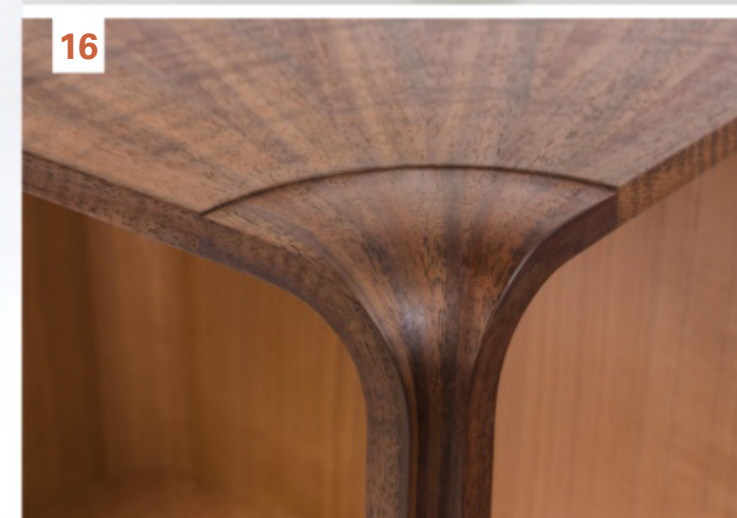
This was mostly answered already, but we'd also like to refer to A Workshop of Our Own in Baltimore, started and run by Sarah Marriage, as a women-only workshop space:

WOO opened its doors in Baltimore in 2017 with a mission to create a professional environment to cultivate and promote the careers of women and gender non-conforming craftspeople in woodworking. Their goals are multi-faceted and clear, holding as values collaboration, professionalism,

education, inclusion, and support, while aiming to amplify the voices of member makers.

We are the makers of our culture. We can choose to build workshops like we are building here in Baltimore. We can provide supportive creative environments to young people who might be overlooked for an apprenticeship, or treated differently, based solely on their gender identity.

*Making a Seat at the Table may be seen at the Center For Art in Wood until January 18, 2020. See [centerforartinwood.org](http://centerforartinwood.org) A comprehensive book of the same name co-authored by the curators will be released in 2021.*







# Mid-Century Dining Table

**With angled and tapered legs, this dining table presents a few joinery challenges which can easily be overcome. Story by Charles Mak.**



**Above:** The author's walnut dining table with angled and tapered legs.

1. Dominos were used to align boards for the top.
2. Edge planing one of the sub-assemblies for the top. Raise the panel to turn your workbench into a mega-sized shooting board.

I find some of George Nakashima's mid-century splayed leg table designs inspiring and decided to adopt the same line of simplicity with the new dining table I recently built.

Walnut has always been one of my favourite hardwoods. It is easy to work with, and most importantly, it can, depending on the lighting, appear dark or glowing gold with its depth and wild pattern. With the proper finish, it can maintain its character and grace as it ages.

While the style of the table is important, its size is crucial. I followed the standard dining table dimensions as shown in the cutting list.

The tabletop is a straightforward build, but the angled rail-to-leg joinery adds complexity. In this joint, the splayed, tapered legs are also sloping while they are joined to the rails at an angle. At first glance, the execution of the angled joinery seems to be quite a challenge for a domino joiner. Once broken down, it is in fact no more than a mitre joint.

## Start with the panel glue-up

To glue up a panel, I usually ignore the textbook advice of alternating the boards as for me, colour and grain pattern matter more. I can handle wood movement or reverse grains with various proven techniques, such as using well-acclimatised timber or planing with a high angle plane.

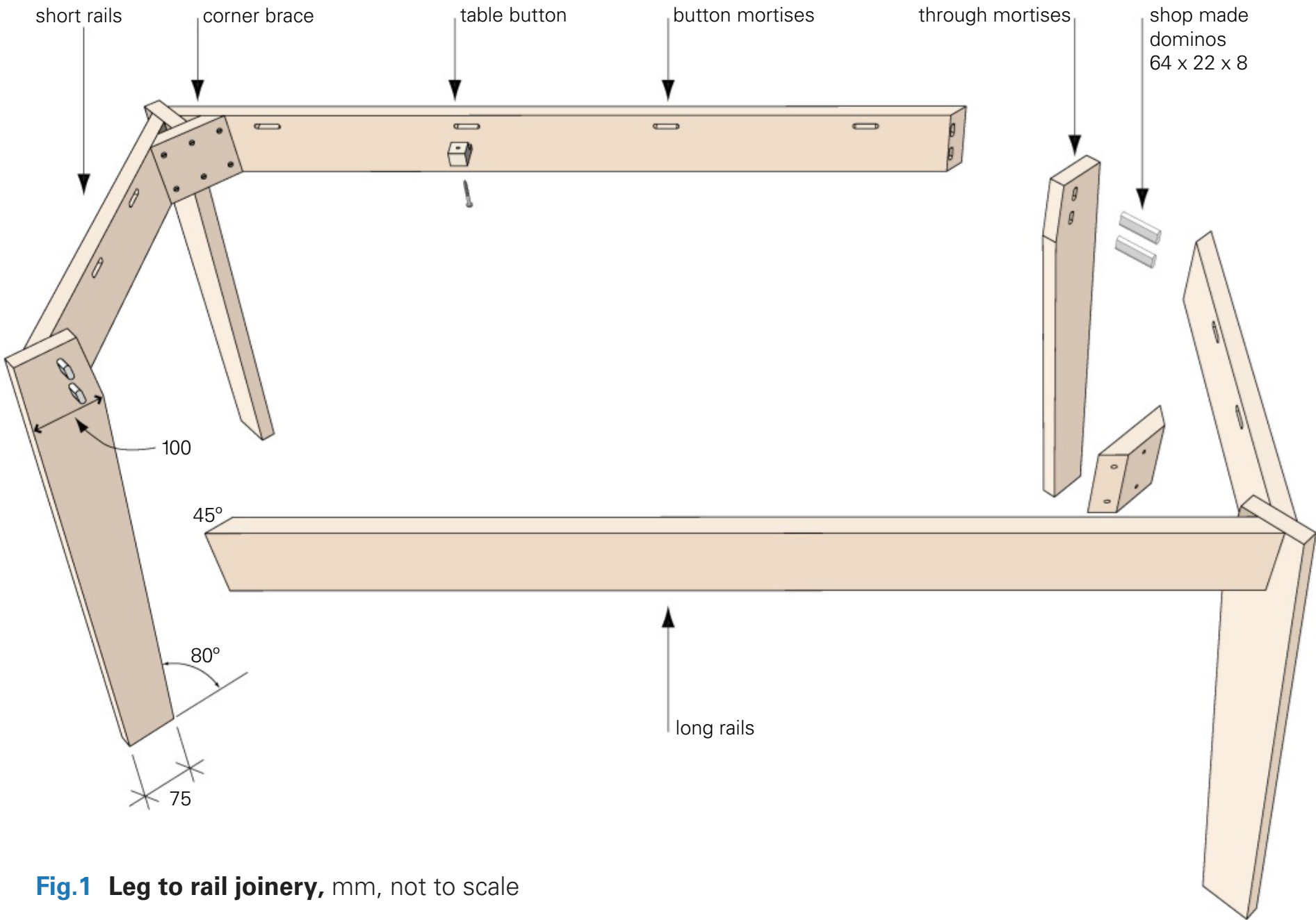




After sorting out the dressed boards, I cut domino mortises on the edges with the aid of a cross stop, which eliminates pencil lines and alignment by sight (**photo 1**). I split the glue-up into two sub-assemblies, and let the glue cure before cleaning up the edges (**photo 2**).

