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WELCOME

It's all dovetailed perfectly this month. We've got Vasko Sotirov's randomly spaced dovetails, London dovetails in Israel Martin's cherry side table and maths-free compound angle dovetails from Michael T Collins. If dovetails aren't your thing, roll with the curves in Paolo Frattari's innovative curvy table, keep it real with Long Island-based Ethan Abramson, who left a computer-based design career to make things in real life, and see it all stack up in Stephen Hogbin's quick and affordable Top Notch stacking chair.

The devil's in the detail – and so are the delights, which is why we've got a bumper issue of step-by-step guides for you this time. Keep your card scrapers sharp with Randall A Maxey, learn to carve volutes with Frederick Wilbur, turn multiple matching legs with Nick Arnull and treat yourself to a gentleman's workbench and cabinet with Colin Sullivan.

And there's plenty of inspiration too: take flight with former RAF engineer and aviation professional Chris Leese-Wood, find inspiration from Italy to create furniture that is also art with Cornwall-based Sebastian Blakeley and learn how US furniture maker Martin Goebel created a chair fit for a queen.

'Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do.'

PELE

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F&C ISSUE 295

Furniture & Cabinetmaking magazine (ISSN 1365-4292) is published every eight weeks by Guild of Master Craftsman Publications Ltd, 86 High Street, Lewes, East Sussex BN7 1XN T: +44 (0) 1273 477374

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gmcsubscriptions.com

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Woodworking is an inherently dangerous pursuit. Readers should not attempt the procedures described herein without seeking training and information on the safe use of tools and machines, and all readers should observe current safety legislation.



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FURNITURE & CABINETMAKING

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CHERRY SIDE TABLE

ISRAEL MARTIN USES HAND TOOLS TO MAKE A TABLE WITH
SPRAYED LEGS, THREE FRONT DRAWERS AND A SIDE DRAWER

The design of this small side table is inspired by Garrett Hack's work. I wanted the table to be lightweight with a few nice 'surprises' on it. I used a variety of techniques in its construction as the table will be shown as an example piece at some workshops I will be teaching.

I wanted to make different types of drawers, using different woods and veneering some of them. Joining together different woods with different colours is always a challenge – the result can be magnificent or it can ruin the piece. In this case my goal was just to use them as an example for my workshop students.

Although the construction could be much easier if the legs were splayed from the mortises, I had a small piece of timber that fitted my needs, so I splayed the legs from the top. This made the joinery a bit more difficult because the apron, drawers, stretchers, etc all have an angle.



1 Shaping the legs 2 Laying out the side drawer apron 3 Marking for the mortises 4 Detail of the double dovetails joining the leg and side apron 5 Detail of the lower front blade joinery (twin tenons) 6 & 7 Front and side views of the complete structure

TABLE STRUCTURE

Normally I would start by making a straight leg and then shaping it, but I didn't have enough wood to do that so I shaped the legs first. Two sides were square and then I removed the waist to shape them.

Once the legs were done, I made a sample apron to add the 2° for the splayed legs. I used haunched mitred mortises and tenons to join the back legs with the aprons and a single haunched tenon to join the front legs with the side aprons. When mortising I added that 2° angle on every mortise end to fit the tenons. The front has double dovetails to join the upper blade and twin tenons on the lower one. I had to bear in mind that every piece would be joined with a 2° angle. All the front drawer guides were joined with mortise and tenons and the kickers with half-lap joints.



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SIDE DRAWER

I wanted the table to have a continuous-grain side apron with a small side drawer. I made the side drawer by ripping the apron in three and then sawing the drawer front, obtaining five pieces that needed more planing before they were glued together again. I glued the four pieces with the drawer front inside without glue. I then used a chisel to make the 2° angle on the drawer space top and bottom and did the same with the drawer front. That way there is more of a gap between the drawer front and the apron but it was almost invisible once all the front edges had been chamfered, and overall this made things easier. Its guides are joined with mortise and tenons to the front and half-lap joints at the back. I used ripple sycamore for the drawer sides.

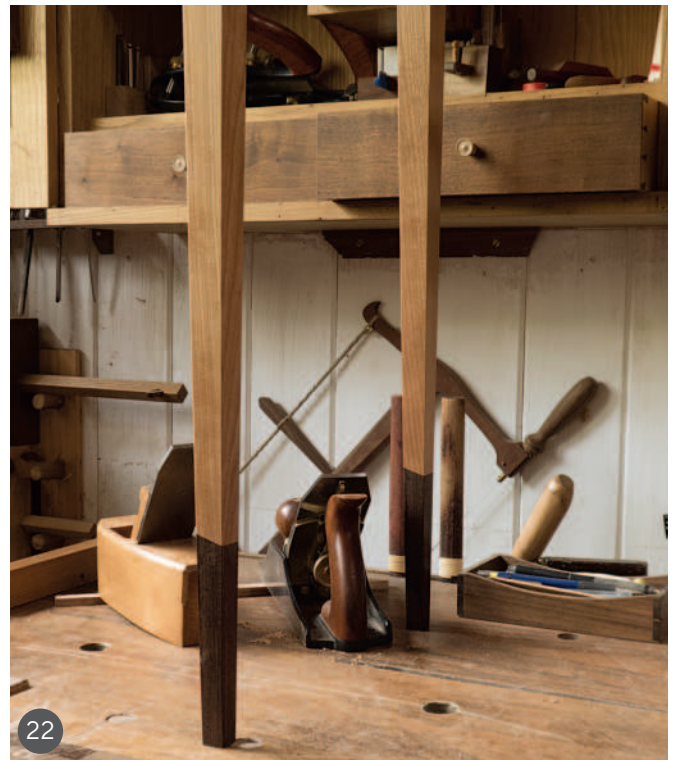
FRONT DRAWERS

The vertical divisions for the three drawers were joined with stopped sliding dovetails. I used walnut and maple with quartersawn walnut and ripple sycamore veneers for the fronts, maple and walnut for the front drawers and Douglas fir for the sides of the sycamore front drawers. I started by gluing the veneers to the drawer fronts. The sycamore one is a 6mm-thick veneer and the walnut ones are only 2mm thick. I added the 2° angle to the two drawers of the sides when I made the fronts; those drawers' sides were a bit wider and joined normally, then I planed the excess on the top and the bottom to get the same shape as the fronts. I used contrasting wood for the drawer pulls: holly for the dark drawers and African blackwood for the lighter one.

MAKING A SMALL ROSEWOOD BEAD

I added the rosewood bead to the side aprons and the front lower blade before I glued the table. I made a small rebate which is narrower than the bead so just the round part of the bead protrudes. I made the bead with the scratch stock on a thicker piece, then sawed it and planed it to the line left by the scratch stock. I then cut it to length and added the 2° to the sides, so it fit perfectly between the legs.





18 Ripping the rosewood for the feet 19 Working on the feet recess
20 Gluing the sides of the feet 21 Back piece of the feet
22 The completed feet

ROSEWOOD FEET

The rosewood feet were added after I'd made all the mortises and dry fitted the structure. First, I sawed the rosewood boards and then I made the recess for the rosewood using the router plane, chisels and a small plane. I removed the first three-quarters of the shock recess with the router plane and the rest with the block plane. I glued the front piece, followed by the two sides and the back. The back was the most difficult one because it needed to fit perfectly between the sides. The result is that the front covers the side of the side pieces and the sides



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23 Detail of the London pattern dovetails 24 Transferring the tails to get the pins 25 All the drawers joined with London pattern dovetails 26 Detail of the drawer bottoms 27 The cedar of Lebanon drawer bottoms

cover the back. I planed the sides with the front, flush with the leg. The last part was to plane the back flush with the sides and the rest of the leg.

LONDON PATTERN DOVETAILS

When making drawers I like the pins to be as small as possible, so I chose London pattern dovetails for this table. The gap on the tails is just the kerf of the saw. To transfer the tails to get the pins I used a 0.8 mm marking knife. I carefully removed the waist overall where the pin gets thinner.

SOLID WOOD DRAWER BOTTOMS

I used red cedar for two of the drawers and cedar of Lebanon for the other two. The cedar of Lebanon was placed with the grain parallel to the sides because the drawers are not too wide, therefore wood movements are almost none. The side drawers' bottoms were the same with the grain parallel to the sides.

The combination of these two wood species creates a wonderful aroma when you open the drawers, as well as showing my students how to work with different woods.

Keeping it real

ETHAN ABRAMSON LEFT BEHIND A COMPUTER-BASED DESIGN CAREER TO CREATE BEAUTIFUL, INNOVATIVE AND ECLECTIC FURNITURE IN THE REAL WORLD



Ethan Abramson aims to bring a sense of origin together with function to create his unique, eclectic and much admired furniture. *Vogue*, *Wallpaper*, *The New York Times*, *New York* magazine and *Architectural Digest* are just some of the prestigious titles that have featured his work, and his first ever piece of furniture – the Irving Chair – was named one of the eight best new chairs by the *Wall Street Journal* in 2014.

Ethan initially started out on a career in design, but found the computer-based work meant he missed making and building in the physical world. ‘I just didn’t feel fulfilled in what I was doing,’ he says. ‘Although I enjoyed the work, I felt I wanted more. I wanted to start something in the morning and by the end of the day have something physical I could hold in my hand. Not an email, not something sent overseas but work that I could put time into and see change, grow, and become something based off of the work I invested my time, thoughts, and skills into. One day it clicked, and once I decided that I wanted something different, I left my job and started an apprenticeship at a furniture company, and I’ve been doing it ever since.’ He started off as an unpaid apprentice, worked into a full position, then took a job at another company where he was promoted to shop foreman, before setting out on his own.

He recalls: ‘When I decided I wanted to go out on my own and start a furniture company, the first piece I designed and built under my own company name was my Irving Chair. Named after my grandfather, who was a cabinetmaker although I was too young to benefit by learning from his skills, this chair is solid white oak with an organic curved feel. It was recognised as one of the “eight best new wooden chairs” by the *Wall Street Journal* that year.

‘To start your own business you need to have full confidence

in yourself, but you never know if that confidence will be shared by other people. This glowing reception wasn’t the only factor that got me going in the very early days, there were countless sleepless nights spent in the shop, the standard blood, sweat and tears – but the recognition did help me see that my dream could become a reality.’

Ethan’s style is diverse, ranging from Modernist asymmetrical coffee tables through mid-century-inspired pieces to the unusual mixed wood Crosshatch collection. Each piece has both a classic elegance and intriguing, innovative details. He says: ‘Honestly I just like to build what I like. I don’t stick to a style, I don’t have a set look. A design inspiration will hit, I’ll sketch it out, then I’ll build it. I won’t put too much time into figuring out if it will work or not. I’ll build it how I want it, then once it’s a real piece I’ll work backwards, figuring out the best way to build it as a production piece.’

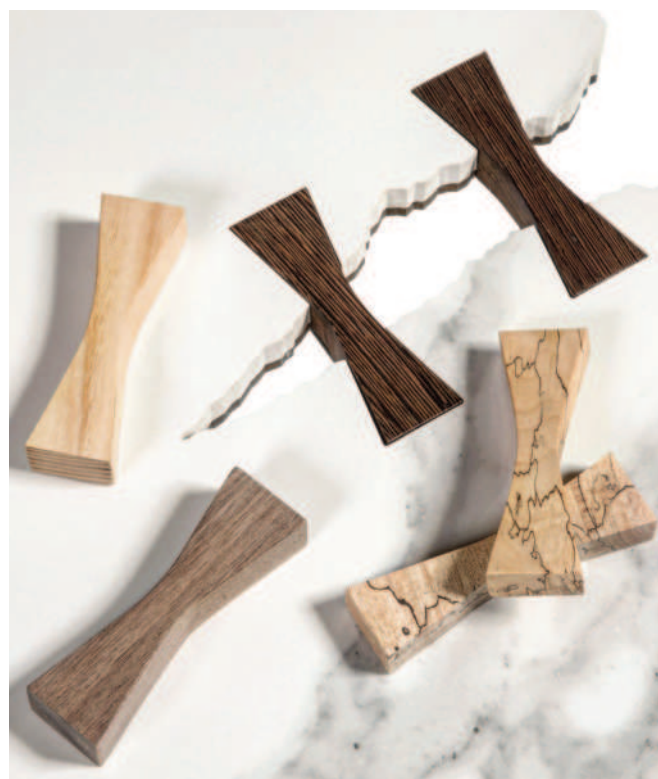
He avoids CNC and computer-based machines – ‘not for any woodworking purist notions, but simply because I’m not a computer guy’ he explains. ‘They seem really hard and I’ve always had issues with learning them. I’d love to be good at it, probably save me a ton of time, but I just haven’t seemed to get the hang of computers in the shop.’

When it comes to tools, he likes to get back to basics. ‘I love to play with fancy tools, but when it comes down to what I use in the shop I keep it pretty simple. Give me a drill, tablesaw, router, jigsaw and a few hand tools and I’m good all day. I never want the tools themselves to rule the design. Just because it can do something fancy doesn’t mean I automatically have to use it. I’d rather start with the basics and see where I go from there,’ he says.

‘Powered tools are just so good nowadays. You could hand me a tool from any brand and I could get the job done. Yes, some would



*'Honestly I just like to build what I like.
I don't stick to a style, I don't have a
set look. A design inspiration will hit,
I'll sketch it out, then I'll build it.'*



PHOTOGRAPHS BY JENNY GORMAN, ETHAN ABRAMSON

get it done faster, but they will all get there eventually. I do a lot of tool reviews so I see a lot of tools, and I'm continuously impressed with where the industry is going. With that said, there is always going to be room in a shop for traditional hand tools, that speak to the essence of woodworking. I combine them in a way to get the job done. I won't shun a powered tool for a hand tool or vice versa, whatever gets the job done is the tool I will grab.'

Ethan has recently moved into a new workshop in Long Island, New York, after eight years in his previous space. 'It is a two-storey shop, with great ceiling height, large bay doors, separate showroom space and offices. I'm in the middle of the build out and it's the most fun I've had in a long time,' he says.

His favourite timbers are white oak, ash and walnut. 'You can get such a wonderful contrast using these woods. And the grains on ash and oak bring a regular piece of furniture and take it to the next level. They are perfect for stains, or left as they are,' he says. 'Exotics have their place, but I've always been drawn to these three woods.'

Over the past few years Ethan has been working on thinner and thinner designs, and has started working with steel, because it was no longer possible to use wood for these pieces. 'My first love will always be lumber for the organic qualities it has and the ability to shape, but I have really enjoyed moving into steel work as well,' he says. He prefers natural finishes, partly for health and environmental reasons. 'People spend all their time picking out the design of a furniture piece but don't give much thought to the fact that it will be a family member in their home as well,' he explains. 'It will be in their house more than they are, and if it has a chemical finish there are all types of lasting interactions that might not be good for their health. I lean towards the more natural options any time I can, it's easier to work with in the shop

and it's better for my health, the planet and the client as well.'

Ethan is grateful for the recognition and brand advancement he has had from the stellar cast of magazines that have featured him – but notes that a personal thanks from a client means just as much to him: 'There's no better feeling than that.' His advice to furniture makers wanting to make a name for themselves in the high-end market is to get a business degree.

He explains: 'Furniture making is an art, but to do it as a professional it is also a business. Design talent is something that is going to come naturally, either you have it or you don't. But knowing how to run a successful business is not something anyone just knows. There are so many extraordinarily talented furniture makers out there that can never reach the next level, because they have only ever focused on the aspect of building furniture. You need to know both sides, the creative and the business side to succeed, especially in high-end markets.'

His current biggest project is building out his new shop and showroom. 'I'm feeling out how the flow should work and the best way to have everything set up for maximum efficiency. I also have a whole new collection this year that I am going to be debuting shortly in my new showroom, as well as in stores across the country.'

Going forward, he plans to just keep on doing what he's been doing and see where it takes him. 'This adventure has taken so many unexpected and exciting turns that I have no idea what is next,' he says. 'What I do know is that I'm going to keep working just as hard as the day I started, because that's really the only way you get anywhere. Just keep working, harder and smarter, and eventually you will get where you are going.'

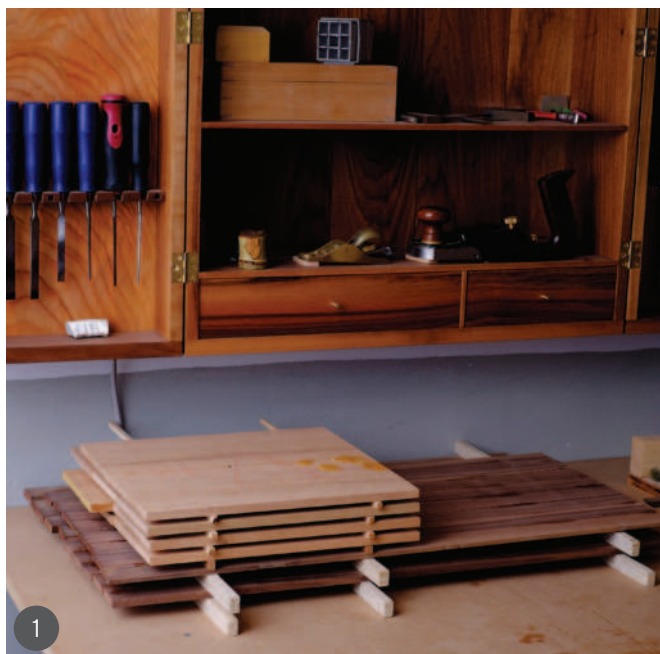
ethanabramson.com



Dovetail heaven

VASKO SOTIROV'S PASSION FOR DOVETAILS FOUND
FULL EXPRESSION IN THIS CUBE OF DRAWERS





PHOTOGRAPHS BY VASKO SOTIROV

- 1 Putting the boards on sticks helps prevent deformation caused by uneven humidity variations across the whole surface
- 2 A 6mm chisel takes care of the waste in one blow
- 3 I saw next to the line and then pare the pins precisely with a chisel
- 4 Random isn't necessarily good-looking. I varied the spacing but followed my taste about what looked like a balanced appearance

For me designing a piece of furniture is a very linear process. Who is it going to belong to? What is it going to be used for? What is it going to look like? Creating is a very private procedure. You get to spend a considerable amount of time thinking, drawing and working on something. You get involved. You translate your thoughts into a physical object with your hands.

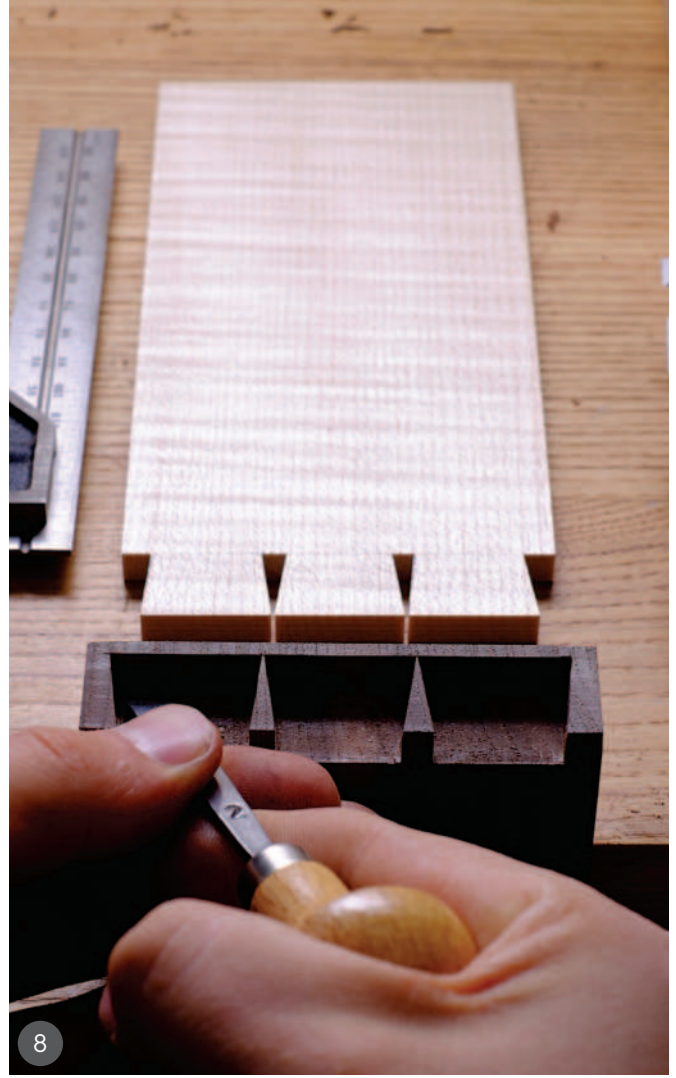
This project was to make some storage for tea bags and loose tea leaves. I decided on a cube-shaped cabinet. There's something special about the proportions that inspires me a lot: three rows of three drawers and a compartment containing three rows of three boxes. And dovetails all around. I love dovetails, it's a pure passion!

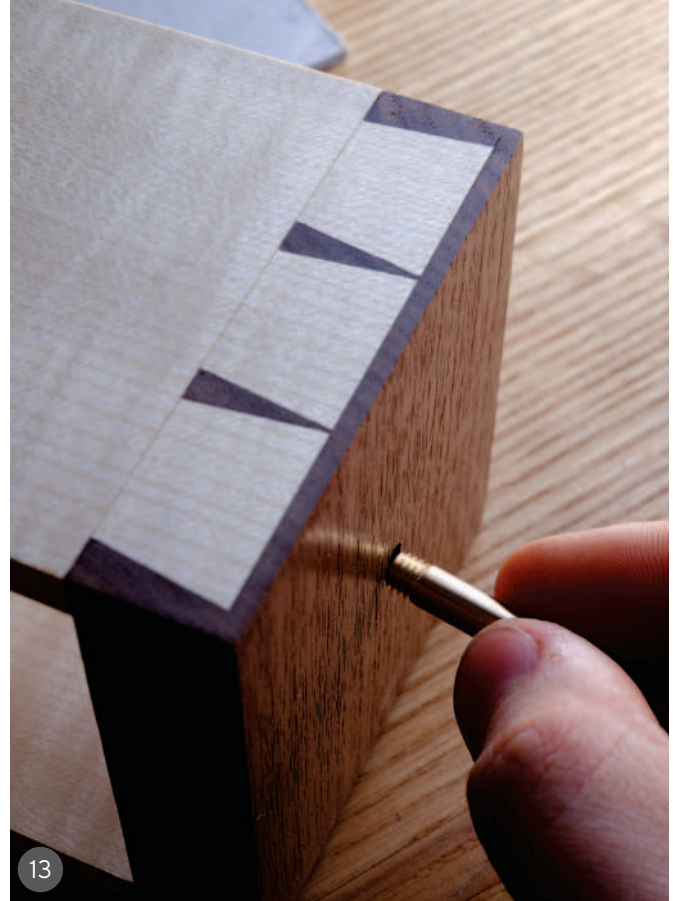
Lumber choice is critical. You can ruin a nice piece by using the wrong materials. Usually I like to combine a few different species. For me the best thing is to actually try out the real deal by putting together a couple of planed boards of the different

woods that you're thinking about using, and judging from that if you like the combo. For this project I used a total of five different types of wood: quartersawn red oak for the outside case and the nine boxes, some beautiful quartersawn American walnut for the drawer fronts and the cabinet back, curly maple for the drawer sides, some amazingly scented red cedar for the drawer bottoms and a few accents here and there are made out of gabon ebony. It's important to have some design criteria in mind when combining different types of wood – there's a very thin line between harmony and a mess!

PREPARING THE WOOD

The first step was to mill the lumber. Usually wood will move a tiny bit after it's been resawn, so I like to leave it a couple of millimetres thicker than the final dimensions, then I let it





5 I like to dry fit the carcass not only to check for well-made joinery, but also to measure the actual dimensions and see if they are true to the plan
6 All the joinery is done, time for the glue-up 7 I like to treat the drawers as if they had all different dimensions, so keeping track of every piece is essential 8 I use a skewed palm carving chisel to clean the waste in the tight corners 9 Having the same pattern across the whole build is very important to me. The number three is omnipresent, so the drawers get three tails per side 10 & 11 The drawers are planed from the front to the back until the sides are flush with the pins. I put a light chamfer at the back to avoid splitting the end-grain 12 & 13 I hold the drawer pulls in the chuck of a drill and polish them with #0000 steel wool while spinning

rest for a couple of days on a sticked pile. I split the work into progressive stages; outer case, inner structure, drawers and so on. Only the lumber for a specific stage gets sized to final dimension. This way it is difficult to mess things up and if there are any variations of the actual size, it's possible to adjust everything accordingly.

The outer case was prepared first. After squaring the four sides and bringing them to exact dimensions, it was time to lay out the dovetails.

THE DOVETAILS

It's been a long time since I first had the idea for this design – randomly spaced dovetails. I never had the courage to actually cut them this way before, but this project was the right one to try it out and before I even thought about it, my hands were already tracing the lines!

I used a sharp pencil and a dovetail marker set at around 1:7 ratio to mark the dovetails. The stock is quite thin (10mm), so I went for thicker pins than I usually use, just to make sure the carcass would be rock solid.

While marking the tails I kept a couple of things in mind:

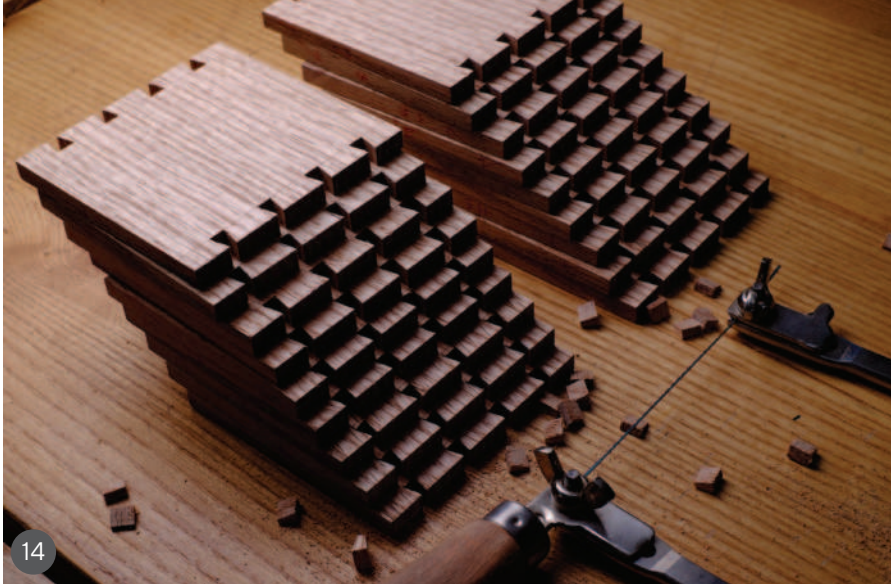
First, start and finish with a half tail that will be mitred. I prefer it that way and I think it's a more elegant look. Another bonus is that mitres help to hide the groove for the back.

