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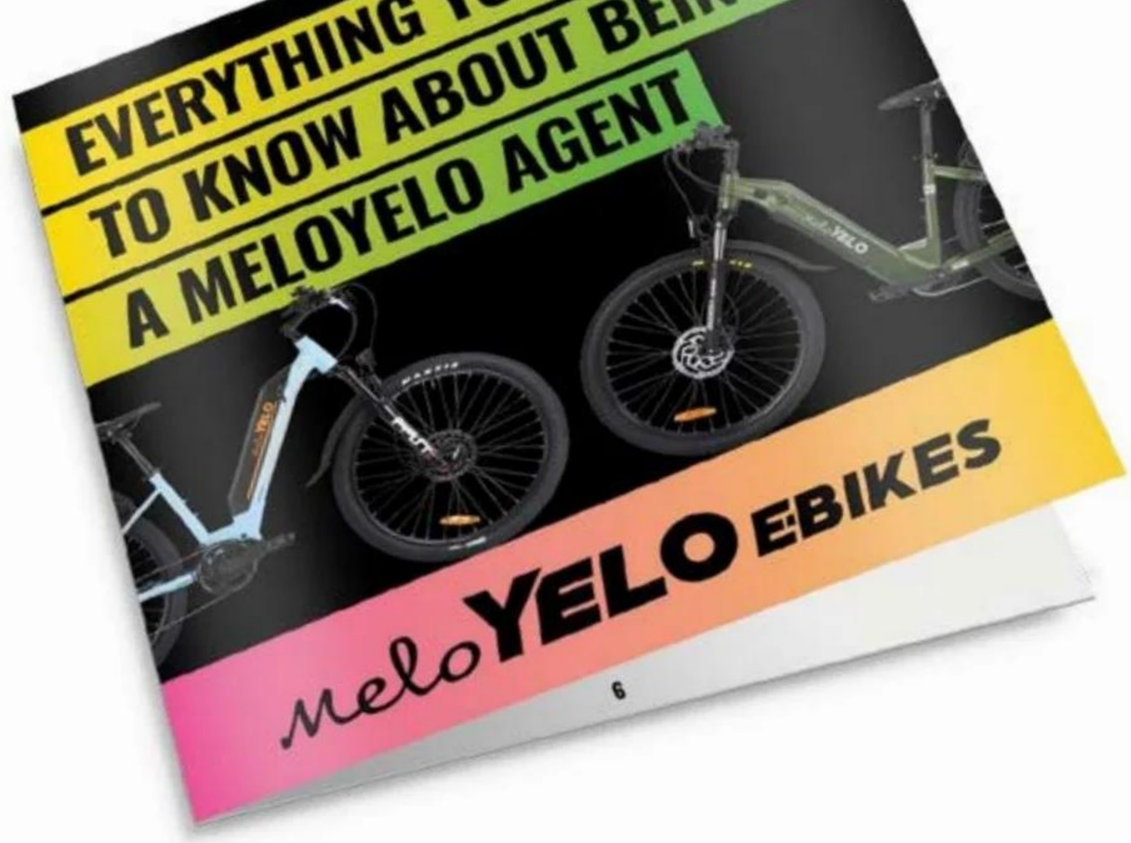


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THE KEY TO SUCCESS

Our main feature in this issue of *The Shed* is about a young sheddie who has created an internationally successful business doing what he loves and is darned good at.

I don't know about you, but, when I was a schoolboy, almost every adult asked me, "What do you want to do when you grow up?" It was relentless. You couldn't bump into any adult anywhere who didn't ask you that question. I mean, am I out of touch – are folk still asking that of schoolchildren these days?

When I was asked that all those decades ago, I had no idea what I wanted to be. I was well into my 20s before I started to get a handle on what was going to float my boat in my working life.

How lucky it is for those who can figure that stuff out early, develop the skills to do it, and get the satisfaction they need from a career.

The young engineer featured in this issue, Tim O'Connor, started developing his mechanical and engineering skills with his dad when he was a youngster. He started building at a young age, watching and working with his dad in his basement workshop. His father sounds like a true sheddie, as well.

Tim says, "Dad was a builder, a real doer, and a tinkerer. Through him, I learned how to make things, overcome challenges. He always found a solution for everything; a bloody clever guy."

This approach comes up time and time again with those whom we feature in this magazine; their parents worked with them, spent time with them, and shared skills. This approach to parenting can never be underestimated in the building of great humans who are successful, competent, and skilled.

I have often spoken in this column about how important I believe it is for the good of our fellow Kiwis, to be taught hands-on skills from an early age to ensure a happy existence. For me, Tim and his successful business with his amazing bikes is the perfect testament to that belief.

The best bit of career advice I ever got was from a successful friend, who said, "As long as you do something that you enjoy doing, you will make a success of it."

That sounded to me like a secret to success, and it is exactly the path Tim has undertaken. Let's get this on T-shirts everywhere.

Greg Vincent
editor@the-shed.nz

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Engineering

21ST CENTURY SHEDDIE

By Jason Burgess | Photographs: Jason Burgess

In the true spirit of the Kiwi DIY tradition, Tim rallied from the disappointment of a Covid-related job loss to create his own very successful, satisfying, and special business

Tim O'Connor in his happy place: at work building minibikes from his Army Bay home-based workshop


Hustler
Hustler
Hustler

Above and below: Getting the Whiskey Bronze–coloured 7hp, 211cc, overhead-cam, key-start Robin engine together

Filming and editing bike-build video updates for clients and social media audience has been a steep learning curve for Tim. Video posts are now a key part of his business practice

display in the corner of his fledgling Army Bay Engineering business for about a year before he had his light-bulb moment.

He recalls, "I looked at it one day and realised I could build these things; I had the skills, and the workshop to do it in."

> "I looked at it one day and realised I could build these things; I had the skills, and the workshop to do it in"



Flanked by inspiration: Tim with his mate Dan (left) – who provided the seed funds to develop and build the original Hustler Fatboy – sit in front of another home-built Kiwi classic: John Britten's V1000

A chip off the old block

Tim says that he started building at a young age, watching and working with his father in his basement workshop: "Dad was a builder, a real doer, and a tinkerer. Through him, I learned how to make things, overcome challenges. He always found a solution for everything; a bloody clever guy. I wasn't into team sports; I was into radio-controlled planes, boats, and cars. I'd be rushing home from school to work on my projects in the workshop. My mates used to love hanging around in the workshop too. Dad had a little lathe, and we would muck around with that."

Tim also credits his father for infusing him with a love



Two passion projects: Tim's 1979 VW beach buggy, which he is customising as his summer ride, and a 1970, two-stroke, two-seater Bennelli Dynamo minibike, which he says are "Italian, high quality, with neat styling but an acquired niche taste". The bike will be getting a new set of gaskets

of old-school tools. He holds up a pair of vice grips with a toggle lock – circa early 1970s – that his dad gifted him when he started his machining and tool-making apprenticeship. He says that he searches out quality second-hand tools like this because, "It saves them from the landfills, and the old stuff is usually better; they can be saved and restored."

Moving on up

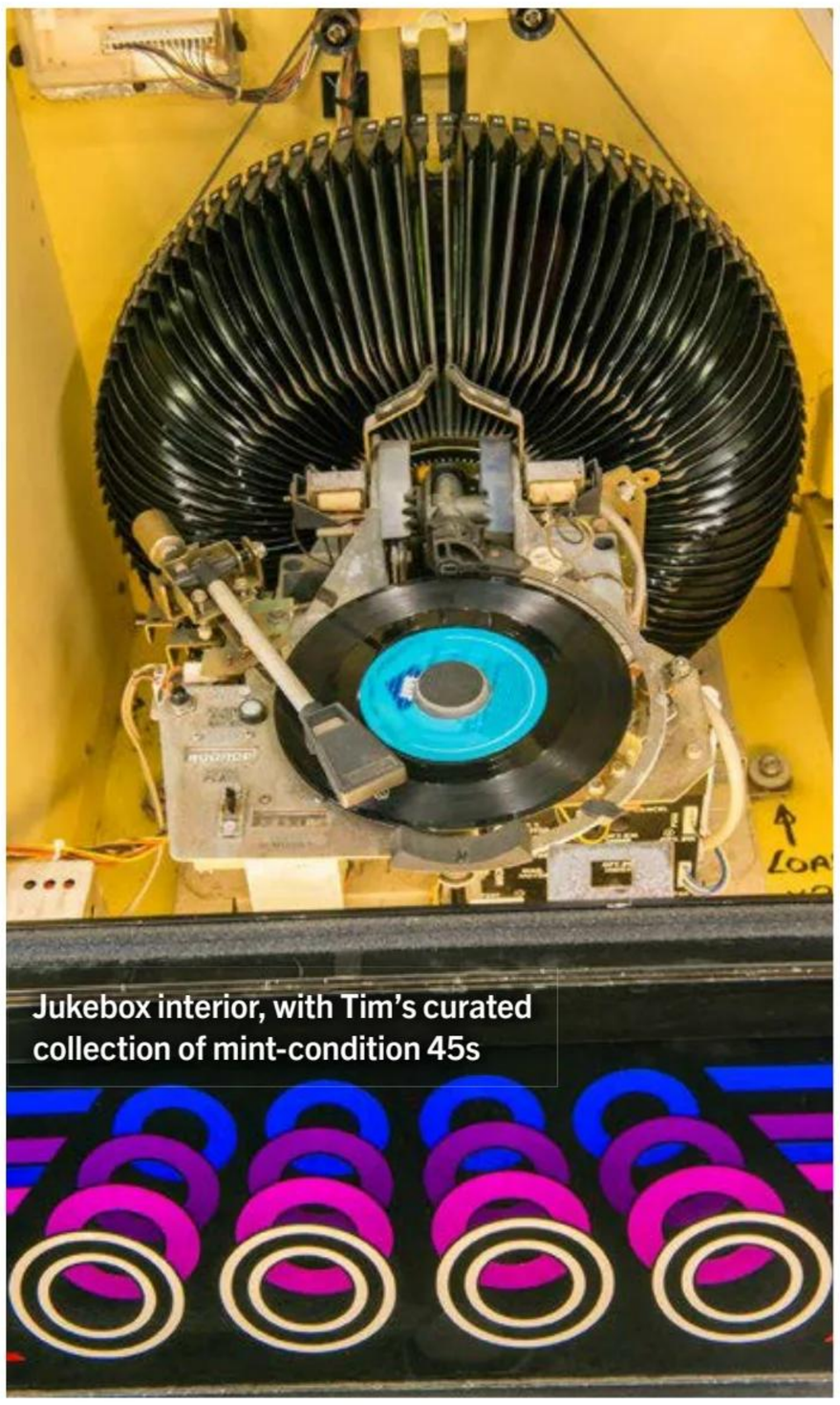
Another key figure in Tim's professional development was his first boss, Chris Courtney of Courtney Engineering.

"Chris guided me from a 16-year-old school-boy apprentice to a fully skilled tradesman," says Tim. "When I started, I was running manual lathes and milling machines. We used to make parts for CNG compressors, pistons, and all sorts. We did some incredible work. I learned how to do CAD design on the computer, and, by the end of my 10-year stint there, I was doing full design and build of automated machinery like high-speed, paper-folding machines."

The paper-folding machine is, he reckons, "The most incredible machine I have made, and the most successful. It makes the papers that fit over the end of



The only pin-ups in Tim's office are this quiver of vintage skateboards – from clay wheels to urethane, all rideable. In the foreground, a Hustler Fatboy chopper and a Puch Maxi moped (left)



Jukebox interior, with Tim's curated collection of mint-condition 45s



"There are nods to the past everywhere"



Rowe R84 exterior, showing the 200 song choices from 100, 45rpm singles



ice cream cones to protect the cone from your hands."

The machine apparently sounds like a machine gun: folding, gluing, and spitting out 11 papers per second; all flat and ready to pop on the cone.

"The challenges in that were phenomenal," he recalls. "It took around three or four months to complete, and everyone at Courtney Engineering played a part in helping me to overcome the challenges. It is 10 years old now and still going strong; it still looks amazing."

Channelling the past

He may be a millennial by birth but Tim considers himself "a real traditional guy". What he does with bikes, he says, is "very traditional engineering". Design-wise, he describes his style as 'retro': "I'm huge on the 1960s, and I love the '80s and '90s – my childhood era."

There are nods to the past everywhere: a '70s VW beach buggy that he is refurbishing in the workshop; a 'down through the ages' quiver of skateboards hanging on the office wall; The Doors and Elvis '68 posters overlooking the milling machine.

Background music is supplied from a beautifully restored 1980s jukebox rescued from a defunct nightclub in Wellington and now stocked with Tim's selection of 45s that span every decade from the birth of rock and roll to '80s new wave.

Tim's branding and merch definitely speak old school too. The graphic on the Hustler hoodie references vintage Ed Roth and *Odd Rod* cartoons, and features a bug-eyed character flying airborne from a minibike. There is even a '60s sci-fi feel to the font used on his Hustler custom-branded steel brackets, chain covers, brake discs, and battery holders. The hand stitching on all Tim's seats would not look out of place on classic café racers or, for that matter, any old-school, full-size moto.

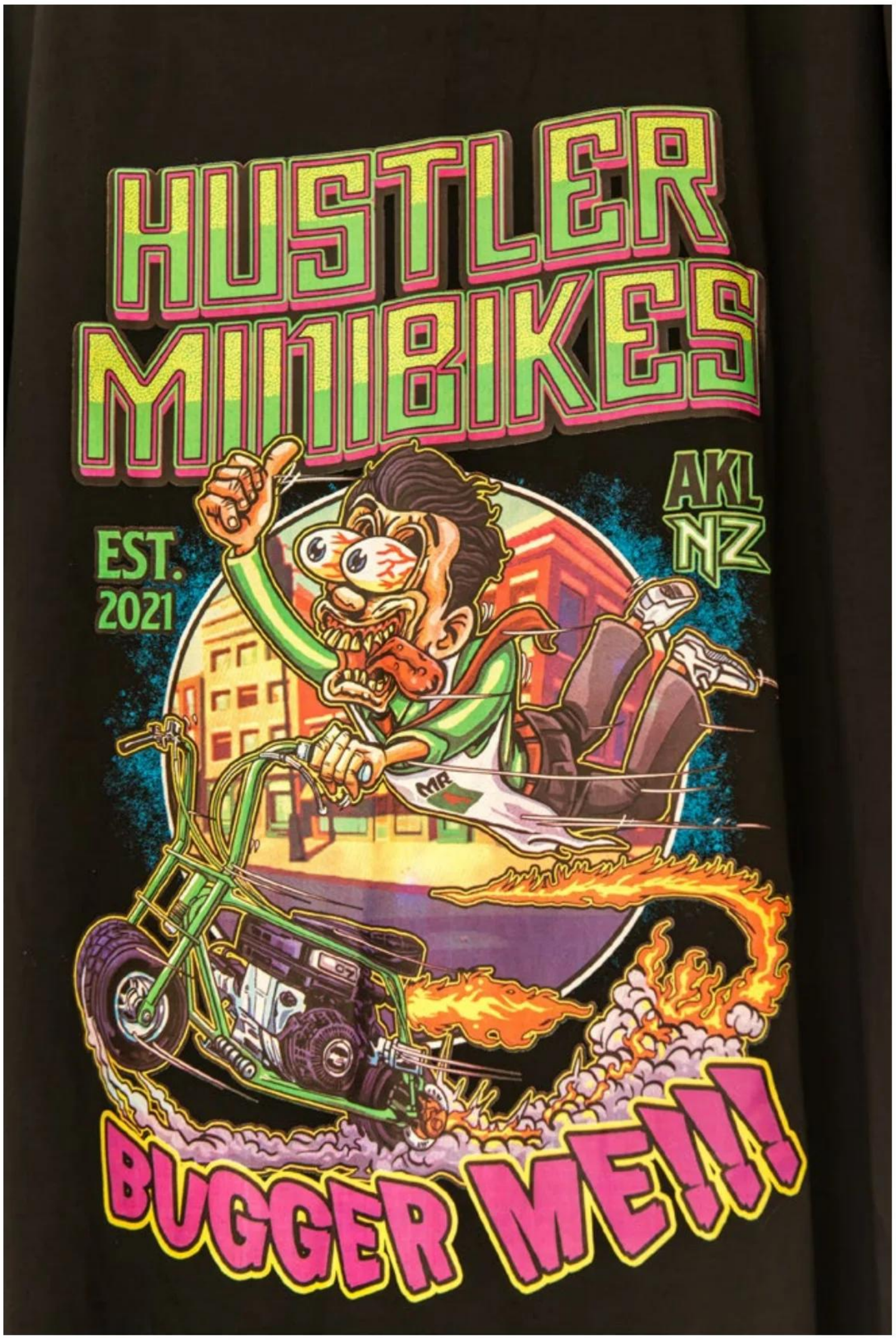
The socials

Brands, reels, and influencers might not be the usual topics of conversation in an engineering shop, but, for Tim, growing an online audience is as fundamental as bending steel.