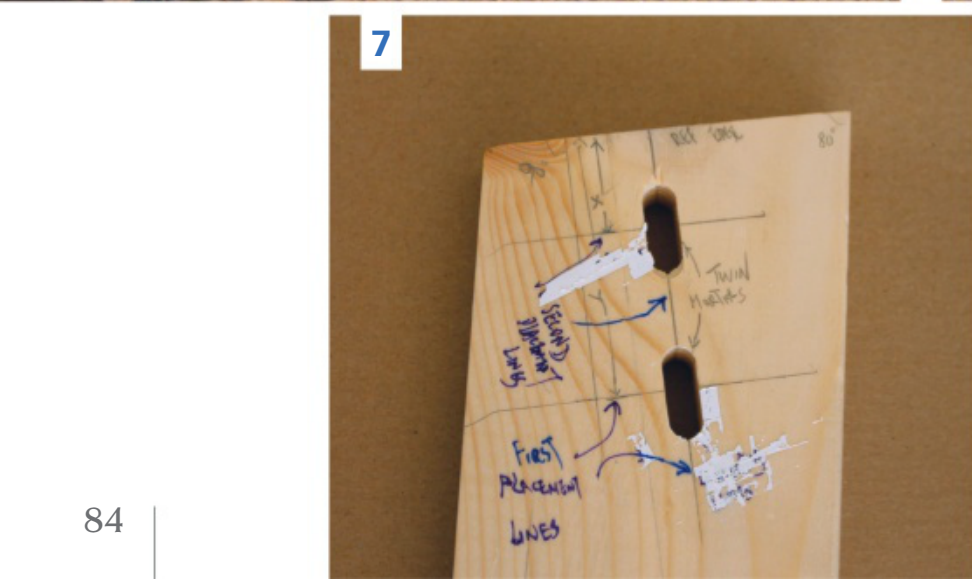
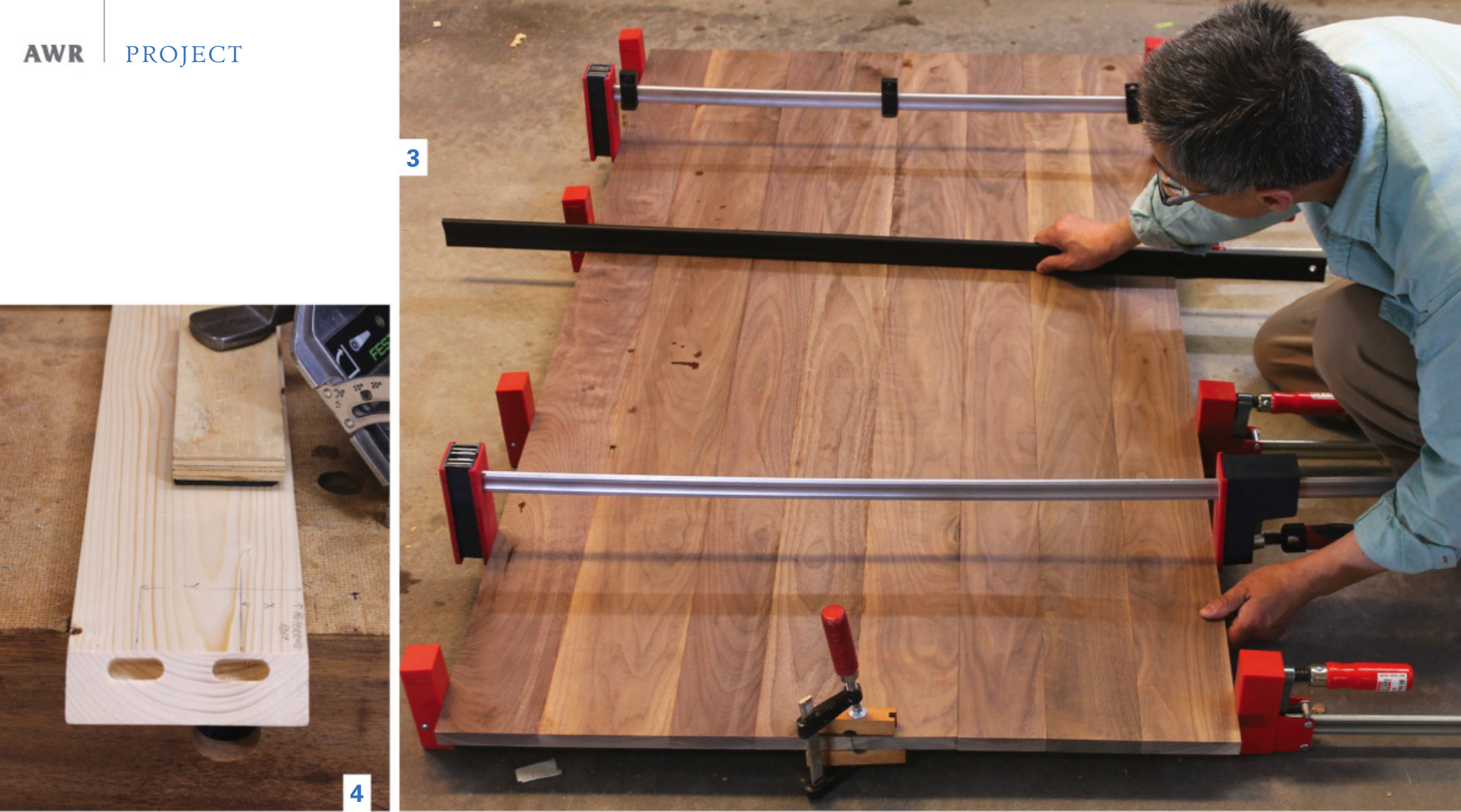
To join the two sub-panels, I picked a flat spot on the shop floor for assembly (**photo 3**). If you don't have a large assembly table or a flat floor, you can lay a full-size thick plywood sheet (20mm thick) on the floor as a platform to do the glue-up.

| CUTTING LIST (mm) |        |       |           |     |
|-------------------|--------|-------|-----------|-----|
| PART              | LENGTH | WIDTH | THICKNESS | QTY |
| Top               | 1530   | 870   | 25        | 1   |
| Legs              | 750    | 100   | 25        | 4   |
| Rails             | 1220   | 100   | 25        | 2   |
|                   | 550    | 100   | 25        | 2   |
| Tenons            | 64     | 22    | 8         | 8   |
| Buttons           | 40     | 30    | 20        | 12  |
| Corner braces     | 130    | 100   | 25        | 4   |



**Fig.1** Leg to rail joinery, mm, not to scale





After the glue-up cured, I planed away any high spots before chamfering the edges and sanding the top. Using a higher grit on the edges can reduce the finishing contrast between the edges and the top.