Second, make the space between the tails equal to a given chisel size, this way cleaning the waste is much quicker.

Once the tails were all cut, I used a thin marking knife to trace the pins. You'll see that I marked the tails with a pencil and the pins with a knife. It's important to distinguish the two. A pencil (or a pen for that matter) leaves a line for you to follow. If you don't cut perfectly to the line you change the aesthetics, but that might be acceptable for your personal preference. You erase the pencil line and that's it. A knife line on the other hand is not erasable, and it's an extremely precise way of marking. When you cut following a knife line, in theory you should be splitting it in half. You can tell how hard that is to do with consistency. If you get it wrong and leave the whole knife line on the keep-side of your cut, then a thin slice of wood might break off, ruining the crispness of your joint. So if the tails aren't exactly how you traced them it is not that big a deal if you have perfectly complementary pins that make for a good joint without gaps.

THE CARCASS

The whole structure is pretty straightforward. The carcass consists of four dovetailed square boards. The inner structure is all held together by dados and grooves. The precision of the layout is critical. It determines if you'll be able to achieve a nice piston fit with the drawers.



14

14 Nine little boxes were on their way

15 The beauty of woodworking isn't hiding only in the finished piece. Take your time looking at this photo and try to spot as many subtle details as you can

16 Using a solid wood bottom in a confined space, you have to leave space for expansion and contraction. For this little one just a millimetre or two perpendicular to the grain is plenty enough

17 I like to play while working!



15



16



17



It was also very important to orient the grain of every piece in the same direction. This way the whole cabinet will shrink and expand at the same rate as far as possible.

THE DRAWERS

Making the drawers is my favourite part of a project like this, and my favourite joinery is London-style dovetails. I think those thin pins just create the perfect proportions: delicate and very elegant.

Piston fit is a must. If your drawers have just the right tolerances side to side, you'll be rewarded with an incredibly smooth sliding action.

My method of drawer making gives me full control and allows for reliable results every time. First of all, I size the fronts and the backs to fit snugly into the openings. My preferred tool for the job is the shooting board. Every drawer has its own place so it's very well organised.

Next it's the drawer sides' turn. I leave them just a hair thicker than the final dimension and adjust them in height so that they can slide easily in and out of their place.

Now it's time to lay out the joinery. The secret is to leave the sides proud just a little bit, something like 0.5mm. After everything is glued together, I plane the sides flush with the front and back. A sharp plane makes it possible to take shallow shavings until the fit of the drawer is just perfect.



Wood and brass is a sexy combination! I used a 6mm round brass rod to make the drawer pulls. It gives a very sleek look to the cabinet. The pulls were screwed in place. I used an M6 die and cut five or six threads on the brass rod. Then I drilled a 5.75mm hole in the wood and tapped it. An optional drop of superglue will make for a permanent union.

MITRED CORNERS

A mitred corner is a very elegant feature. It also gives you the possibility to cut through grooves for the bottoms instead of stopped ones. You can see a detail of the bottoms sticking out a couple of millimetres. This way, when piling the boxes they stay stuck together.

Mitring the last dovetail layout is very important. The last pin is cut only from the inside and then only half of the waist is removed, compared to normal through dovetails. I cut the rough 45° with a rip saw and pare them precisely with a chisel and a paring guide.

The secret for making beautiful dovetails is... cutting a lot of dovetails! Enjoy the time spent on every single pin. Focus on the details. The sound of the saw cutting, the end grain chips from the chisel paring. It's you and the wood, take care of it.

vaskosotirov.com; Instagram: [@vaskosotirov](https://www.instagram.com/vaskosotirov)

THE PLUS

NORWEGIAN FIRM **VESTRE** IS BUILDING THE WORLD'S MOST ECO-FRIENDLY FURNITURE FACTORY

Vestre is a Norwegian manufacturer of urban furniture, known for its sustainable seating in locations such as Times Square, New York; Brixton in London and Forum des Halles in Paris. Now the family-owned business is building the world's most eco-friendly furniture factory, The Plus, in the town of Magnor in the middle of the Norwegian forest. This will be the largest single investment in the Norwegian furniture industry in decades. The factory is designed by the world-famous architect BIG Bjarke Ingels Group and will serve as a global showcase for top standard architecture and high-efficiency production.

The Plus is part of Vestre's commitment to becoming the world's most sustainable furniture manufacturer. 'By using cutting-edge technology and Scandinavian collaboration, we can produce faster and greener than ever. In that way we will ensure global competitiveness,' says Vestre chief executive Jan Christian Vestre. 'Man-made climate change is the greatest challenge of our time. I sincerely believe that everyone can save the planet, at least a little bit. Sustainability is a result of the choices we make every day.' He hopes to inspire people to act and think green through his business.

The investment is close to NOK300 million (approx. £26 million) and the construction began in August this year. All-electric Tesla trucks will shuttle between the current factory in Torsby, Sweden, and the new site in Magnor.

CHOOSING SUSTAINABILITY

The Plus will be the first industrial building in the Nordic region to achieve the highest environmental certification of BREAAAM Outstanding. All materials have been carefully chosen for their environmental impact, for example the building's façade material will be made from the pine trees that need to be removed for the building site.



*‘Man-made climate change is the greatest challenge of our time.
I sincerely believe that everyone can save the planet, at least a little bit.
Sustainability is a result of the choices we make every day.’*





The Plus will employ several Industry 4.0 solutions, such as smart robots and self-driving trucks, and the whole factory can be managed through a tablet. Every aspect of the factory will be based on principles of renewable and clean energy to ensure an eco-friendly production. The Plus will be 'Paris Proof' (meeting the Paris Agreement's goal of cutting greenhouse gas emissions by 40% by 2030) and have at least 50% lower greenhouse gas emissions than similar projects.

Vestre has tied its commitment to nine of the UN's Sustainable Development Goals. The twelfth goal is about responsible consumption and production, and Vestre aims to reach this goal by making products that won't break. Vestre operates with a lifetime warranty on rust, and if anything needs repairing the company will provide spare parts for an unlimited amount of time.

A FACTORY IN THE FOREST

The decision to place an industrial building in a forest showcases architect BIG and Vestre's ambition to reimagine the factory typology by bridging the gap between environment, transparency and manufacturing.

The Plus needs to efficiently process all logistics of factory traffic and is therefore formed as an indoor roundabout. From this urban plaza a colourful staircase will lead to the Vestre office and exhibition centre, which is lifted above the production facility. The inclined shed-roof forms two extensions along the wood factory, creating a path for visitors to hike up the building while following the production processes inside. This pathway leads up to the roof terrace – a viewpoint into the panopticon as well as a shared event space in the crown of the pine forest.

'The design has a simple geometry with

four main directions, which leaves you with a feeling of being in the woods at all times, but the production flow will still be efficient. The midpoint of The Plus creates an effective centre of logistics and a meeting place for both employers and visitors', says architect Bjarke Ingels.

The Plus will consist of spectacular architecture, a visitor's centre and a 300-acre park, making the town of Magnor a destination for visitors from all around the world. Magnor has a long cultural and industrial history and is strategically situated between Oslo and Vestre's factory in Torsby, Sweden. When the main production is moved to Magnor, Torsby will provide steel and aluminium components, which will be sent to The Plus for painting and assembling.

The Plus is due to be completed by 2022.

vestre.com







PHOTOGRAPHS BY PAOLO FRATTARI

A CURVY TABLE

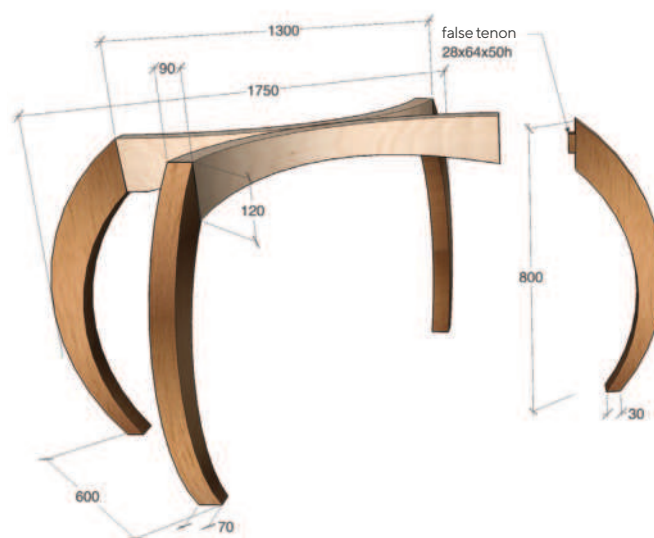
RESEMBLING AN INSECT OR AN ABSTRACT SCULPTURE, **PAOLO FRATTARI'S** TABLE IS MADE ENTIRELY OF CURVES

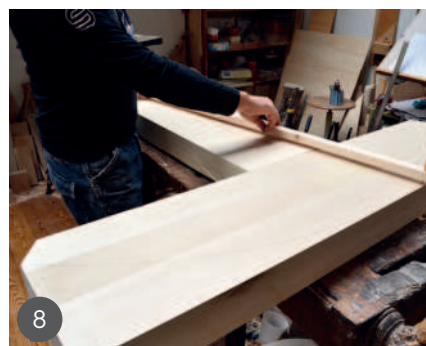
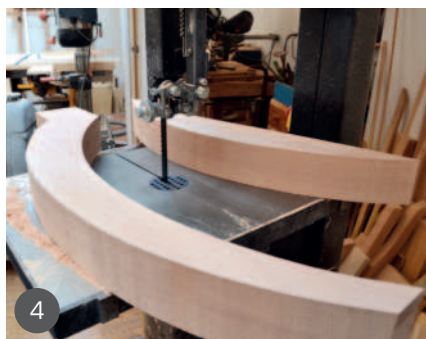
A project that started out as single chair design for my personal summer exhibition led to a commission for six chairs and a table to match. For the table, I set myself the challenge of making it entirely from curved sections of wood. The client and I agreed to add a glass top to show off the table to its full advantage.

You can read about my design for the matching set of chairs in *F&C 294*.

THE DESIGN

The table is made up of two distinct structures, each formed by two legs and a crosspiece, to be joined in the centre. When viewed from the front, you can see that the legs are tapered downwards and have a pronounced curve that recalls that of the front legs of the matching chairs and continues in the traverse but in a much lighter way. In the view from above, the crosspiece has a semi-circular curve that forces the legs to assume an inward angle of 36° with respect to the main axis of the structure. I used beech for the table legs and lime for the crosspieces.





1 Spokeshaving the leg template to smooth out the curvature 2 The curved shapes required boards to be extended widthwise 3 Cutting the external curve needed a rollerstand (out of sight here) 4 Removing the major waste makes each component lighter to handle 5 Machining with the bearing running against the thin ply template underneath. Note: guards removed for clarity 6 The remainder of the edge could now be done with the top bearing fitted. Note: guards removed for clarity 7 A sharp spokeshave working with the grain gives a cleaner finish

THE LEGS

I needed to create a template to make sure the four legs would match. I drew the shape on 4mm plywood; the curve is wide and the inside shape is different from the outside, so for this reason I avoided complex calculations and drew the lines freehand instead.

To reach the 70mm thickness necessary for good leg strength, I assembled two pieces of 35mm board, while for the 220mm width that the curve required, from boards which were only 140mm, I added a strip from the same part of the table board material and glued it on the opposite side. This way the joint appears less evident.

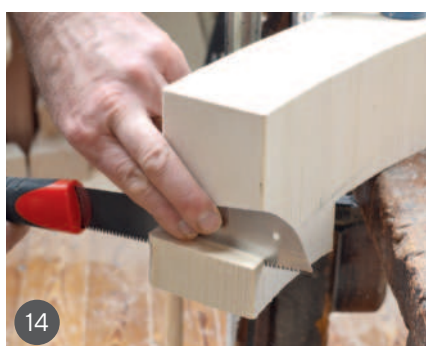
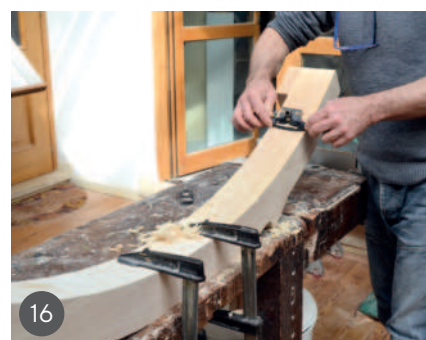
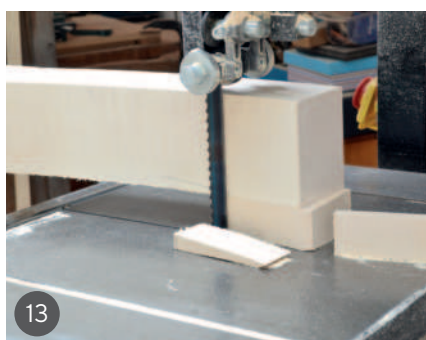
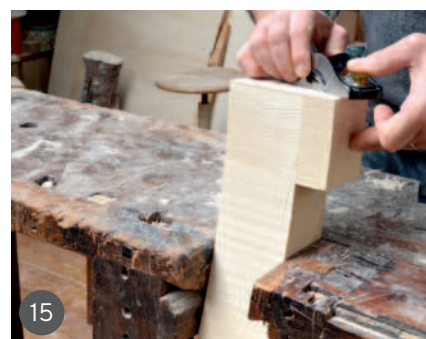
At this point the pieces are normally cut to length and the shape of the foot cut out, however their thickness exceeded the height capacity of my mitre saw so I had to invert the timber and complete the cut by hand.

After planing the pieces, I drew out the shapes and cut the outer edge with the bandsaw, leaving a square portion in the last 150mm to facilitate assembly with the crosspieces. I then cut the upper end, first making a partial cut with the mitre saw, then completing the cut with a Japanese saw that guaranteed a good finish.

I used the bandsaw to cut out the rest of the shape, keeping the cut about 1mm outside the line. I then machined it to shape using the top-bearing guided cutter in the router table with the template taped onto the piece. This was done in two stages to cover the full 70mm thickness of the wood. Any imperfections or burns were eliminated using a flat-bottomed spokeshave.

CURVED CROSSOVER

These two long pieces are made from 100mm-thick lime boards, assembled together to reach 300mm. After squaring them, I then



8 Placing the big board blanks together using a long compass bar **9** Marking out the internal radius **10** Another large blank requiring the rollerstand support **11** A crossover piece cut out but leaving two wedge shapes for clamping **12** Clamping on the end blocks to the crossover piece **13** Levelling the blocks with the rest of the component **14** A pullsaw is the best and quickest way to trim the block end off **15** Smoothing the end using a low angle block plane **16** Some essential smoothing work using a spokeshave **17** More spokeshaving on the outside curvature

made 36° angled cuts using a larger machine owned by my friend and fellow woodworker, Francesco.

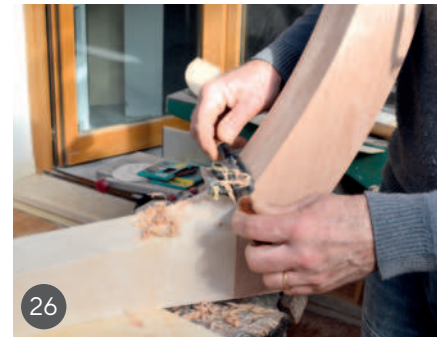
The crosspieces have a double curvature, the one on the horizontal plane corresponds to an arc of a circle. To draw it, I put the two boards together to form a T-shape, I traced a central line on the transverse one and I extended it on the other and with a rudimentary compass set at 1,100mm, I traced the external curve. Then moving the compass back 70mm, I marked the inside curve. The external arc stops 80mm before the centre, on one side and the other, so a 160mm flat surface is obtained, which will be used to join the two crosspieces.

With the bandsaw I cut the external and internal contours. The processing itself is simple, but the difficulty lies in the large component being moved. A roller conveyor is indispensable but it must also be moved as the component is turned. I left two

wedges, with one side parallel to the end of the piece, which fixed the clamp when joining the crosspiece with the legs. To accompany the join between the beam and the legs and create that slight curvature visible from the front, a height of 120mm against the 90mm of the two pieces would be needed, so I had to glue on two 30 x 120mm wide additions.

The two additions necessarily overran, so to match the crosspiece I bandsawed the two lateral cuts. To level the top part I used a Japanese saw and then levelled the surface with a low angle hand plane. To eliminate bandsaw marks on the curved surfaces of the crosspieces, a spokeshave was needed.

To trace the curve on the frontal plane that shows off the foot, I made a 3mm plywood template that helps join the end with the centre of the crosspiece; being thin it can therefore bend and flatten completely on the curved piece.



18 Using the curved template to mark out for bandsawing **19** Carefully does it, without letting the wedges catch on the bandsaw table
20 The cut made with the waste lying on top **21** The L-shaped mortise jig with the alignment marks **22** The face that has a cutout for the router guide bush for mortising **23** Note how the jig is screwed to the end, the joint will cover the holes **24** One of the loose tenons with its rounded corners to match the mortise shape **25** The legs clamped to the crossover piece, the wedges locating the clamps **26** Using a curved bottom spokeshave to smooth across the joint area **27** Clamping the curved assembly to the bench for smoothing with a chisel **28** Using a waste piece to support the work while chopping off the wedges **29** Now the exterior curve can be completed following the template



30 Driving in discreet dowels to help hold the tenons in place 31 Using a trimming pullsaw to flush off the dowels 32 The finished table and chairs

When cutting the excess wood on the bandsaw I used a tilting movement and proceeded slowly while rotating the long curved piece around the blade, but being 90mm wide it was sufficient to give a good support. Curved and flat-bottom spokeshaves were used to clean up the curved surfaces.

MAKING THE JOINT

The legs are joined to the crosspieces by loose tenons. I made the 28 x 50 x 32mm deep mortises on the eight components in one batch.

To machine the mortises, I created a special template with an opening to match the guide bush. My router only has one 17mm diameter guide bush, so to calculate the measurements, I subtracted the diameter of the cutter, in this case 8mm, from that of the guide bush: $17 - 8 = 9$ mm. For a 28mm mortise I then added the 9 of the difference: $28 + 9 = 37$ mm with the opening centred on the component.

The crosspiece has a curvature that involves two bottoms, so my mortise template must do both left and right. I could not add a lateral stop, so by marking the centre on the crosspiece and on the template, I could align the marks.

For the legs I used the same system to align the template, the front curve prevented me from fixing it with the clamps so I used two screws inserted in the part to be removed later.

I made the tenons in beech using a small 8mm-diameter router cutter to round the corners. A light pass of a hand plane on the edges of the tenons eliminated the size difference.

FINAL TOUCHES

When joined, the two curved parts were adjusted at the meeting point, using a spokeshave on the underneath edges, a chisel for the two vertical sides and a plane on the top.

Now the wedges used to join the crosspieces to the legs needed to be removed. A chisel was sufficient for this operation but the difficulty lay in holding the assembly firmly. My solution was to use some scrap wood and keep the legs overhanging the sides of the bench using two clamps to hold everything securely.

The last part to be eliminated was the triangle high on the legs that served to hold the shape. Using my first template, I marked the continuation of the external curve of the foot and using a jigsaw I removed most of the material. To avoid damaging the hard beech, rather than using a hammer and chisel, I chose an angle grinder and abrasive flap disc, finishing with a spokeshave. Lastly, to ensure the tightness of the joint over time, I inserted two 6mm beech dowels from underneath which go into the tenons.

FINISHING

I sanded all the parts with the random orbital sander using P120, 180 and 220 grit discs, and with the last grit I also smoothed all the edges. Then I gave the table two coats of transparent water-based sealer, interspersed with sanding with P320 grit paper and finishing with two coats of water-based transparent top coat varnish.

The table was transported by the client in two parts, which, after being connected together, were completed with a 2,000 x 800 x 12mm crystal plate glass top. The client is very happy with the result and so am I, as the intended shape has performed really well.

PLAIN SAILING

TRADITIONAL WOODWORKING SKILLS ARE BEING PRESERVED AT THE BOAT BUILDING ACADEMY, INCLUDING FURNITURE-MAKING TECHNIQUES

If you've ever dreamed about taking your furniture-making skills in a completely new direction, perhaps a course at the Boat Building Academy could be the thing for you. Based in Lyme Regis, Dorset, the Academy was founded in 1997 by Royal Navy veteran and Yacht Master examiner Commander Tim Gedge. It provides full-time, highly practical skills training on boat building and furniture making, with the emphasis on 'hands-on' learning.

PRESERVING AN INDUSTRY

Commander Gedge was inspired to set up the academy after witnessing the sad decline of the British boat-building industry. The trade had disappeared in many areas and where it did survive, boats were often mass produced. The traditional skills still existed with the older, experienced tradesmen, but these skills were in danger of dying out as the end of traditional apprenticeships meant they were not being passed on.

'My aim in setting up the Boat Building Academy was to provide training for men and women of all ages that would carry forward the best traditions of British boat building and enable each of them to develop his or her potential using the best modern techniques in boat construction. I am particularly proud of the excellent standard that our students achieve and of the success that so many have made in their careers in the marine industry', explains the Commander.

The academy's courses are intensive and highly practical, with most of the students' time spent in hands-on activity in the workshop, with instruction from the team of highly experienced instructors. Academy students do not work on commercial projects: people learn a wider, deeper range of skills without the conflicts of interest that arise from the requirements of commercial work. A wider range of boats are built than are found in most boatyards, enabling students to gain practical experience of many different construction methods and techniques.



PHOTOGRAPHS COURTESY OF THE BOAT BUILDING ACADEMY





EXPERT TUITION

All of the furniture-making courses are supervised by experienced designer-maker Mark Ripley. Mark is a member of the Society of Designer Craftsmen and the Hampshire and Berkshire Guild of Craftsmen, and his work has been widely exhibited and published. He has also been a regular contributor to *F&C*.

Mark's lifelong career as a maker began with an early interest in vernacular woodwork, especially the boats, buildings and furniture of England and Scandinavia. While studying for his degree in furniture design and production at Leicester Polytechnic, he was further inspired by the Arts and Crafts movement and the design and spirituality of the Shakers.

FURNITURE-MAKING COURSES

Although it was primarily set up to preserve traditional boat-building skills, the academy also offers a variety of furniture-making courses. There are two 12-week courses: Furniture Making with a Level 3 Boat Building Academy Diploma and Advanced Furniture Making. Students learn hand skills and power tool use, and make tables, cabinets and boxes, before researching, designing and making a personal project piece that uses all the techniques they've learned. An archive of students' furniture projects can be seen on the website

There are also short woodworking courses which last two or five days, covering skills such as antique furniture restoration, bench making and marquetry.

BOAT-BUILDING COURSES

The Academy's flagship course is its 40-week Boat Building, Maintenance and Support course, which teaches traditional and modern wooden boat-making skills; fibre plastic boat building; yacht joinery; spar and oar making; finishing and coatings; rigging, chandlery and cordage making, and sail making and repair. The course incorporates a City & Guilds Level 3 Diploma in Marine Construction, Systems Engineering and Maintenance, and many students use it as a way into the marine industry, while for others it is a challenging retirement project.

The students work together as a group to build boats, and you can see a selection of the vessels on the Academy's website. At the end of each course, the boats built by the students are walked in procession down to the sea and launched with due ceremony in Lyme Regis harbour.

Shorter courses are also available focusing on specific skills such as sail making, ropework, repairs and renovation, and modern and traditional boat-building techniques.

After a brief hiatus during the lockdown, courses are now back up and running with safeguarding measures in place. For more details, see the Boat Building Academy website.

boatbuildingacademy.com







DINING CHAIR RESTORATION

LOUISE BIGGS SORTS OUT SOME RICKETY CHAIRS IN NEED OF HER EXPERT CARE

My clients own a set of antique dining chairs, some of which were in need of repair. They brought in two carvers and two singles that had become very loose and wobbly, more so than I would have expected from just loose joints.

The only visible damage was a broken top rail on one carver and previous repairs to the others. The first stage therefore was to remove the upholstery and find out what the problem was, bearing in mind that the upholstery, cover and braid would need to go back on later.

For this article I will focus on cutting in false tenons, used on some of the rails, and how to replace seat rails using templates with a look at repairing the joints between the back legs and top rails.

ASSESSING THE DAMAGE

- Some of the seat rails on the chairs had been replaced during an earlier restoration.
- There was extensive insect damage to some of the rails and the corner straps.
- Nails were through the legs and tenons, punched well into the timber or bent over.
- Some of the tenons were broken due to the nails and/or insect damage.
- Frames were loose, which had put stress on the back legs and top blocks of the front legs, causing splits and breaks.
- One back leg on a carver had a break just by the mid rail, which had previously been repaired with evidence of glue.
- The carver also had a broken top rail and corresponding damage to the tops of the back legs.
- On the other chairs there was evidence of repairs to fix the arms on the carver and to the joints of the top rails.



A Upholstery being removed before assessment

B One chair knocked apart with insect damage to the rails and severely damaged tenons

C A carver with the top rail broken and damage to the tops of the back legs



STAGES OF THE RESTORATION

1 Each chair's frame components were marked before being knocked apart. The nails had previously been hammered through the joints and were punched well in or bent over. Each joint was assessed for the nail positions, those in the frame covered by upholstery were removed, being careful not to increase the existing damage.