Connecting, engaging, and communicating with followers not only sells bikes – it also creates community. Shooting and posting his bike-build-progress videos is a crucial part of his day-to-day operation. Using social media to tell the back story of his work processes creates a provenance for each bike and helps reinforce Tim's testament to "good old-fashioned manufacturing" principles.

He believes that his followers "love that they can see their bike is handmade; Kiwi-quality; that I am an engineer and this is not some assembly plant. I care deeply because it's my business and my reputation."

Tim's Hustler brand now has more than 240,000 Instagram followers; some are in the business, many have commissioned bikes – and most of those are offshore clients – while others simply come to watch and learn. The entire process, from design and build to filming and export, takes place in his spotless garage-workshop beneath his home on the Whangaparāoa Peninsula.



Sail GP

After his time at Courtney's, Tim moved into a project management role with an industrial automation company, where he got himself acquainted with robotics for a couple of years, before returning to the tools as a machinist with Sail GP's Technical Team.

"I was on tour during the 2019 season; travelling the world with a 40-foot shipping container that I fitted out as a machine shop," he says.

The container went from venue to venue with Tim and the team. His chief responsibilities were for the steering and dagger-board systems, also maintaining all the mechanical elements of the race boats, building parts, completing repairs, and making sure everything worked as it should.

"I learned a lot about high-end engineering, working with composites and titanium; also, a lot of automation, hydraulics, and the importance of teamwork when large-scale projects and tight time frames are paramount. That experience set the precedent for my idea of what I wanted my business to be like – when I was ready," he explains.

Pivoting

Tim did not have to wait long. When Covid hit, yacht racing shut down and he was made redundant.

"I was left pretty high and dry," he says. "I had a big rethink, sold my '67 Chevy Impala big block coupe, and put the money into buying this house and a lathe."

He established Army Bay Engineering and initially began doing CAD and some automotive work. Then came his Hustler minibike epiphany: the time was right; he started trialling the concept.

To test the market, Tim fabricated a batch of 10 bikes, then sold them as kitsets, at cost price. His first customers were mates but he learned quickly that, "Not everyone could find all the parts and put it all together. After that experience, I started doing them as ready-to-ride bikes."

Initial models were powered by Briggs & Stratton engines, but now his baseline Lil Hustler models are driven by Honda-clone four horsepower (hp) motors, with a top speed of 40kph. ▶

“I’m an entrepreneur and not just a business owner, in control of my brand and my product. I reap the benefits of everything I put into it”



Hustler Custom Number One taking shape

Three years on, and most of Tim’s time is spent developing his bike range. The precision engineering commissions equate to about 10 per cent of his business. Of those, he chooses to take on only projects that challenge and keep him engaged.

“Pioneering my own product, and building a following around it, is super fun,” he explains. “The most satisfaction I have is realising that I am self-sufficient now. I’m an entrepreneur and not just a business owner, in control of my brand and my product. I reap the benefits of everything I put into it.”

Home base

Tim’s passion is contagious, and it does not stop with bike building. It is also reflected in the pride that he takes in his workspaces.

“A workshop should be impressive because this is where the magic happens,” he believes. “Sail GP had an emphasis on workplace aesthetics. Like Formula 1, they want visitors to be impressed, and that inspired me.”

The whole experience of building good-looking products in a visually interesting workshop is crucial, not just because, as he says, he gets to enjoy every day, working on what he wants to work on in an enjoyable workplace, but because his place is regularly showcased



On the lathe: turning aluminium wheel spacers

in videos. Tools, machinery work stations, and storage areas have a sense of order; the polished concrete floors are free of dust and filings.

"The fabrication of the bikes is quite clean," Tim says. "There isn't a whole lot of cutting and grinding; everything is laser cut and it all just fits together and then you weld it. Engineering doesn't have to be dirty. It's a little more expensive to do it clean; more gear and more time to clean things."

His advice for anybody wanting to set up a workshop: "Good lighting is key to good work. Anyone who has a dingy workshop is fighting themselves. Get serious about it."

Pulling together

Working solo from his garage, Tim also understands the value of having a solid network of positive-thinking friends, supportive colleagues, and business mentors to call on.

"It makes you want to do better," he says.

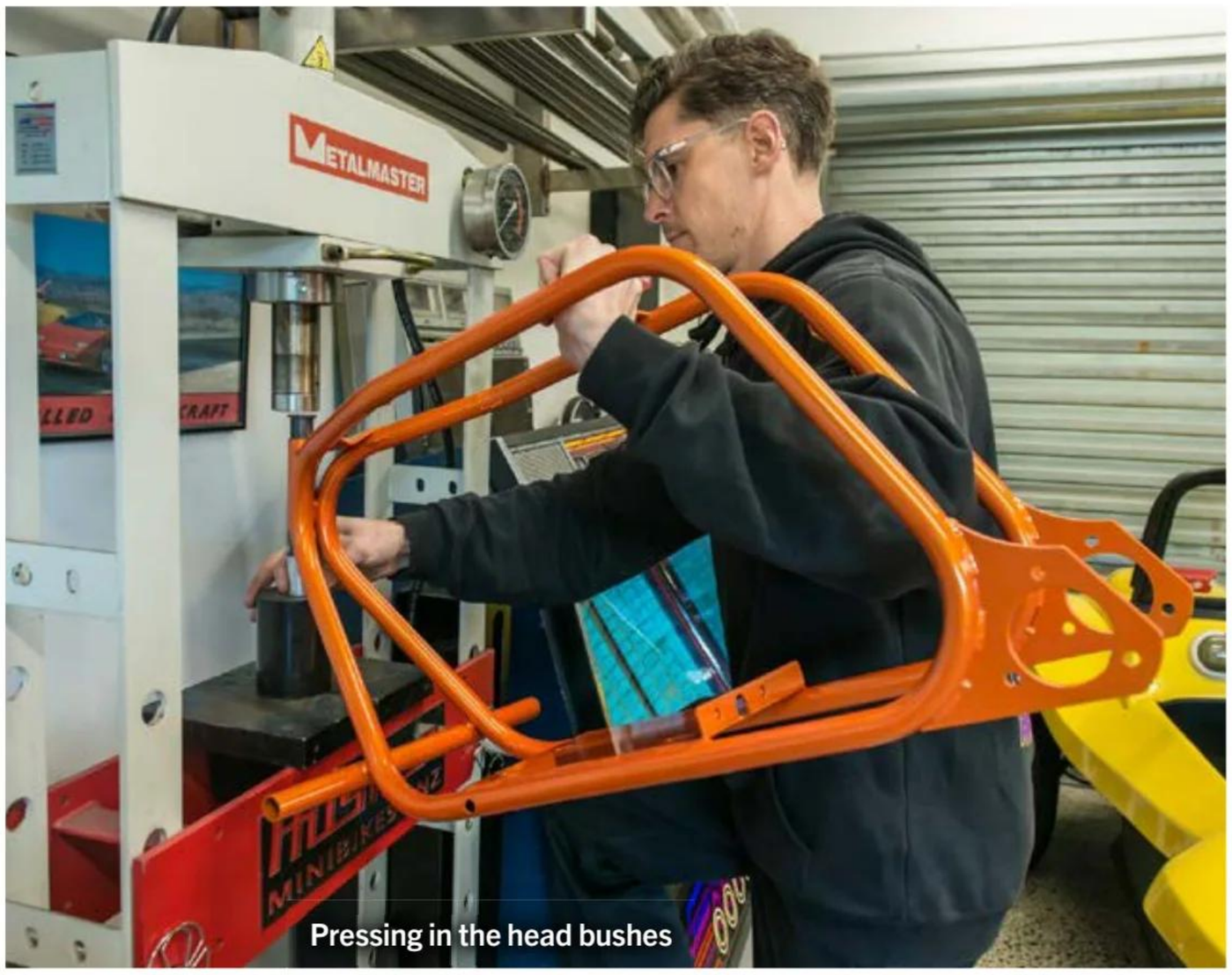
He also acknowledges the importance of the relationships that he has developed with importers and preferred motor trade specialists: "There are dozens of suppliers who make my life easy. I can ring them up and order stuff on demand. In my first year, I had some pain trying to find reliable suppliers. I'd sell a bike then I couldn't get parts for the next



"The Robins are a great-looking engine in the bike – they really fill the frame up; a neat fit, slung to the back. The whole engine slides in on slots; jacking bolts to stop [the] engine shifting back – they give you a nice, fine adjustment for the chain tension," Tim says



Tim designs and manufactures all his sprockets and discs. "These are the type of details that I think my customers love about my bikes"



Pressing in the head bushes



Work in progress: a Hustler Badboy XL model being laid up

one. I'm always experimenting with different wheels and tyres. My limits are what is available – I could chew up a lot of time sourcing stuff, so I use third-party importers."

Building minibikes

The bike that started teenage Tim on his journey was scratch-built from hard-to-find parts, sourced from the Saturday morning edition of *Trade & Exchange* (*T&E*). The first buy was an original 1970s, New Zealand–made Tru Test minibike frame, still with its primer paint, that had never been used. A pair of original wheels came later, also from the *T&E*. A Honda water blaster engine bought from a mate's father served as Tim's power source. He robbed a vintage reel mower for the chains and sprockets, and commissioned a local mechanic to make up a jackshaft to transfer drive to the rear wheel. The foot pegs were purloined from his freestyle BMX bike.

Tim's mother, a seamstress, whipped him up a custom seat cover with flames stitched into the vinyl. He finished the frame with a couple of spray cans of metallic blue from Mitre 10, and painted the wheels black. Then, using his dad's Myford lathe, he skim-cut the wheel faces to create a bright silver lip and spoke. A set of mudguards, which he scored from eBay in the US, was sprayed silver.



A 15-year-old Tim putting the finishing touches to his first homemade minibike

Production levels

Fast forward 20 years, and all Tim's bike builds are still hands-on, but at production levels. For framing, he uses New Zealand–made ERW steel furniture tubing, formed in Hamilton and sourced in mill runs, cut to his specific needs. The tubes are CNC mandrel bent, and he employs CNC press-break folded steel parts. All plate work is CNC laser cut. He MIG welds his frames and AC TIG welds the aluminium chain guards. The high-tensile, zinc-plated fasteners are all generic brands and were initially supplied – and, if necessary, still can be – by Mitre 10.

When he first started, Tim and his ex hand stitched all the seat covers for the proto-models. Today, customers get to choose the seat colour scheme, and the seats, designed and assembled in house by Tim, are individually upholstered by a local upholsterer.

Initial experimentation with locally sourced single-stage powder-coat paint systems was disappointing. There was excess chipping, and they lacked the quality finish that Tim desired. All his paintwork is handled by High Performance Coatings, and automotive-grade powder coats are imported from Prismatic Powders US. Tim has a stable of go-to colours but clients can choose a bespoke colour for

an extra fee. The chrome work is done by Bumper Replacements NZ.

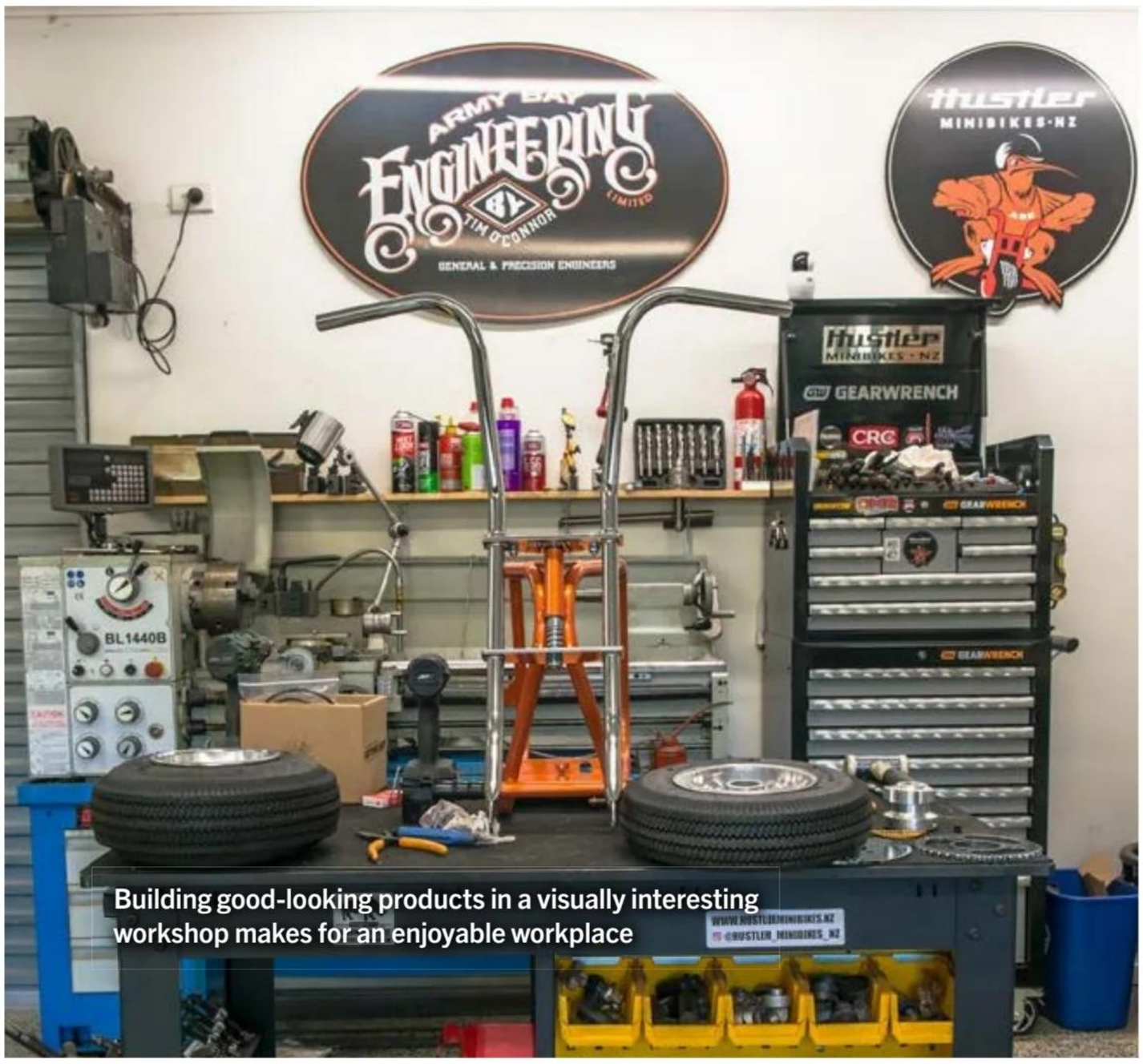
Some of the special features Tim offers are: custom exhaust systems, jacking bolts to stop engine movement and provide precision adjustments to chain tension, custom-made discs and sprockets, and a range of axle sizes to accommodate wheel choices and back-end frame widths.