Demystify the angled joinery

The base for the table is composed of sloping, tapered legs and rails. Unlike a typical rail-to-leg joinery, the rails are not joined to the legs at a right angle, but at 45°, due to the angling of the legs (**fig. 1**). The sloping and angling give the legs a stylish look.

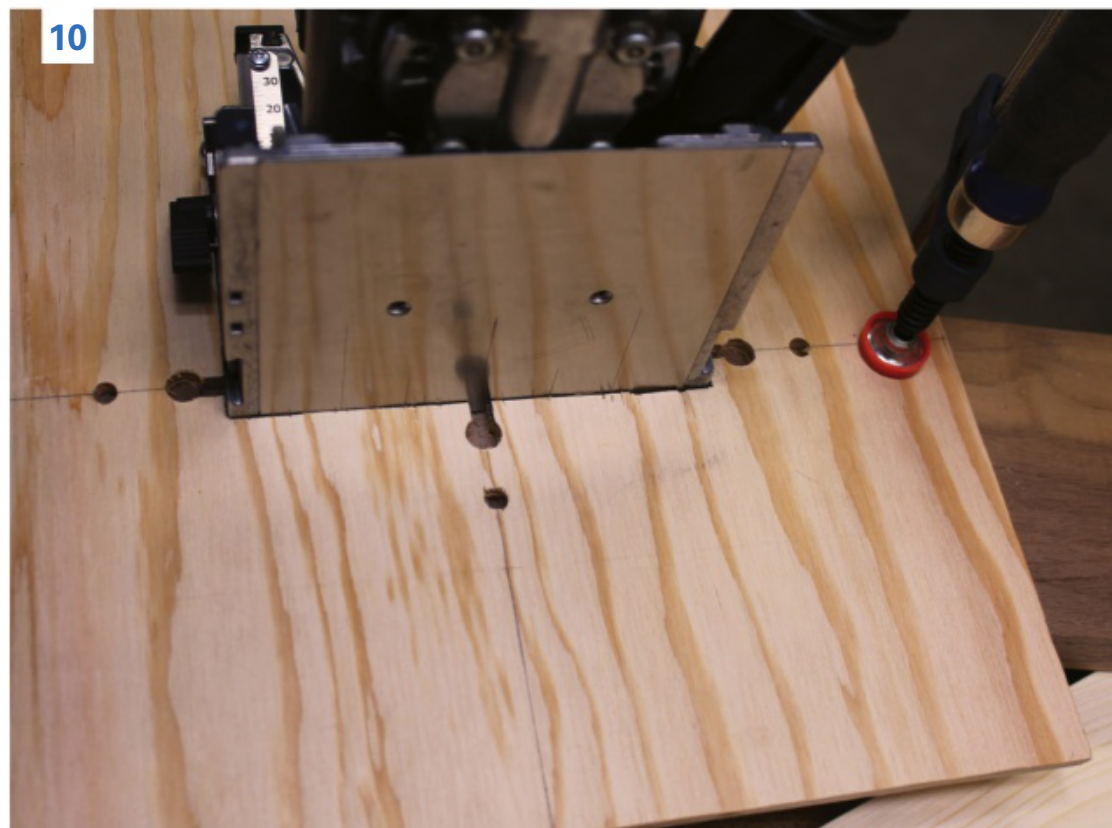
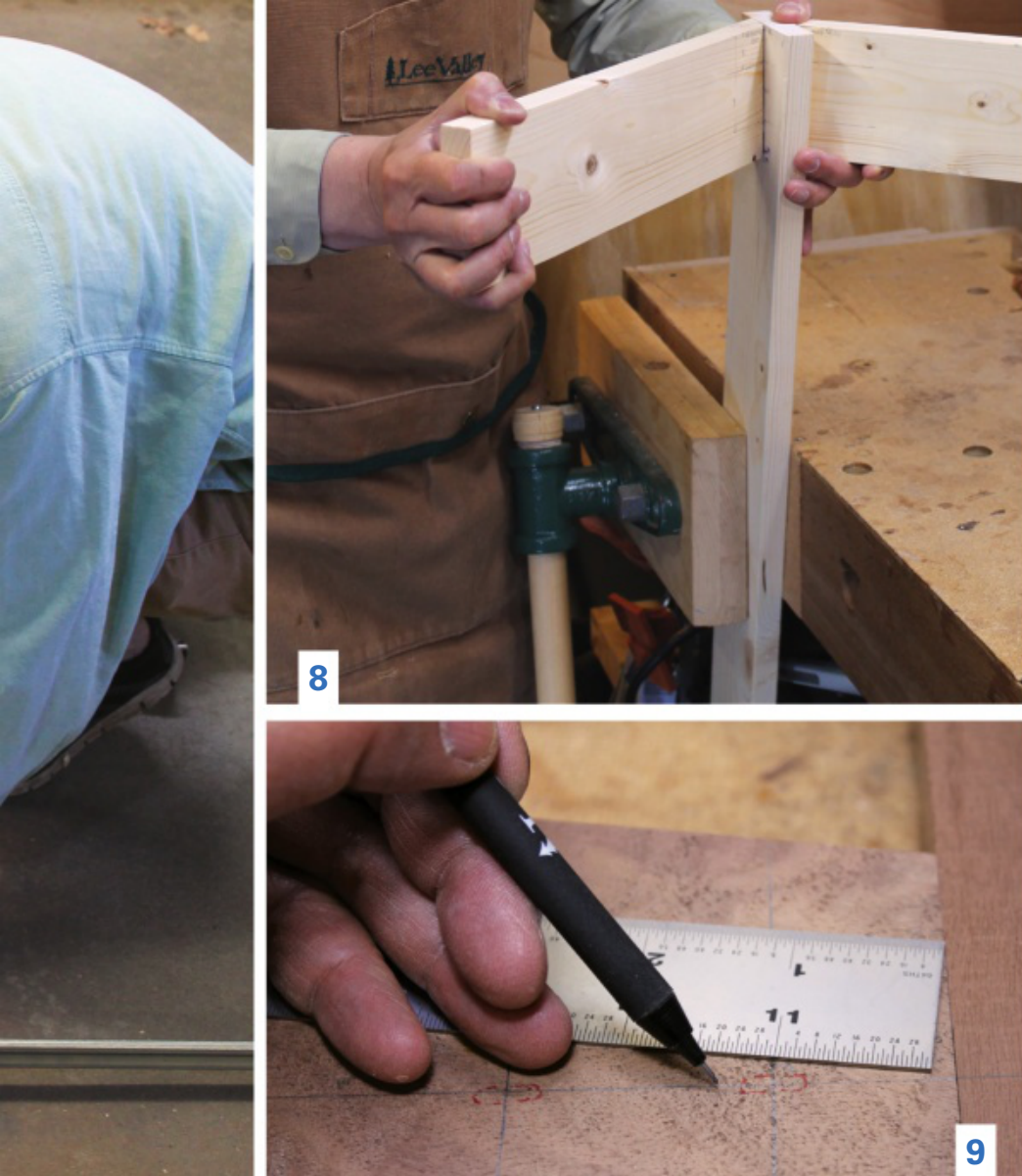
For this joinery design, we are working with three types of angles: the sloping angle (the angle of the legs relative to the floor), the rail angle (angle of the rails relative to the legs, which is a mitre), and the taper on the legs.