2 The decision then was whether to damage the show-wood in trying to extract the nail or damage the tenon while removing the rail. Some of the original rails were weakened by insect damage and the tenons had already suffered badly. Having noted four rails between the chairs that needed replacing, the tenons would break quite easily. The tenons were quite short compared to the depth of the mortise so I decided to damage the tenon rather than the show-wood.

3 With the frames apart the nails were removed where possible or cut level to the mortise walls using a piece of hacksaw blade. (If you're doing this, wrap part of the blade in tape or use a glove to protect your hands.) The moulded edges were removed from the rails, which were going to be replaced using a flat blade to break the remaining glue joint.

4 Those rails where the tenons were to be repaired were cleaned up. Where possible a sound piece of original tenon, on the top

side of the rail, was left to act as the template when cutting the new timber. A saw cut down the tenon separated the sound timber. Using wedges to hold the rail securely in the mortiser, a mortise was cut in the centre of the rail to line up with the tenon at the shoulder.

5 A section of timber was cut to shape with a tenon saw and chisels to fit into the mortise in the rail. Excess timber was left at the end, which covered the area of the remaining original tenon. The section was then glued and clamped in position. Steps 4 and 5 were repeated as necessary to the rails that could be saved.

6 Once dry, the tenons were shaped to match the existing pieces, checking that they fitted with their respective mortises. Initially cut to shape with a tenon saw, the shoulders and sides of the tenons were then trimmed using a chisel. To strengthen the false tenons small holes were drilled at an angle going through the rails and false tenons and stopping in the outer part of the rails. Small dowels were then glued into place and levelled off when dry.

7 Templates were made for each new rail, marking them for each chair. Using the remaining material from the existing tenons, the positions of the tenons were marked on each template. There was clear indication as to the shoulder line, so the template was checked against each chair component so that the tenons were correct.



8 The timber for the new rails was planed to the right thickness while allowing the width and length to be a little larger. Once prepared the templates were marked on the timber before being cut out on the bandsaw. At this stage only the rail shapes were cut.

9 The sides of the rails were then trued up using a plane on the convex side and a spokeshave on the concave side, keeping the

sides square to the top edges and the shape true to the show-wood moulded edges.

10 For each rail the tenons were then cut out using a bandsaw, with the top shoulder being taken out using a dovetail saw. The shoulder line and surfaces of the tenons were then trued up using a chisel, checking all the time with the mortise that the positions of the rails were correct.



11 On one carver chair the back leg had a previous break just on the point where the mid-rail mortise and tenon joint was cut. Having carefully removed the old glue without removing any timber I found that the joint was a close fit. Although it had broken at one of the worst points for strength of the leg with support of tight-fitting seat rails and the arm, I decided to repair



the leg as opposed to making a new one. The joint was glued and clamped in both directions to keep it aligned and, when dry, small dowels were fitted at angles to help support the joint.

12 The tops of the front legs were glued up and strengthened in a similar way to the break in the back leg. The broken joints at the top of the legs and top rails were repaired by inserting sections of timber to infill the broken sections. The repairs were glued and clamped together and, when dry, the dowel joints were re-drilled to fit the top rail. The previous repairs around the other top rails were tidied up as much as possible, so when polished they were less visible.

13 With the chair frames re-glued, the cut-outs for the corner straps were cut into the new rails and the new corner straps cut and shaped to fit.

14 The show-wood moulded edges were reinstated on to the rails. The repairs were then stained and polished to match.

15 The upholstery was reinstated on to the chairs, which were then returned to the customers in full working order.



STEEL. SAPPHIRE. LEATHER. BRASS. OIL. RUBY. PAINT.

ARRANGED IN A CERTAIN WAY.



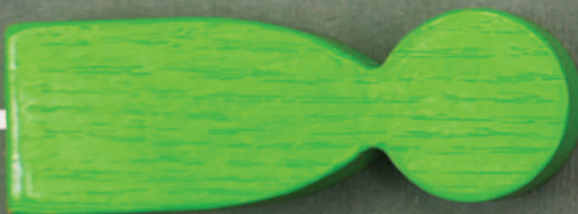
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HOW TO GET AHEAD IN ADVERTISING

PROMOTION IS AN ONGOING CHALLENGE FOR SMALLER BUSINESSES. HOWEVER, WITH A FEW CLEVER 'OUTSIDE-THE-BOX' IDEAS, YOU COULD START REACHING THOSE NEW CUSTOMERS TODAY



Unless you are a major corporation with an equally major advertising budget, you've got to think a little bit harder about getting the word out there about your business – whether you build houses, carve wooden sculptures or restore period furniture. Here, we'll help you get started with some advertising strategies to boost your profile.

IT'S ALL IN THE PLANNING

Seems obvious, right? But the pressure to bring more money in can lead to a panicked, scattergun approach to marketing your business. So, it's worth taking the time to think carefully about the upcoming 12 months and sketch out the main ways you will advertise. This is especially key if you only have a small budget, and when doing some research into consumer trends is helpful. For example, if you're in the kitchen-building game, targeting potential customers around January – typically a time when people consider bigger projects like this – is a good idea.



MEAN BUSINESS WHEN ATTRACTING BUSINESS

It's a business 101 to make sure your Google listing is up to date. As the adage goes, first impressions count and this is likely to be the first thing someone sees when they search for your business. Your profile needs to be complete – are your opening hours and contact details on there? And don't overlook the hundreds of other online directories out there. Have you claimed your company's space on Yelp, for example?

It's also a no-brainer to make sure your listing – and website, for that matter – are fully optimised. Try using a free SEO (search engine optimisation) tool like Yoast. Conducting some basic keyword research is pretty invaluable in terms of boosting your ranking in search engines.



BE WILY IN THE OLD WAYS

The purpose of advertising and marketing is simple: get the right message to the right people. In the pre-internet age, this meant distributing leaflets and pinning business cards and posters to message boards, and as old school as that might sound, this avenue could be ripe for exploring. Why? The very fact that this way of advertising has fallen out of favour means there are fewer competitors jostling for customers' attention – and money – in that arena. For a relatively low production cost, the return could well be surprising and lucrative.

ARE YOU 'SHAREABLE'?

In today's social media landscape, whatever you can do to get people sharing your Instagram, Twitter or Facebook posts is A Good Thing. While the Ice Bucket Challenge (remember that?) has already been done, it gives you an idea of the kind of thing that has the potential to go viral. OK, so your chair-making company might not 'break the internet', but posting an image or clip of a humorous moment in the workshop could well tickle someone's funny bone and boom, you've got a share. The same goes for content. Write a blog with the aim of getting people talking. Consider using quotes from leaders in your sector and offer to share the blog on their websites, too. It's all about creating a buzz.

And don't forget the opportunistic piggyback move. A couple of years ago, the online 'is it black or blue' dress debate went viral and even made headline news. Both Oreo and Lego quickly seized the moment and gave it their own spin with pretty simple reinterpretations. So be on the look-out for similar opportunities. This is about being both proactive and reactive.

FORGET ALL THE BELLS AND WHISTLES

Slick production values on a video to promote your business

will cost some serious money. Just think of the 2019 John Lewis Christmas advert. Featuring a cute animated dragon with an out-of-control fire-blowing problem, it cost several million pounds to make, only to be eclipsed by a simple, 'down home' video of a little boy and a broom, chronicling the story of a family-owned hardware shop in Wales. Total cost? £100. There are some perfectly acceptable free templates on biteable.com to help you create your own budget-friendly option, and in a couple of clicks you can embed your masterpiece into your website. Remember that consumers are a pretty sophisticated bunch these days and appreciate an authentic 'sell'.

FORUMS ARE YOUR FRIENDS

Whatever you specialise in, online forums offer a space to connect with similar trades or craftspeople. Not only can you glean (or 'permanently borrow', depending on the way you look at it) helpful tips and information this way, but it may also lead to work. If you build good relationships over time with other businesses, you could come to a mutually beneficial arrangement, perhaps agreeing to use each other for any projects you are too busy to deal with. Spread your net wider, too, joining forums featuring professionals with complementary skills to yours.

And don't overlook Quora – when the internet has a question, this expert forum is often where it turns. Answering queries swiftly and with well-researched information can help build subject-matter authority and create trust. Add backlinks to drive traffic – and soon-to-be customers – back to your website.

WORK YOUR ANGLES

Is there anything unusual about what you do, or do you have a strong personal story that you are willing to share? Both are good 'hooks' to grab the attention of local newspapers, websites and radio stations. Email a press release containing the most interesting points of your pitch, leaving the recipient hungry to find out more.

UTILISE YOUR ASSETS

Are you missing a trick when it comes to promoting your business on the side of any company vehicles or by putting the logo on employees' T-shirts or bags? It's a simple yet effective way of drawing people's attention to what you offer as a business.

MAKE IT PERSONAL

According to a 2016 study by American company Virtual Incentives, 56% of consumers said receiving a personalised incentive would improve their perception and consideration of the brand. Look to Coca Cola's hugely popular 'Share a Coke' campaign. Giving their customers the chance to buy a drink with their own name emblazoned on the side is the ultimate example of this in practice. And while the beverage giant certainly has big shoes to fill, the good news is that another study, this time by TD Bank, found that 77% of consumers like it when brands and businesses show their appreciation. It could be a simple discount offer or a 'thank you' gift for any referrals they have put your way. Bigger isn't always best.



GRINDING TOOLS SAFELY

GEOFFREY LAYCOCK CONSIDERS THE POTENTIAL HAZARDS FROM SHARPENING TOOLS

Did you know that fine aluminium dust is explosive? Now you may guess, quite rightly, that inhaling aluminium dust impairs your lung function, but many dusts have more than one risk up their metaphorical sleeve.

DRY AND WET TOOL GRINDING

We write, and the woodworking community talks, regularly about wood dust and the adverse health effects this can have, but it's not the only type of dust that we are exposed to – grinding tools is the activity I have in mind. In its most aggressive form – dry grinding using an abrasive wheel – we can expect to generate and be exposed to two types of dust. Firstly, dust from the grinding medium, secondly dust from the tool being ground. Inhalation is the primary concern but we also need to consider eye and skin contamination. The effects

on eyes should be obvious, especially if rubbed: irritation, scratches or worse. Remember also that larger flying particles could penetrate the eyes. Skin can also become irritated.

Using a wet grinding method has several big advantages. There's almost no risk of overheating the tool edge and no airborne dust unless you let the resultant slurry dry out before disposal. The more common dry abrasive varies in hardness depending on whether it has an inorganic (harder) or organic (softer) bonding agent. The former, something such as aluminium oxide or similar, is most likely in your workshop. In use any abrasive wheel releases minute particles of the bonding agent and the grit it holds together, and neither are good to inhale. The most recent development has been solid wheels with diamond or cubic boron nitride particles providing the cutting action. These are very long

lasting so little dust from the actual wheel should become airborne, but it is possible and there are adverse health effects. I use an abrasive belt finisher and similar comments to the dry wheel apply to this, although it can produce even larger volumes of dust.

DANGERS OF METAL DUST

As we reshape or sharpen a tool we also generate metal dust from that tool. The steel the tool is made from will influence what those particles may consist of. Harder steels and those with corrosion resistance will contain many components that have serious effects – cadmium, nickel, lead, molybdenum, for example. If you are grinding a tool contaminated with resin or other build-up from use this may also become airborne, but the concentration would be virtually nil.

There is a third problem when generating airborne grinding dust – work contamination. If your grinding station is close to where you apply finish or have other sensitive materials, your work may suffer.

If your sharpening method generates sparks, remember they can ignite wood dust and shavings, or maybe that discarded finishing cloth – a good reason to clean up your workshop regularly.

Remember that all except a belt finisher require the grinding surfaces to be refreshed and trued. With the wet system this is no problem but with a dry wheel even larger volumes of bonding agent and grit will be produced.

SAFETY PRECAUTIONS

With all those hazards, you may feel confused about what to do – but it is simple. Wear eye and respiratory protection – the best impact resistance being a full-face shield which means you can wear a disposable mask if that is your preference. Choose a minimum FFP2-rated mask. It may be that you use a powered full-face respirator such as the Trend or 3M Versaflow or similar, which provide protection in one unit. These respirators should be rated a FFP2 or THP2. With dry grinding you should also consider hearing protection.

For typical intermittent grinding, it is worthwhile thinking about improving your room ventilation and providing extraction.



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WOOD AWARDS 2020 SHORTLIST

WE SHOWCASE SOME OF THE PROJECTS NOMINATED FOR THIS YEAR'S AWARDS

Seventeen structures and nine product designs have been shortlisted for the Wood Awards 2020. The independent judging panel visits all the shortlisted projects in person, making this a uniquely rigorous competition. An online exhibition of the shortlist opened on 14 September during the London Design Festival and can be viewed at woodawards.com.

The Wood Awards is the UK's premier competition for excellence in architecture and product design in wood. It

aims to encourage and promote outstanding timber design, craftsmanship and installation. The awards are split into two main categories: Buildings and Furniture & Product. Unfortunately the Student Designer category had to be postponed this year as many students have been unable to complete their projects due to the Covid-19 lockdown. All 2020 student entries will be rolled over to next year.

The winners will be announced in November.

BESPOKE FURNITURE



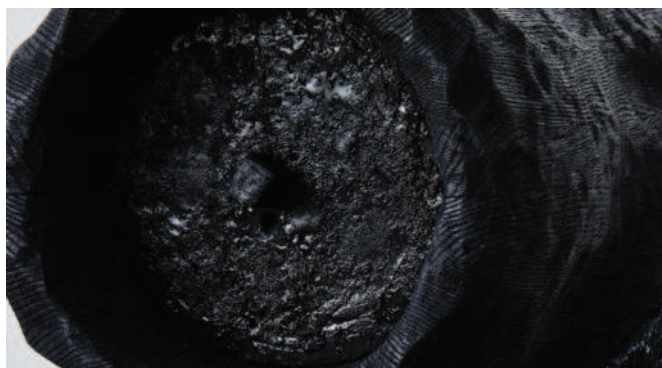
PHOTOGRAPHS COURTESY OF THE WOOD AWARDS

Serpentine Postbox designed by Studiomama and made by Benchmark Furniture for the Serpentine Gallery





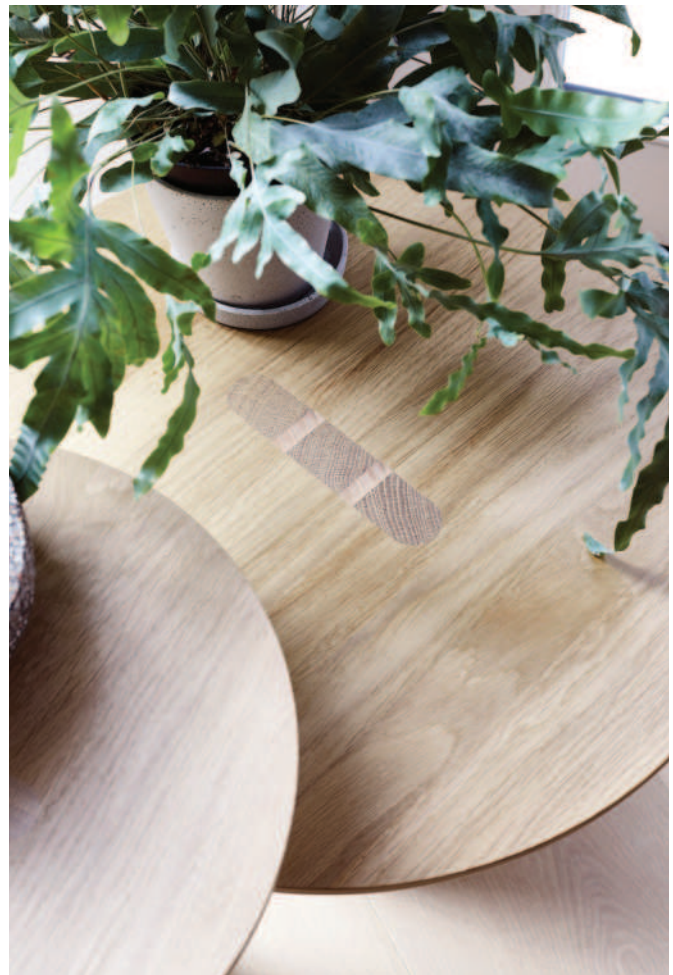
Above The Semi Synthetic Series designed and made by Peter Marigold
Below The Beehive designed by Studio Marlene Huissoud and made by Benchmark Furniture for Science Museum London



PRODUCTION FURNITURE



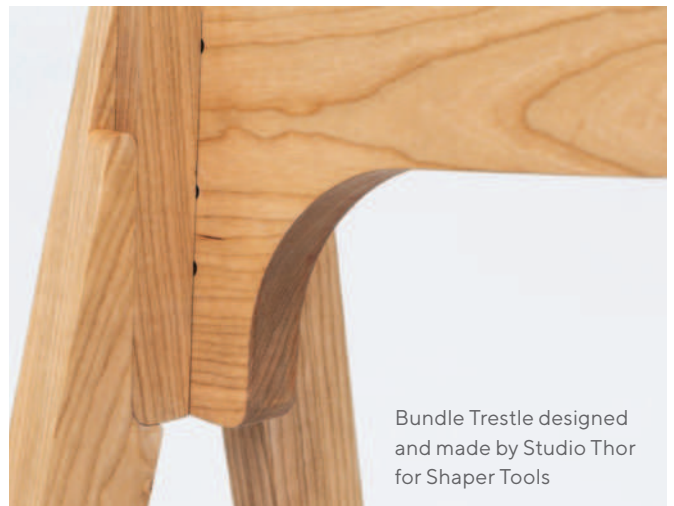
Tenon Table designed by Daniel Schofield
 and manufactured by L. Ercolani



Barking Up The Wrong Log table and chairs designed and made by Charlotte Kingsnorth



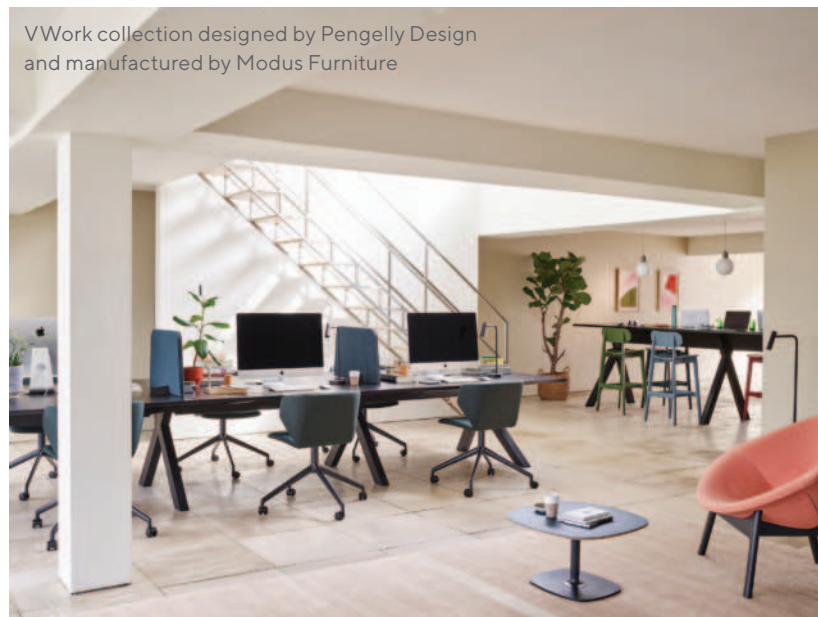
Bundle Trestle designed and made by Studio Thor for Shaper Tools



Chamfer Dining Table designed by Ben Fowler and made by MARQUE Sussex

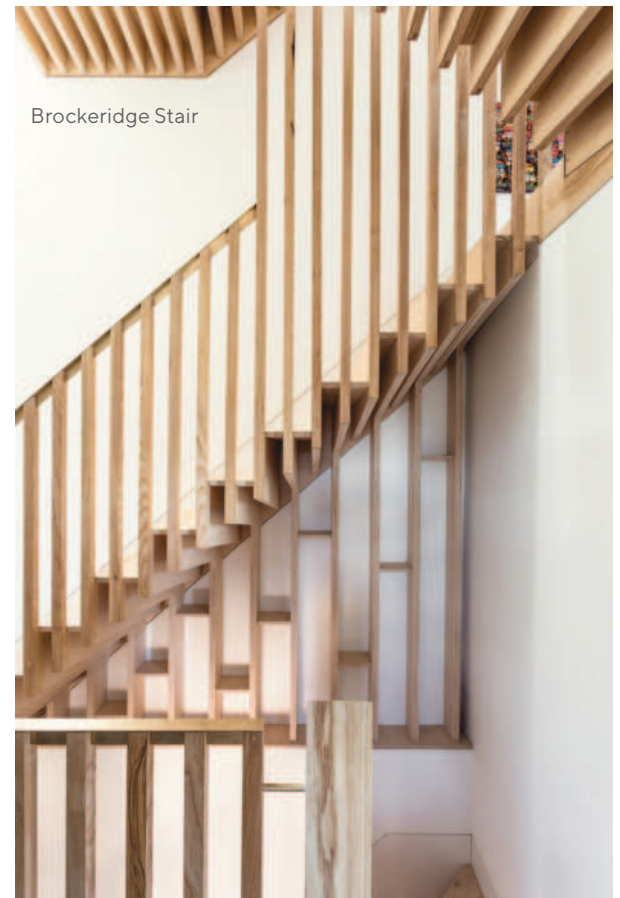


VWork collection designed by Pengelly Design and manufactured by Modus Furniture





The Handlebar Café

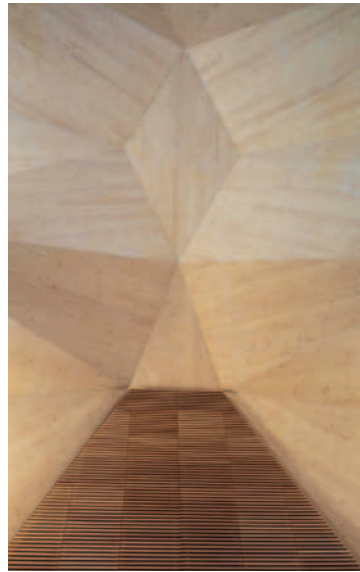


Brockridge Stair

BUILDINGS

The nominations in the Buildings category are:

- National Automotive Innovation Centre, Coventry
Architect: Cullinan Studio
- The Handlebar Café, Winchester
Architect: ArchitecturePLB
- Stroud Christian Community Chapel, Stroud
Architect: Nicolas Pople Architect
- Dulwich Pavilion 2019, Dulwich
Architect: Pricegore
- The Royal Exchange Theatre – The Den, Greater Manchester
Architect: Haworth Tompkins
- Hurstpierpoint Performing Arts Centre, West Sussex
Architect: Burrell Foley Fischer
- Swimming Pool Hall at King's College School, Wimbledon
Architect: David Morley Architects
- Harris Academy, Sutton
Architect: Architype
- MOTHER..., Wicken Fen
Architect: Studio Morison
- Frindsbury Manor Barn, Rochester
Architect: The Heritage Design & Development Team
- Bumpers Oast, Tonbridge
Architect: acme
- Two and a Half Storey House, London
Architect: Bradley Van Der Straeten Architects
- Redhill Barn, Devon. Architect: TYPE
- The Rye Apartments, London
Architect: Tikari Works
- House for Theo + Oskar, Surrey
Architect: Tigg + Coll Architects
- Brockridge Stair, Bristol
Architect: CaSA Architects
- Wooden Roof, London
Architect: Tsuruta Architects



Stroud Christian Community Chapel



Wooden Roof



Frindsbury Manor Barn



FLAUNT

DRESSING TABLE

THOMAS EDDOLLS' TABLE SHOWS OFF THE
BEAUTY OF RIPPLED SYCAMORE

The Flaunt dressing table was originally designed and made as a speculative piece for the Celebration of Craftsmanship and Design (CCD) exhibition in 2018. I was, in fact, more than happy to sell it to a private client halfway through the making process, which made it extra special.

The initial concept came from one of my favourite ideas in my sketchbook, which had been inspired by a different client's design brief two years previously. I always enjoy making spec pieces, watching an idea become reality, and this was to be no exception.

SELECTING THE MATERIALS

I decided to use a solid rippled sycamore for the carcass with solid pear for the legs. These are two of my favourite timbers, and to my mind they are complementary 'feminine' colours. Obviously rippled figuring always looks stunning, but pear in particular has such a beautiful rich colour and is exotic to work with by hand.

The materials were obtained from Sykes Timber, who selected and delivered the wood and, after initial conversion, it was evident that the rippling in the sycamore was really wonderful!

THE TABLE LEGS

The next step was to make templates for the legs. In this case I scaled off my concept elevation and found the curves by springing a steel metre rule to find the curves which I had point plotted out. They were then pencilled in, rough cut out on the bandsaw and finish-shaped by hand with my prized vintage compass plane. Both front and side elevation templates were needed because the legs have compound curves.

With the templates made, I now had a reference to rough mill out the leg blanks and work out actual shaping jigs for the spindle moulder.

Looking over the boards and using the templates, I carefully selected where to get the legs from, avoiding defects and nesting the shapes around each other to be as economical as possible with the timber. To make the legs up to the required thickness I had to laminate two sections together from consecutive boards so as to get the best grain match, which I did in the veneer press. When this was achieved, I roughed them out on the bandsaw. I tend to leave components for a while after this process to let any tension and stress settle before final shaping.

With this in mind, I milled the sycamore carcass material to finished dimension and edge-jointed the panels together with biscuits. Each joint was carefully hand-planed with a No.7 plane to ensure a crisp and seamless joint line.

Then it was time to begin the leg shaping exercise. After making a firm 18mm base board following board from my templates and planing and thickening the leg blanks to a nominal thickness, I was able to place the leg blank onto the shaped board, securing the blank to it by screwing it down into the waste on the overlength top and bottom. Once I was happy that it was secure, the front elevation shapes were produced on the spindle moulder with a rebate block mounted on a bearing follower. With fresh knives cutting in sheer at 4,500 revs, I obtained a good result. I was very careful to arrange the run so as to be cutting with the grain wherever possible.