Production

Drawing on Toyota's lean-manufacturing blueprint, Tim works in small-batch cycles to streamline his manufacturing processes.

He admits that the bikes cost a little more to produce this way, but it ensures that the customer gets their bike more quickly and Tim recoups his investment faster.

"I do two-week cycles," he says. "I fabricate frames in batches (usually four or five frames at a time). When I build a bike, I build the whole thing – every single part. [Then I] strip it down and put it in boxes; label it for colours; and give it to my powder coater, who does his magic. The coatings are a huge part

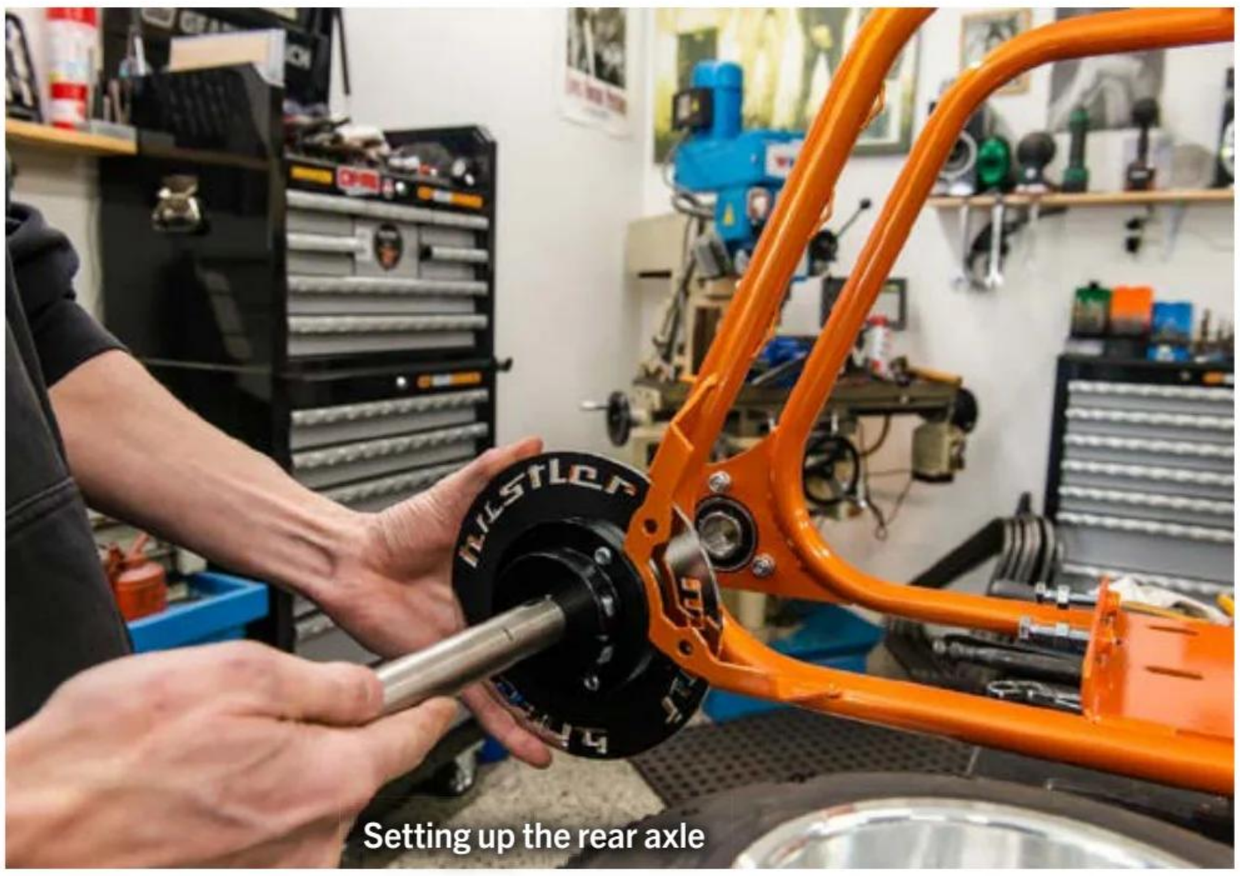


Building good-looking products in a visually interesting workshop makes for an enjoyable workplace

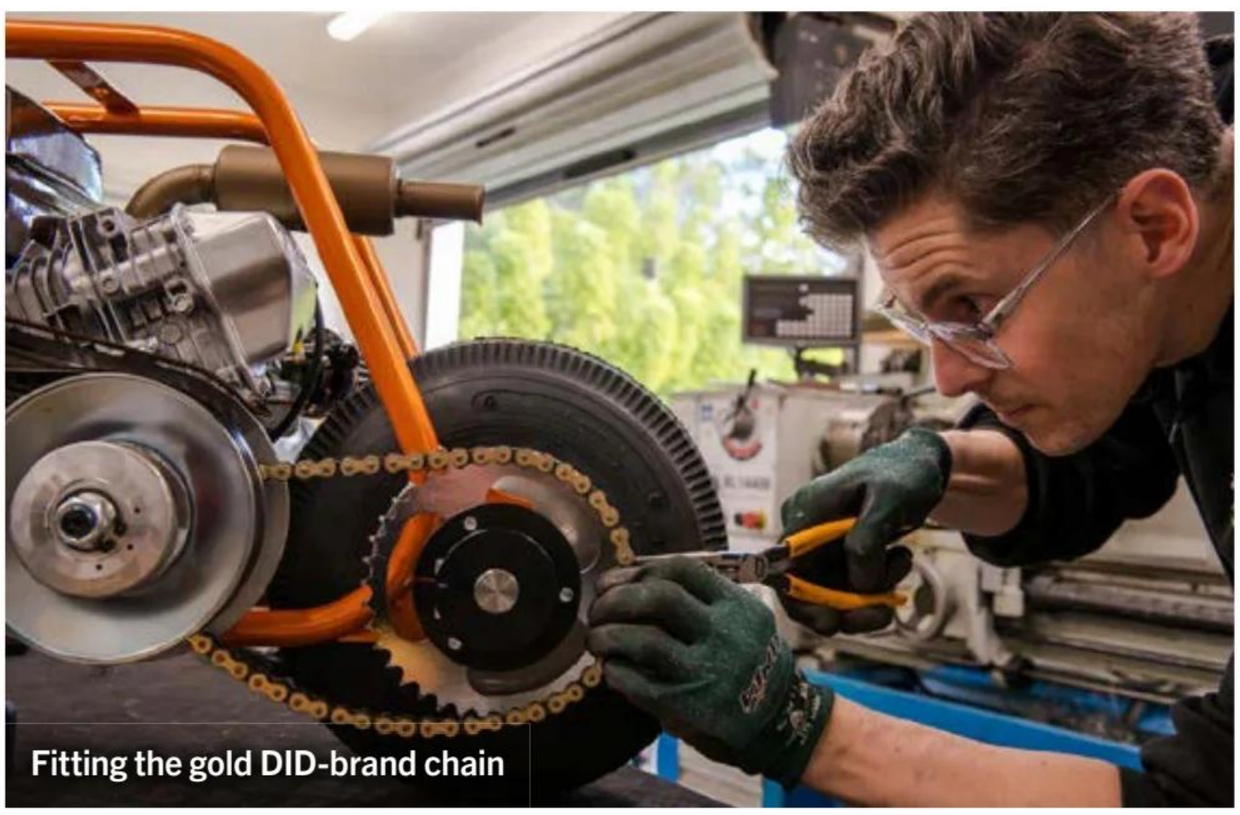
"The coatings are a huge part of the process; it's a whole other trade"



Milling back-axle keyway slots



Setting up the rear axle


Fitting the gold DID-brand chain



Every Hustler gets a unique badge

of the process; it's a whole other trade. Then it's straight into assembly, before I switch over to fabrication again."

Each Hustler bike comes with its own unique serial number, and customers get to make a variety of bespoke decisions – from colour choices (6500, literally) to adding specialised parts.

Tim concedes, "It is difficult to make money out of the bikes if you meander around and custom build everything as a one-off."

To address this and simplify his workflow, all models share the same seat, and the frame side pieces are identical but set at different widths with different brackets for each model.

"If someone wants a particular wheel on their frame, I clip the jig on to the back of the frame and put the right brackets on," Tim says.

The Fatboy

Tim is busy assembling one of his premium-model Fatboys. This one is a modified stand-alone with a low rider configuration, commissioned as a corporate giveaway.

"It is Hustler Custom Number One; fat boy rear end and a low rider, swept-forward front end, with larger astro-style wheels," he tells us.

This is the first bike that Tim has done with a Whiskey Bronze–coloured engine, and he's stoked with the results.

He calls the Fatboys two-wheel go-karts. Their performance is, he says, "pretty rapid". They have a 7hp, 211cc, overhead-cam, key-start Robin engine with continuously variable transmission (CVT).

"They are the best stationary engine you can buy. They take off at three-to-one ratio and then automatically shift up to one-to-one. So torquey; a big single-banger," he enthuses.

"Nice wheel-standing ability off the line, but then it smooths out and you end up doing 70kph, and it's just ticking along doing 3000rpm. This one responds and runs like a






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proper dirt bike engine. I modify them with a slide carburettor from Honda motorcycles. That is key to the performance; it gives them awesome throttle response. I do a modification to the bolt pattern. Slot them slightly so they will fit."

Big boy's toy

While Tim pitches his Lil Hustler as cheap and cheerful with just enough power not to get you into trouble, the Fatboys are more a big boy's toy.

"They can spit you off the back if you give it a good twist," he says. "The guys that buy these are into racing and want them at the drag strip for a pit bike. They sound hot, go hard, and have the look with the fat tyres. They are customisable, with lots of neat bits, powder-coated or fully chromed to your requirements."

Taking the old-school chopper style one step further, he also does a Hustler Badboy Chopper, equipped with taller tyres, raked-out forks, and ape hangers.

On his top-line custom bikes, Tim includes vintage rotary engine options – these engines are fully reconditioned and restored, with mechanical repairs, ignition upgrades, and bead blasting of all aluminium components. Custom parts for these include 3D-printed aluminium intake manifolds and a CNC power take-off shaft (PTO).

Tim has also found success in exporting specialised rotary component kits that he has designed and developed to streamline the process of converting rotary engines for minibike use.

Product confidence

Tim is often asked why he does not build a more sophisticated suspension system into his bikes. While he clearly has the skills to develop a more refined



Tim about to test drive a chopper







The finished product: Hustler Custom Number One, with a fat boy rear end, a low rider front end, and astro-style wheels

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Good luck!

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motorcycle, he says that this is not what minibikes are about. The real joy is in their simplicity.

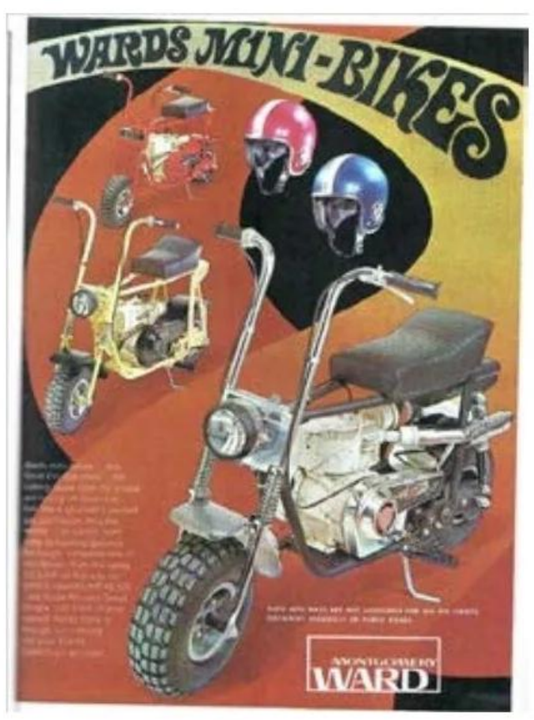
From the beginning, he explains, "I wanted to recreate the fun of the Tru Test but with modern-day reliability. The people buying these take pride in the look and feel. They are like a hot rod; a customer can spec it out and have something unique to them. I want people to embrace the fact that you can take these things apart with two spanners; you don't need special tools. If you can work on these yourself, you are going to be much more engaged in the ownership of them. It's as simple as maintaining a lawn mower. They are something people can feel confident in owning."

For anybody wanting to have a crack at building their own minibike, there are plenty of free plans online. For Tim, it is the designs of the 1960s that inspire him.

"I have just modified them and applied some modern engineering principles – computer processes – that give you the same outcomes but are more precise and allow greater productivity," he says. "They are custom engineered to a high level, bullet-proof, and can be easily serviced in the future."









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TRIUMPH

FOR THE RIDE



Jacks thought it was an opportune time to hold one of its JacksTech displays

By Ritchie Wilson

JacksTech 2024

A chance to get up close and personal with the latest in woodworking technology

Jacks is a long-established New Zealand company with branches in Christchurch and Auckland. It supplies woodworking machinery, from turnkey production lines for major industry players to home-workshop equipment for shed owners.

Examples of the latter are the excellent Tormek sharpening system, Felder dust extractors, Ascent bandsaws, and Hammer multi-machines.

With the absence this year of the once-annual Australian Woodworking Industry Suppliers Association (AWISA) woodworking trade show in Australia, and since Jacks recently took over as exclusive representative of the huge Chinese KDT brand, the firm thought it was an opportune time to hold one of its 'JacksTech' displays.

Jacks teamed up with 10 industry partners to stage New Zealand's largest woodworking industry trade show. It was held from 14 to 16 August in Auckland, at Jacks' large East Tamaki premises.

The partners' offerings included software to run CNC machinery, adhesives, hardware systems, specialist hand tools, and innovative fastenings to hold cabinetry together. The last is an area where innovation seems to be happening at speed.

Intelligent Fixings

Intelligent Fixings, aka 'IF', makes plastic clips called 'peanuts', which allow flat-packed cabinetry to be assembled with only a rubber mallet.

The system is based on key-shaped cavities routed in the wood of one side of a cabinet into which the heads of peanuts, attached to another side, very snuggly fit. This produces an admirably rigid joint, with the peanut being completely hidden. The cabinetry produced can be relatively easily disassembled with the mallet after, say, trial assembly or for relocation.

This seems a superior method of joining together cabinetry made from composite sheet, and a few sheddies have already bought jigs to allow them to use it.

Desirable hand tools

Displaying and selling rare and desirable woodworking hand tools at JacksTech was Gaston Monge-Grassi.

Gaston runs Piranha Tools: "Tools with bite". He exclusively imports selected brands of carpentry and fine woodworking tools from Japan and Europe and is one of the exciting stars of the Scott Brown Carpentry YouTube channel.

For many years, Jacks has sold machines made by Austrian manufacturer Felder. Felder makes three product lines: Format4, Felder, and Hammer. The red Hammer machines are designed for the home workshop and range from bandsaws to hefty planer-thicknessers.

Hammer has a planer – here in New Zealand, we would call it a 'buzzer' – that doesn't buzz because it has a cutter that is helical; it curves around the cutter head. The machine is fairly quiet when in operation, and can produce a finish on the wood that hardly needs sanding.

One type of machine that KDT produces is industry leading in fitting edging to cut sheets. Perfect edge banding is of paramount importance in the competitive world of kitchen manufacturing. If you are making kitchens, you need an edge bander.

The event was very well attended and the show hailed as a success, with plenty of sales on the day for many of the firms.