When Tage Frid worked with complex designs and builds for the first time, such as his skill-demanding mahogany cabinet, he built a mock-up to establish his procedures. The best way to figure out the sloping and taper angles, and understanding how such joinery can be executed for this table, therefore, is to experiment on the design with a mock-up.

Do a mock-up

Start with two rectangular pieces, and mitre their ends to form the mock-up rails. Mark out and cut two mortises on the mitres with the domino joiner (**photo 4**). Placement lines are drawn on the leg to match the pencil lines on the rail mitre (**photo 5**). A second intersecting line is then drawn on the leg to complete the layout of the mating mortises (**photo 6**). To cut the twin angled mortises on the





leg, I followed the same intersecting-lines technique that was explained in my *Step by Step Stool* article in *AWR#101* and is shown in **photo 7**.

To find the desired sloping angle of the mock-up leg, cross-cut the top and bottom of the leg to a chosen angle and stand the leg on the bench or floor to check (**photo 8**). After a couple of trials, the sloping angle I liked came out to be 100°.

## Prepare the legs

With the marking and mortising steps sorted out, cut the sloping legs from the dressed stock, and machine the twin mortises (**photos 9, 10**). I tapered the legs using a modified tablesaw jointer jig, or you can taper them on a bandsaw, and remove the saw marks with a plane. To make room for the corner braces, trim off part of the inside edge of the leg's top portion (**photo 11**). In the last step, ease all the edges, and mark out the leg locations on the underside of the tabletop (**photo 12**).

## Make the rails

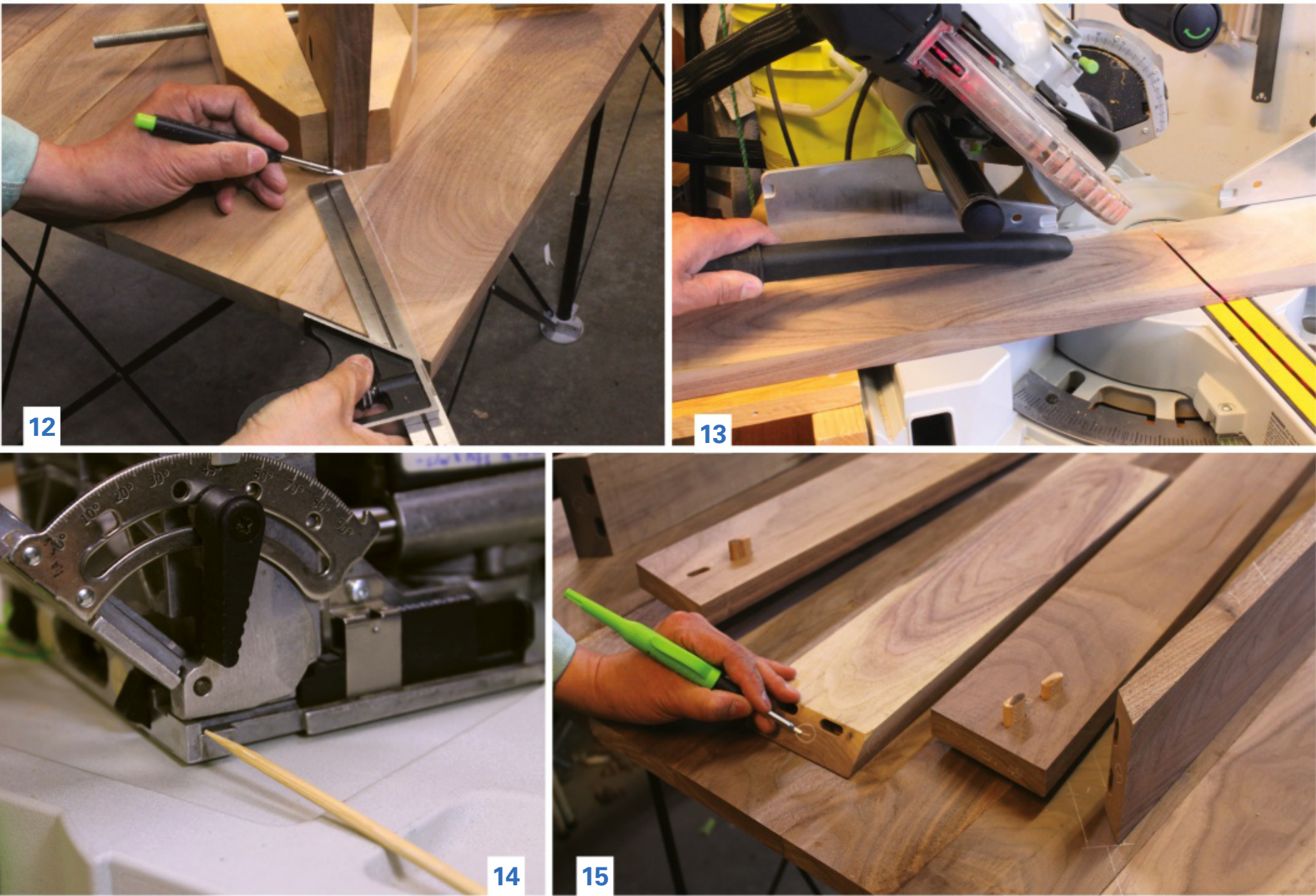
Rip the long and short rails to length and mitre their ends (**photo 13**). To cut mortises on the mitres, set the joiner fence such that the mortises are cut close to the inside corner for maximum strength (**photo 14**). After mortising, ease the sharp edges, and dry fit the rails to the legs using standard size dominos (**photo 15**).

## Cut some cabinetmaker's buttons

The end-to-end grain direction on the top means wood movement will be side-to-side. The tabletop can be fastened to the rails with various methods such as screws

3. Place clamps on both sides of the panel to distribute pressure evenly.
4. For a stronger joint, cut the bevel mortises as deep as stock thickness allows.
5. Transfer the pencil lines on the mitre to the leg to mark out the intersecting placement lines.
6. Place the mitred rail on the leg to mark the second intersecting pencil line.
7. Cut the twin domino mortises where the lines intersect.
8. A mock-up lets you sort out angles and assembly sequences.
9. Mark the orientation of the mortises to avoid confusion.
10. A simple cradle prevents the machine moving during plunging.
11. The top of the leg was trimmed in part to make way for the corner brace.





- 12.** Mark the position for one leg, then transfer that setting with a combination square.