With the leg shaped in one plane I then needed to shape the curve in the side elevated surfaces. In a bigger batch I would have jigged this all up for machining, but this time, for speed, I simply made a flexible marking template, marked out the curve lines with a pencil and, while leaving the appropriate flats to joint the carcass ends to, I carefully bandsawed just shy of my marks before shaping down to them by hand with the compass plane. A highly satisfying and effective method to achieve the desired results.



1 Front and side elevation templates were needed for the legs

2 The side panels were biscuit-jointed between the legs

3 Hand-cutting a loose tongue into a leg



After a clean-up with abrasives, I then began to look at building up the end framework.

THE FRAME

The side panels were jointed in between the legs with biscuit joints, leaving just enough protruding from the face of the legs to hand-shape to the leg profile. After bisecting the angles on a full-sized rod, I found the correct bevelled jointing angles to joint the top and base in, which were produced on the panel saw with a canted blade. This stage was reasonably straightforward, but the next challenge was to work the top and base into the assembly.

After some consideration I decided to drop the top onto the carcass and mitre the base panel in. This panel would have to be scribed around the legs, which I did using a simple 90° MDF template and a sharp one-to-one bearing following router cutter. The mitres could be biscuit jointed but the scribed endgrain would need something different, so I worked in a loose tongue by hand. Sometimes I find it quicker to hand-cut a couple of joints rather than take a long time jiggling up for only a small number of operations.

Once I was happy with everything the base was final sized in width and it was then time to add drawer box divisions. I decided to include two drawers. The mid division was straightforward but there was a bit of work to do around the leg area, putting in running dividers to meet the apex of the leg curve and closing off the void behind by jointing on a blanking screen flush to the back of the leg.

Finally, the divider ends were angled off to meet the back of the sloping drawer fronts and, after checking everything was square and true, it was time to joint the top down to the underframe which had previously been sized and moulded; again, I opted for biscuit joints here, which I have always found to be reliable.

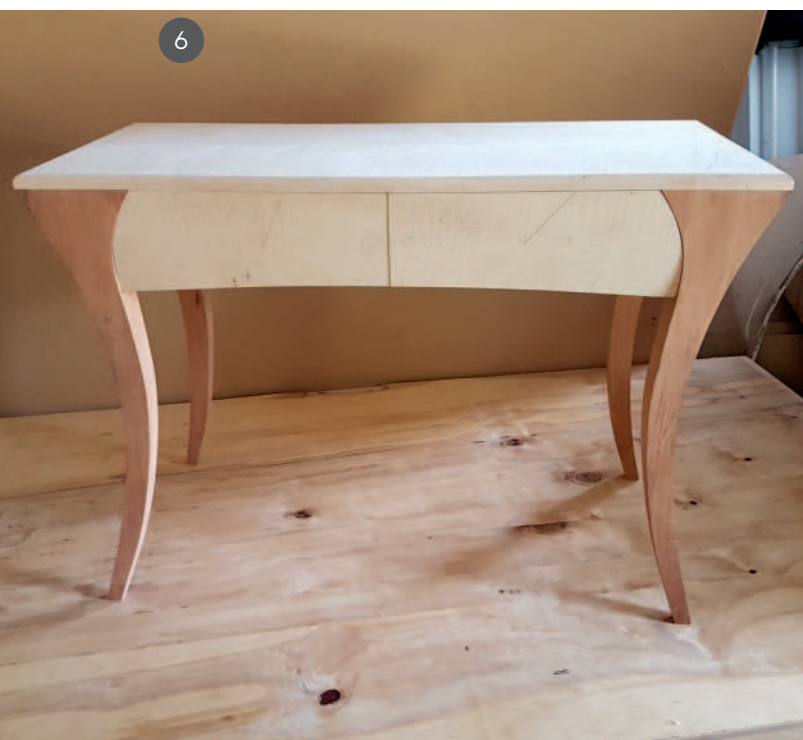
Once this procedure had been completed the time had come to glue the underframe together. All of my careful work had been worth it and this stage went through rather painlessly.

The next and more daunting part was to glue the top on. Using Titebond 2 (which I have found to be an extremely strong adhesive with slight elastic properties when cured) in an extremely warm summer did not give me long to work, so it was a bit of a frantic battle against the clock this time.

Thinking carefully about the correct order of glue application was vital here, so I glued all of the biscuits into the top, then applied glue to the lower frame and after a sweat-inducing 15 minutes I was happily able to step back and quite frankly breathe a sigh of relief.

THE DRAWERS

So now I had my table, the next thing to do was make the drawers. Firstly, the drawer fronts had to be coaxed into the apertures, which was quite tricky on the angle. I achieved this by making a reverse template of the leg curve and one-to-one routing it onto the drawer ends, which I had to slightly relieve by hand so they mated nicely to the legs. The drawer fronts would have a rebated relief on the back side so the shoulders sat inside the dividers which I could then lap dovetail the sides into. After carefully completing the necessary processes and neatly slotting them into their openings I could finally see the piece starting to



come together. I was pleased with the way the shapes and curves interacted with each other and happy to realise something which had once only been a small pencil sketch.

With the drawer fronts snugly fitted I then needed to construct the drawers themselves. My first task was to run the sides into the carcass and then angle the fronts off before hand-cutting the tails. These were marked onto the rebated end grain and the pins were cut by hand, carefully paring down to the knife lines for the final fit. I always leave the sides overlength in case I make a mistake and only cut to finished sides once the all-important front dovetails are cut and mated. After jointing the more conventional backs in and grooving the rear face of the drawer front to accept the base, I cleaned up the inside faces and the drawers were glued up and left for 24 hours to fully cure before manipulating.

The next day I was able to work the sides down the pin ends to achieve the desired fully fitted action. This was a bit tricky because I had to work across the grain, owing to the extended ends of the drawer front. I did this by planing across the dovetails with a shoulder plane and then working the rest down with a No.5 plane and a smoother before scraping and sanding, checking the sides were nicely straight and flat. Adding a bit of paste wax inside the carcass and the drawer sides made the drawers a nice snug fit. Then it was time to machine up some slips, glue them to the drawer sides and veneer up some bases. I decided a flash of colour would be an interesting surprise when the drawer was opened, so I pressed a dyed turquoise veneer from the wood veneer hub onto a 9mm birch ply substrate.

When the veneers were ready to come out of the press I needed to rebate them into the purposely grooved slips. The shoulder lines were especially important here as anything but a dead fit can produce unsightly gaps. Fortunately this process went well and with the bases in I could fine-tune the drawer fit as necessary.

THE FINISH

So that was virtually most of the making done and it was time for the final clean-up in preparation for the finishing process. I prefer to use an oiled finish on solid pieces, only really going for a sprayed lacquer on fragile veneered surfaces or heavily used tops. Osmo satin polyx oil is my preferred option.

I worked everything down to 240 grit by hand, then used a random orbit sander to complete the preparation. Finally I could put some finish on and bring out the wonderful colours and figuring in the timber. Three to four coats seems best, depending on how much cutting back there is in between. Oil finishing is an organic process and is extremely versatile and adaptable, leaving you with options to rework and repair if necessary.

With the work all finished and a veneered back in and waxed, the Flaunt dressing table was ready just in time for Britain's premier fine furniture exhibition and subsequent client delivery.



- 4 Gluing the underframe together
- 5 Gluing the top
- 6 The drawer fronts had to fit snugly into the apertures
- 7 The veneers needed to fit precisely into the slips
- 8 With everything in place, the drawer fit could be fine-tuned
- 9 The oil finish brought out the wonderful figuring in the timber

ITALIAN INSPIRATION

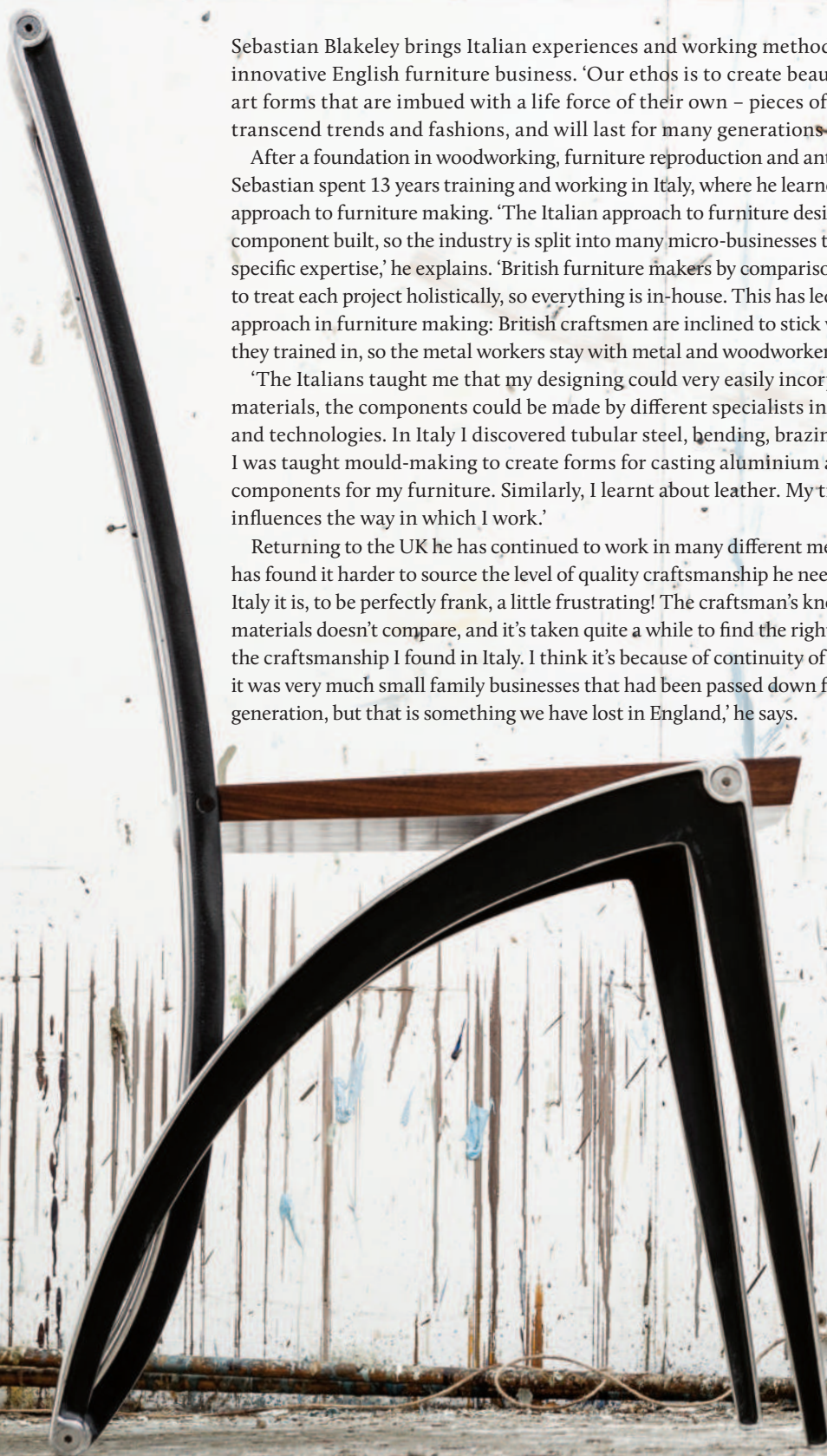
LUXURY FURNITURE MAKER **SEBASTIAN BLAKELEY** BLENDS MEDIA WITH A DISTINCTLY ARTISTIC OUTLOOK. HE TELLS *F&C* ALL ABOUT IT

Sebastian Blakeley brings Italian experiences and working methods into his innovative English furniture business. 'Our ethos is to create beautiful, practical art forms that are imbued with a life force of their own – pieces of furniture that transcend trends and fashions, and will last for many generations to come,' he says.

After a foundation in woodworking, furniture reproduction and antiques restoration, Sebastian spent 13 years training and working in Italy, where he learned a different approach to furniture making. 'The Italian approach to furniture design and making was component built, so the industry is split into many micro-businesses that specialise in specific expertise,' he explains. 'British furniture makers by comparison are more inclined to treat each project holistically, so everything is in-house. This has led to a different approach in furniture making: British craftsmen are inclined to stick with the materials they trained in, so the metal workers stay with metal and woodworkers stay with wood.'

'The Italians taught me that my designing could very easily incorporate diverse materials, the components could be made by different specialists in different materials and technologies. In Italy I discovered tubular steel, bending, brazing and welding. I was taught mould-making to create forms for casting aluminium and bronze components for my furniture. Similarly, I learnt about leather. My time in Italy greatly influences the way in which I work.'

Returning to the UK he has continued to work in many different media, although he has found it harder to source the level of quality craftsmanship he needs. 'Compared to Italy it is, to be perfectly frank, a little frustrating! The craftsman's knowledge about his materials doesn't compare, and it's taken quite a while to find the right people to match the craftsmanship I found in Italy. I think it's because of continuity of the trade – in Italy it was very much small family businesses that had been passed down from generation to generation, but that is something we have lost in England,' he says.



'In reality I probably just wanted to make bog standard furniture, but this darn creativity just keeps on showing its ugly head!'

One of his favourite ways of working is to create laminated organic forms. 'I feel that using constructional thickness veneers to laminate up many of our chair components gives the finished chairs superior strength and is also an extremely economic use of timber from a diminishing resource. I do really enthuse in finding and combining materials that compliment each other, and in doing so create a harmonic that sings. Much of my range of techniques and styles is about relationships, and fundamentally the finished pieces' relationships with their human owners. It's important to me that there is a strong rapport between a finished piece and its owner or owners.'





LIFELONG PARTNERSHIP

Sebastian is now based in Cornwall. He works with his business and life partner Marianna Lassalle, whom he has known nearly all his life. 'We got together and started a family in 1998. In 2000 we bought, with family members, a large property near Exeter, Dunmore House. We worked for five years restoring this property together before moving to Andalucia, Spain. There we spent seven years restoring a 17th-century olive mill. Marianna has a very good eye for colour, light and quality. She is also very good at admin, so she manages the business side of things. All my designs and all furniture leaving the workshop are quality checked by Marianna. She is also heavily involved in the natural oil finishes.'

Sebastian has a 'surprisingly minimal' workshop in rural Cornwall, with a machine room, assembly room, finishing room and showroom office. But he says he will need more space soon, and has plans to move closer to London to be better placed for networking both in the capital and internationally.

'I have never had a workshop with heavy industrial three-phase machinery,' he says. 'I prefer to work with the smaller, single-phase machines. I have maintained a strong rapport with all my hand tools and still take great pleasure in working with extremely well-sharpened chisels or hand planes, spokeshaves and carving tools. I find it is what gives our furniture a different quality: the tools are an extension of me, this is what gives our furniture real character and soul.'

BUILDING ON INSPIRATION

Sebastian gets ideas from nature and from historic architecture styles including Roman, Romanesque, Renaissance, Art Nouveau, Art Deco and Bauhaus. 'Although I have never really studied these design periods, there seems to be a strong subconscious attachment to the three latter design periods, and I'm not sure where it comes from.' He adds that he loves nature, all the diverse flora and fauna to be found on the planet, and spends all his free time gardening and being in nature.



Commissioned work forms the bulk of Sebastian's business, but he also enjoys working on speculative pieces. 'Commissioned work is more stressful and demanding because often the client is working to tight deadlines and budgets, so speculative is delightful – it would be nice to have a bit more space to create speculatively,' he admits.

When he is working on commissions, collaboration is key, and Sebastian makes sure to keep the client in the loop throughout the process. 'It is my relationship with the client that enables me to hold the visual image of what I'm working on clear and strong. I want them to feel involved, as it creates a better relationship between the patron and their finished "work of art",' he says.

He starts his design process by discussing in detail with a client what it is they are looking for. He then spends time alone, preferably outdoors in the countryside. 'I visualise in my mind's eye the client's property, and look for an idea or visual image of what they want. Sometimes this can be rapid, it can even happen driving back to base. Once I have this visual image locked in, I

will then make conceptual hand sketches. These I present to the client and talk through the idea.'

Designing for his own collection follows a similar process, followed by construction, testing for structural weaknesses and ergonomics. 'I now have enough experience to be able to build purely from the mental image, only stopping every now and again to check proportions and dimensions by drawing 1:1 on a sheet of 3mm ply,' he says.

North American, British and European managed forestry hardwoods are his favourite woods to work with. 'I like these timbers for their character and technical qualities, strength and durability,' he says. 'The richness of their character allows me, with careful selection, to create beautiful works of art without having to embellish my furniture with inlays, carvings or staining.' He also works with tubular, cast and CNC-cut aluminium, as well as tubular steel, stainless steel, bronze, leather, fabric and crystal acrylic. Sebastian says: 'I love the timbers I work with very much, probably over and above the



other materials. But I do also love the harmonics that are created in a finished piece by combining different materials.'

He prefers to finish his timber work with natural oil, particularly teak. 'It enhances, encourages an easy and rapid natural oxidisation of the timber and creates a very tactile finish. Colours darken and deepen very quickly,' he says. 'I prefer the non-ferrous metals to be highly polished, but I do like experimenting with powder-coating and electro-plating.'

UNWILLING ARTIST

Sebastian has only recently started to refer to himself as an artist. He says he felt reluctant to do so 'because I have been surrounded by struggling "artists" all my life'. 'I didn't want to have to struggle, but my overriding creativity just keeps on pushing through,' he says. 'In reality I probably just wanted to make bog standard furniture, but this darn creativity just keeps on showing its ugly head!' However, because of the way he designs and visualises his work as three-dimensional solutions, and because of the organic and fluid sculptural elements many of his chairs have, he now feels it is right to recognise them as works of art as well as functional objects. 'This furniture is nurtured into existence, I guess in the same way as a painter or sculptor would work,' he explains.

Among his all-time favourite projects are his chaise-longue and a dining set he made for a client in Portugal. 'They are both grand

manifestations, they were challenging and they were achieved. They also give their patrons great pleasure,' he explains.

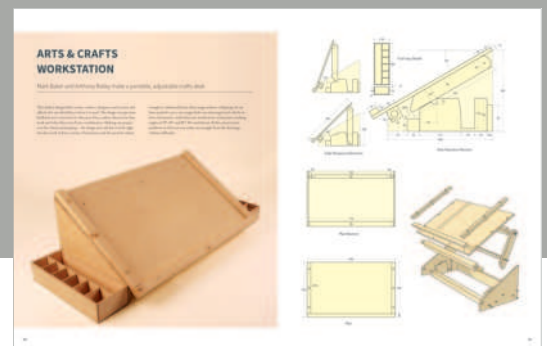
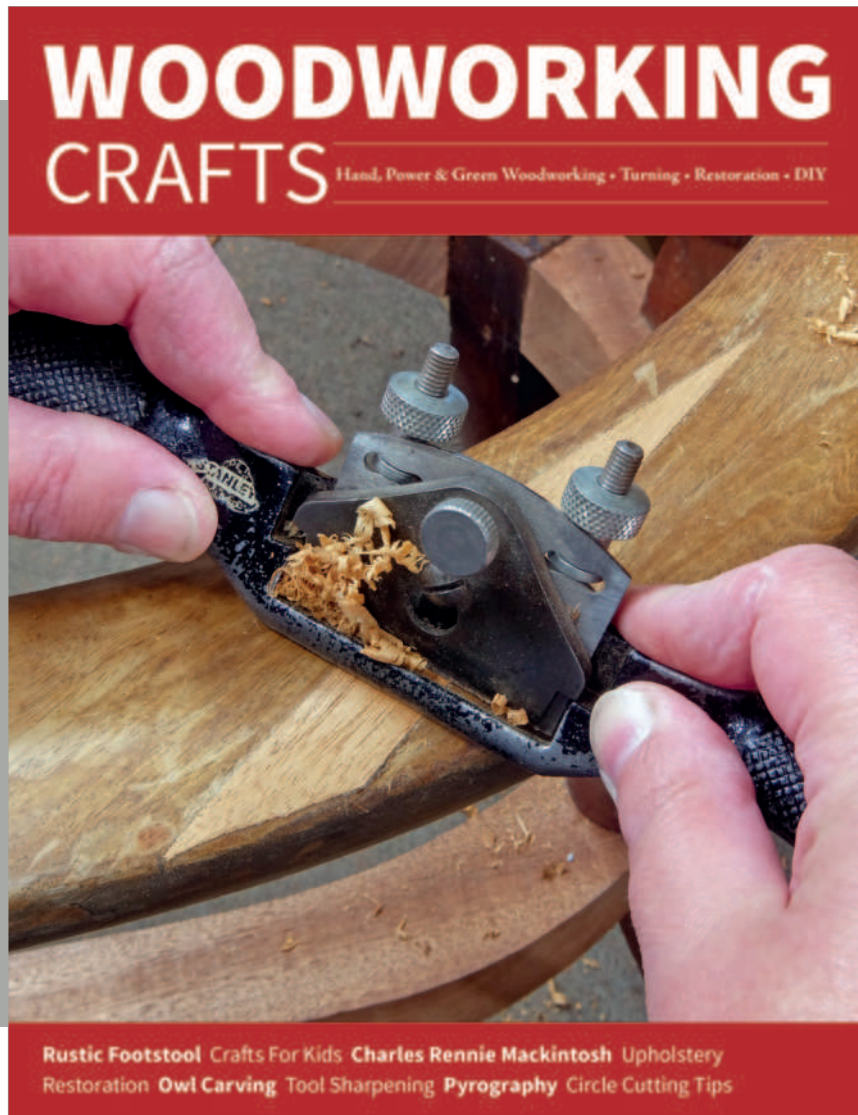
Sebastian's team is currently working on two Civetta carvers or dining chairs for a client in St Louis, Missouri, and also on what he calls a 'sculptural console'. He says: 'With all this talk about being an artist, I was amused to get a call from one of our best clients. She asked if I had ever designed or made a sculpture. They had had a spiral staircase removed in a corner of their living room and needed something "dynamic" to fill the void. I have designed this "sculptural console" to be made from sycamore and bronze – a very exciting project.'

Looking forward, Sebastian aims to continue growing the business's overseas market, although he has had some projects put on hold because of the Covid-19 pandemic and international lockdowns. He says: 'The UK market worries me, although despite this our other business, staircase-solutions-sw.com, is picking up traction. I think the long-term impact on many areas of society will be devastating. However, the high-end market may prove to be more resilient.' Either way, he is not letting it get him down. 'I believe in perseverance and conscientious tenacity, being acutely aware of quality and originality,' he says. 'We are creating a brand. Sebastian Blakeley Design has a growing overseas market. The world is our oyster.'

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COPY TURNING

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GUIDE TO COPY
TURNING

Copy turning is, to my mind, the keystone to all turning. Repeating these cuts and techniques allows us to gain satisfaction from producing the best type of cut possible from our tools and reducing the amount of time spent abrading our work.

In this article I will guide you through a simple spindle, working from a sample or plan. When making components for furniture a major consideration is where the pummel cut starts and finishes. Make sure you leave enough space to make joints and allow for the rails to be fitted.



PHOTOGRAPHS BY JANE ARNULL

REVERSE SANDING

Do furniture spindles require reverse sanding and raising the grain to give a more even application of stains and finishes? Generally, the answer is 'yes'.

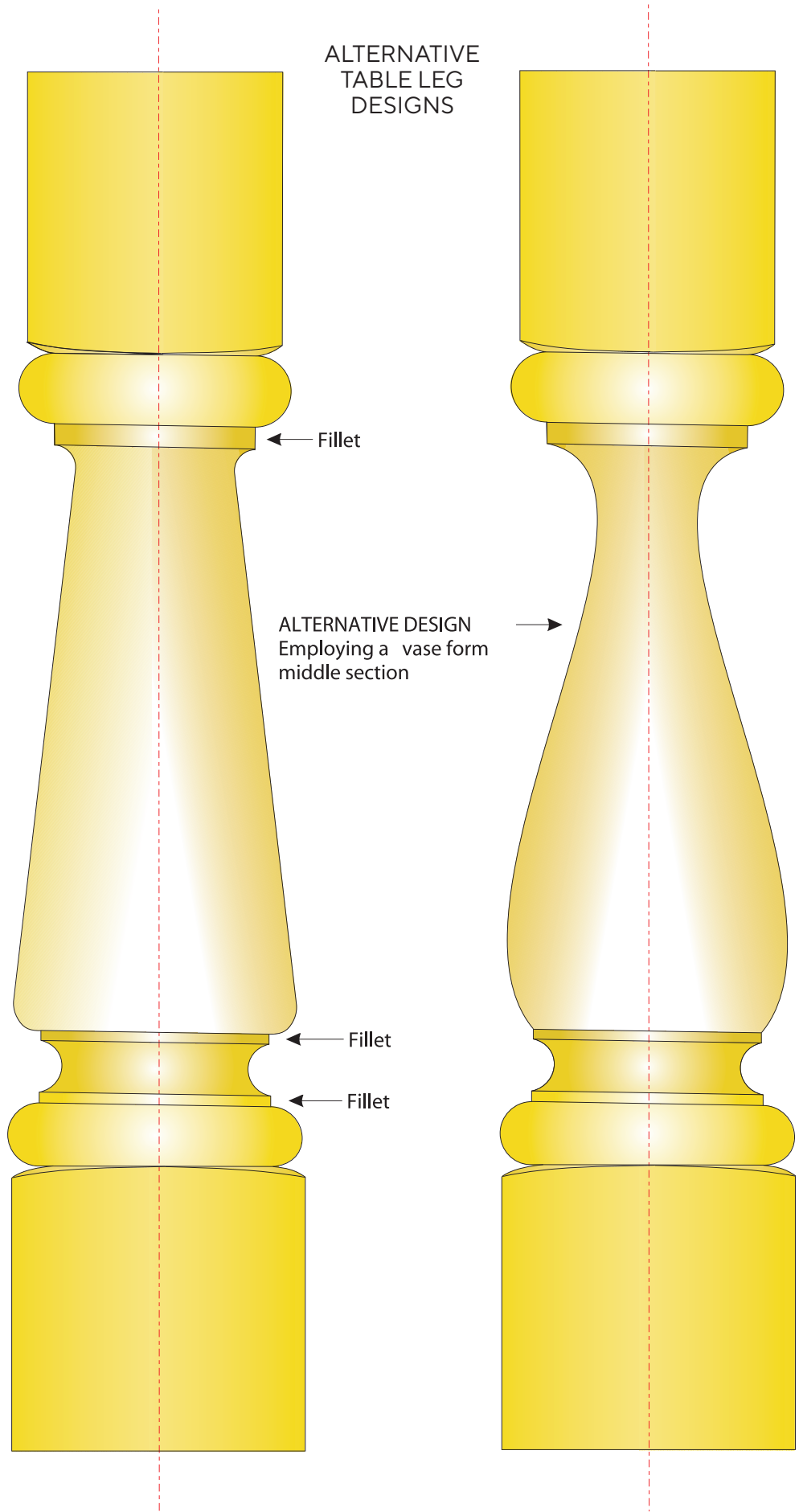
Reverse sanding stumped me to begin with, until I thought about it. The answer is so easy! You do not need a lathe that runs in reverse, just use a matched pair of drive (live) centres, then remove the spindle from between centres and swap it end-for-end. Turn on the lathe and the timber runs in the opposite direction. I use steb centres as they give a better drive, having many teeth to grip the wood. Use these on dry wood only, because if you try using them on wet timber they will slip, losing drive.