Daniel Strekier's unusual chainsaw table. This piece of art was inspired by Javier Milei, the president of Argentina (Daniel's country of birth): the chainsaw was a feature of Milei's election campaign, used to let people know that he will reduce government waste for the good of the country





One of the trade stands at the event was Masterpiece Woodworks; some readers may recognise Daniel Strekier and his unique wooden bike from *The Shed* Issue No. 84



There were plenty of trade stands to explore



Gaston Monge-Grassi of Piranha Tools sells rare and desirable woodworking hand tools

THE SHED ONLINE

What's happening online at the-shed.nz?

Every week, we upload new content onto The Shed *website to add to the hundreds of articles and videos already on the site for readers to discover, learn from, and enjoy. Some uploads of the past few months include:*



New life for old stuff

Tired tools and discarded parts are reinvented:
https://the-shed.nz/new-life-for-old-stuff/



Kaizen in wood

Turning to small and delicate:
https://the-shed.nz/kaizen-in-wood/



Preserving the past

A sheddie's extraordinary collection of objects gives a vivid snapshot of bygone eras:
https://the-shed.nz/preserving-the-past/



Easy rider

A bike enthusiast relishes the challenges of a rebuild:
https://the-shed.nz/easy-rider

editor@the-shed.nz

MEMORIES FROZEN IN TIME

LETTER OF THE MONTH



Ngaire McRae pictured with a MacDonald's refrigerator in the 1950s



The MacDonalds in 2024: Fraser and "young Ian" (right)

I really enjoyed the story about AW MacDonald Refrigeration (*The Shed* Issue No. 77 and the-shed.nz).

My mum, Ngaire McRae (née Tucker), worked there in the office at Weld Street in the mid 1950s for a few years. Her brother, Raymond Tucker, was a fitter and turner there. The factory manager had a professional photographer friend who took a lovely photo of Ngaire next to one of the coloured fridges. Mum is wearing one of her home-sewn dresses, red with white polka dots. I wonder if the MacDonalds have a history archive and would like a copy?

Mum told me it was her job to collect the wages from the bank. One day, a man who lived over the road asked her if she was going to the bank to collect the wages. Knowing he was a bit dodgy, she told her supervisor and no longer went alone.

She remembers a wonderful Christmas do for the office staff – a flight with Fred Ladd in his seaplane, which they all thoroughly enjoyed.

Mum is now 91, and a bit frail. She can still recall the days at AW MacDonald with a smile; Mr MacDonald and young Ian MacDonald, a vivid memory of a great company to work for.

Thank you for the very interesting story. Machines that my uncle probably used. I loved the photos of the coloured fridges, and am sure it will make Mum's day when I show them to her.

Many thanks,

Tricia McRae



A few survivors of the extensive range of fridges made by MacDonald Refrigeration over many decades



Murray found it tough to recreate chrome for his models, but John has a solution for him

LIQUID CHROME

Hi Greg,

I noticed in the current issue (*The Shed* Issue No. 116) that Murray Grimwood commented "chrome is a toughie to recreate" in his Bentley project.

A good art supplies retailer (e.g., Gordon Harris in Christchurch) will stock Molotow Liquid Chrome in marker pen style. The tips are various sizes (e.g., 1mm, 2mm) and they're made in Germany (molotow.com). They're extremely well made, very realistic chrome, and saved my bacon on a model motorcycle. Great for touching up any damage. Maybe you could pass this on to Murray?

Great magazine – I've never missed a copy!

Thanks and best regards,

John Proffitt

LETTER OF THE MONTH PRIZE

Every issue, our Letter of the Month winner will receive a copy of *Best of The Shed 1* and 2. More top projects from 15 great years of *The Shed* magazine.

Letters to be emailed to: editor@the-shed.nz



Odd Jobs

Hang out on your own DIY swing chair!



Elevate your outdoor entertainment area with your very own DIY swing chair. This is a satisfying weekend DIY project that you and your family and friends can enjoy for years to come.

Swing chair to do list

- ✔ **Prep and prime with the right Resene primer for your materials**
- ✔ **Build out the base, framing and construct the chair**
- ✔ **Paint with Resene Lustacryl in your chosen colour**
- ✔ **Suspend your chair and hang out!**



View how to make your own swing chair, plus cut lists and step-by-step instructions at masterstrokebyresene.com

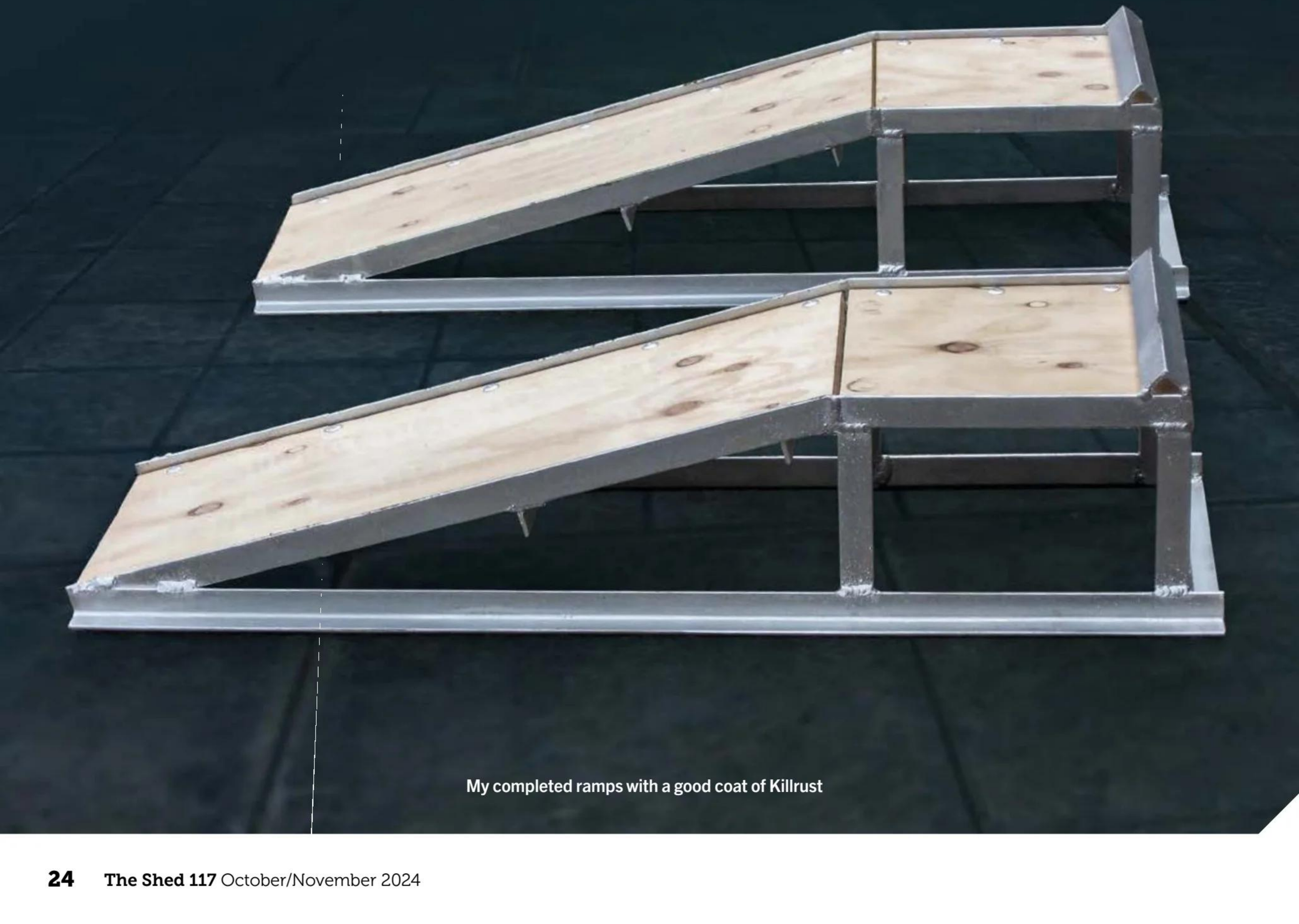
Visit your local Resene ColorShop for all your decorating needs and the widest range of NZ made paints, wood stains and colours.

MasterStroke by Resene

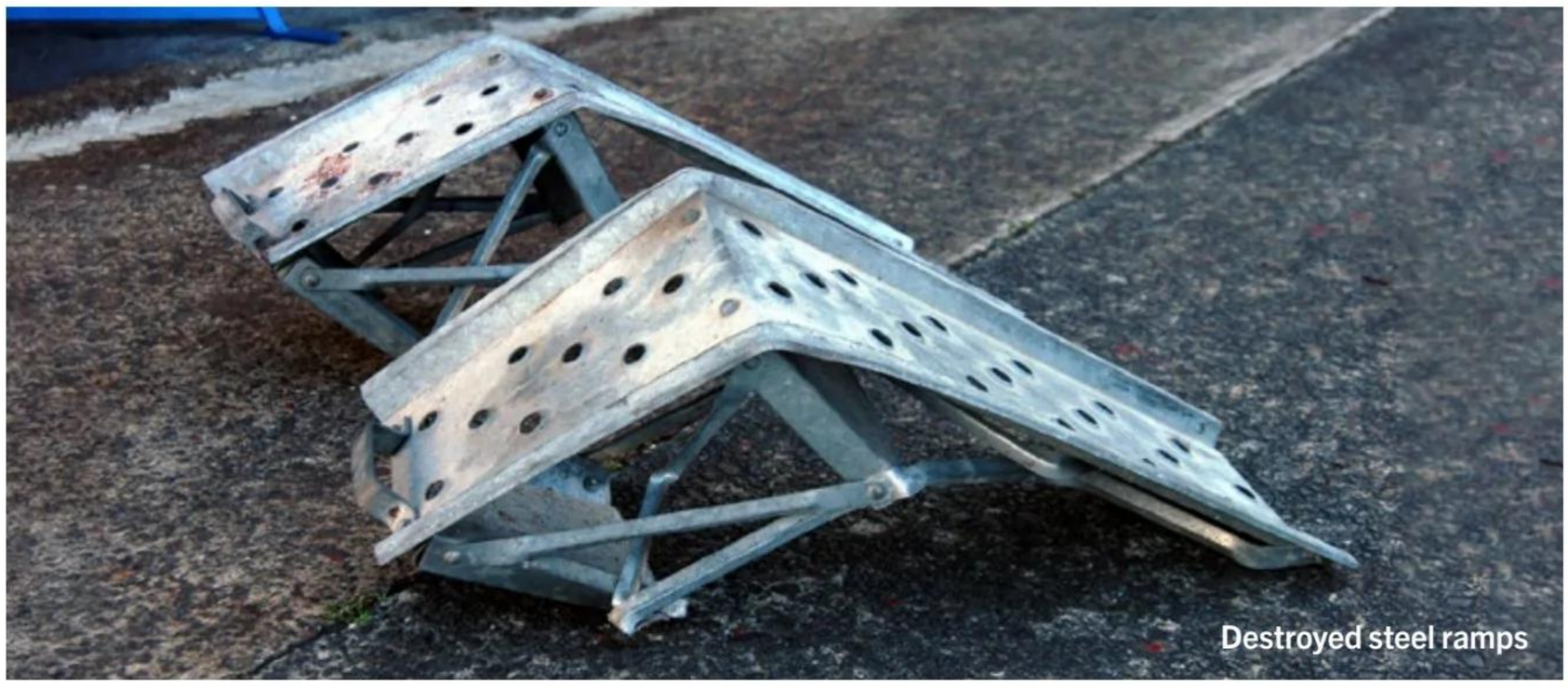
RAMPING IT UP

Make a pair of ramps for home car maintenance

By Bob Hulme | Photographs: Gerald Shacklock



My completed ramps with a good coat of Killrust



Destroyed steel ramps

This project came about because of a mishap with the trusty car ramps that I had had for more than 20 years. They were a clever pressed-steel design, a product of Spedding Ltd, one of the country's original importers and wholesalers, which took on manufacturing as a response to the import restrictions and import licensing laws of the time.

I was the factory manager, and car ramps helped to fill the seasonal gap in our aluminium-boat manufacturing. Spedding Ltd did not survive a Brierley-style takeover and split. My beloved car ramps didn't survive, either, to some degree due to automatic transmission.

Automatics

I love a car with a manual gearbox and loathe automatics, although one day, when I am really old and feeble, I may change my mind. However, I was being helpful for a friend and guiding a car up my ramps to do some regular maintenance. Halfway up the slope, the car stopped.

The logical thing in that situation is to give the car a bit more loud pedal, which is what the driver did.

Unfortunately, with automatic transmissions, it is not so easy to back off if you give it too much. Once the wheels made it to the top of the ramp, the car was like a wound-up rubber band and tried to drive right over the stops at the end. The result was that the ramps tipped sideways and were crushed underneath. Pressed-steel ramps are light and strong, but once they are bent you cannot just straighten them and expect them to be as robust. It was a chance to make a better pair of new ramps. As it was, the old ramps had become too steep for modern cars with lower bodywork, such as spoilers and more overhang.

Owning ramps can save you money by enabling you to do your own oil changes and other under-car maintenance. I like to use good-quality oil and a new filter at every oil change. To drain deposits from the engine with the old oil, I use a flushing additive added before the oil is drained, with the engine left to idle for 5 to 10 minutes. You can recycle your old oil to collection centres or ask your local mechanic if he will take it. Most garages have a regular pick-up service for recycling oil. Plus, friends and family will no doubt want to borrow your new ramps, and you will be able to trade favours.

Materials

I decided to use 30x30x5mm angle iron for the framework and a 15mm thick construction plywood top surface.

Angle iron is easy to work with; it is rugged, easy to weld, and not too expensive. Plywood is also easy to work with and is very strong for its size. Care must be taken, though, as plywood does deteriorate over time if not cared for.

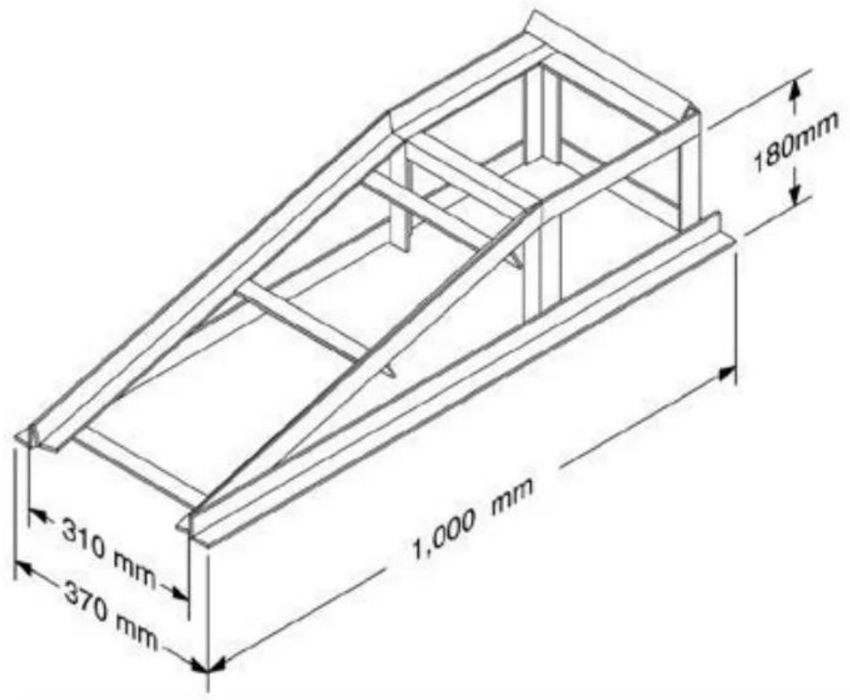
I used a 15-degree angle for the ramp slope. If you have a particularly low car, 11 degrees should work better. Each ramp is 370mm wide

"The result was that the ramps tipped sideways and were crushed underneath"


Draw chalk outline


Cut pieces laid out


Cut angle iron



including the angle iron frame, and a metre long. The top platform, where the tyres rest, is a 300mm square of ply – a width that suits wider tyres. Use angle iron for the stop. The shorter cross-piece in the middle of the ramp is designed not to stick out beyond the edge.