**13.** Use stop blocks so the rails are bevelled to identical lengths.

**14.** To cut mortises in the mitres, always set the fence angle before lowering and setting the fence depth.

**15.** After a dry test-fit all parts were labelled to establish an order for the glue-up.
- 16.** When cutting the rebate to depth, the waste fell to the offside of the blade.

**17.** Assemble the frame and measure diagonally to check for square.

**18.** Screw holes on the corner braces were pre-drilled on the drill press.

in pockets or ledger strips that allow seasonal movement. Cabinetmaker’s buttons are chosen for this table (**fig. 2**), and are easy to make in bulk. For strength, the buttons, if made of hardwood, should be made with the grain on the tongue running perpendicular to the rails. I rebated a strip of plywood and cross-cut it into cleats (**photo 16**). These buttons are used with slotted holes cut with the domino joiner on the inside face of the aprons.

Make the long tenons

The combined mortise depth of a rail-to-leg mortise is 64mm, while the longest dominos available for the standard DF500 domino joiner are 50mm. To make longer dominos, I ripped some scrap beech stock to size (22 x 8mm), rounded its edges on the router table and cross-cut them to length. You could also shorten some of the 80 x 22 x 8mm dominos that are available for the larger DF700.

Apply the finish

Polyurethane is my usual choice of finish for tables, but I have heard enthusiastic praise for the Osmo oil products, and decided to try the Polyx oil out. After sanding everything to 150 grit, I applied two thin coats (10 hours apart) with a cloth before the final assembly.

Assemble the legs and aprons

Let the oil finish dry to touch in about a day, then clamp the aprons to the legs, working with one joint at a time.

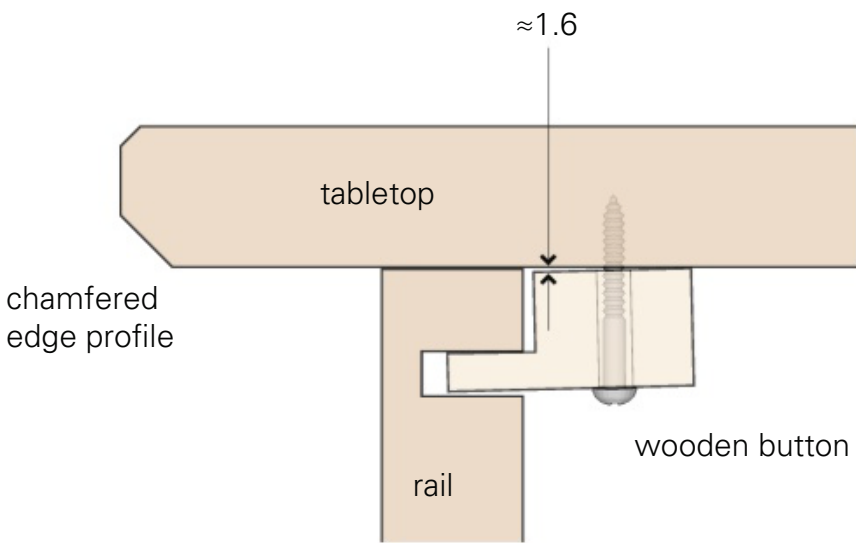


Fig.2 Tabletop attachment

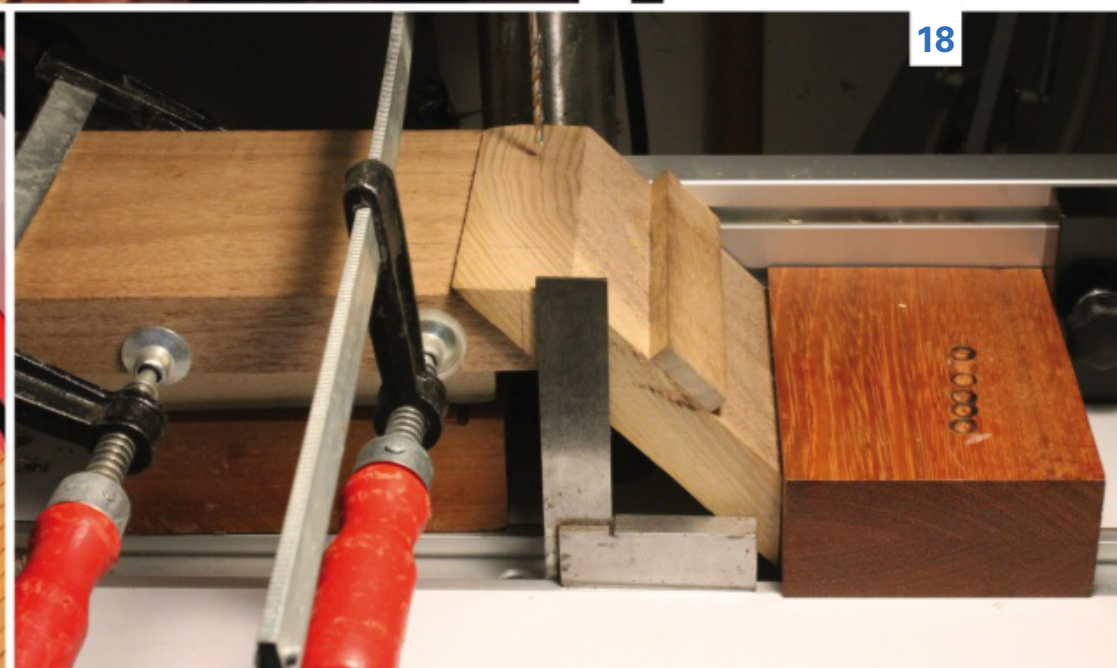




17



16



18

When working with a large or complex glue-up, my secret to a less stressful experience is the use of a reliable assistant. I briefed my helper beforehand so she knew how to handle her tasks (**photo 17**).

To increase a table's rigidity, corner braces such as metal brackets or corner blocks are usually used. I made some wooden braces and screwed them in to bridge the corners from rail to rail (**photo 18**).

### Attach the top

In the final step, position the top on the base, and install the buttons. Allow the finish on the top to cure (about two weeks), and your heirloom dining piece is ready for a celebration meal!

Building a dining table can be a challenging undertaking. There are more design factors to look into such as reach and seating clearance than just the style and size that I have mentioned here. 'Make furniture that people can be comfortable living with', Sam Maloof said. His advice is as sound for tables as it is for chairs. And that's what you should keep in mind when you design a dining table!

*Photos: Charles Mak*

*Illustrations: Graham Sands*

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



# Preserving Our Past

**Queensland Art Gallery's well equipped frame studio is unique to any public art museum in Australia, producing all the gallery's framing needs as well as carrying out conservation and restoration treatments.**

**Story by Linda Nathan.**

The Conservation Frames and Furniture Studio at Queensland Art Gallery and Gallery of Modern Art (QAGOMA) must surely rank as one of the most well equipped workshops around. Everything from a dental probe through to a suite of Martin machinery not to mention a Marunaka surface planer have a home there, and are lovingly used and maintained by the studio's tight-knit team of three.

The studio's well appointed machine room leads into a long bench room which doubles as space for conservation and restoration treatments, traditional frame making and assembly. Further along, a glass walled office is used for administrative tasks and for housing reference books.