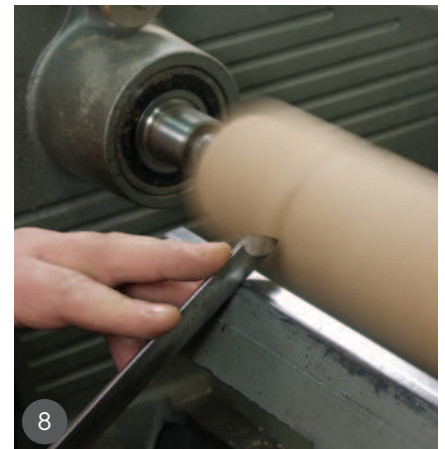
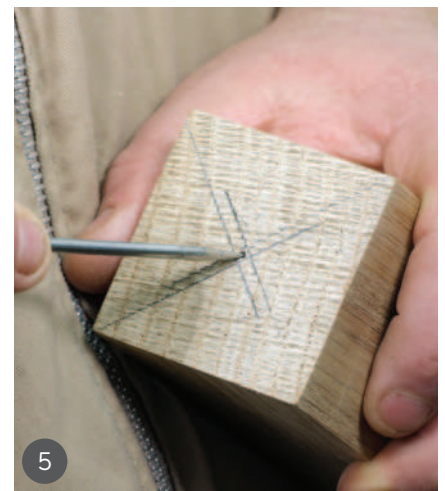
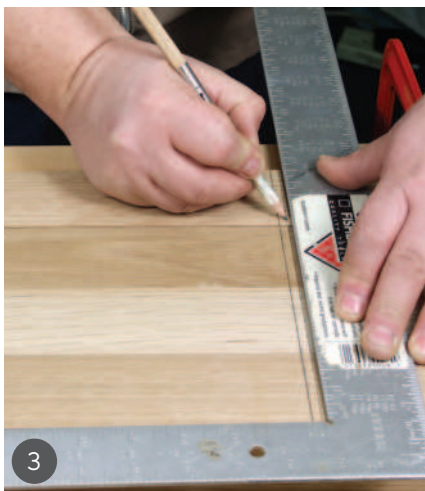
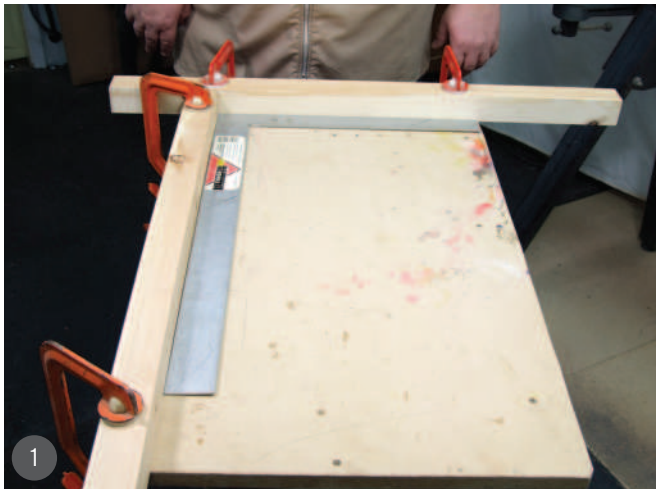
There is a certain sense of satisfaction at the end of turning a batch of hand-turned spindles. I find it enjoyable and rewarding knowing that my components are going to contribute in the making of new or reproduction furniture, maybe even antiques of the future.

HEALTH AND SAFETY

When working with spindles the usual safety issues apply. Protect your eyes and lungs at all times and work at a speed that you feel is safe and comfortable.

ALTERNATIVE TABLE LEG DESIGNS





THE TURNING TECHNIQUE

1 With copy turning, remember that accurate setting out/mark out is the order of the day, not speed. Take your time – there's no hurry. Once you have adopted this ethos, set up a frame using a framing square.

2 Mark the pummels. This requires two measurements (top and bottom).

3 Place all the spindle blanks in the frame and scribe the lines across using your square.

4 Centre the spindle blanks on all corners.

5 Spike the centre with a bradawl.

6 These are a matched pair of steb centres. The centre is spring-loaded to minimise penetration of the timber with the teeth, giving extra drive on dry timber.

7 Drive all the centre marks.



8 Make a right-hand v-cut using a skew chisel ...

9 ... then do the left-hand v-cut.

10 The left-hand end pommel cut is complete. Notice how the cut has just

scored the surface. This allows for maximum diameter on the spindle.

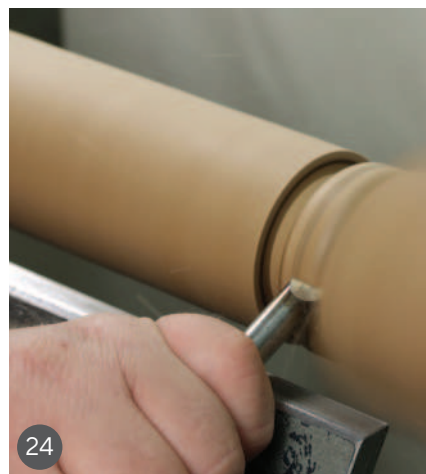
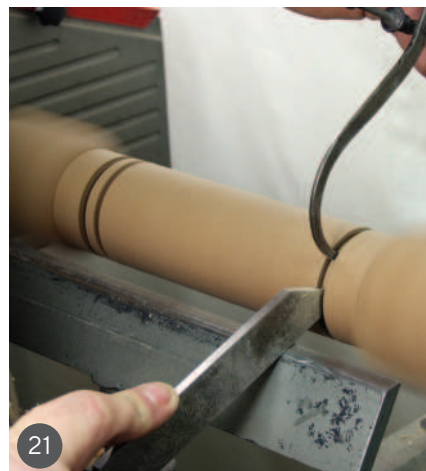
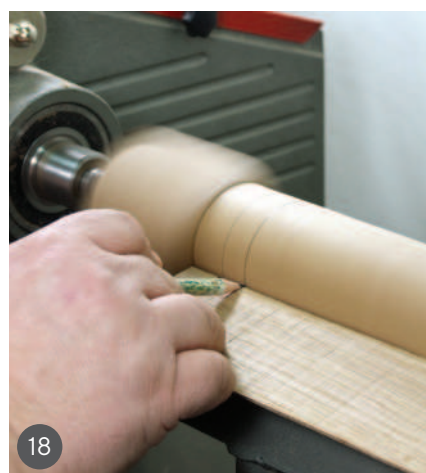
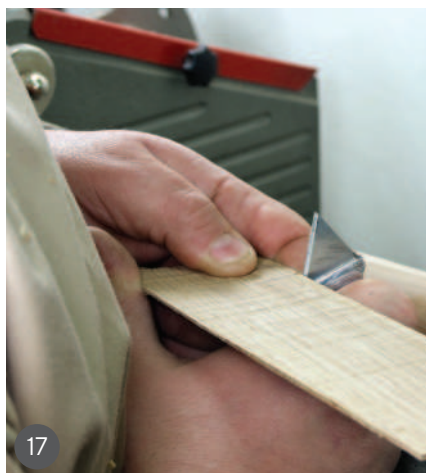
11 Now the tailstock end, left-hand side v-cut first.

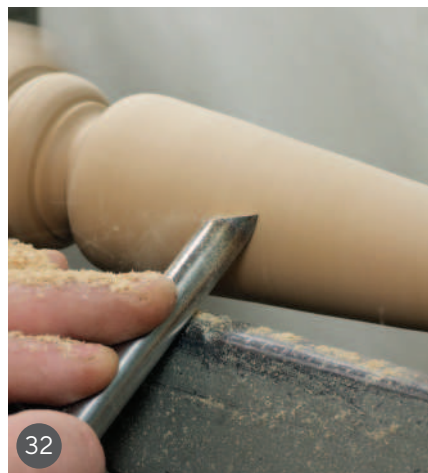
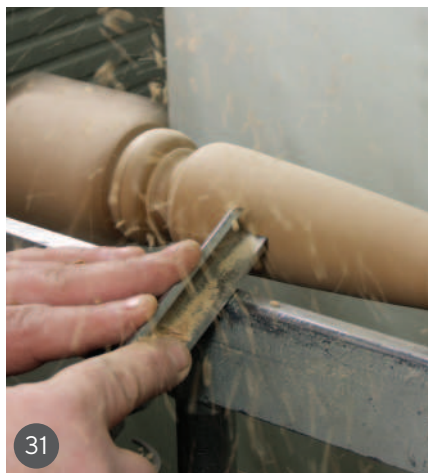
12 Then the right-hand side v-cut.

13 Both pummels are now cut.

14 With a 20mm roughing spindle gouge, remove the waste timber until it is round.

15 With the centre section turned, you can mark on key points.





16 Cut a thin board that is slightly shorter than the distance between the two pummels and mark the main details. Cut in on these lines with a small saw.

17 Use a sharp knife to make the v-shapes. This allows the pencil to sit in exactly the same place each time.

18 Place the storyboard against the spindle, keeping it to the left, and mark the details at that end. Move to the right-hand end and do the same.

19 Alternatively, draw the pattern on and use the v-notch technique to do the same. Keep the marking out simple to avoid confusion.

20 Set callipers to the appropriate diameter to size down to the fillets for the cove.

21 Repeat as needed along the spindle.

22 Flatten the centre of the cove to the same height as the fillets.

23 Mark the centre of the beads and turn the right-hand side of the bottom bead using a 10mm spindle gouge. Repeat for the left-hand side of the bead at the tailstock.

24 Using a small skew, round turn the right-hand side of the bead.

25 Blend the top of the bead to create a smooth curve.

26 Alternatively, you could use the point tool to give better access to create the bead at the left-hand end of the spindle.

27 Using the small skew chisel, round over the corner to gain better access to the cove.

28 Using callipers and a 'skewchigouge', size the cove to the diameter required. A skewchigouge is a turning tool designed by Allan Beecham that works as a skew, chisel and gouge.

29 Repeat for the top of the tapered section.

30 Refine the half cove at the top at this stage.

31 Remove the waste timber with a 20mm roughing spindle gouge. Use the wing to get this as straight as possible.

32 Make a finishing cut using a 12mm round skew.

33 Finally, hand sand the spindle.

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UNDER THE HAMMER

MODERN DECORATIVE ART & DESIGN

THE BONHAMS AUCTION IN NEW YORK FEATURED 20TH-CENTURY GLASSWARE, JEWELLERY AND PAINTINGS. WE TAKE A LOOK AT THE TOP-SELLING FURNITURE LOTS



◀ **LOT 47**
PRICE \$43,825 (£33,588)

Set of six Egyptian Chairs designed in 1949 by Finn Juhl (1912–89). The chairs are made from Brazilian rosewood with vinyl upholstery. This design was inspired by an ancient Egyptian chair that Juhl saw on display in the Louvre. He combined the ancient original's construction with his own modern Scandinavian style. The Egyptian Chair was displayed for the first time in 1949 in Copenhagen at the Cabinetmakers' Guild Exhibition. His success at this exhibition led to Juhl's breakthrough into the international design world.

▶ **LOT 57**
PRICE \$5,075 (£3,889)

Home Desk made in 1946 by American designer George Nelson (1908–86) for the furniture retailer Herman Miller. The desk is made from oak, leather and steel. Nelson worked as lead designer for Herman Miller in the 1940s and 50s, as well as running his own design studio. He is known as one of the founders of American modernist design.



PHOTOGRAPHS COURTESY OF BONHAMS



◀ **LOT 28**

PRICE \$35,075 (£26,882)

Wall-mounted elm cabinet made for the Hotel Royal, Naples, in 1953 by Gio Ponti (1891–1979). Ponti was an architect, industrial designer and furniture designer, and also founded the design magazine *Domus*. He was one of the leading Italian designers of the 20th century and played a major role in the revival of Italian design after WWII.



▲ **LOT 49**

PRICE \$18,825 (£14,428)

Pair of Easy Chairs designed by Finn Juhl ca. 1953. Juhl introduced the Danish Modern style to the USA.



◀ **LOT 17**

\$18,825 (£14,428)

Oak pedestal desk made ca. 1935 by Alexandre Noll (1890–1970). French artist Noll created sculpture, furniture and other household objects out of wood. His style celebrated the natural forms of wood, as opposed to the industrial design processes and man-made materials used by many of his contemporaries. A self-taught woodworker, Noll had an almost spiritual connection with the material, stating that he wanted 'to make of wood all that could be made out of wood.'



PHOTOGRAPHS BY CHRIS LEESE-WOOD

HIGH FLIER

FORMER RAF ENGINEER AND AVIATION ENTREPRENEUR **CHRIS LEESE-WOOD** IS PILOTING A BRAND NEW CONTEMPORARY HANDMADE FURNITURE BUSINESS THAT TOOK OFF JUST BEFORE THE PANDEMIC STRUCK

Looking back, the end of 2019 probably wasn't the best time to launch a brand new furniture business – but for Chris Leese-Wood it was the culmination of a lifelong love of woodworking.

'In hindsight, it was probably not the best decision given the soon-to-arrive pandemic, but it did provide a focus for me during lockdown to start to create my initial portfolio' he says. Chris, whose contemporary handmade furniture business is called Leese & Wood, has been fascinated with woodwork since he was a child and used to visit his saw doctor father, who ran a sharpening shop for a timber yard, after school. 'I was always fascinated by the sights and sounds of the circular saws, bandsaws and the other specialist tools being sharpened,' he recalls. 'I would often walk around the sheds and watch the guys cutting and building various items from the timber.'

He left school at 16 and, having just completed his first solo flight in a powered glider, joined the RAF as an avionics engineering apprentice. He went on to a career selling defence equipment such as Fastjet aircraft, radar systems and infrastructure. In 2013 he moved to run the composites business for AIM Aviation, now AIM Altitude, near Cambridge. The company is an innovator in the commercial aerospace cabin sector. Chris explains: 'They were one of the first to design and build first class bars for customers like Emirates and Virgin, where design and feel is key to the airline brand and eventual shareholder value. As well as manufacturing most of the components for AIM, we also had a very large third-party customer who designed and manufactured inspirational business and first class seats for airlines such as United Airlines, Virgin and Air New Zealand to





name a few. Again, the design and feel of these seats is extremely important for the airline, as many customers choose the airline by the seat they use.'

During his time there Chris worked with design houses to create new and inspiring products. Given the constraints in the cabin on space, strength and safety, the design process, testing and certification typically took from 18 months to three years and cost millions of pounds before the first production seats would be in service. Chris says this experience has influenced his furniture-making.

He explains: 'My main guiding principle is that there is a balance between form and function. Many things are beautiful to look at but can be totally useless. I try to select the best possible joint and combinations of wood to get the best result.'

'Regarding style, I have many ideas in my head that I want to try at the moment, some of which cross what some would call "style boundaries". I will probably end up creating collections which are inspired by different styles or elements.'

CABIN FEVER

Chris's experience in airline interiors informs his design process, as does his childhood love of building models. 'With regard to woodworking, I am completely self-taught,' he says. 'I have always been very practical and from the age of about 10 I started building radio-controlled models from balsa and ply, which probably gave me a good basis for which joints and techniques

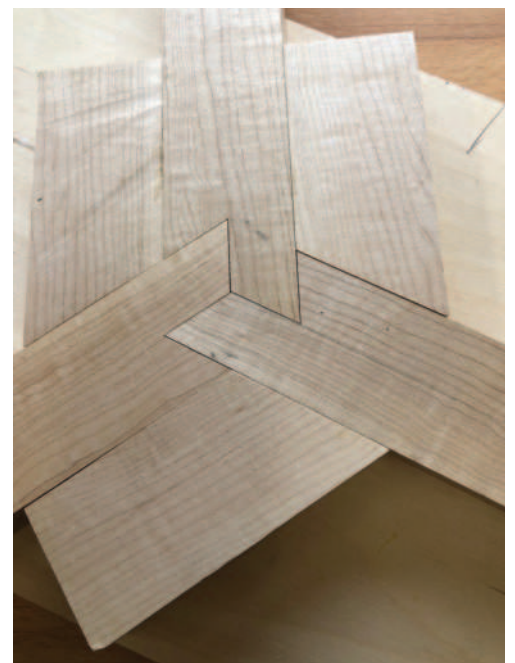
worked and which did not. More recently, as I became more interested in furniture, I adapted some of the techniques used in my previous industry roles in aerospace to get the best out of the wood to match the design I had in mind.'

In his work in aircraft cabins Chris was mainly working with composites, but he has found many similarities between composite and wood. 'They both move over time, they both need jigs and tooling to ensure success and they are both creative materials.'

'Having worked on the largest business-class seat programme, the need for manufacturing engineering is critical for success. Obviously, the scale of this activity is much smaller working in my workshop, but nevertheless, it pays to assess how to make the item before cutting the first piece to avoid costly scrap. I also probably run the same development process through my head that I used in the aerospace sector, but in a much smaller way and without the certification elements. Thankfully this is much cheaper,' he adds.

'Another element critical in the aircraft cabin is space, which was extremely important in the economy cabin. At Acro Aircraft Seating we strove to get the best possible comfort from the very constrained parameters.'

'Most airlines have about 189 economy seats on an A320 – that's a lot of seats and comfort is not always the highest priority. When I design a piece of furniture I think about the boundaries and how the client will interact with it.'



READY FOR TAKE-OFF

Chris set up his business in his converted three-bay oak-framed garage. 'I have been in there about eight months now and expect to be there for at least another year until the business gets up and running,' he says.

He started out by buying all the machinery and tools he needed for his workshop, then investing in a selection of timber from a nearby supplier. 'For the past six months or so I have been in the workshop pretty much from nine to five, designing and building new ideas. I typically do the admin side of things in the morning before going to the workshop, which luckily is next to my house. My wife Victoria, being a little younger than myself, understands social media so she does a great job on the website, Instagram and Facebook.'

Most of Chris's work is based around three main machines – the tablesaw, the thicknesser and planer and the bandsaw – which get the basic material ready to work. From that point he mainly uses hand tools and a little routing.

'Having spent the past 10 years or so managing factories with CNC machines, I love to get back to basics with a Japanese saw, plane and chisels,' he says. 'During the set-up period I bought a dovetail router jig, but I haven't used it as I prefer to do it by hand, even if it takes a little longer.' In terms of finishes, he likes hardwax oil – 'it just compliments the beauty of the wood' – and tends to use satin.

Chris's favourite wood to work is maple – 'just the way it feels, looks and the way you can work it', he says. 'It plays havoc with the blades but is just so stable that I probably use it in most pieces I make.'

'I also use American black walnut a lot as most of my customers have asked for it in commissions and my wife adores it for its colour and feel. Other woods I am currently using are American white oak, cherry, iroko for outdoor furniture and American ash.' Going forward, he hopes to build on his knowledge of aerospace and composite techniques to bring different media into his domestic furniture.

In his cabinetmaking Chris starts with an idea which he develops into a basic form using 3D design software SketchUp. 'I then do most of the work in the workshop, developing the tooling to execute each element of the piece. The design usually changes throughout the process as I see it develop. I probably think about the piece the majority of the time when I am making it, to ensure that I get the best result. Some would say I was a control freak, but I just want to get perfection, which is very hard to achieve,' he says.

Around 30% of his work is done on commission, but he hopes that will increase as the business grows. He says: 'Commissioned work takes a lot of liaison with the client to get the definition right before commencing and you get a sense of excitement from their feedback as the project progresses. My own work develops as I make it.'

SKY-HIGH INSPIRATION

Automotive, aerospace and architectural designs all inspire Chris, whose main aim is to do something different that will capture attention and have a real wow factor. 'There are a few design icons that never fail to get my heart pumping, such as the Spitfire that flies over my house a few times a week as I work with the doors open in the sunshine,' he says.

He finished his first project in about 2005, a modern plank-style oak coffee table. For the past six years he has been renovating his house, and for that he built a helical staircase made from laminated plywood with walnut risers and treads. 'I suppose you can call them architectural furniture,' he says. 'The time and effort invested in the tooling made everything easy and the stairs are fantastic.'

But his favourite – and most challenging – project so far has been a recently completed console table with drawers in walnut and maple. Chris explains: 'I particularly like it because it is very different from anything out there and it commands attention. It originally came from a sketch I made which developed over the four weeks it took to make, and looking back I would not change anything.'

'It was challenging because of its leg configuration and drawer shape. The legs are angled at 30° to match the sides, and given the height, they required braces grafting on to them to spread the load. It was also the first time that I had attempted to make drawers with sloped sides, which created issues positioning the maple runners with the differing angles. Looking at the unit now, I believe it was all worth it and I will use these features again soon on another piece.'

He is currently working on a set of bedside drawers with an unusual design and a commissioned elliptical dining table in walnut and maple. 'I have a few things on the list for the next project, including a desk with suspended drawers, garden seat, armchair and maybe a lamp.' The business is occupying him seven days a week at the moment, but once he has established it and finished his home renovation, he hopes to have some spare time to build a Harley Davidson Bobber motorcycle, a Ford GT40 replica and a boat.

Late 2019 may not have been the best time to set up a brand new business, but Chris has seen the Covid-19 crisis decimate the aerospace business and put many of his good friends and colleagues out of work. He, however, was able to focus on building his furniture and homeware portfolio. 'Who knows what the future will hold?' he asks. 'Maybe goods made in the UK by craftsmen will become the norm. I would like to think I could grow my business and still deliver craftsmanship to our clients. I would love to take on apprentices and keep the skills alive in the UK.'

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'Regarding style, I have many ideas in my head that I want to try at the moment, some of which cross what some would call "style boundaries". I will probably end up creating collections which are inspired by different styles or elements.'



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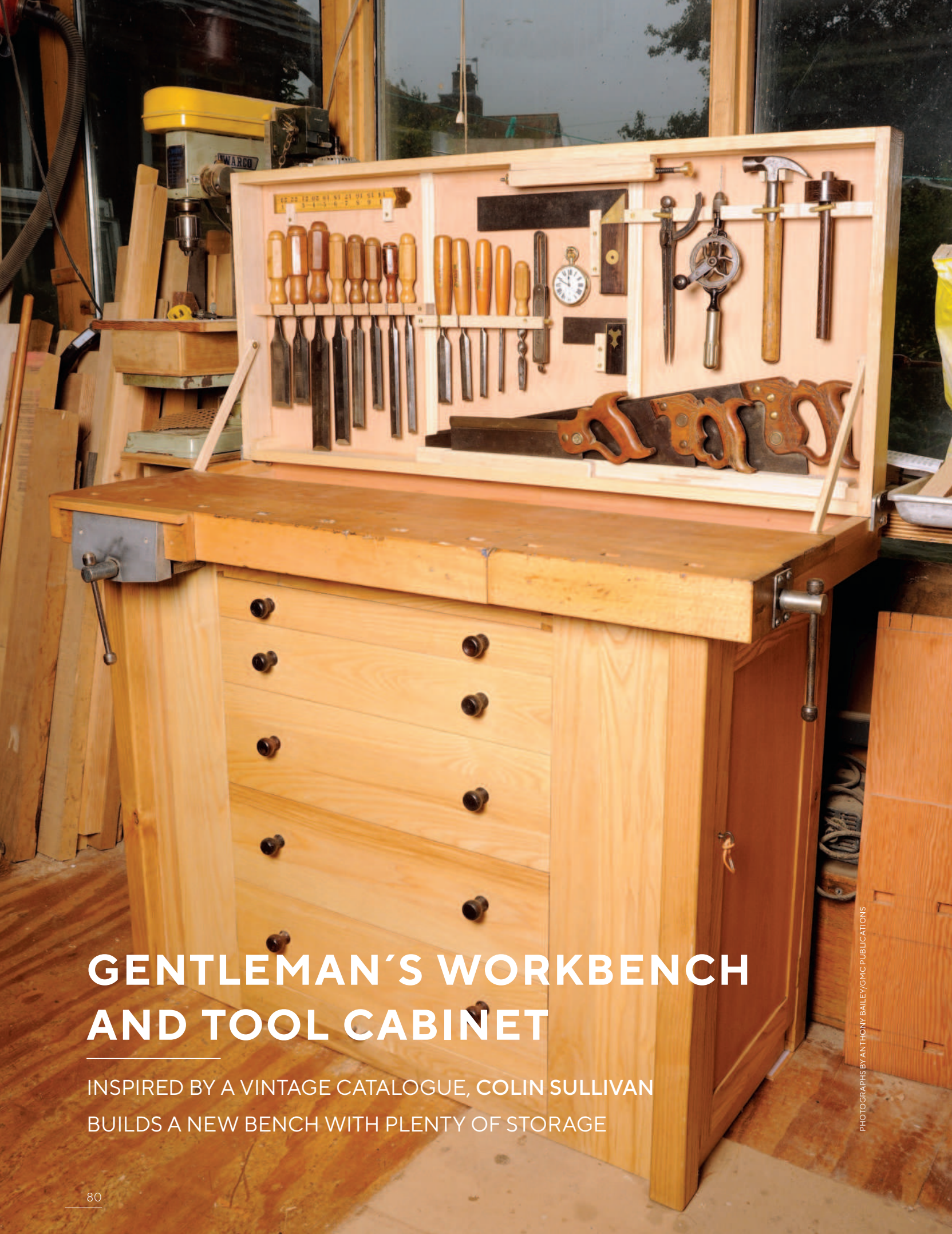
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GENTLEMAN'S WORKBENCH AND TOOL CABINET

INSPIRED BY A VINTAGE CATALOGUE, COLIN SULLIVAN
BUILDS A NEW BENCH WITH PLENTY OF STORAGE

PHOTOGRAPHS BY ANTHONY BAILEY/GMC PUBLICATIONS

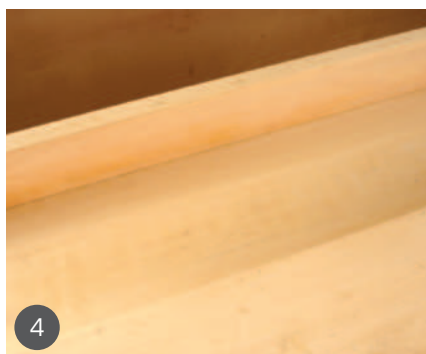


Illustration of the bench on which I based mine, from the 1905 *Melhuish Catalogue of Woodworkers' Tools, Machines and General Contractor's Appliances*

The first illustration of this type of bench I can find is in a Melhuish catalogue from 1905. The Excelsior Patent workbench and cabinet sold for as little as £13.10s, and the tool kit was a further £10.