I like to draw a design in detail on paper first, but it can be marked out with chalk on the concrete floor. Make a cutting list, and cut all the pieces of angle iron first, then lay them against your chalk outline to check sizes and evaluate the structure. Any angled ends can be cut by marking them once you lay out the pieces so that the best joints will be achieved.

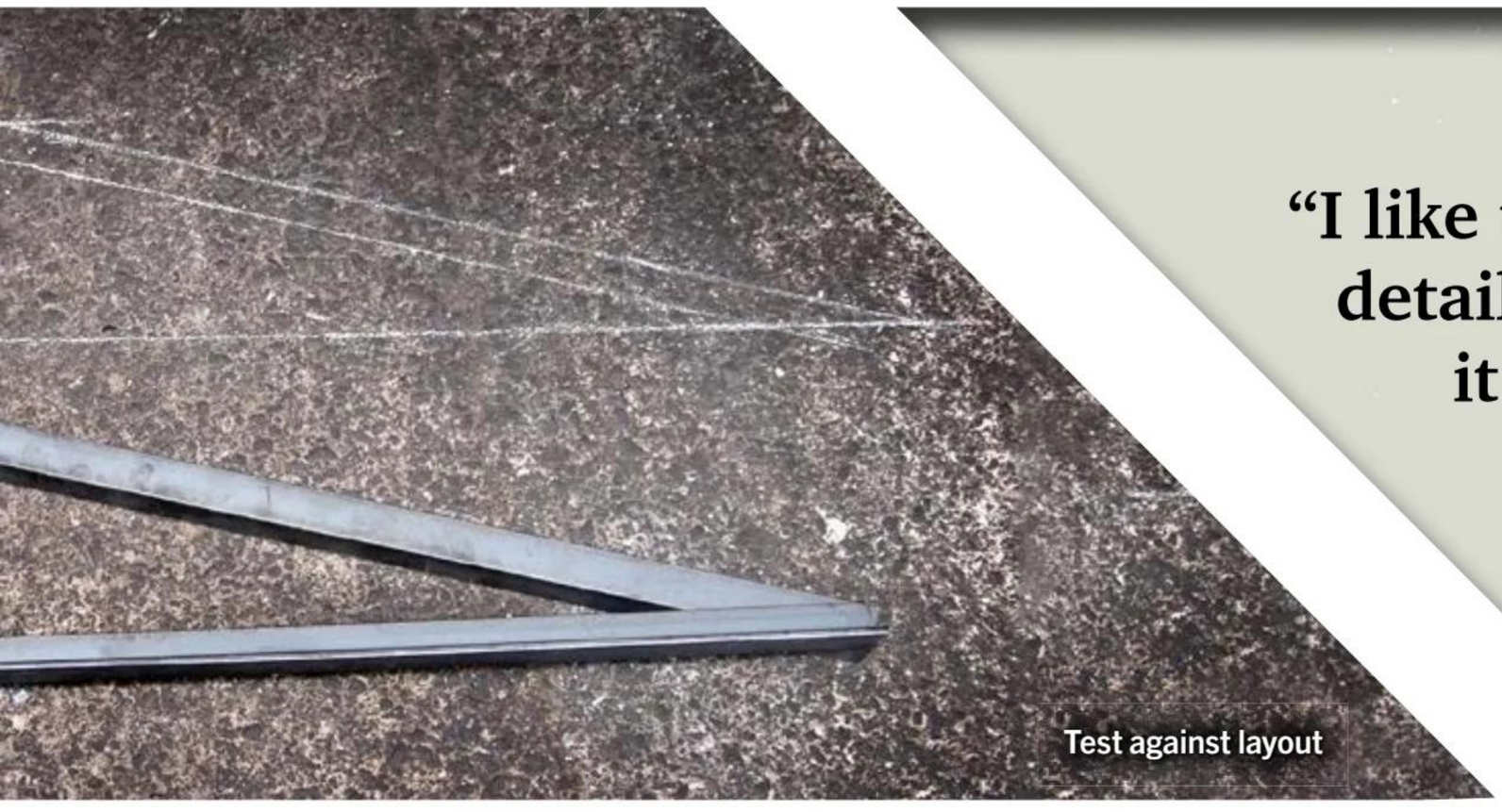
In my design, only the top edge of the sloping side rails needs to be cut on an angle. Cutting the angle iron by hand with a hacksaw can be laborious. A local engineering business might supply the material cut to length, or it may be time to invest in a small power hacksaw. They are not expensive and save a lot of time.

Tack welding

For this job, I preferred arc welding because of better penetration. I am



Tack weld



Test against layout

“I like to draw a design in detail on paper first, but it can be marked out with chalk on the concrete floor”

Cutting list

- 30x30x5mm angle iron

Each ramp:

- two 1000mm base rails
- two 700mm sloped side rails
- four 300mm top platform sides and cross-members
- four 180mm vertical supports
- three 310mm ground cross-members
- one 250mm wheel-stop
- 15mm construction ply – one 296x300mm; one 296x725mm



Top platform stop

“Tack weld a complete ramp together before doing any full welds”

using a 2.5 electrode to show it can be done with that. I would normally use a 3.2 electrode but not every home workshop or shed would have one.

Use a rafter square and a G-clamp to position the various pieces ready to tack weld. To help space the ramp sides correctly apart, position and clamp the cross-member across while fixing the ends.

A ‘tack weld’ is a small weld that is easily broken or at least allows parts to be adjusted for squareness with a light tap with a hammer. Tack weld a complete ramp together before doing any full welds so that you can check the alignment and sizes first. When you have made any necessary adjustments, start doing the full weld runs at the joints using G-clamps to minimise the effect of movement caused by contraction of the hot weld.

Timber ramps

I have seen ramps made from timber planks that are probably 50x250mm. The pieces are simply stacked on top of each other and secured together. The sloping part is formed by cutting the ends of the pieces of timber on an angle. The advantage is that they are completely solid so cannot collapse and are simple to make. However, if you buy the timber especially for the ramps, the cost becomes significant. It works well if you have offcuts left from a building project.



Drill through ply and metal

Extra cross-members

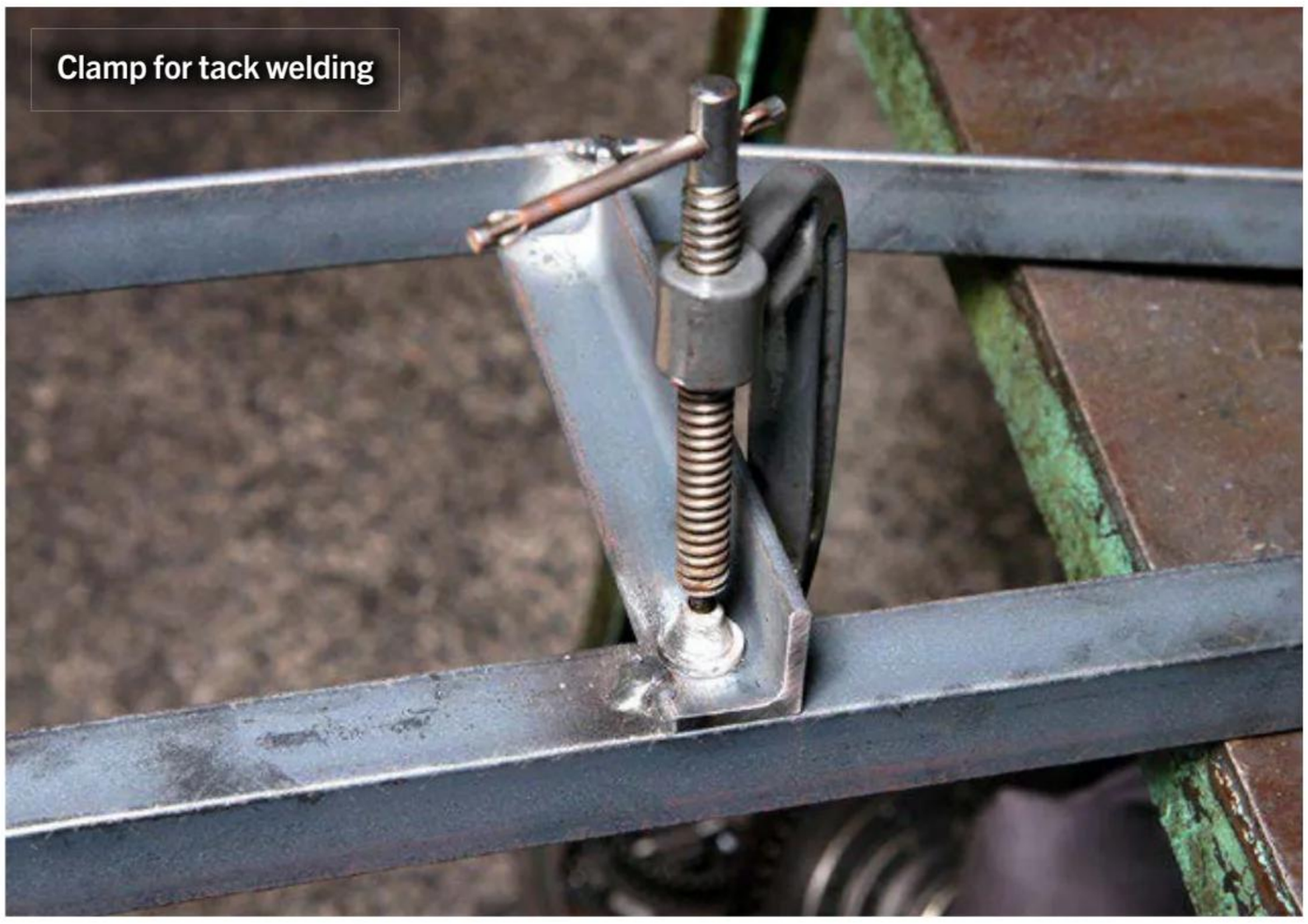
When I started this project, I designed each ramp to be made from one 6m length of angle iron. However, when the completed ramps were tried with a medium-to-heavy car on them, the deflection of the plywood was more than I expected. Consequently, I have added two more cross-members and these are now included in the plan. The job needs 6500mm of angle iron.

One cross-member goes under the top square of plywood, at its edge where it meets the sloped ply ramp. The other cross-member is about 40mm away from that to support the top end of the sloping ply.

These cross-members need to be cut at their ends in such a way that they 'check in' to the side members and are hard up against the underside of the plywood panels to give full support. The cross-member that is positioned under the sloping ply about halfway down its length could also be checked in to give better support.

Cutting the ends to give the shape for checking in can be done with a hacksaw, bandsaw, or cut-off wheel in an angle grinder.

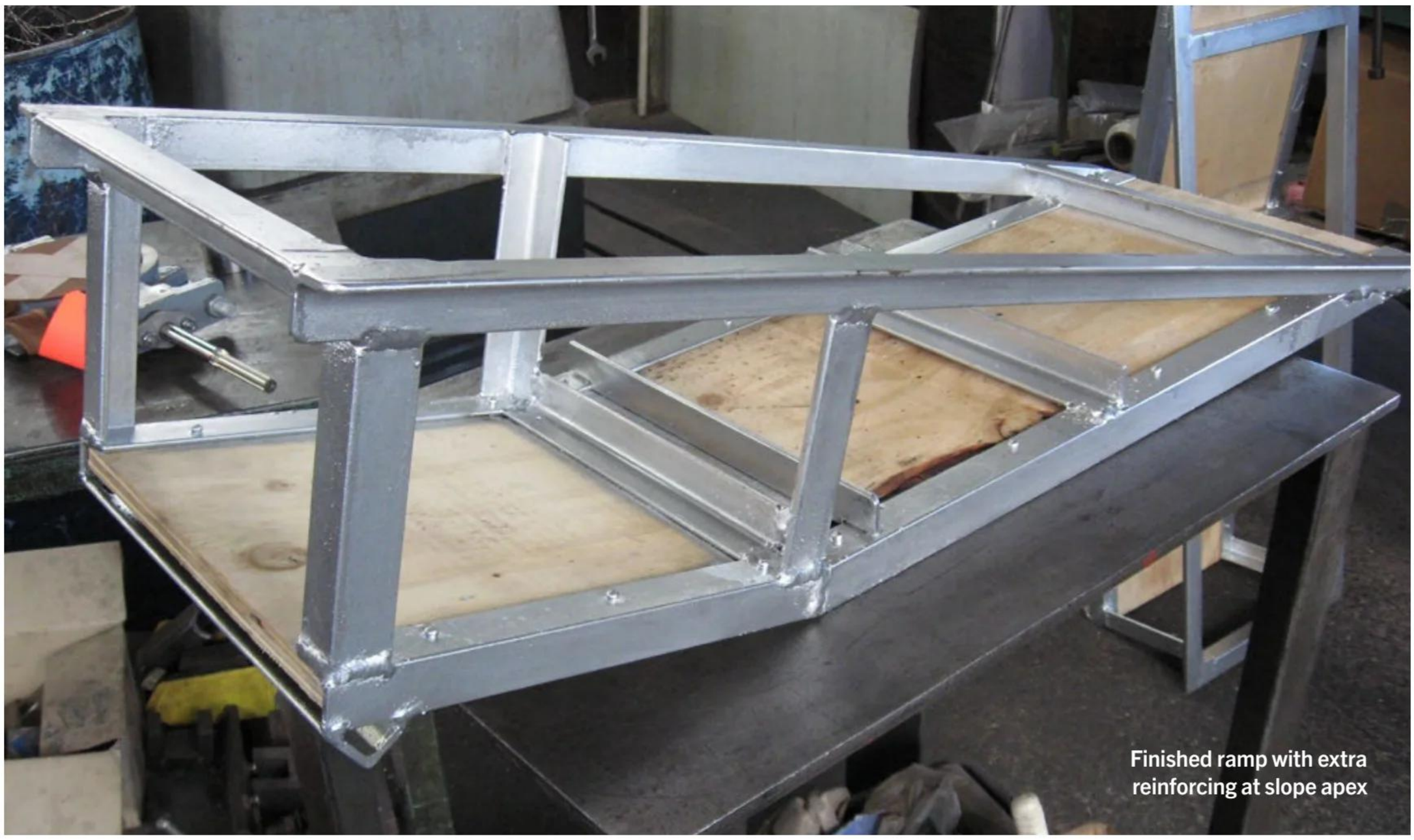
After welding and before fitting the



Clamp for tack welding



Grind welds smooth



Finished ramp with extra reinforcing at slope apex



Rivet on ply


Use large-flange rivets


Use anti-rust paint before attaching ply

plywood surface, give the structure a good coat of paint so that the ramps are easily cleaned, don't go rusty, and stay looking good. I used Wattyl Killrust paint. It can be used directly on bare steel and gives a tough coating that will take a lot of knocks. It is OK to do this instead of galvanising the ramps, as you would probably store them inside and use them only in dry conditions.

Paint preparation

Preparation is the key to any good paint job.

Wire-brush any surface rust off and ensure that the welding slag is cleared away. When you are using arc-welding rods, the slag that sets on top of the weld should be broken off with a chipping hammer before you paint the metal. Otherwise, it will certainly come off on its own in the future to expose an unpainted weld area. Removing the slag also allows you to inspect the weld to make sure it is a good one.