Conservation framer, cabinetmaker and studio manager Robert Zilli came to the gallery as a volunteer in 1993. Following two year's study in furniture restoration in Italy he was offered a traineeship at QAG under Paul Curson, then manager of the studio. Committed to furthering his knowledge and skills, Robert received an ISSI Fellowship in conservation gilding (Chicago, 2008), and later a Churchill Fellowship for which he studied traditional framing at The National Gallery in London in 2015.

Damian Buckley is a conservation framing technician and certified cabinetmaker who is also an accomplished visual artist with an education degree majoring in painting and sculpture. Damian's work extends to the conservation and restoration of picture frames and furniture, as well as manufacturing replica period and custom picture frames. He has worked in the studio for 15 years.







The Conservation Frames and Furniture Studio team at Queensland Art Gallery and Gallery of Modern Art, left to right, Alex Forrest, Robert Zilli and Damian Buckley.





1



2

1. In recent years funding has made it possible to acquire a suite of top of the line Martin machinery, including a T70 sliding tablesaw, T54 planer, T45 thicknesser and T27 spindle moulder.
2. The view into the restoration and assembly room. Robert Zilli stands before a valuable frame that will be painstakingly restored.
3. The German-made Stegherr machine cuts double mitred bridle joints for stretchers in pairs.
4. Machining on the Stegherr is completely guarded during operation.
5. No more sanding: the Marunaka surface planer delivers knife finished surfaces (and wide shavings of wood).
6. An original 19th century frame (left) sits next to its replica which was produced in the studio.
7. Frame restoration work can start at virtually microscopic level, in this instance with a dental probe.

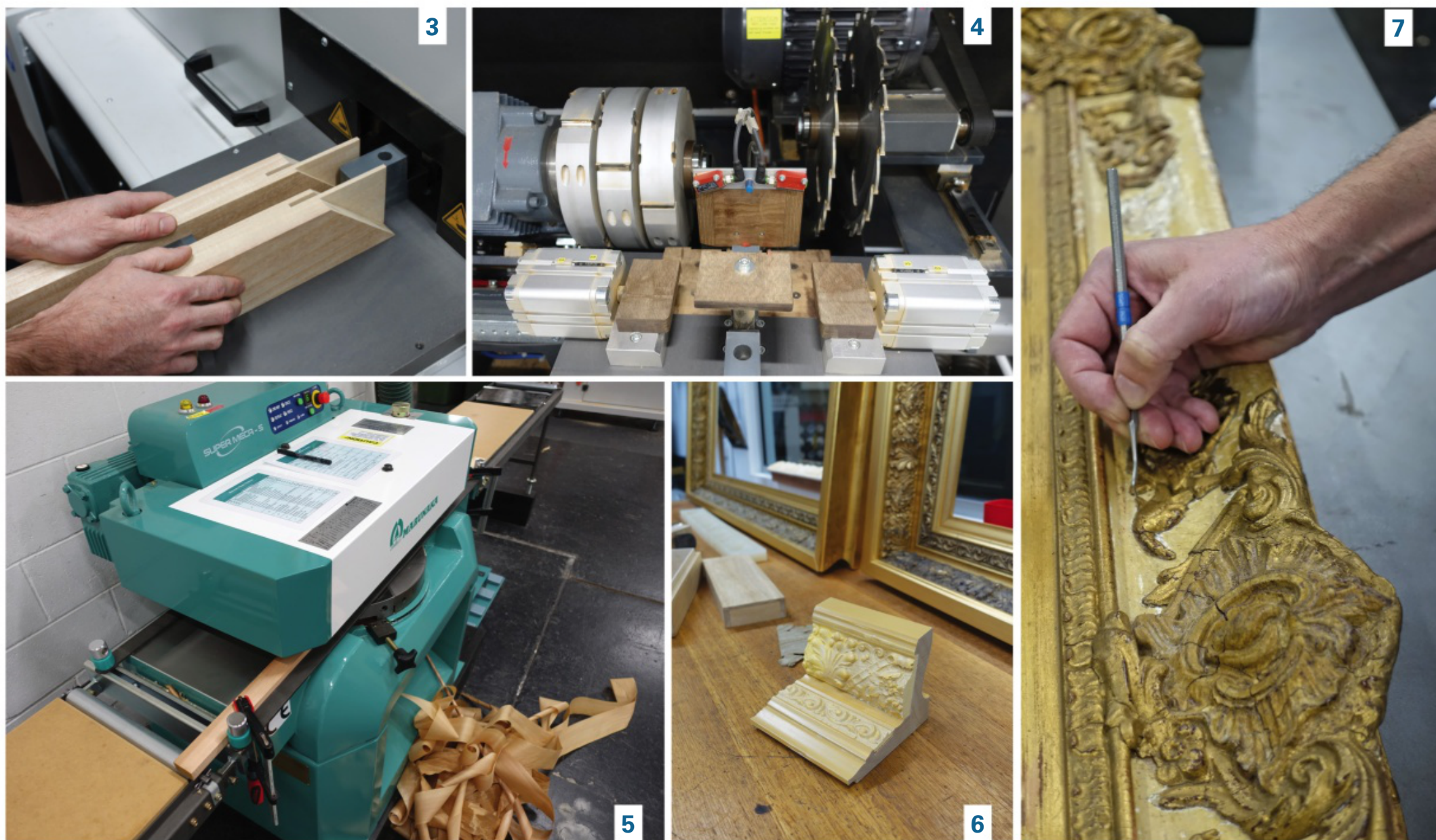
The team is complete with its newest member, Alex Forrest, conservation workshop technician. Like Damian, Alex has a fine art background but with a degree majoring in jewellery and small objects. His interest in woodworking developed while studying at Qld College of Art. Later experience working at a commercial framers and then as a technician for artists prepared him for gallery work.

The studio is located within the labyrinth of service and storage areas that exist behind gallery display areas. Weaving through hallways leads to a loading dock and a floor to ceiling timber storage area populated with species that mostly pertain to making frames, but also to furniture restoration. Australian natives dominate and include red cedar, Qld white beech, blackwood, hoop and bunya pines.

QAGOMA's frame studio is unique to any public art museum in Australia and manufactures all its own canvas stretcher bars, standard works on paper frames, custom frames and replica frames for the gallery's collection. In-house capacity means quality can be assured, deadlines met and modifications made where required.

Frames for works on paper are made from native and imported timbers chosen for their sustainability, appearance, affordability and certification. Western red cedar is used for stretcher bars but due to rising costs the gallery is trialling the use of paulownia. Paulownia has a





very high strength to weight ratio, fine straight grain and is dimensionally stable – all essential attributes for the timber required to make stretcher bars.

In recent years gallery funding has made it possible to acquire specific purpose machinery such as the German-made Stegherr stretcher bar milling machine. Replacing several operations on the spindle moulder, this machine cuts double mitred bridle joints in the one operation, a pair at a time. Machines like these speed processes, guarantee accurate joinery and offer reliable operation for decades.