The illustration shows what a grand affair it was, with six drawers, two cabinets and a huge removable vice, stored under the close-down top. By coincidence it is almost the same size as the one described in this project.

I always liked the look of them, and when I was offered a pair of bench tops it got me thinking – I can make one of those bench-cabinets for myself!

PREPARATION

1 The tops came from a local college that thought woodwork was now out of date and closed its craft department. Making this workbench also turned out to be a good opportunity to use some of the wood left over from previous jobs lying around the workshop. It's amazing how the offcuts build up without a regular clear-up.

Any Scandinavian-style bench top would suit this project, with appropriate adaptation to the design. They come complete with vices and bench dog holes.

2 I always start a piece like this by making a simple working drawing, then a cutting list, and with these I can sort out, cut and plane the pieces required. The 75mm-thick top is 1,200mm long and 300mm wide. I extended this in width to form a well, making it 535mm overall. The legs and carcass are ash, the top and panels are beech and the ply inside is birch. The only thing I had to buy was the 8mm birch ply – a whole board was used. No elaborate machinery was used in the making of this bench, most of the jobs were done on my reliable Luna combination machine, with a circular saw, planer thicknesser and spindle moulder.

THE TOP AND CARCASS

3 I began by cleaning up the second-hand

top with a small hand-held electric planer, carefully checking at each stage that it was flat and not in a twist. I finished it off with a smoothing plane and a cabinet scraper – a Stanley No.80 with twin handles is perfect for this job. Two beech end pieces were made at each end and a rail along the back where the lid will go. A bridge joint was made on the back corners and the end pieces were cut round and glued and screwed from underneath to the top.

4 A small fillet was fixed low down on the inside faces to support the 6mm ply board to the well. In the example shown, the fixings in the form of small screws are underneath instead. There is always a debate about the merit of a tool well, but it comes as standard with this bench top pattern and does at least enable you to keep a clear working area in front and tool storage when the lid is closed.

5 Now the top was finished I could decide about the cabinets to go underneath. The top already had two good vices fitted and I could see no reason to change them. I suggest a medium-sized vice, something like the Record 52½ with 9in jaws would be more than adequate, and not to bother with the end vice which would be difficult to make.



6 The ash carcass and drawer fronts are glued up from 15mm reclaimed shelves, old stock left from Beaver and Tapley CD units a friend gave me.



7 The 50 x 50mm legs were planed up and the two front edges given a pencil-size radius, then simply rebated to take the ash front and back panels, and glued and screwed flush on the inside leaving the inside faces flat. This also set the drawer fronts back, making room for feet under the bench.



8 Cross rails at the top were dovetailed to the legs and mortised at the bottom to make frames for the doors at each end. Then a complete carcass was formed by adding an 8mm birch ply back rebated into the ash so as not to show at the front.



9 I now had the bare bones sorted and by spacing them 600mm apart the drawer area was formed. Two more frames were made to support the carcasses; the top one is dovetailed as a feature and two larger rails span between the back legs mortised in.

10 Before final assembly, I fit the drawer runners to the cabinet sides, spaced out to suit the drawer sizes. You also need to think about what is going to go into these two cabinets and make provisions for them, i.e. trays to hold small tools, as I have done.

THE LID

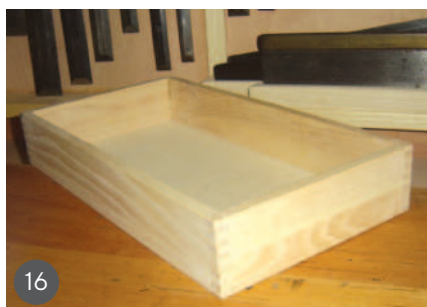
11 The lid is made from a 75 x 20mm ash frame section, dovetailed on the corners with three panels of 10mm

beech separated by narrow rails. I made it this way to use up some ply offcuts and give a bit of interest and character to the appearance. The inside of the lid shows the sectioned construction and the way all these lovely tools have fitted into it. Also note the spring catch at the top for locking the lid down on the completed workbench.

12 The lid in the down position makes the bench look tidy and creates a useful surface when not in use. The corners have exposed through dovetails cut by hand.

THE DRAWERS

13 These are made from solid ash fronts and ply sides, back and bottom. The fronts are only 14mm thick – too thin for dovetails – and ply is not good to dovetail



anyway. Instead I chose to make a simple joint entirely using the circular saw. I have made drawers in this way for years without any problems. The back-to-side joint is done by making a groove across the end on the saw and a rebate on the back forming a tongue.

14 The 4mm ply bottoms are grooved in about 6mm up from the bottom edge. After the drawer has been glued up a hardwood fillet is glued in flush to reduce wear on the ply.

CABINET DOORS

15 These are made from an ash frame grooved all round on the inside edge to take a beech ply panel, which is 4mm thick. I had to veneer these two panels in beech in order for them to match the rest

of the bench. They are small enough to veneer by cramping between two MDF boards. The corner joints of the frames are then mortised and tenoned.

TOOL TRAYS

16 The four small trays in the left-hand cabinet are designed to hold the smaller tools that need to be stored but easy to find when required. They can be lifted out easily and make best use of the space available. I like to use a combing joint on things like this and I fortunately invested in a set of spindle cutters many years ago for this purpose, but the joint shown on the drawer backs would do just as well. The bottoms are grooved in all round and set almost flush with the bottom edge. The same ash was used but planed down to 10mm.

HANDLES

17 All the drawer knobs are made from rosewood and turned on the lathe to match the front knob on Stanley block planes, which is perfect for the bench. Then they are simply held by a screw from the inside of the drawer front.

OPENING TOP HINGES

18 I wanted to arrange the top so it could be opened when the cabinet is up against a wall, rather than hinge it on the back rail and stand the cabinet about 100mm from any wall. This has been solved by making two slotted plates that allow the top to slide forward then lift up level at the back. Two swing-down arms hold it secure when the top is in the open position.



19 The lift up and slide hinge system works very easily. The design can always be modified slightly to suit your own circumstances.

20 The whole bench was given several coats of Danish oil to finish. This will help give a warm appearance as well as being hard-wearing.

FITTING THE TOOLS

21 This was the good bit, the cabinet was finished and now I could choose which

tools would be most useful and decorative in the lid. To start with, I wanted my best chisels at hand in the same way as they are in the workshop; paring chisels to the left, next to the everyday bevel edge chisels and a nice screwdriver. The rail holding the chisels is drilled to fit the ferrules of the handles and slotted only enough to allow it to be put in and taken out, otherwise they will fall out when the lid is lowered. The three saws just drop into a fine slotted piece of ash and the other tools are held in a similar way.

22 Small brass strips with turned-up ends act as the way to hold these tools in place. The holding screws need to be tight so the strips cannot turn unintentionally.

23 In the right-hand cabinet are a No.7 and No.8 plane, a large sliding square, a large sliding bevel, a trammel, hacksaws and on the door a few of the more often used tools.

'This was the good bit, the cabinet was finished and now I could choose which tools would be most useful and decorative in the lid.'

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FINAL STEPS TO SUCCESS

IT'S EASY TO START A NEW PROJECT, BUT HOW CAN YOU ENSURE YOU SEE IT THROUGH WHEN YOUR MOTIVATION STARTS TO WOBBLE?

Changing deep-rooted habits requires a high level of willpower, but once you get into a routine and have established a new pattern of behaviour, it becomes easier to stay motivated... for a while, at least. Take, for example, resolutions to exercise, learn a new skill or start a new project. Pride and excitement about the plan can give it impetus. But too often the motivation can fade as you get closer to your dream.

It's then that frustration, doubt and negativity can creep into a once focused mind. The positive and negative sides of your mind start a battle. The former might convince you to take a little break after all your hard work and re-group. Negative thoughts, however, can undermine your confidence and convince you that the project is doomed. When this happens it can be a struggle to rediscover the motivation to complete the task. Statistics suggest that only 9% of people ever achieve their New Year's resolutions. But is it really that difficult to stay focused?

It's all well to say 'don't give up', but this only works if the will is there in the first place. If you're the kind of person who sometimes falters, despite your best intentions, there are a range of methods and techniques to maintain focus and avoid getting side-tracked.



Work out your strategy to stay on track

1 Make a plan

Write down what your goal is and the specific reasons you are doing it. What will success look like? How long will it take? What will the benefits be? By putting it on paper, you are actively doing something about it rather than keeping it in your head. But be realistic – the goal should be attainable.

Create a mission statement. Whenever you're veering off track, re-read it for inspiration. It's never too late to make a plan. Putting something in writing, even after the doubts have set in, can give you resolve a new lease of life.

2 Time management

Life can sometimes get in the way of ambition, and finding the time to dedicate to a project can be difficult. Use a calendar to plan how long it will take to achieve a goal and consider what milestones you want to reach by certain dates. Monitor your progress by using a diary, making notes or taking photographs of your project as it progresses.

3 Use others to help you

Telling others about a project increases the chances of success. This could be via social media, such as Instagram or Facebook, or even through videos of your project on YouTube. Reading other people's comments or motivational words will inspire you to keep going. They will be following your journey and so you will not only be reaching the goal for yourself, but for others too. Don't think of it as added pressure, see it instead as extra support. Sharing your experience can also put you in touch with other like-minded people who can offer advice and inspiration.

4 Long-term goals

Don't let a bad 24 hours derail the whole project, just get back to your mission the next day. But if you're really falling behind or going off track, set a timer for 20 minutes and do something positive towards your goal in that short time. Quite often, getting the ball rolling once again will make a huge difference.

The key thing is to focus, keep going and not give up. It won't always be easy, but keep reminding yourself of your mission statement and the reasons you are doing it. Envisioning success will motivate you.

5 Celebrate all your milestones

Don't forget to celebrate the milestones you pass on the way to the summit. Breaking the journey into stages and marking each success makes time go quicker and makes the experience more enjoyable and rewarding. It's also important to have a clear finishing point, which can be vital to help maintain motivation in those final weeks.

6 Congratulate yourself

When you reach your end point, give yourself a big pat on the back.

WORDS: DONNA FINDLAY

BE SMART WHEN PLANNING HOW TO REACH YOUR GOAL

Use these S.M.A.R.T. targets to plan out your steps to success

SPECIFIC – be specific about what you want to achieve

MEASURABLE – think about how you will measure your progress

ATTAINABLE – consider exactly what you need to do to achieve your goal

REALISTIC – check your target is realistic if you work hard enough

TIMING – plan how long you will need to complete the project

ONLINE CHARITY AUCTION

WE HEAR HOW THE FURNITURE MAKERS' COMPANY RAISED THOUSANDS FOR THE INDUSTRY CHARITY

A month-long online auction organised by The Furniture Makers' Company, the City of London livery company and charity for the furnishing industry, has raised over £12,500.

The auction ran from Monday 13 July to Friday 7 August and was hosted on the National Funding Scheme's fundraising platform, Donate. Around 40 lots were on sale with items including pieces of art, tickets to the Chelsea Flower Show, limited-edition prints, a four-day chair-making course, a night in a five-star London hotel with dinner and a golf day experience.

Unlike a traditional auction, the Donate system allowed buyers to quickly make bids via their computers or mobiles, which resulted in a fast and furious final few hours with lots of quick-fire offers being made right up to the wire by those wishing to secure one of the fantastic auction lots.



ABOVE Landmark London donated dinner and a night's stay in a five-star London hotel

LEFT Axminster Tools donated a four-day chair-making course



The online auction – the first of its kind for the charity – was organised to mitigate the shortfall in funds the organisation faces following the cancellation of its usually well-attended summer fundraisers due to the Covid-19 pandemic.

David Woodward, Master of The Furniture Makers' Company, said: 'My sincere thanks to everyone who donated such fantastic lots for our first and very successful online auction. Our donors were: Abinger Cookery School, Achieve+Partners, Artistic Upholstery, Axminster Tools & Machinery, Bisley, Burbidge & Sons Kitchen Makers, Catfoot Designs, David Dewing OBE, David Wyndham Lewis, Designer Contracts, Ercol, Häfele UK Ltd, Harrison Spinks, HIPPO, Hypnos, Jay & Co, John Makepeace OBE, Jonny Westbrooke, KI Europe, Margaret Miller, Momentum Contract Furniture, Morgan Furniture, Nathan Furniture, Ocee Design, Panaz, Prima Foam, Race Furniture, Reallyverynice Gallery, Sarah Kay, Stephanie Reeves, The Landmark London, Whitemeadow and Wood Workers Workshop.

'Thank you to everyone who placed bids and my congratulations to those who secured the lot of their choice, I hope you enjoy them. By taking part you have made a significant difference as all the money raised will go towards our Personal Support Grants, helping us to support even more of our industry colleagues who have suffered financially as a result of the pandemic.

'Applications are expected to rise significantly as the furlough scheme is wound down and because of the generosity of our members and friends we will be on hand to help. Thank you all and please look out for future events that you may enjoy.'

Details of the Personal Support Grants can be found at furnituremakers.org.uk/welfare/

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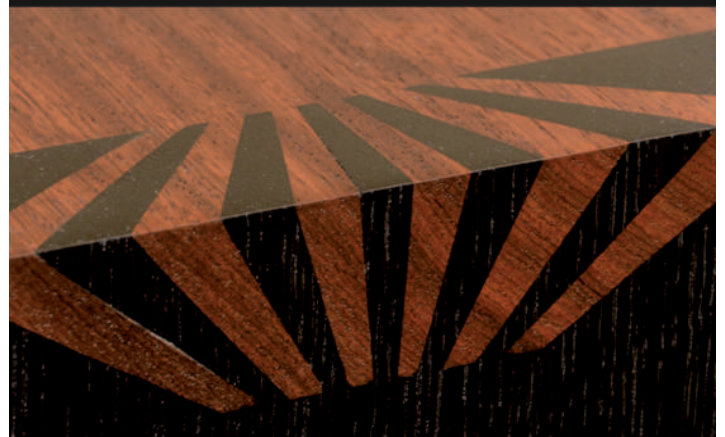
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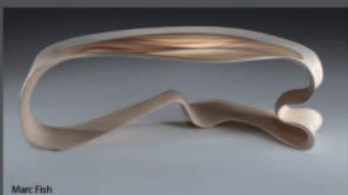
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TOP NOTCH STACKING CHAIR

BEING ABLE TO PUT ALL YOUR CHAIRS IN A NEAT PILE REALLY DOES STACK UP, AS **STEPHEN HOGBIN** ARTFULLY DEMONSTRATES



Many of my chairs have been too expensive. A high-quality chair tends to be a bit heavier, take up more room, require a high skill set and cost more. So I set myself the challenge to make a chair in just one day that is lightweight, uses inexpensive materials and is easy to construct. The result was the Top Notch Stacking Chair.

These are two different approaches to chair design – high quality versus inexpensive – but both are appropriate in the right circumstances. It's a bit like Champagne and beer – each is right for certain occasions. It is important to understand what the differences are. It's about making the right choices and the economics of aesthetics – the right chair in the right context.

ASPIRING VALUES

The Top Notch Stacking Chair does, by its title, aspire to a certain set of values. Not so much for a palace, rather a community hall or kitchen. The chair is a tool for conviviality when set around the dining table for guests. An uncomfortable chair is a horror for your guests and they will be reluctant to return if they felt uncomfortable throughout the meal. So there are three things to consider – good food, good conversation and a top notch chair to enhance conviviality.

COMFORT ZONE

Comfort is often associated with masses of upholstery. However, a hard surface can work if the angles are just right. When working at the computer I use a chair that has a 90° seat and back angle. It forces me to have good posture. Also, perhaps I am just lucky. If I relax my posture, it's a very uncomfortable chair. An inexpensive chair is likely to not have soft upholstery so the angles of seat and back become critical.

DESIGN DIFFICULTIES

When I developed the Top Notch Chair, I received a grant from the Ontario Arts Council. It took a few attempts to get the chair right. I recalled an industrial designer taking seven years to perfect a stacking chair which later became a classic. The chair is thought to be one of the most difficult objects to design and still get a variation to call one's own. The features of the Top Notch Chair would include, of course, the notch, the legs that come from two turnings cut in half and the plywood construction. I don't remember seeing it before but it's highly likely someone has had a similar idea.

MATERIALS

I used white ash or sugar maple for the chair legs. The legs need wood with long fibres and a bit of flexibility. They are made from pieces sized 25 x 51mm. The rails are made from the same wood for visual consistency. In the end I settled on 22 x 48mm rails throughout. In an earlier version a thicker rail was used for the front rail. However, it's convenient when machining to use a consistent thickness for all the rails.

The seat is made from 13mm plywood. Use the veneer of your choice. I have used birch, oak and maple. The back uses 3mm plywood laminated with four layers to develop a curve for comfort supporting the lumbar region. The back could be a flat piece of plywood but the chair will be considerably less comfortable.

There are 10mm diameter hardwood dowels. I usually use maple to go with the birch plywood as using the same wood creates less contrast. However, on occasion a contrasting wood works well.

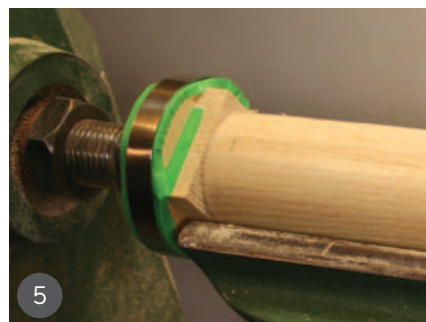
Modern glues are miraculous and I still use lashings of good quality, water-resistant PVA. Occasionally I will use an epoxy of the kind that retains some

flexibility and when the joint is stressed it yawns rather than cracks.

SEAT BACK PATTERN AND MOULD

1 Start with the chair back as it takes time to dry after the lamination. The pattern shown here on to which the chair back is moulded has been used many times for different chairs. The pattern was modified for this chair to make the lower part of the back flat. The 16mm tongue on either side of the 457mm-wide chair back will slot into the back leg. The notch at the top gives the chair its name. The lower shape makes for a handle to move the chair around. To make the pattern for moulding the chair back, make a series of ribs shaped to the back profile. Glue and screw fix each rib on to a 19mm sheet of plywood – one rib every 152mm should work. Then stretch thin plywood or 3mm hardboard over the ribs. It needs to be thick enough to avoid depressions between the ribs. The plywood is glued on to the curve and nailed or screwed down. Wax the surface thoroughly so any glue that spills or oozes cannot adhere to it.

2 The plywood is coated with glue on both sides using a slotted spatula. Lay a sheet of plastic over the lamination and add one more plywood sheet without glue. Then, using finishing nails, pin down two corners so the plywood does not skid around on the glue when the pressure of the clamps is applied. Use stout cauls (a wooden press) close together and as many clamps as possible. Start at one end where the nails hold things together and begin the clamping. Work across the surface to the end. Leave it in the clamps overnight. Remove the clamps, cauls, dry plywood, sheet of plastic and then replace clamps strategically to keep the back in the



curved place. All that damp glue will slowly wick out. If epoxy glues are used the wait time is 24 hours, compared to a few days, depending on humidity levels.

TURNING THE LEGS

3 Cut the legs 21 x 51mm for the back and front. The height of the back leg is 610mm and the front leg is 445mm. To be safe, add 100mm to both front and back legs. Finish the inside to be glued to 180 grit. The two faces will be put together inside the turning. A tiny bead of glue is applied to each end and placed together. This will prevent movement when the turning chisel catches.

4 The crescent-shaped blanks turn the square into a circle. Hold these on with painter's tape. Tighten it together with a stainless steel band clamp, first at one end and then the other. Wipe up any glue and set aside to dry.

5 Mark out the centres for mounting on the lathe. Place between centres and mark out the length of the leg. The extra length needed is becoming self-evident. Turning up to the clamps is not ideal and there will be other uses for the square ends later.

6 If the legs are long they will need to be clamped in the middle. While the two strips of wood are held firmly at the ends they will expand apart when the lathe is turned on at speed. Wrap the clamp with painter's tape to protect yourself as the screw head whips around.

7 Rough out the square to a cylinder, first one end, then the other. The clamp in the middle also helps prevent too much breakout of the inside edge.

8 Profile the leg over its length. Shape the ends and don't go too deep and have it

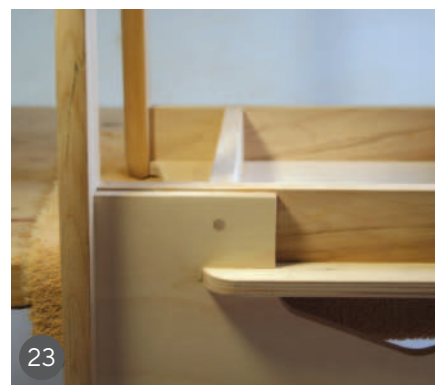
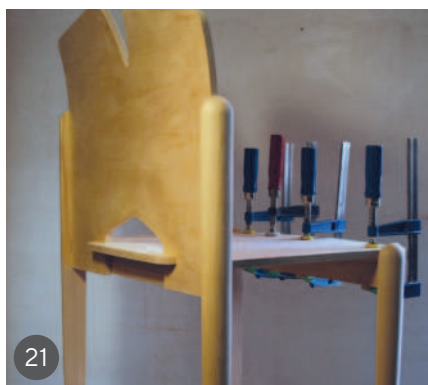
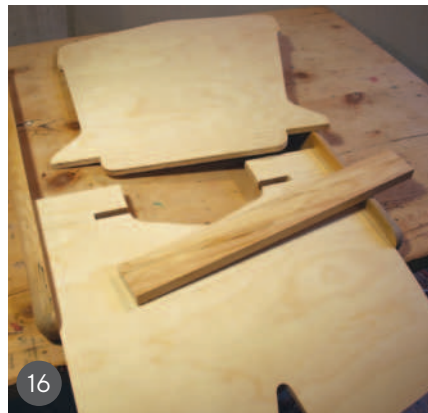
dangerously break apart while spinning on the lathe. Keeping the relationship of the square ends to the turned leg will be vital later in the process.

9 The legs are turned and finished with abrasives to 220 grit. To separate the legs, use a broad chisel and give a gentle tap to divide the two halves.

CONSTRUCTING THE CHAIR

10 One of the separated legs is placed in a jig ready for cutting a slot for the 13mm-thick plywood. The square ends hold the semicircular leg in place. The block at the end makes it all tight.

11 The square strip at the back is the fence against which the router will follow. In the foreground the packing strip comes up to the same height so the router has a larger surface on which to rest.





12 The slot or mortise for the front leg is much shorter. For both front and back legs the end of the mortise is squared off with a chisel. It is also possible to round over the plywood tongue or tenon to fit the rounded finish from the router. It is a little stronger to round over the tenon than square out the mortise.

13 Keep the jig and label what it was used for – it's easy to forget when you have a rack full of jigs.

SEAT AND BACK

14 Mark out the back shape on cardboard and keep for future reference. The moulded plywood was cut longer than the cardboard. The notch at the top may well make the chair more comfortable for people with protruding spines. The other shape at the bottom becomes the handhold for moving the chair around.

15 The shape was cut out on the bandsaw, the edges smoothed with a belt sander and drum sander. Keep the edges square at this point. Just release the edge rather than round over the edge with abrasives. The final rounding is done after the edge is painted.

16 The seat and back are shown here with the final shape. It's easier to determine the final seat shape later. At this point the seat just needs the tongue to go through the back slot.

ASSEMBLING THE CHAIR

17 Clamp up dry first to make sure all the parts fit together. It's critical to make sure the joinery works. At this stage it's possible to mark out the shape for the seat and then finish the edge. When the chair

is taken apart the blocks on the top of the legs may be removed and the legs finished.

18 The legs may now be glued to the plywood back and the front rail of the seat. It is easier to glue two pieces of wood together than all the parts of the chair at once. Procedure is everything to maintain control. Also, cleaning off squeezed-out glue is easier at this point.

19 Glue the seat into the back, making sure all surfaces that touch are brushed evenly with glue. Ply blocks are then clamped into position to help support the seat.

20 In this design the seat and back are square at 90°. There is an illusion created by the shadow of the bar clamp that there is a rake to the back. While it would be slightly more comfortable, it's not how this design works.

21 Clamp on the front legs dry and cut the separator strips of wood at the feet of the chair.

22 Turn the chair over and glue on the rails and front legs. Fix the side rails first, then the front leg assembly. This is the easy way, the dowel joinery is added later. Add a corner block on the inside after the clamps are removed. With no lower rails the joints will be stressed from the live load of a person sitting down.

23 Here you can see the under structure on the chair with the dowel added and the glue cleaned off. Two dowels are better than one and corner blocks should be added. The plywood back is slightly short of the rail by 3–6mm. It saves

having to flush the surface but there is still the glue to clean off.