Before painting, smooth all sharp edges and corners. Paint does not like sticking to sharp edges so a better coating will be achieved by filing or otherwise smoothing off edges. An angle grinder with a grinding wheel will grind off an edge but leaves its own sharp edges. A flap wheel in an angle grinder is much more effective. Equally important, round off the corners of the exposed angle iron so that you don't catch yourself or your clothes while working with the ramps.

Fixing

You could fix the plywood to the ramps using gutter bolts, countersunk screws, or rivets. My choice is blind rivets with a large flange head. They remain tight and are effective, as is proven by their popular use for holding plywood decks on trailers. I put three rivets each side of the top and five in each side of the sloping plywood.

Your car tyres should grip the plywood well enough when driving up the ramps but if not (or if you are likely to use the ramps in wet conditions) use some of your leftover paint on the plywood surface. Just sprinkle some sand on the paint before it dries to give a grippy surface.

> "Just sprinkle some sand on the paint before it dries to give a grippy surface"



Using your car ramps

You must already know that it is wrong to crawl under a car supported only by a jack. A raised car should be supported securely on axle stands. You can also feel secure under your car when it is up on the ramps.

Here are a few tips to help you use ramps safely:

1. They are intended for use with a car, not a truck or large 4WD.
2. Line the ramps up carefully with the car wheels before driving on. Preferably, have someone watching to guide you on.
3. Use ramps only on level, stable ground, preferably a concrete or sealed surface.
4. Apply the handbrake and chock the wheels that are not on the ramps.



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A GUIDE TO THE PERFECT WORKSHOP

PART 1

Having a workshop is one thing, but organising it so that it works for you and is an enjoyable place to tackle your projects is another

By Nigel Young | Photographs: Nigel Young

Having the garage door open on a sunny day helps, but the shingle drive makes working outside more awkward. Positioning the open garage door on my layout drawing allowed me to see what impact it would have when open

Working on a number of projects recently has made me realise the need for both a better working environment and a better workflow. This has to include timber and sheet storage and improved access to power tools that need space around them in order for large lengths of timber or full-size sheets of MDF, ply, and the like, to be manoeuvred.

I have used bamboo panels on two projects recently: the music desk (*The Shed* Issue No. 113) and a desk for my granddaughter. I love using them, but they are 2200x600x25mm and weigh 21.5kg each. If I'm using several – as I did for the music desk, for which I used four – then I need to be able to store them where they won't get damaged. Now, a full-size sheet of MDF is 2400x1200mm, and an 18mm thick sheet weighs around 37kg, so the ability to move one into position for marking out, cutting, and then stacking the pieces in order of use is imperative.

Considerations

When I started writing this article, my workshop was around three-quarters of a typical 1990s Skyline double garage – about 4800x6000mm of space. It has two 2400mm long windows – one on the back wall at the south end and one on the western side wall – with a fixed 2400x900mm workbench in front of the west window and a 2100x900mm workbench in front of the south one.

I have a 700mm high, 2440x1220mm assembly table on castors that I can move around as required; a floor-standing drill press that is fixed to the floor; and a bandsaw on castors that lives next to it.

Up until recently, I also had an old Tanner ripsaw that was great, but it was awkward to use and I lost too much of the depth of the blade to its cast-iron top. It had two castors but was top-heavy – the body was also cast iron – and fell over on me once as I was trying to move it. It also required a decent amount of space if large lengths of timber were to be fed through it. I kept it by my garage door and fed from inside the garage, so I had no issue with having to accommodate lengths as they passed through. However, I have recently replaced the Tanner ripsaw with a larger one with a 12-inch blade.

I have a 10-inch mitre saw that needs space to take large lengths to its left-hand side and reasonably sized cut lengths to its right, and a Tanner cast-iron lathe that I want to learn to use. I keep screws and nails in a set of drawers on castors that came from our kitchen when we did up our house some years ago. A cast-iron scroll-saw lives on top of the drawers – I lift it off and move it as I need to. Long term, I want to get a thicknesser.

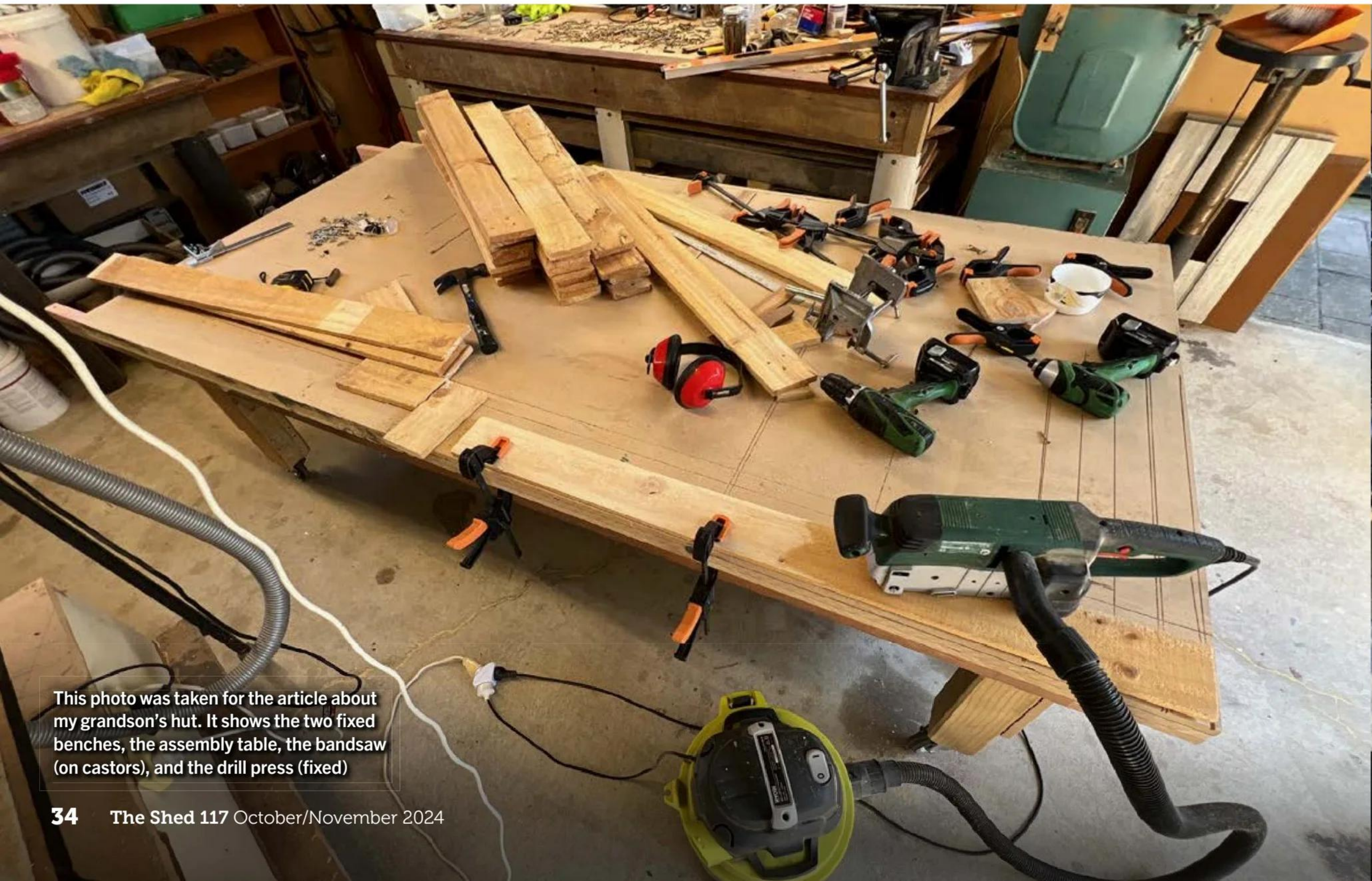
I had decided to relocate my lathe from the back workbench to a mobile stand with drawers that had previously housed the cross-cut saw. I had added extensions at either side of the stand to accommodate decent lengths of timber, but they had never been particularly successful.

I had LED strip lighting and extra double power outlets installed during the house alterations, but I could always do with more.

The workshop's needs

I wrote a list of everything I could think of that my workshop needs – both existing and planned, and including items as well as methods:

- lighting and power
- dust extraction



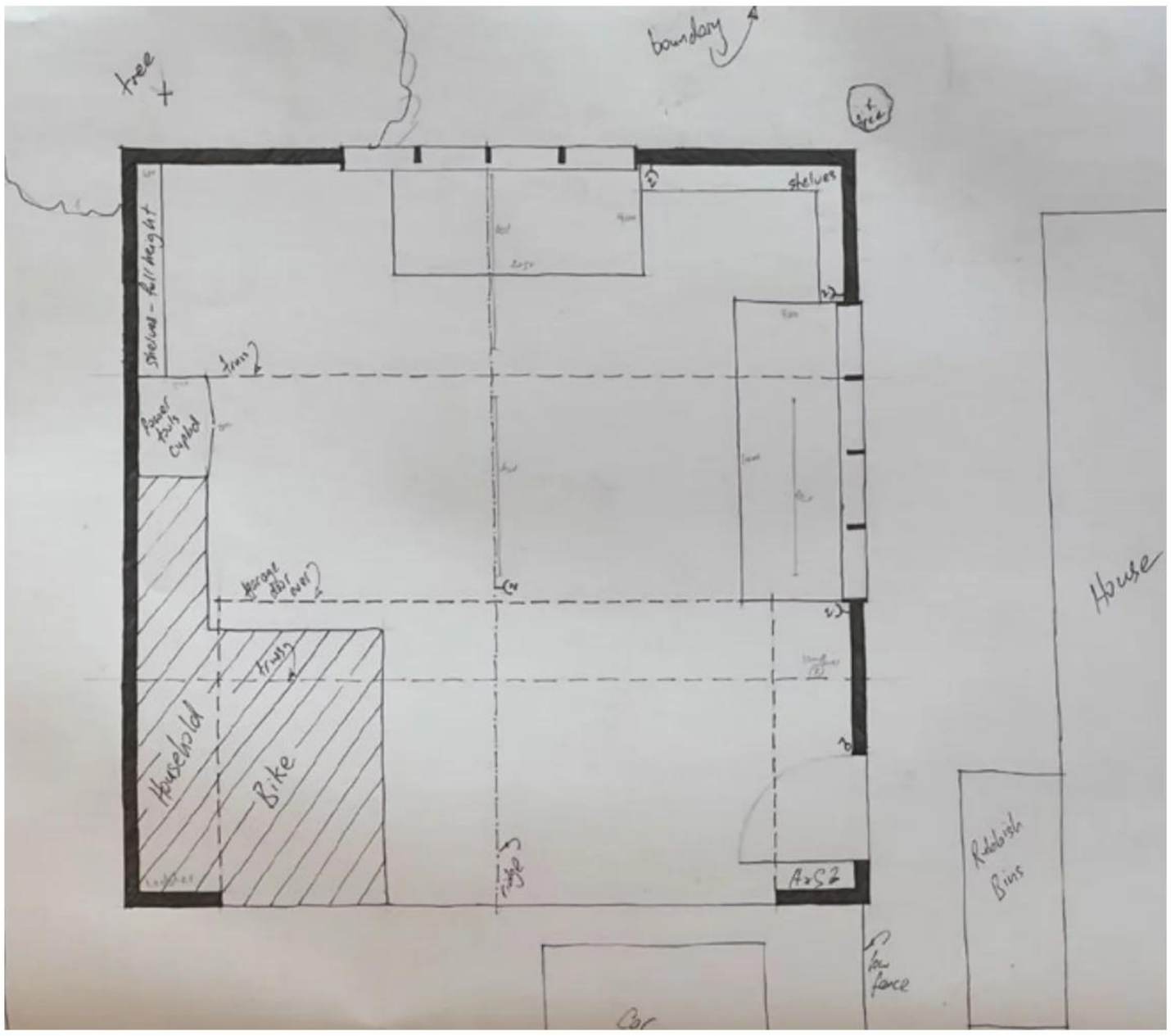
This photo was taken for the article about my grandson's hut. It shows the two fixed benches, the assembly table, the bandsaw (on castors), and the drill press (fixed)

- compressed air
- mitre saw
- table saw
- bandsaw
- drill press
- lathe
- edge planer
- thicknesser
- timber and sheet storage
- health and safety requirements
- other resources
- workflow and space planning
- long-term planning
- roof space
- fixed tools
- egress
- storage
- ongoing jobs
- seating
- colour
- mobility
- floor covering.

These are the ones I came up with – I'm sure you have your own requirements.

Dust

Other considerations were my garage door, which tilts up and over; a side



A layout for my revised garage after my wife suggested that I take over the whole thing (I didn't see that coming – more on that in the next article). I have also marked out the trusses, the coverage of the overhead garage door, and the area set aside for household storage. Showing its position in relation to the house and boundaries helps see its context

> "This brings us to the issue of dust"



My workshop from the opposite direction to the previous picture – this photo taken for the music desk article. The back bench has become a dumping ground and is very frustrating



A mobile workstation for my cross-cut saw showing the two extensions. It was OK, but awkward to park and not sufficiently accurate



The desk for my granddaughter – an assembly table on wheels is a wonderful thing

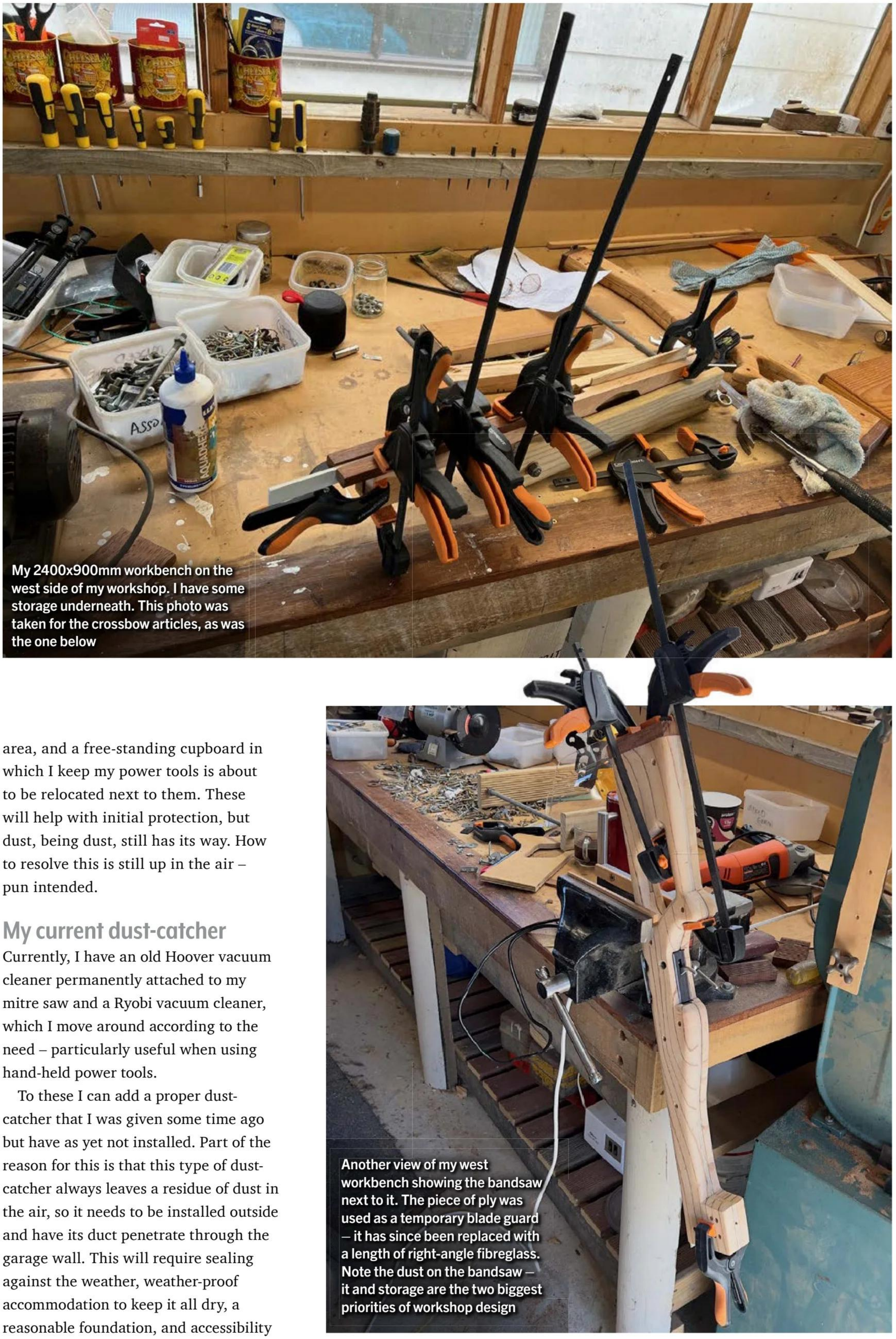
door, also on the west side, which must be shut when the garage door is in motion; some household stuff that lives in the remaining 1200x6000mm part of the garage; and my Kawasaki W650, which can be moved out on a good day.