Dust is the enemy of conservation framing and is minimised with a custom designed overhead collection system. The Marunaka surface planer was acquired to cut down on manual sanding as it produces fine knife-finished surfaces.

In the studio, period frames undergo conservation and restoration treatments and the team adheres to the Australian Institute for the Conservation of Cultural Materials (AICCM) code of ethics and practice.

Treatments can take months, commencing with a thorough examination of the object to determine the most suitable approach. Preventive treatments see modifications made to the backs of frames to accommodate glazing, hanging hardware and backing boards. Prior to commencing work

on replica frames and in consultation with curators, in-depth research is undertaken by the studio team to ensure the most historically accurate frame style is chosen.

As with artworks, the QAGOMA furniture collection is displayed in rotation. A recent upgrade to storage facilities has seen a rehousing of the growing collection in floor to ceiling racking systems. Spotted while wandering through were Tony Kenway chairs, Robert Dunlop's *Rocking in Free Form* chair, a buffet by Shulim Krimper, an ornate hallstand by John Mason and carved work by Elvin Harvey, to name just some of the treasures within.

The same conservation ethics are employed when conserving furniture in the gallery's collection. The aim is to preserve and protect original surfaces and structures using a combination of traditional and contemporary materials that have been tested for long-term stability and reversibility in the future.

Every element of the studio speaks of attention to detail and carefully managed activity. Robert Zilli sums it up: 'There are always challenges, always something new to solve, and of course there are deadlines to be met.'

*Photos: Raf Nathan, Linda Nathan*

*Learn more at [www.qagoma.qld.gov.au](http://www.qagoma.qld.gov.au)*



# Wood Diary

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Diary listings are free. **Email to:** [linda@woodreview.com.au](mailto:linda@woodreview.com.au)

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

**UNTIL JANUARY 18, 2020**  
**Making a Seat at the Table: Women Transform Woodworking**  
 Center for Art in Wood,  
 Philadelphia PA  
[www.centerforartinwood.org](http://www.centerforartinwood.org)

**23 NOVEMBER–8 DECEMBER**  
**Twelve: Sturt School for Wood Graduating Exhibition 2019**  
 Mittagong, NSW  
[www.sturt.nsw.edu.au](http://www.sturt.nsw.edu.au)

**11 DECEMBER**  
**Deadline for entry**  
**AWR Student Awards 2019**  
 Information and entry at:  
[www.woodreview.com.au/student-awards](http://www.woodreview.com.au/student-awards)

**13 DECEMBER**  
**Popular choice voting opens**  
**AWR Student Awards 2019**  
[www.facebook.com/Woodreview/](http://www.facebook.com/Woodreview/)

**12 DECEMBER–18 JANUARY**  
**Graduate Exhibition**  
**Centre for Fine Woodworking**  
 Refinery Artspace,  
 3 Halifax Street  
 Nelson, New Zealand  
[www.cfw.co.nz](http://www.cfw.co.nz)

**14–15 DECEMBER**  
**Woodturning exhibition**  
**Woodturners Society Queensland**  
 Mt Coot-tha Botanic Gardens Auditorium  
<http://woodturnerssocietyqld.org.au/>

## 2020

**13 JANUARY–21 FEBRUARY**  
**Michael Fortune Artist Residency & Open Studio**  
 Centre for Fine Woodworking  
 Nelson, New Zealand  
[www.cfw.co.nz/course\\_m5.html](http://www.cfw.co.nz/course_m5.html)

**16 FEBRUARY–29 MARCH**  
**EDGE – Exploring Boundaries**  
 An exhibition of work byStudio Woodworkers Australia  
 Sturt Gallery, Mittagong, NSW  
[www.studiowoodworkers.org.au](http://www.studiowoodworkers.org.au)

**15–16 FEBRUARY**  
**Tools & Techniques Weekend**  
 Sturt School For Wood, Mittagong, NSW  
[www.sturt.nsw.edu.au](http://www.sturt.nsw.edu.au)

**23 FEBRUARY**  
**The Traditional Tools Group**  
 Sydney Tool Sale, 9am–1pm  
 The Brick Pit Stadium, Thornleigh  
[www.tttg.org.au](http://www.tttg.org.au)

**MARCH (dates TBC)**  
**Timber, Tools & Artisan Show**  
 RNA Showgrounds, Bowen Hills, Brisbane  
[www.timberandworkingwithwoodshow.com.au](http://www.timberandworkingwithwoodshow.com.au)

**7–8 MARCH**  
**Lost Trades Fair**  
 Bendigo Racecourse, Bendigo, Victoria  
[www.losttrades.info](http://www.losttrades.info)

**7–8 MARCH**  
**Woodcraft Expo, Demos & Sales**  
**Kiama Woodcraft Group, NSW**  
 Masonic Hall, Collins St, Kiama  
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**28–29 MARCH**  
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**2–4 MAY**  
**Maleny Wood Expo including Wootha Prize exhibition**  
 Maleny Showgrounds, Qld  
[www.malenywoodexpo.com](http://www.malenywoodexpo.com)

**16–17 MAY**  
**Lost Trades Fair**  
 Cobb & Co Museum  
 27 Lindsay St, Toowoomba, Qld  
[www.losttrades.info](http://www.losttrades.info)

**6 JUNE**  
**Open day**  
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 Ian: 0408 361 848

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**Annual Wood & Craft Expo**  
**Maryborough Woodturners & Woodcraftsmen Guild**  
 Maryborough Showgrounds, Bruce Highway,  
 Maryborough Qld  
[www.mwmginc.squarespace.com](http://www.mwmginc.squarespace.com)

**OCTOBER (dates TBC)**  
**Lost Trades Fair NSW**  
 Hawkesbury Showgrounds, NSW  
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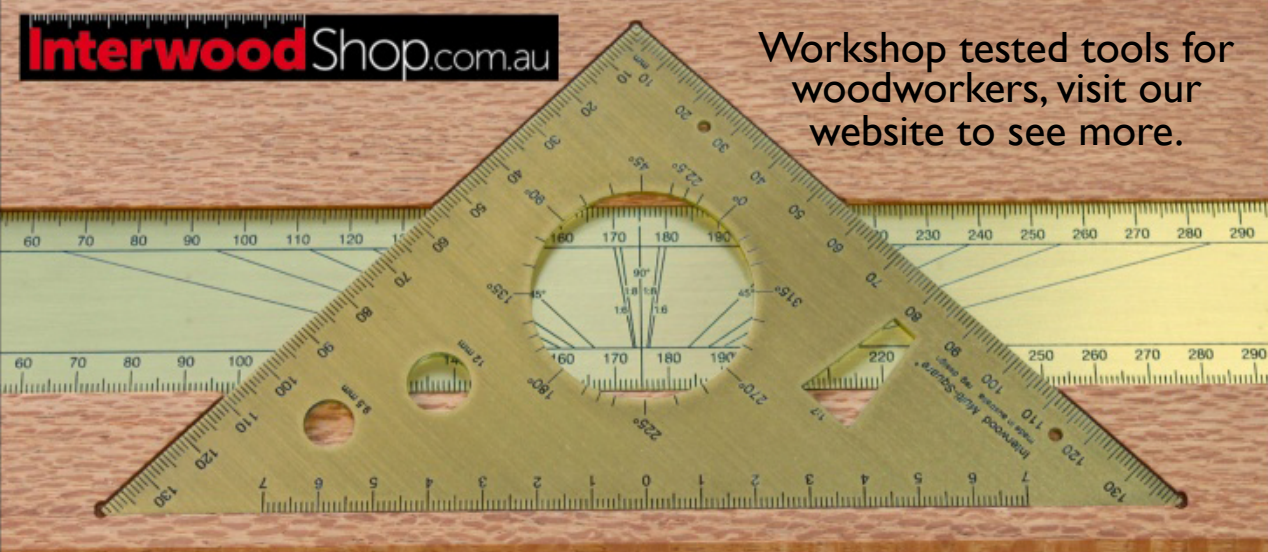
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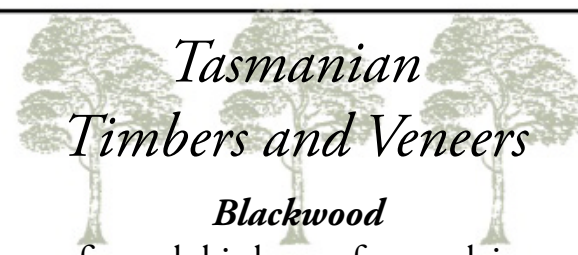
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# The Measure of Things