24 The front rail has two dowels and the seat has one on either side of the chair.

25 The top of the front leg is cut at an angle. It protrudes above the seat but it's hardly noticeable when sitting down. Furniture is all about connections, transitions and relationships. Make them as interesting as possible.

FINISHING DETAILS

26 Each seat of the two stacked chairs has a different shape. I preferred the shape of the chair on top. Visually it worked better. Also, when the chair is stacked the back leg is less likely to dent, scuff or abrade the seat below. The waist of the seat looks lighter and more elegant and functions well for stacking.

27 The edge of the plywood and the inside of the leg are coloured. I often introduce colour to contrast the wood and bring visual interest. Apply the colour and allow to dry, then sand the edge to give the round-over you prefer. The edge of the paint becomes sharp and clear and all loose brush marks are lost.

28 Brightly coloured surfaces make each chair different. When they are stacked it makes a new arrangement each time. In a chair that needs to be identical the colour allows for random patterns that appear in use. It also makes the difference between a commercially produced consistent chair and a handmade chair where variation is easy and desirable. It places the chair in the category of inexpensive, but it is after all Top Notch.

COMPOUND ANGLE DOVETAILS

MICHAEL T COLLINS TAKES A MATHS-FREE
APPROACH TO COMPOUND ANGLES

PHOTOGRAPHS BY MICHAEL T COLLINS



Faux dovetails – actually dovetail keys

A couple of summers ago I was staying with my sister who had just purchased an antique cutlery tray with what appeared to be dovetails. However, on closer examination they turned out to be faux dovetails – mitred corners with dovetail keys cut into them.

I thought it would be fun to give a step-by-step on how to cut real compound angled dovetails. If you have made through dovetails, then a compound dovetail is a joint that will really tax the mind on many levels.

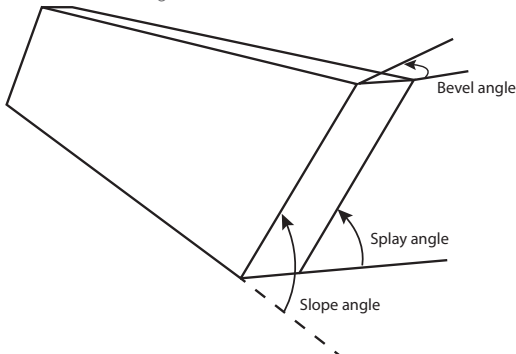
The really hard part of making compound angle dovetails is figuring out all the angles. Let's start by relaxing and, more importantly, not over-thinking the process. This is one of those skills that is easier to do than it is to think about and, while I taught mathematics in a previous life, calculating these compound joints is an exercise in complex geometry and trigonometry, and woodworking should be fun. So I promise, no maths.

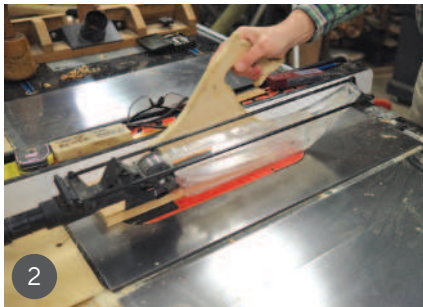
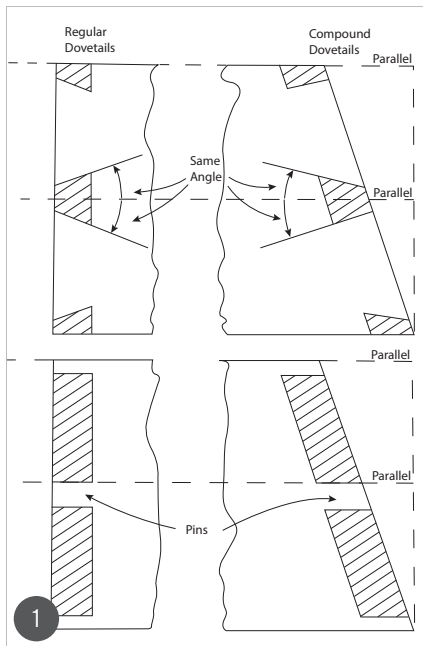
In this article I will be making just a single joint, using 20mm-thick pine to illustrate the process.

DOVETAIL ANGLES

1 When making regular through dovetails, the pin and tail boards are at 90° to each other and it's easy to take a lot of the process for granted. For example, we think of the pins being perpendicular to the end of the board, but actually they run parallel to the top and bottom edges of the board. Similarly, the baseline or shoulders of the tails and pins look square to the face, but they are really parallel to the end of the board. It's important to understand that dovetail angles must be visualised relative to the edges of the board, parallel with the grain, and not perpendicular to the shoulders. The reason they look a little odd is because of the side's splay angle.

Naming convention





A BUTT JOINT

2 It all starts with a butt joint. First cut your boards to the length you want the top edge of the tray to have. Mark which is the tail and which is the pin board, the face and edge side, inside and up. This is important – I can't stress this enough.

Next, decide on the angle that you want the sides to lean (the splay angle). Dial this into the tablesaw and rip the bottoms of all the boards with the word 'in' (for inside) facing up. As I promised, no maths will be used in constructing this joint.

3 To determine the height of the sides, place the bevel you just cut on the bench, then at one end measure the perpendicular height to where you want the top of the tray. In my example, I marked a point about 75mm from the bench. If you are leaving the top flat, that is all you need to do, but if you are going to round over the top edge you

will need to allow for this extra height by measuring to the middle of the top edge. Now, rip all the boards to this width ('in' will now be down). You should now have four boards that are parallelograms in cross-section.

FINDING THE INTERSECTION ANGLE

4 Take a tail and pin board and place them at 90° to each other (I used a couple of blocks of wood to support them while I found the slope angle), so that the outside top of the tail board is in line with the end of the uppermost edge of the pin board. With a card scraper resting on the tail board, slide it towards the mating pin board and then draw a line along the edge of the card scraper – this is the projection of the tail board on to the pin board. Since the splay angles of the tail and pin boards are the same in my example, I now have the angle that the ends of

the boards need to be cut. If you want different splay angles for the tail and pin boards, simply repeat the process, but this time project the pin board on to the tail board.

5 Set a bevel gauge to this line and this will be the line on which you cut. You will see that this angle is not the same as the splay angle.

6 Using your method of choice, cut along this line. Retain the waste piece – you'll need it in a bit.

7 Now when you put the tail and pin boards together at 90° you will discover that the boards leave a small gap on the inside...

8 ...or, if you tightly butt them together, they will not be at 90° and will be out of square by the amount that needs to be bevelled on the ends.



9 In my example, the bevel angle was a tad under 7°. Set a bevel gauge to this angle. The easiest way to remove this small bevel is with a shooting board. My shooting board is just an oversized bench hook.

10 You will need two set-up blocks, one was the piece you cut off the pin board and the other is a wedge that has the bevel angle (the photo shows a selection of blocks for different splay and bevel angles). Note: There are several online calculators to determine these splay, slope and bevel angles, but I find it just as easy and effective to measure the angle by eye.

11 Mark the extent of the waste on the ends and, with the shooting board and the two blocks, plane away the waste. Your shooting board will need to have two sides so that you can plane the bevels on the other end of the boards.

12 A pencil mark on the end grain is a good visual cue to see when the bevel is planed away.

LAYING OUT THE DOVETAILS

13 I am a proponent of tails first so, with a marking gauge, measure the width of the end of the board. Owing to the bevel

edge, this is marginally longer than the actual thickness of the board.

14 It is important to realise that when marking the shoulders on the faces, they will be at the different locations on the front and back face sides due to the bevelled end. So, when marking the inside shoulder make sure that the marking gauge is seated flat on the bevelled end. Scribe the line on all four sides of the tail board and only the face sides of the pin board.



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TAIL LAYOUT

15 If you have not labelled your parts by this juncture, now is the time to do so.

16 Set the half-pins at 6mm from each end. To mark the tails, set a pair of dividers to a quarter the distance between the two half-pins plus 3mm. Starting at the first half-pin mark, walk the dividers across the end grain. Place the divider in the other half-pin mark and walk back – this involves a little trial and error. The marks will represent the edges of the dovetails. If you don't like the layout, simply change the divider

length. I rather like having very narrow pins, 'English' style.

17 Now, with the bevel gauge set to the angle of the bottom, proceed to draw the edges of the tails across the end grain. Note that these lines are parallel to the bottom and top and not perpendicular to the face sides.

GETTING THE TAIL ANGLE

18 I like my tails to be at an angle of 1:6 or approximately 9.5°. The easiest way to get the angle of the tails is to draw a line parallel to the sides and then mark off

1:6. You will need to set one bevel gauge to the left-hand angle and one for the right-hand angle.

19 Draw in all the tails. Place the tail board in the vice so that the tail's layout lines are perpendicular to the bench – this will aid in sawing. Normally when I am making dovetails, I gang the tails together and cut them all at once, but in this case that is not possible as the shoulders are at different locations. Because these shoulder lines are at different heights, work from the shorter side (the outside) – that way you can cut close to the shoulder line without going below on the other side.

20 Mark all the waste on both sides of all the boards and saw down to the line on the waste side.

21 Then, proceed to chop out the bulk of the waste. Repeat this for all the other tails.

22 Chop out the waste but go easy and remember that the chisel does not chop perpendicular to the board's face, but at the bevel angle. If this is your first time, resting the chisel on a block of wood cut to the same bevel angle will help.

PIN LAYOUT

23 Now for the pins. Lay the tail board on the pin board and support it while you mark the location of the pins.

24 With a bevel gauge set parallel to the sides, draw the pins and mark the waste.

25 Chop out the pin waste.

26 Test-fit and pare away any tight areas. Now all that remains to do is make the other three joints. This is the time to round over the top of the boards and cut the groove for the bottom.

27 Once glued, the joint is easily cleaned up by using a smoothing plane working from the joint to the middle of the sides, this avoids tearing out the tails and pins.

28 If you would like to start on something 50% easier, leave the tail board at 90° and just slope the pin board or vice versa.



Fit for a **Queen**

FROM ROCKING CHAIRS TO
CREDENZAS TO THRONES,
GOEBEL & CO FURNITURE
MAKES THEM WITH A FUSION OF
TRADITIONAL CRAFTSMANSHIP
AND DIGITAL DESIGN

From building a throne for the Queen of Zambia to a dream of high quality furniture for the mass market, Martin Goebel has seen it all. The St Louis, USA-based furniture maker has created pieces for major organisations such as law firm Lewis Rice, agriculture business Monsanto, Washington University, Nike Corporate and French architect Philippe Starck, as well as for a number of hospitality businesses. He also produces fascinating bespoke items including a floating bed with a curved footboard, stunning live-edge tables and classic dining furniture – and of course, a throne for the Queen of Zambia.

Martin says the throne – which he delivered in person in March 2020 – was one of his most challenging and rewarding projects. He recalls: 'It brought me to Africa and exposed me to a world I never knew existed in such vivid reality. It made me experience the true concept of "people being people", no matter where in the world or how far apart. It was a life-changing commission and experience.'

But he adds: 'It was also the most difficult as we had to create three prototypes, flat-packed, assembled in a hotel room in Zambia and delivered in under six weeks. It was madness. Time is often the most difficult x-factor to overcome. As a fully developed craftsman, craft and making has become the easy part for me – my comfort zone. Nothing is easier than a quiet shop, beautiful material and all the time in the world.'

So how do you get from a schoolboy interest in making furniture to building the Queen of Zambia's throne? Martin started by training with a very good teacher in high school for three years, took an apprenticeship under influential cabinetmaker James Krenov at 19 and then studied for a bachelor's degree in Studio Fine Arts at the University of Missouri and a master's degree in furniture design at the Rhode Island School of Design. His master's degree focused on digital design and automated manufacturing. 'I also worked under Tom Moser directly at Thos Moser Cabinetmakers in Maine, USA, before starting my company 10 years ago,' Martin says. The first project he completed was a Honduran mahogany Queen Anne candle stand with three legs.



PHOTOGRAPH BY SCHROMM.



Martin had always wanted to set up his own business, so he started in 2010 with two silent business partners, US\$20,000 and some old machinery in a 1,800 sq ft workspace. 'We now have 15,000 sq ft, utilise CNC manufacturing and lots of traditional hand craft and have a staff of five full-time craftsmen, not to mention office staff – 10 people all in and growing,' he says.

'We create uncompromising pieces focused on the purity of lines and material at the intersection of digital design, automated manufacturing, team-based fabrication and highlighting the very best of craftsmanship by any means available.'

TOOLS FOR THE JOB

Goebel & Co's current workshop was built in 1919 as an enamelling plant for truck chassis. It has 16-foot-high ceilings with a centre clerestory which pops up to 30 feet, and nearly 100% natural light.

'We have a mix of new and vintage woodworking machinery,' says Martin. 'We design fully in 3D via Solidworks and assign a digital or analogue production method to components. Our work spans residential, hospitality and corporate interiors.'

When it comes to tools Martin is not fussy – he will use the right and most effective tool for the job, whatever it is. He explains: 'As John Lennon once said, "I'm an artist. If you give me a tuba, I'll get you something out of it." We use the most effective tool for the job. Sometimes this is a hand tool and other times it's a high-tech CNC controlled by computers. We don't let the vanity of the craftsman's hand reduce the quality of product to limit our work to a single methodology, skill set or tool. We try to stay traditional as many generations of craftsmen have informed us of the path of least resistance, but are not handcuffed by this thought process.'





When designing he starts with simple sketches, then quickly develops them on the computer to work out dimensions and create templates. ‘Templates are printed out in full scale and physical prototypes are created. The refinement of forms bounce back and forth between digital and physical realms until it is refined enough for the first iteration. The process ensures we can reproduce or further refine results,’ he says.



MAKING THE MOST OF MATERIALS

Martin's favourite woods to work with are American hardwoods such as domestic white oak, walnut and cherry – 'but we work with everything under the sun,' he says. 'The American hardwoods are a joy to work and don't have the silica content of tropical wood, which makes it abrasive to tools and people. We start with green logs and have them sawn into timber or lumber. We are able to partially air-dry and partially kiln-dry for best results. Often wood from elsewhere comes in poorly dried, yielding defects, voids and case hardening. We prefer handling the entire process to get the best results.'

These results include a strong focus on accentuating grain patterns and features of wood. 'We break the material from raw logs and leave them with live edges on until they are removed by the craftsmen after drying,' Martin says. 'We give the lumber the best chance to sing by not making choices about grain pattern prematurely. We also create most pieces from a single log, ensuring grain matching and colour matching. Rarely do we add colour to finishes. We take the best we can find and do the best we can with it. Often the wood is better than us. We don't try to over-work the wood. By listening to what the wood is telling us, often we make the right choices on how to use it best.' The business also uses stone, glass, carbon fibre, fibreglass and metal to pair warm organic materials with manufactured materials. Finishes are subtle, and Martin chooses from a broad toolbox to get it exactly right. 'We want the finish to look like it isn't there,' he explains.

RE-ENGAGING AFTER THE PANDEMIC

During the Covid-19 pandemic, Martin's work shifted to almost entirely residential furniture. 'Our corporate and hospitality furniture has dried up as the world figures out how to re-engage during a pandemic,' he says. 'Furniture will play a big role in how the world interacts in the future. Any office or restaurant manager not rethinking how staff or patrons interact will become a self-fulfilling prophecy soon enough. The rich are still rich, stuck in one location for the first time in a long time and buying new furniture at a steady pace.'

'We try to solve problems with elemental solutions. Simplicity is elegance.'





At the other end of the cost spectrum, he would love to create affordable furniture on a large production scale going forward. 'I loathe the quality of furniture consumed by the mass market,' he says. 'I know it can be done better and at appropriate cost structures. Our bespoke work will always continue, but I've always aimed at creating a line of accessible high quality furnishings for the masses.'

Around half Martin's work is done on commission, which he is happy about. 'I like variety,' he explains. 'Living in one's own head too long is never desirable. Personally I need more furniture like a hole in the head – creating for an agreeable client is stimulating, and external influence on a project can be very cathartic.'

He likes the financial security of commission-based work, but notes that some of his best-sellers have been based on speculative ideas – 'because we can idealise design, material and execution'.

His ideas come from daily life: 'We try to solve problems with elemental solutions,' he explains. 'Simplicity is elegance.'

At the moment the business is developing its Avec cabinetry line, which has been selling well, and is working on dining and occasional chairs. 'One of them uses hide from American alligator, which we are very excited about,' he says.

So what does Martin do when he's not working? 'I am a small business owner, so the past 10 years haven't seen a lot of free time,' he admits. 'When I am down from work, I try to recharge the battery. I cook. I bake. I play water polo with a masters team. At times I have more than a few cocktails while enjoying a cigar. I very much enjoy gardening. I spend time with friends in whatever context is currently available.'

CARVING VOLUTES

FREDERICK WILBUR SHOWS HOW TO CARVE A DECORATIVE SPIRAL



Empire-style bedhead with decorative volute

PHOTOGRAPH BY SHUTTERSTOCK

The volute is a geometric design with a long history. As early as the treasury of Atreus of about 1325 BCE, the running spiral was carved as a surface decoration. So universal is the motif that it appears in nearly all art forms and in many media such as ironwork, silverware, ceramics, floral fabric patterns, and even on violins and other stringed instruments.

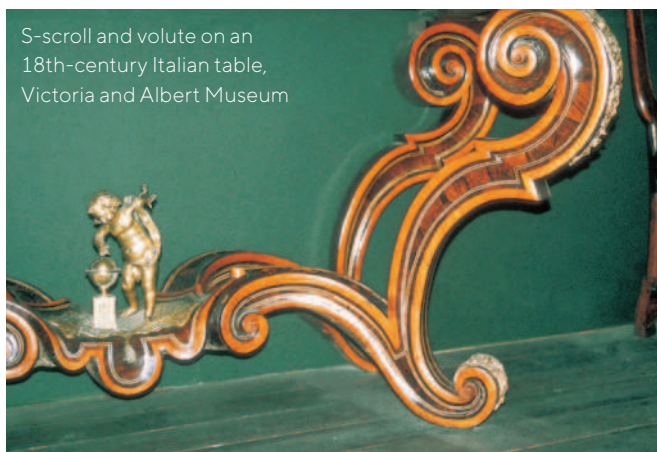
Volute is more properly an architectural term used to describe the spiral that gives Ionic capitals their distinction, and which forms the primary element on various kinds of supporting brackets. And what is more supporting than a chair or table leg? The volute is associated with many other elements: it is found on chair backs, on antefixae covering the ends of roof tiles, on acroteria at the corners and apex of a pediment and under stair treads. It is used where a line needs to be terminated, as when a handrail reaches a newel post.

In some examples, acanthus leaves themselves serve as the volute. The origin of the volute is probably vegetative; it is one of

those archetypal motifs found in all cultures worldwide. There are many examples from nature, including mollusc shells (garden snail, nautilus), rams' horns, fiddlehead ferns and vine tendrils – even the structure of hurricanes, though it is doubtful that this influenced the ancient Greeks!

PREPARING THE CARVING BLANK

If glue-up is necessary to obtain the proper-sized block, the glue lines should be symmetrical when viewed from the front elevation. Ideally, the grain should be bookmatched so that visually it will remain symmetrical in the front view. Mark the front elevation centreline, and carry it around the back of the block as well, because bandsawing will remove the guidelines on the face. It may be helpful to mark the centrelines of the large volute on both sides, to help ensure that the two sides of the bracket match. This is a wise precaution even if using photocopied patterns. It is helpful to compare all the blanks by

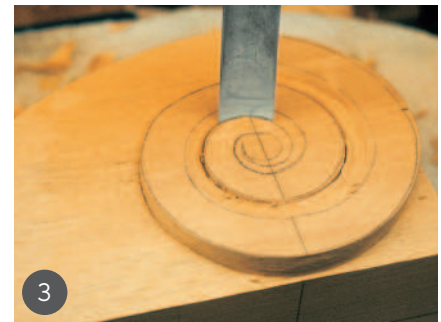
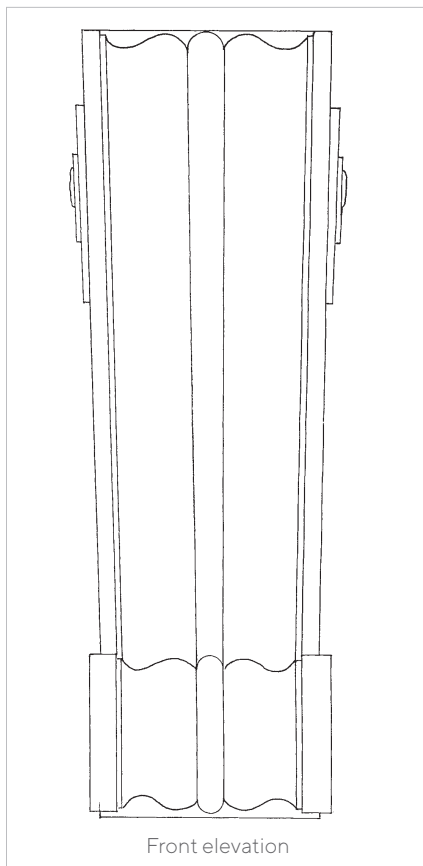
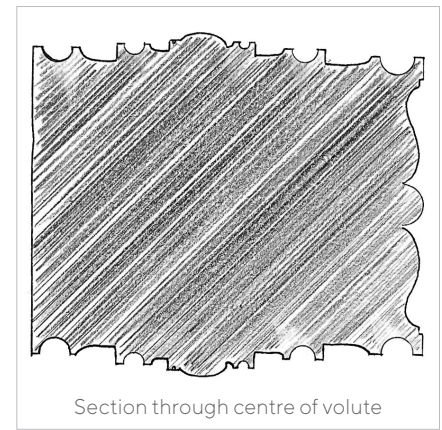
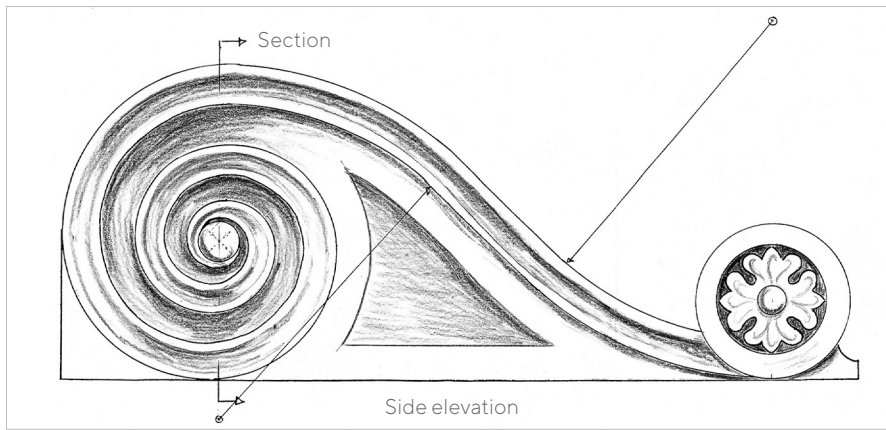


S-scroll and volute on an 18th-century Italian table, Victoria and Albert Museum



Acroterion, University of Virginia

PHOTOGRAPHS BY FREDERICK WILBUR, UNLESS OTHERWISE STATED



- 1 Carving sequence: relieving around the line of the spiral in preparation for setting in
- 2 Beginning to set in around the spiral with a shallow gouge
- 3 Setting in towards the centre of the volute. If a gouge of the exact radius is not available, choose a shallower rather than a deeper one
- 4 Beginning to form the inclined surface of the volute

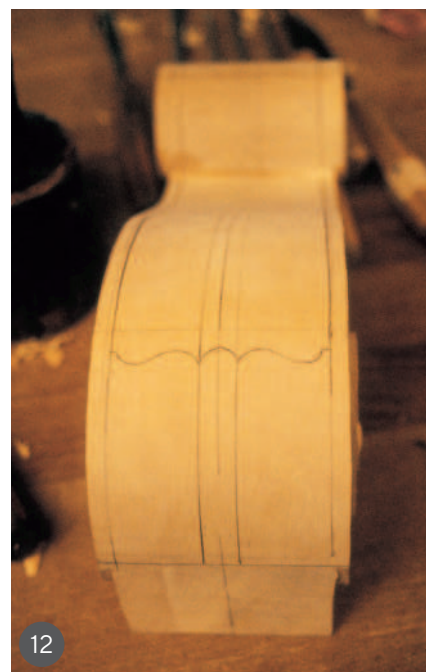
lining them up along a fence or straightedge or placing them back to back so that the eye can detect areas of dissimilarity.

Secure the pattern to the blank with masking tape along one edge only. Using the tape like a hinge, lift the pattern to make sure the alignment is correct and the large volute fits on the blank. Using two sheets of carbon paper back to back, you can trace the drawing onto one side of the blank and at the same time transfer the drawing to the reverse side of the pattern, creating a mirror-image pattern.

After transferring the pattern, bandsaw the blank, checking that the blade is cutting perpendicular to the table. It is disheartening to cut the top side perfectly, only to find the bottom side has been shaved off. If there is any doubt, saw proud of the line and then plane or file until the sides match.

CARVING THE VOLUTE

Noting where the recessed cove will be (you may prefer to shade it in pencil to avoid confusion), use a quick-sweep gouge (#9 or #11) to waste just outside the defining spiral line. This immediately shows where the recess will be, but also allows (as in any relief work) for subsequent setting in to the marked line. The gouge used for setting in will break away the wood between the marked line and the groove made by the quick gouge. Stabbing directly around the spiral without this preliminary groove would put strain on the surface wood and cause chip-out. Remember that the grain direction at the cutting edge of the gouge changes as the gouge describes a circle; a quarter-circle can be cut before a change of direction (and a change of hands) is necessary. The trickiest area is



5 The incline completed: a view from the side should show a continuous gentle slope from centre to edge **6** Marking the fillet around the volute and along the rest of the profile, using the tip of the middle finger as a fence to guide the pencil **7** Near the centre of the volute, the cavetto is best cut from the side with a #7 gouge; the rest of the shaded section can be cut along the line of the spiral, using first a #7 and then a deeper gouge **8** The cavetto around the volute completed **9** The rosette in the small circle **10** The flute running down the centre of the fillet is an optional refinement in this design **11** Marking the front fillets with a pencil gauge **12** The fillets marked out, with a schematic section of the centre bead and flanking cyma profiles

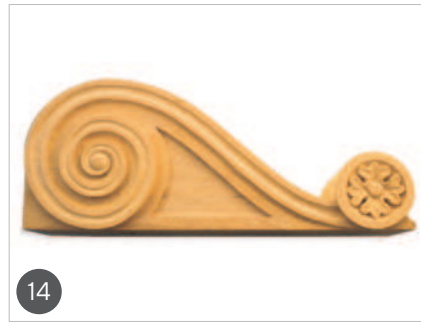
parallel to the grain, where the tool has a tendency to follow the grain, making the arc appear flat.