This brings us to the issue of dust, as the household items and the bike both need to be protected. I keep a blue tarpaulin over my bike, but care must be taken when removing it – to avoid accidental spillage over it – as there isn't much room around it. Some of the household items are stored away long-term, but others need to be accessed reasonably regularly. So, dust is a big concern.

The main issues, then, are the immediate removal of dust, and the control and removal of any residue, of which there will always be some. This requires a three-pronged attack: removal at creation; removal of residue; and protection at the beginning, such as the tarpaulin over my bike.

Two tall bookcases divide off the

"Until recently, this was in the too-hard basket"



My 2400x900mm workbench on the west side of my workshop. I have some storage underneath. This photo was taken for the crossbow articles, as was the one below

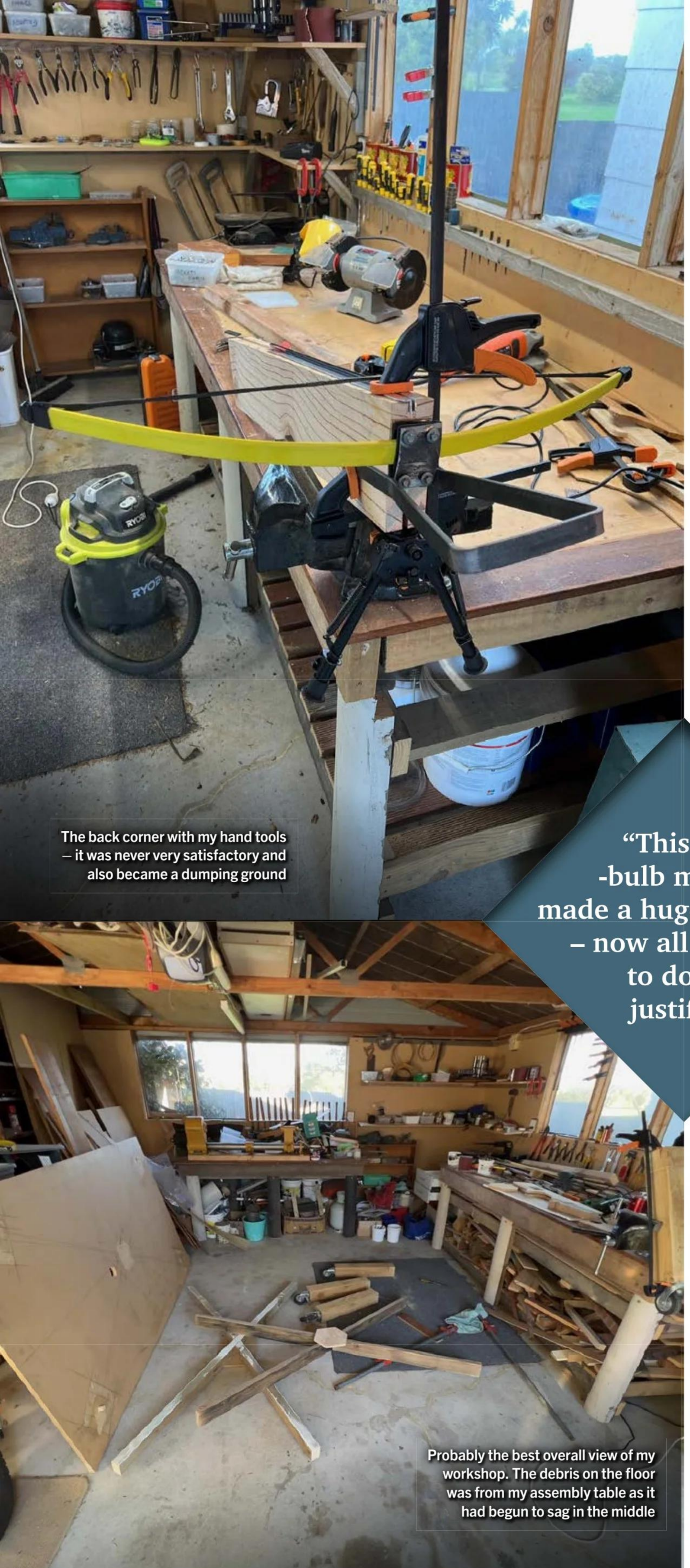
area, and a free-standing cupboard in which I keep my power tools is about to be relocated next to them. These will help with initial protection, but dust, being dust, still has its way. How to resolve this is still up in the air – pun intended.

My current dust-catcher

Currently, I have an old Hoover vacuum cleaner permanently attached to my mitre saw and a Ryobi vacuum cleaner, which I move around according to the need – particularly useful when using hand-held power tools.

To these I can add a proper dust-catcher that I was given some time ago but have as yet not installed. Part of the reason for this is that this type of dust-catcher always leaves a residue of dust in the air, so it needs to be installed outside and have its duct penetrate through the garage wall. This will require sealing against the weather, weather-proof accommodation to keep it all dry, a reasonable foundation, and accessibility

Another view of my west workbench showing the bandsaw next to it. The piece of ply was used as a temporary blade guard – it has since been replaced with a length of right-angle fibreglass. Note the dust on the bandsaw – it and storage are the two biggest priorities of workshop design



The back corner with my hand tools – it was never very satisfactory and also became a dumping ground

Probably the best overall view of my workshop. The debris on the floor was from my assembly table as it had begun to sag in the middle

for emptying the bag. Until recently, this was in the too-hard basket.

The extractor also requires ducting in the garage, with T-shaped controllable junctions needed to branch off to each tool and one on the floor to take away dust delivered to it by broom.

The route for the 100mm diameter PVC pipe ducting is also an issue. Should it go up the wall and then run overhead – at which point my garage door would limit its reach – or under the benches and around the bottom of the floor, with leaders coming up as required? Or do I even use it? These were questions to be answered.

To go back to the 'reasonable foundation' in my too-hard basket, I realised that I could make a hut using a pallet for a floor – the same technique that I used in making my grandson's hut (*The Shed* Issue No. 114). Prior to this, I had been thinking in terms of a lean-to roof attached to the south wall of the garage, which meant covering over part of the back windows, thereby reducing light from them. This light-bulb moment made a huge difference – now all I needed to do was justify it.

"This light -bulb moment made a huge difference – now all I needed to do was justify it"

Painting

I decided to paint my workshop. It is lined with some old 12mm MDF cover sheets, and the existing shelves – also MDF and fixed with 40x40 timber brackets that I made – needed some attention, as did the workbenches. Storage was inconsistent, and tool management wasn't – managed, that is.

I had tried different approaches, but I always seemed to end up with items that didn't fit anywhere, so they got piled onto the back workbench. Between them and the lathe that I had installed there, the workbench had become a dumping ground. There was room under the benches, but that too was somewhat 'troubled'. A new approach was needed.



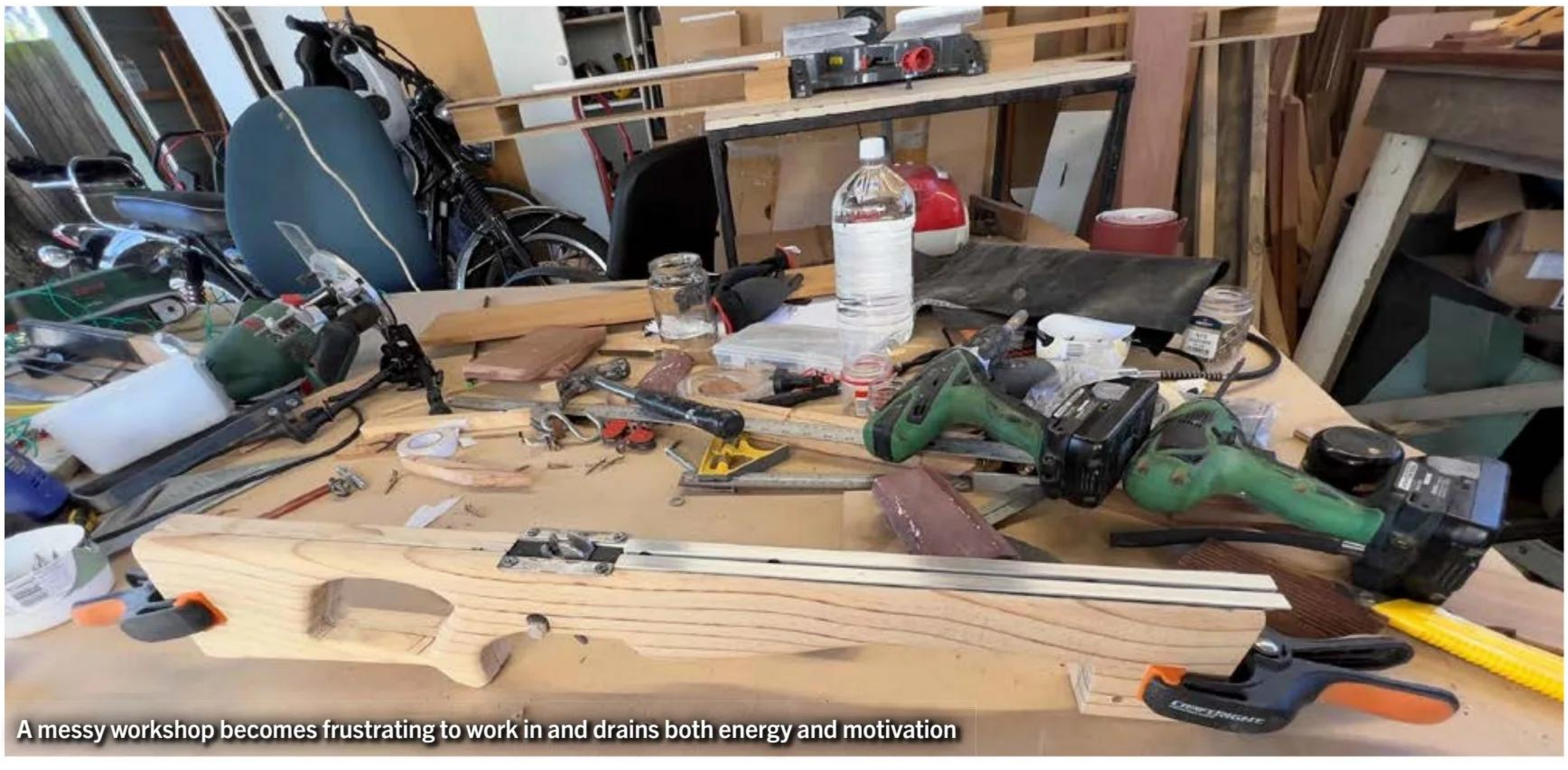
New assembly table: I used the same legs and wheels, but the top was redesigned and as flat – as it should be. I have made a 50mm overhang to allow for clamps and the like

Time to sort

Everything came off the walls and was piled high on my assembly table, which was pushed out of the way as much as possible. Even then, there was still stuff on the floor.

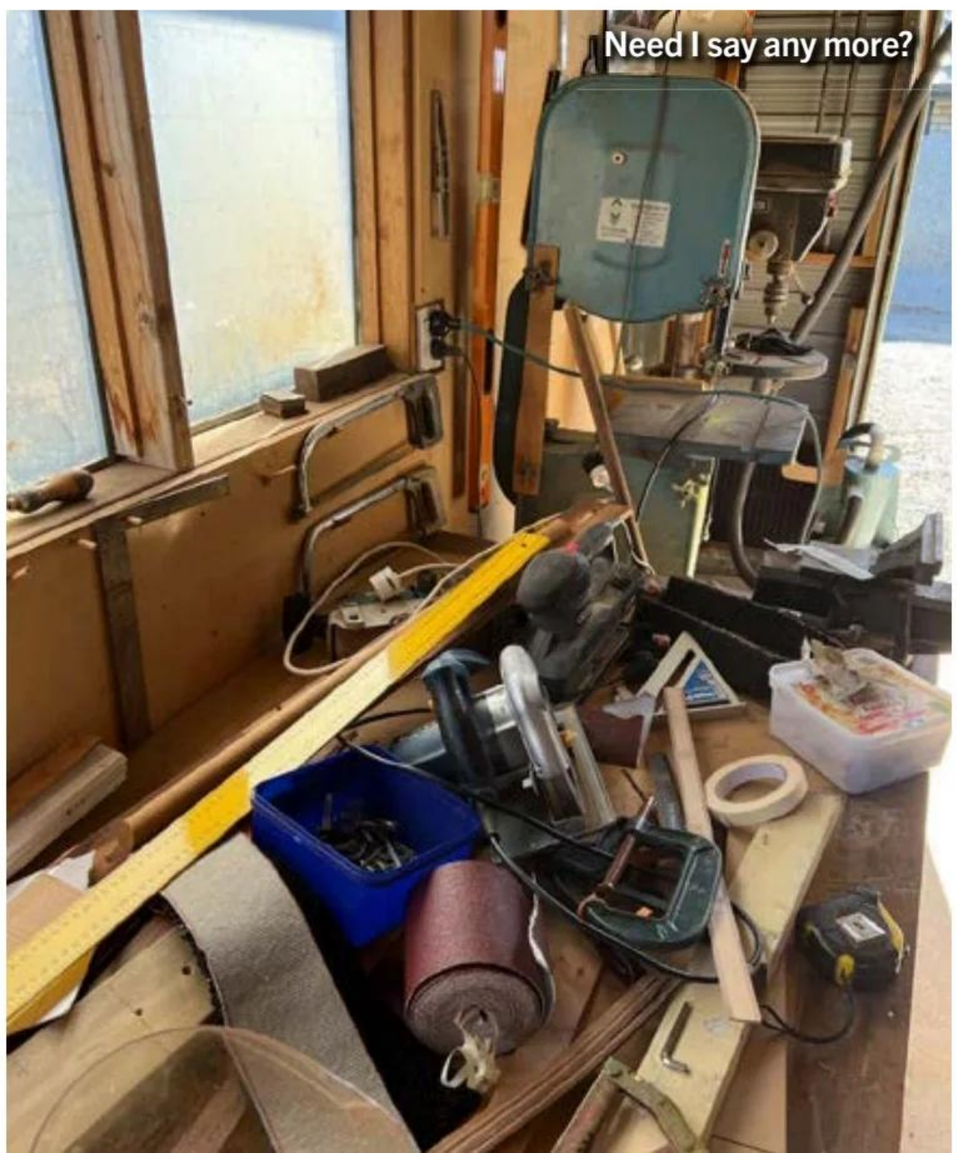
I sorted the existing shelves, tightened the hardwood edges that I had on my workbenches, fixed some 40x40 timber I had across the window sills in order to extend them for shelves, and then started painting.