With pencil in hand, Raf Nathan looks at the ins and outs of tape measures.

If I can't find my tape measure and pencil then in an instant everything in the workshop comes to a grinding halt. We underestimate how important these humble tools are. More so the pencil; pause to think – without the pencil in most ways you can't even begin to work. Combine a pencil with a tape measure and you can draw, write, measure and ultimately be accurate.

Everyone will have preferences on what sort of pencil to use and how to sharpen it. Personally I use an HB pencil and sharpen it with a chisel. I never use those broad tip carpenters pencils. You may prefer a pencil sharpener or rub the tip on sandpaper to form the point.

Mostly, the finer the point the better, and of course remember that when we work we always leave the pencil line. If you saw the pencil line away then you have lost your reference mark. A knife line is even better to work to for greater accuracy.

## Class distinctions

Tape measures come in a variety of styles. Note that different tape manufacturers will have different ways of displaying the measurements. In the end though all are pretty much the same in their use, you may just prefer one style over the others. And of course buying really cheap can be a complete waste of money.

Fortunately there is a Euro standard for tape measures. There are three grades rated by allowable deviation over 10 metres. The tape will be



A selection of tape measures illustrates some of the variations in measurement display.



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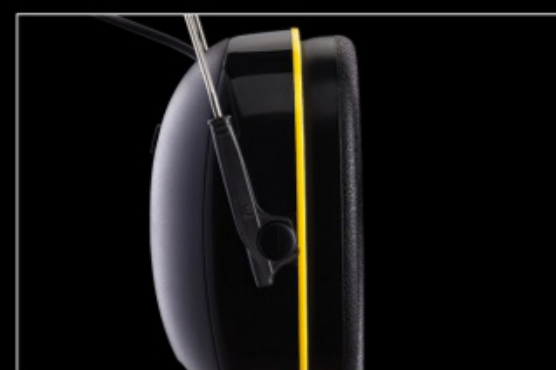
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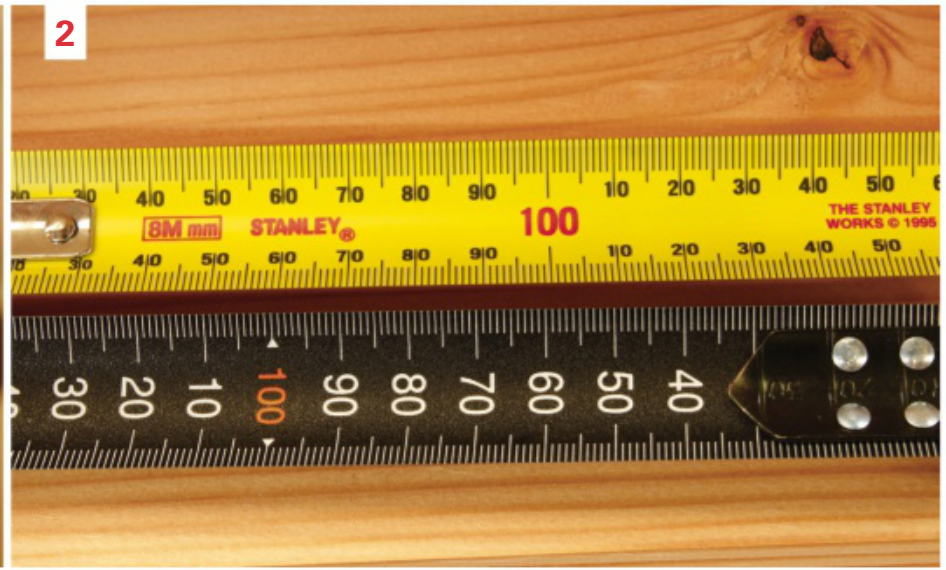
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1. Keep your pencil sharp if you want to layout accurately.
2. Two different manufacturers show how ruler markings can considerably vary.
3. Showing how the tab compensates for its thickness in an outside reading.
4. For an inside reading the tab is pushed in.

forth a bit. This allows the tape to measure inside or outside a structure. The movement of the tab should be equivalent to the thickness of the tab, so the same reading will result.

Tape measures have an auto retract to recoil the metal tape. On some, particularly the eight metre version, this recoil can be very quick and sharp. I had one tape with a large tab that could catch my finger with a whack. You will need to train yourself to keep fingers clear of your tape measure on retraction.

Most tapes are bright colours which makes them easy to find on site, which makes sense given its importance. However for years now I have used my all black Lufkins, as to me, flouro coloured tapes are visually offensive. To be honest I have two Lufkin tape measures that were bought at least 15 years ago.

Lastly, as with any ruler, you should use the same tape for a whole job to maintain consistency in *measuring*.

*Photos: Raf Nathan, Rebecca Nathan*



Raf Nathan is a woodworker and tool designer who lives near Brisbane.  
Email: [raf@intwerwoodshop.com.au](mailto:raf@intwerwoodshop.com.au)

marked near the start with an encircled 'CE', meaning it has been classified. A Roman numeral 'I' denotes first class for the most accurate.

Class I allows for a deviance of 0.4mm over three metres, while Class II (most commonly used) has a deviance of 0.9mm. Grade III with 1.8mm deviance is for less critical work. Tapes without class markings are unclassified but may still be very accurate. Deviation over ten metres is a critical thing for someone building a yacht or wall but for most of us using measurements

under two metres any deviation is relatively minimal.

For most workshop use a five metre tape will suffice, for building work I use an eight metre version – and my preference is never one that displays inches. Left handed users will decide on markings that work best for them, or opt to purchase tapes specifically designed for them.

### What's the tab for?

At the end of the tape measure is a metal tab that can move back and



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