The next stage is to set in to the marked line using gouges of appropriate radii. Because gouges are made so that each sweep describes a circle when rotated vertically, each width of a particular sweep describes a different concentric circle. Spirals have arcs with decreasing radii, so a sequence of sweeps is necessary to define them. Use shallower gouges for the outer arc, increasing in quickness as you work inwards. In trying to match the available tools to a particular arc, it is best to err on the shallow side, because facets that may be left by a shallow gouge can be smoothed out easily enough, whereas divots caused by the wings of a gouge too quick are nearly impossible to remove. Of course, matching gouge to curve may be limited by the tools in one's collection. Begin with the outside line (already partially defined by the bandsawn edge), with the bevel of the gouge towards the waste side, and stab vertically. There is no need to cut deeply at this stage: if you're

using a mallet, a few taps will do for now. Proceed by keeping the blade of the tool in its own cut and sliding it towards uncut wood, then stabbing again. Continue setting in by this self-tracking method until the shallow gouge ceases to follow the spiral line; then select a smaller gouge of the same sweep, or a slightly quicker one of similar size. See that it matches the last cut of the previous gouge before proceeding. You will have to change gouges several times to complete the spiral. A combination of sweeps #5, #6 and #7 will usually be sufficient on all but extreme sizes of volutes.

Set in carefully around the eye. More often than not the eye projects beyond the fillet, which slopes away from it. Often, to save time and material, a hemispherical 'button' is glued on to form the eye, but our example is made in one piece. Under these circumstances it is best to round over the eye at this stage, so that it is less likely to be split off while carving the rest of the volute. This also serves as a starting point from which to slope the fillet.

Clean up the area between the vertical defining cuts of the



13 Rounding over the convex part of the cyma with an inverted gouge. A back-bent gouge is helpful where the curve changes direction near the lower baluster. Some filing and sanding will be needed to produce a uniform finish **14** The completed volute from the side **15** A three-quarter view, showing the bead and cyma treatment on the front

volute. This should be a simple matter. Because the volute will spiral from the eye downwards, cleaning up this area begins to form an incline. Repeated setting in will be required as this process continues. Work the incline on a shallow angle from the eye outwards, so that the eye is left protruding slightly. Ideally, a flat chisel (#1) would produce the flattest surface, but using a #2 or #3 gouge avoids the scratches and divots which the corners of the chisel are liable to cause. When the incline has been worked all around the volute, sight from an oblique angle to see if the incline is even, without dips, and flat. Viewed in this way the succeeding revolutions should appear parallel.

Using the finger-fence method of marking, redraw the line defining the arris or corner between fillet and cove. With a #7 gouge, pivot around this inner line to begin carving the cove, in the same manner as in the original wasting. After working this cove around, shaving close to the line, repeat using a #8 or #9 gouge right up to the arris. This makes for a nearly 90° corner at the surface while maintaining the curved bottom of the cove. Again, several different-sized tools are necessary to work the cove all around. Near the eye it is difficult to work the tool along the spiral, so stabbing from the side should be used instead – as you can see, the cove is so small here that this change of technique is not noticeable. As will be obvious, sloping the fillet back from the eye of the large volute reduces the width of the bracket at the end where the small volute is. It is imperative for the two sides of the bracket to be even, so measure and mark the new width using the centreline on the back of the bracket (carried anew to the front). As the cove opens into the triangular space between the volute and the rear edge of the bracket, the ground should be sunk as far as the smaller circle at the opposite end. To break up this flat expanse, a flat-bottomed recess is made that echoes the surrounding perimeter. The level of the small circle should also be lowered, but it should remain above the fillet, as shown in the drawing of the front elevation. Finally, a flute is centred on the fillet to break up the flat surface.

At its simplest, the front elevation is left unmodelled, but usually a symmetrical profile is carved. This is often a combination of astragal and cyma curves, confined at the outer edges by fillets. There is no need to draw a pattern for this work, as several lines defining the centre bead and the side fillets will suffice. Though the profile will diminish in width from the large volute to the smaller end, the border fillets are kept the same

width throughout, making the bead and cyma do the reducing. This profile usually circles the baluster or roll as well.

A parting tool can be used to separate the astragal from the flanking cyma profiles. The bead can then be rounded over using a medium gouge turned over; using a semicircular #9 for this is difficult, as the wings of the gouge dig into the valley created by the parting tool. As the curve begins to flatten and butt against the baluster, a backbent #7 will allow the correct angle to work the profiles. Often there is a flat plane at the bottom of the valley, in which case there is more room for quicker gouges. The concave part of the cyma is worked next. The convex part can again be rounded with the gouge turned over. The curve of transition between the two elements of the cyma is broader than the curve meeting the bead, so a flatter gouge or backbent gouge can be used here.

A reasonably nice surface can be obtained with gouges, but files and sandpaper on rigid forms (laths, dowels, V-blocks) will be necessary to get sufficient smoothness for truly clean, crisp shapes. The challenge is to work the tool marks into a smooth surface which requires the minimum amount of sanding. Though irregularity in some types of carving is permissible – indeed charming – in such a strict geometric form as the volute unevenness is immediately discernible and distracting, especially in a capital or cartouche where volutes are placed adjacent to each other.

Among some carvers the notion of sanding may send chills down the spine, but in architectural work it is often necessary. Files should be used for shaping and smoothing as much as possible, but they are limited in their ability to turn interior corners. There are many gadgets and gizmos on the market to take the drudgery out of sanding, but simple shop-made blocks are as good as anything, because one can constantly customise them. Dowels, stock with rounded edges, and foam paint rollers can be used for concavities. Blocks with various angles on their edges and even old credit cards can be used for the tight spots. Most sanding, however, is done with the tips of the fingers. Mechanical sanders, even profile sanders, are not very sensitive to the material, much less the decoration. Flap wheels, as used in industry, tend to round over the crisp edges of the carving and should not be used except very lightly to clean up fuzz.

A judicious use of the finer grits is all that should be needed, and sanding should only be used after all the carving has been accomplished.



CARD SCRAPERS

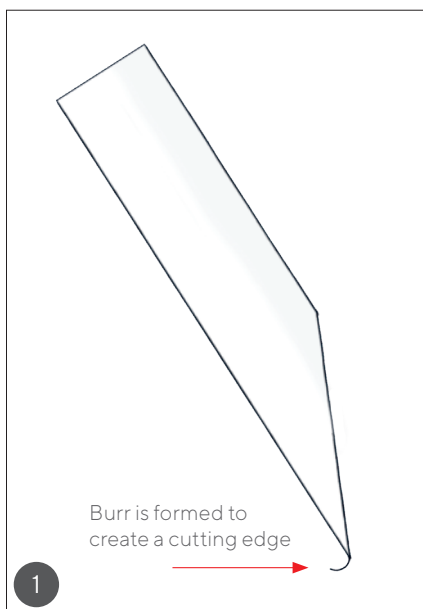
FOLLOW **RANDALL A MAXEY**'S SHARPENING TIPS
TO KEEP YOUR SCRAPERS IN PERFECT CONDITION

A scraper is a handy tool to have in the woodworking shop. Properly sharpened, it can smoothe a wood surface better than sandpaper. Scraper planes, cabinet scrapers and card scrapers are especially useful for woods with wild grain patterns. A scraper can create a silky-smooth surface without tearing out the grain. Scrapers are also handy for removing machining marks left by saws, planers and thicknessers.

FORMING A BURR

Scraper blades and card scrapers use a relatively thin steel blade. A burr is purposely formed along the cutting edge. It is the burr that does all the work of removing a thin shaving. To improve the cutting action of a scraper plane or rectangular card scraper, the blade is flexed, or bowed, in the middle during use. This creates a cutting edge that is slightly arched so that it removes the most material in the centre while tapering off to no shaving at the edges. When using a card scraper by hand, the thumbs flex the blade. On a scraper plane or cabinet scraper, a screw mechanism slightly bows the blade.

Card scrapers come in a variety of shapes and sizes. Thinner scrapers can be bowed to a tighter radius to smooth smaller areas than their thicker counterparts.



PHOTOGRAPH BY SHUTTERSTOCK

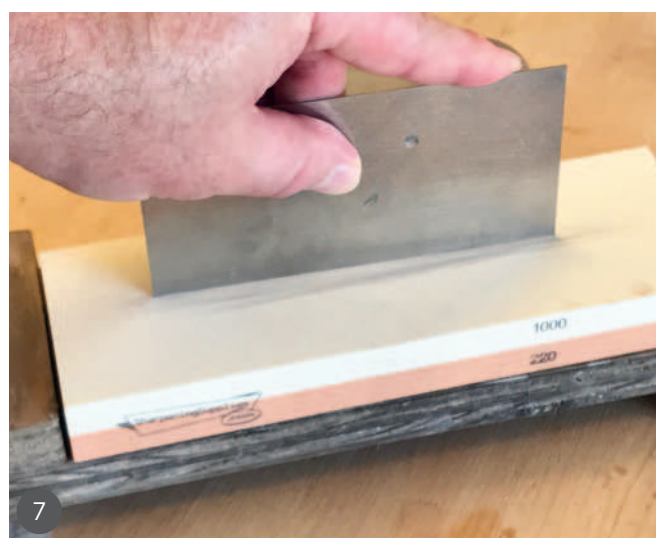
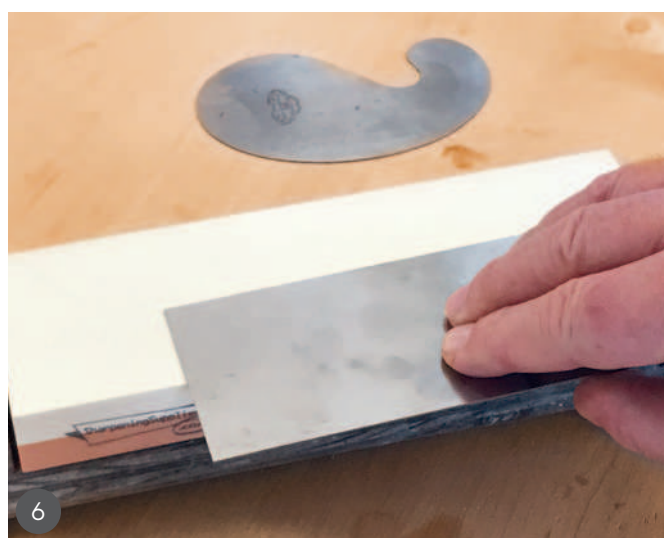
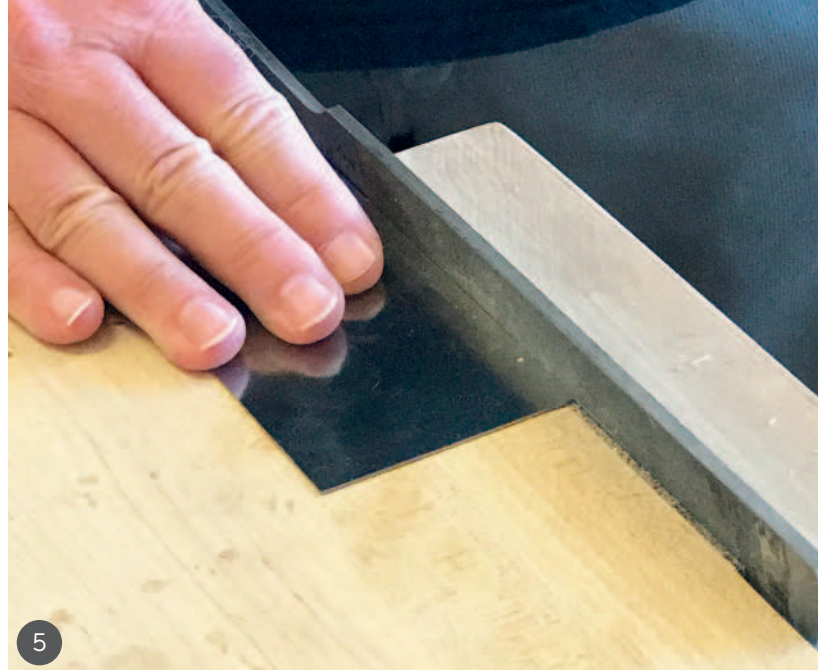
1 Forming a burr along the cutting edge of a scraper blade or card scraper is the secret to getting thin shavings

2 A scraper plane behaves like a smoothing plane, but is designed to scrape the surface to smooth hard-to-plane workpieces

3 Card scrapers are available in a variety of shapes and sizes. Curved scrapers excel at smoothing moulding profiles such as crown or cove mouldings



PHOTOGRAPHS BY GMC PUBLICATIONS, UNLESS OTHERWISE STATED



- 4 Use a file to create a smooth, square edge on the card scraper. Notice that I'm using my index fingers against the scraper to help hold the file square to the faces 5 Clamp the file in the vice and use the worktop as a guide to file the edge of the card scraper smooth and square 6 Place the scraper face on the sharpening stone and file away the old burr. Do this for all the edges on both sides of the scraper 7 Holding the scraper square to the stone, polish the edge until the scratches left by the file are gone

SHARPENING A SCRAPER

The supplies you will need to sharpen a card scraper or scraper blade include a machinist's file for straight scrapers, a small diamond file for curved scrapers, a hardened steel burnishing rod and a sharpening stone. Before sharpening a card scraper, I use a sharpening stone to remove any burr. You'll be forming a new burr so you need to start with square edges.

The next step smooths the edge in preparation for forming new burrs. To do this on a card scraper, I clamp the scraper in a wood vice and then use the file to smooth the edge. When the entire edge is shiny, you are ready to proceed to the next step.

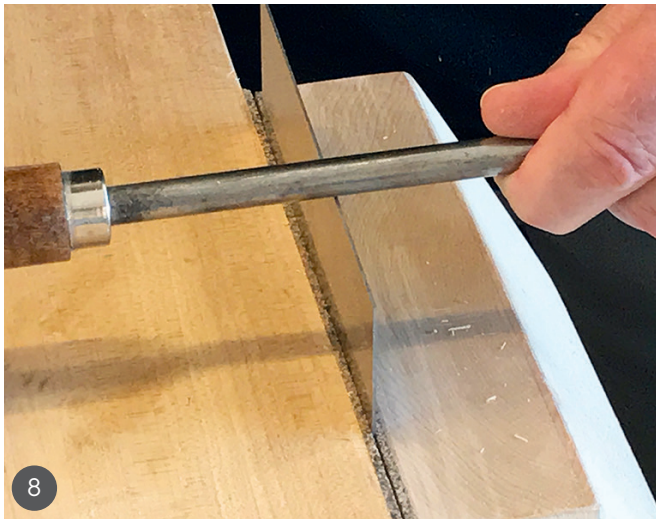
It might take a little practice to hold the file square along the edge as you are filing. If you struggle with this, you can use the trick shown here. Once the edge is filed square, I like to polish

it on a sharpening stone (1,000 grit). This helps ensure that the resulting burr is as sharp as it can be.

Now you are ready to create the burrs. To do this, clamp the scraper in a vice. Use a hardened steel burnisher for this next step. You can find burnishers from many online woodworking supply retailers. In a pinch, I've sometimes used a roundshaft screwdriver.

Burnishing a scraper is not as difficult as it might appear. It involves applying moderate pressure on the burnisher, then pushing and pulling it across the edge of the scraper. You don't need to rotate the burnisher – just slide it across the edge, making sure to burnish the entire length of the scraper.

This first step starts to deform the steel at the outside corners of the scraper's edge. To create the final burr, there is a little more burnishing to do.



8 Angle the burnisher to about 10–15° to form the final burr along the edge **9** A burnisher deforms the steel at the edges of the card scraper to begin forming a burr. Start with the burnisher square to the faces of the scraper **10** A small diamond file is ideal for polishing the edge of a curved scraper before using a burnisher to form the burr **11** Burnish the edges of a curved scraper the same way you would a straight scraper edge

Start tilting the burnisher ever so slightly by lifting one end. You're now going to concentrate on the outside corner. As you tilt the burnisher, keep applying moderate pressure downward along the entire edge. Keep the burnisher moving as you make several strokes. Continue to angle the burnisher to about 10–15°. This angle creates the final burr. You should be able to feel the burr with your fingernail. Repeat the process on the opposite face of the scraper. You will end up with two burrs – one on each side of the scraper. You can go ahead and flip the scraper over to create burrs on the opposite edge, but you'll need to protect the burrs you have just completed.

To sharpen a curved scraper, the same process applies. Since you can't polish the curved edge on a sharpening stone, I like to use a small diamond file. Using a burnisher on a curved scraper

is easier than it might seem: just remember to keep applying pressure to the edge as you go.

There's one thing I want to point out. For small scrapers that may be hard to burnish to form a hook, you can get perfectly acceptable results by forming a sharp corner along the scraper edges. You do this by honing with a sharpening stone and diamond file. A sharp, square edge makes for an effective scraper. In fact, many craftspeople in centuries gone by would use pieces of broken glass as scrapers.

Sharpening the blades for a scraper plane or cabinet scraper is no more difficult than what I've explained so far. The process is very similar; the only thing that is different is that there is a 45° bevel along the cutting edge. When you're filing, you will want to maintain that same angle.



12 The burr on a cabinet scraper blade is formed on the face opposite the bevel. Start by burnishing at the same angle as the bevel, then gradually tilt the burnisher a few degrees to create the burr **13** To sharpen a blade for a cabinet scraper, start by polishing the bevel first with a file and then on a sharpening stone

When you form the burr, start with the burnisher following the angle of the bevel, then tilt the burnisher slightly to form the cutting burr on the opposite face of the blade from the bevel.

It doesn't take much of an angle to create the burr. You can actually curl the burr over too far, which makes it difficult to engage the wood for cutting.

Sharpening and using a scraper takes practice. Adjustments in the angle of the scraper against the wood are often needed until you feel the burr start to cut. This is common. If you're having to angle the scraper excessively, it is likely you've gone too far when burnishing.

As you are using a scraper, the friction from the cutting action will heat up the blade. It doesn't take long before the burr is worn and is not cutting as effectively. For card scrapers, simply switch to a fresh edge. When all the edges lose their cutting ability, it is time to resharpen them. Once you learn the process, it doesn't take long.



Sharpening:
A Woodworker's Guide by
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DECORATIVE INLAY

AMBER BAILEY DISCOVERS THE HISTORY OF BOULLE MARQUETRY AND TRIES HER HAND AT DECORATIVE METALWORK

Inlay is the technique of inserting pieces of contrasting material into a base object. It is a decorative art that has been used on furniture for thousands of years with examples being traced as far back as the ancient Egyptians. Materials vary throughout history, but precious materials such as bone, ivory, pearl and metal have been most commonly used.

ABOVE Carved rosewood table inlaid with brass
RIGHT 19th-century Boulle marquetry cabinet inlaid with red tortoiseshell and brass



PHOTOGRAPHS SHUTTERSTOCK.COM



BOULLE MARQUETRY

This craft was particularly prominent during the 17th century and involves veneers of metal (traditionally brass or pewter) and tortoiseshell or horn cut into a decorative pattern using a marquetry donkey (*chevalet*), then glued to a wooden base.

André-Charles Boulle (1642–1732), known as the ‘furniture jeweller’, was the finest marquetry maker of his age and his name later became synonymous with the craft. He was one of the most famous and accomplished French cabinetmakers of his era and his patrons included Louis XIV, the Sun King.

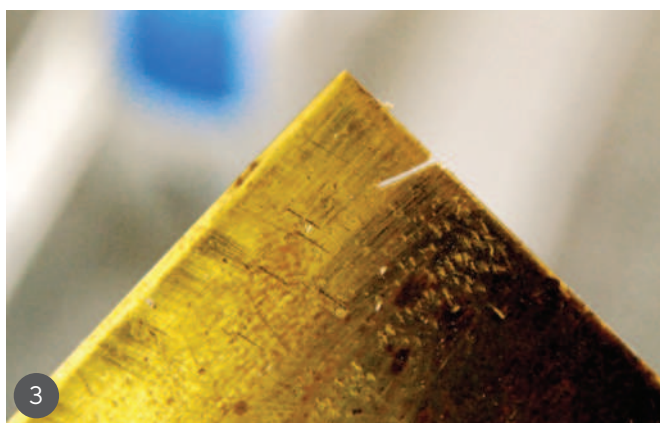
Boulle often worked with rosewood, ebony, kingwood and other dark timbers to create colour contrasts. For inlay, he used tortoiseshell, brass, pewter and animal horn. His technique was to create a packet of two contrasting sheets of inlay, one light and one dark. The intricate patterns were then cut from the packet.



ABOVE Boulle marquetry would often have detail engraved into the metal to give a more pictorial finish

ABOVE LEFT Cabinet on a stand, attributed to André-Charles Boulle. The cabinet is made from oak veneered with pewter, brass, tortoiseshell, horn, ebony, ivory and wood marquetry; it features bronze mounts, figures made of painted and gilded oak, and drawers made of snakewood

LEFT Writing table made circa 1715 by André-Charles Boulle for Louis Henri, Duke of Bourbon. The table is made from oak and walnut with tortoiseshell veneer, ebony, brass and gilt bronze ornaments



PHOTOGRAPHS BY AMBER BAILEY

WORKING WITH METAL

I decided to try my hand at the Boulle marquetry technique in metal. I made up a packet from brass, pewter and copper.

1 All metals have to be treated as sturdier and heavier than wood, but pewter is alarmingly soft enough to roll up, while brass is far more solid. Cutting metal by hand is traditionally done using a jeweller's saw or fretsaw. Any coarse burrs need to be removed with jeweller's files.

2 Metal cutting saw blades require finer teeth and produce a fine dust that is very dangerous if you get it anywhere near your eyes. It is a slower process than working with wood.

3 Polishing up metal involves sanding in a single direction with abrasive paper going from coarse until extremely fine, removing all scratches and leaving behind a smooth surface. Most metals require a protective finish to avoid oxidation.

4 The business end of the marquetry donkey, showing the clamping jaws and the fretsaw frame with a blade fitted.

5 Detail of some of the finely cut pieces, which all have to be carefully saved and reassembled in the correct order.

6 One of my designs from this packet, waiting to be glued up.

NATURAL GLUE FOR METAL

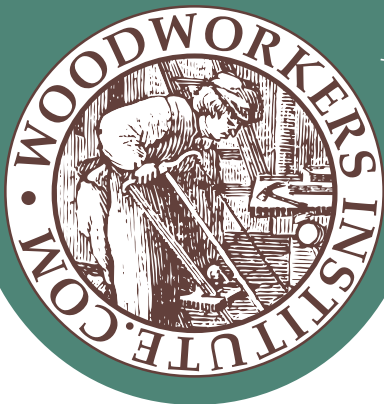
Historically, fish glue has been favoured over animal glue for its higher adhesive properties. Sturgeon glue works better than conventional fish glue as it is essentially nature's superglue. The metal always needs to be 'toothed' with an abrasive to allow a stronger grip than the natural smooth surface.

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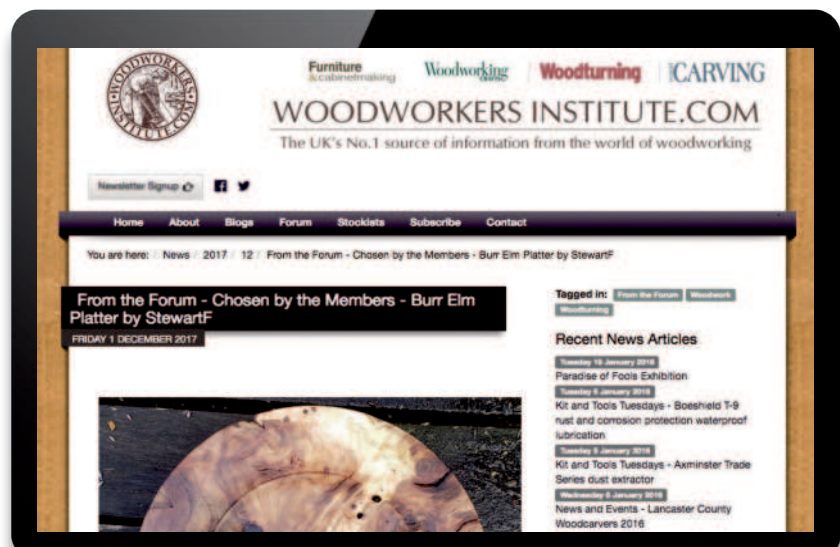
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THE TRIPLE LAP JOINT

CHRIS LEESE-WOOD UNVEILS
THIS ELEGANT DETAIL

I first used the triple lap joint on a mid-century coffee table I made in maple wood. I wanted a strong symmetrical joint that would connect the elements of each leg in a decorative manner. I had previously seen this joint being used, with varying levels of success, so I decided tooling would be required to get close fitting pieces.

After sketching out the geometry of the joint, which is made up of three identical pieces, I manufactured a router jig that encapsulated the bare timber that was used for both sides. The dimensions of the jig and the timber are absolutely critical to success, as the slightest deviation in dimension creates extra work to get a good joint. After removal from the router jig, the corners were then chiselled out.

Next I fabricated an assembly jig that held the three legs in position at the correct angle of 120° between the legs. I used this for the dry assembly check and for final glue-up. When I was happy with the fit, I waxed the jig and commenced the glue-up, using clamps to first secure the legs to the jig and then to pull the legs into the joint.

After leaving overnight to cure, all that was left was to profile the final shape using a mixture of trimmer and sandpaper.



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Woodturning 317



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