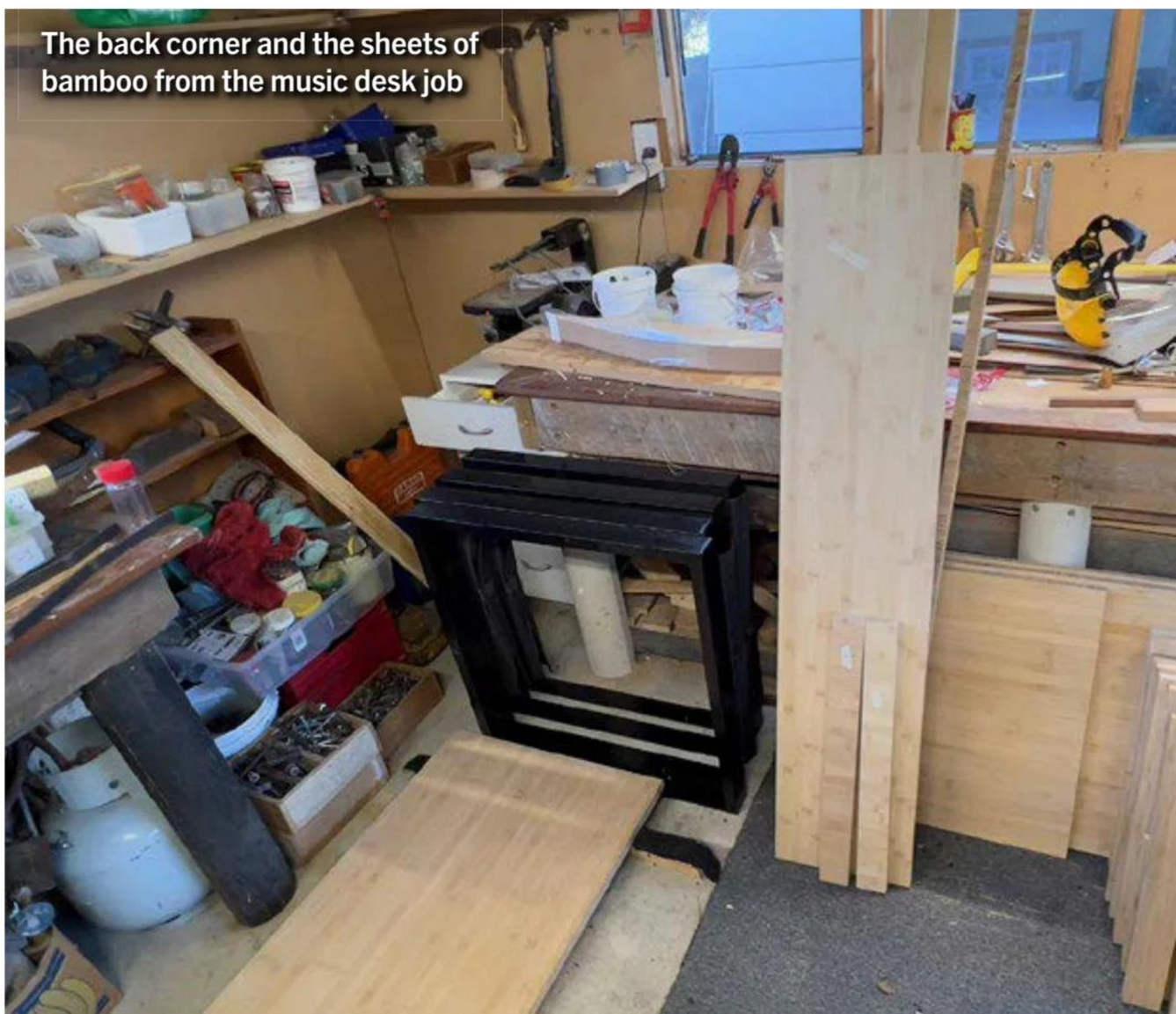
I was able to resuscitate about 4 litres of white paint from a 10-litre bucket left over from our house alterations and used it to seal the MDF and the window mullions. There was around 7 litres of thick gunk in another 10-litre bucket; with the help of some water and a large stirrer on the end of an electric drill – and a paint stirrer on the other end – I attempted to revive it. I used a corded drill for the task, as I needed the torque. It eventually became almost usable. I passed it through a muslin strainer and then took it to a hardware shop, where I had it tinted to a machine grey for $1 a litre. Some more stirring, and then I began. It was a bit lumpy at first, but it seemed to settle down. After two coats over the white sealant coat, it looked



A messy workshop becomes frustrating to work in and drains both energy and motivation




Need I say any more?


The back corner and the sheets of bamboo from the music desk job



Another view across my workshop, this time showing my first attempt at setting up my cross-cut saw – it took up too much space on my assembly table





The mobile workstation – back left – has since been rebuilt. More on that in the next article

good. I also sanded down my two workbenches and sealed them with a coat of Danish oil. At that point, I went away for two weeks, giving all the paint a good time to harden.

Planning

While I was away, I read some library books on workshops and watched a number of YouTube videos on the subject. I had my sketchbook with me, so I drew up my garage as best I could remember it and then cut up some pieces of cardboard to represent the different tools and workspaces that I needed to consider. It was at this point that I had the light-bulb moment regarding the hut for the dust extractor. Being able to move the pieces of cardboard allowed me to get a better sense of the flow I needed. My research gave me some guidelines to consider:

- the processing of materials from a production and handling perspective; this includes material storage and accessibility
- mobility and the need to be able to move the tools and workplaces, rather than having to move around them
- the maximisation of space, particularly the use of corners, which can often be difficult – think of kitchen design here
- tool storage and where the tools are likely to be used
- allow for future plans – the table saw and thicknesser mentioned earlier are examples of this. I also have an edge planer in bits that I want to reassemble – it is made of cast iron and requires a mobile stand.

The processes

Workshops are always a work in progress, so the need to be process driven is imperative; otherwise, a reorganisation is required every time we buy a new tool or attempt a new idea.

An example of this is my garage roof. Storage in amongst the trusses is great, as it gets things off the floor, but accessibility is a challenge, and even remembering what is up there reminds me of the old saying, 'out of sight, out of mind'. It is a short-term solution only – unless it is for actual long-term storage.

I have a steam-box up there, which I built some years ago after experimenting with bending ply for some speakers that I was working on (for which I used a smaller steam-box). I built the larger one with some ideas in mind, but then we moved and other priorities took over. Now I have to figure out how to get it down by myself, position it for use as part of my workflow, and then store it during its use before finally putting it back in the roof space.

The decision to use it will require a mental determination as much as a process, as it will dominate my workshop once it is down. It is 2400mm long, so I would require plenty of room around it in order to use it. While it would sit on my assembly table, it would also require height, as it needs room for a gas ring and water container to produce the steam under the large hole at one end. Its use is very process driven, and also in the too-hard basket for the moment. ▶

Storage

The example of the steam-box shows the need for accessible storage.

I also have timber and sheets of MDF, ply, and the like up on the trusses, but it has all become too unwieldy – there has got to be a better way. Add to this some pallet wood on trestles behind the garage, along with other pallets I have yet to dismantle. There's also a timber rack under my bench on the west side of my workshop.

Storage, then, is as much about consolidation as it is about accessibility and awareness of what's there. I had considered building some racks off the window mullions along the back wall, but there would always be the risk of a piece of glass being broken, and then I would need to move it all to repair it. Effective storage is ultimately where I would begin – but more on that in the next article.

Cost

Cost is also important, as not many of us have much in the way of discretionary spending power these days; when we do, there is usually a list of things contending for it.

Tools don't need to be new; neither does the timber, for that matter. If you have a local Menzshed, then join it – the membership fees are very modest and the accessibility to high-end equipment and high-quality experience and wisdom is awesome. Make this a priority if you can, and see it as an extension of your own workshop.

The members of the Menzsheds have planned the processes, materials storage, dust control, and tool management – they, too, have read the books and watched the YouTube videos. The shed layouts have already been subject to reorganisation for new equipment, as well as movement throughout due to the growing number of people using them. There is also access to discounts, and it doesn't take many of those to cover your annual membership fee. Ultimately, however, they are places of vision and 'can-do,' leaving you to enjoy your workshop rather than it determining what you can or can't do.

Making your workshop work for you frees you to enjoy what you're there for. It is the means to the end and an outlet for your own plans and visions.

In part two, we'll see how well I've been able to put all this into practice, and what lessons I have learned along the way.



"Cost is also important, as not many of us have much in the way of discretionary spending power these days"

My grandson's hut: this approach of using a pallet for a floor became the basis of the small hut that I built for my external dust extractor installed behind my garage

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INTRODUCTION TO ELECTRONIC MUSIC

PART 1

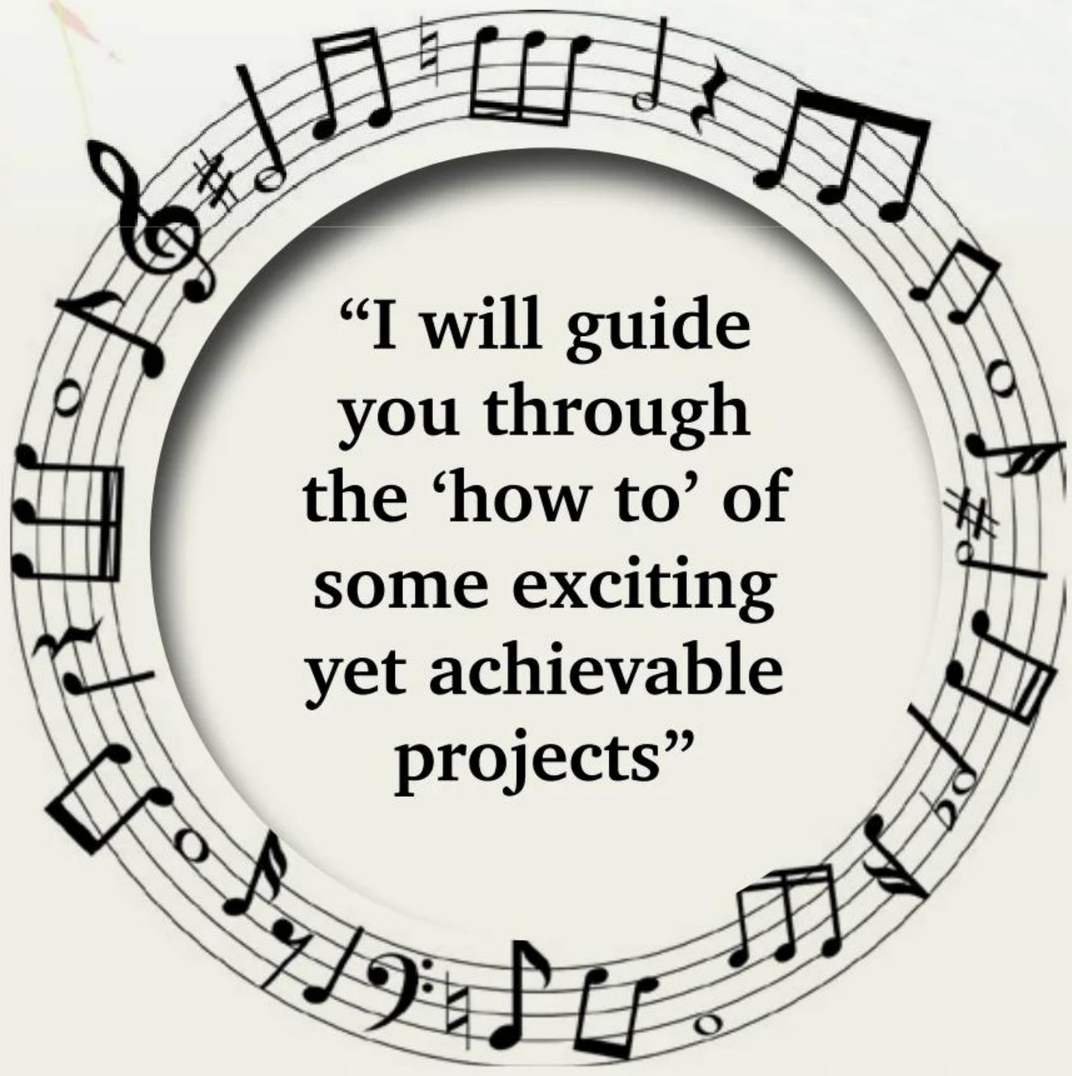
Ever imagined yourself as a John Bonham or a Jimi Hendrix? The magic of electronic music means that you can set up your own one-man band, create original masterpieces, or rearrange your favourite instrumental

By Enrico Miglino | Photographs: Enrico Miglino

In this issue of *The Shed*, we will start a new adventure: an introduction to electronic music, utilising theory, examples, and electronic projects.

Throughout this and the following articles in this series, we will explore the practical side of electronic music creation, looking at hardware and software options. I will provide the essential theoretical knowledge and references for studies, and guide you through the 'how to' of some exciting yet achievable projects for you to try.

I am not a musician, but I love music and I am a maker. After playing classical music on classical guitar for more than 40 years, I moved to electronic music some years ago, mixing traditional instruments. That was the starting point of merging making, electronic knowledge, software, and electronic instruments.



The many meanings of 'electronic music'

Electronic music is a genre: the most skilled electronic musicians are also producers. They use electronic machines, sound samples, and more, including physical computing, creating musical subgenres such as house, techno, trance, dubstep, drum and bass, ambient, synthwave,

and industrial. Indeed, electronic instruments are increasingly present in classical music.

Most of these performances do not involve traditional musical instruments – of course, there are exceptions – while, frequently, original soundtracks are adapted and arranged. It is not unusual to discover that some arrangements are inspired by classical music, from Mozart to Beethoven, antique music, classical sonatas, and popular songs from the 1980s.

A way of playing

Electronic music is a way of playing, regardless of the genre. Frequently referred to as rock and metal, electronic music includes pieces in which electronic musical instruments like synthesisers predominate. We can also include electronic instruments such as digital drums, electric pianos, and analogue synths.

Experimentation

Electronic music is a way of conceiving the song: execution, production, and post-production. This approach is the most flexible and open to experimentation and is the one we will follow. It allows us to explore the broadest range of possibilities, including creating original sounds and making custom sound machines.

Choosing the right tools

The market offers several different tools for electronically managing sounds. If you are lucky enough to make music with a band, it is likely every member will have skills in his own musical instrument, such as electric guitar, drum, keyboard, etc.

Then there is the one-man band. This should be seen as an alternative rather than a limitation. It can also be more fascinating. Nowadays, it is possible to follow this approach without affecting the quality.

In this instance, we can explore the

“This approach is the most flexible and open to experimentation and is the one we will follow”




MENFYS 5
BOSS
Fender
BOSS GT-1

entire scenario offered by electronic music production, refining the choice of tools, which, in many cases, also means the need for a proper investment.

After some years of experimentation, I learned how to optimise the choice of tools, orient on an attractive market with a broad range of offers, and optimise my investment by choosing only the essential but not the least.

The images in this article display as many accurate details as possible of the electronic tools that I currently use. Choosing the tools was not simple, and I often made the wrong choices. The final reason for choosing one device instead of another is personal. In this series, I will explain the reasons for my choices, hoping that this will help other music makers minimise their concerns.

What to expect starting this adventure? Expect to make changes to your devices more than once, and begin to search your favourite online second-hand markets.

Be minimal

Regardless of your preferences, you should minimise the number of devices as much as possible. In many cases, connecting a lot of filters and pedals, or creating convoluted effect chains, makes things complex without appreciably improving the quality of your production lab.

The final decision of this minimal approach is whether you will use traditional instruments. ▶

Below: In most cases, a good pair of headphones is recommended for producing music; during the post-production steps, it is useful to identify the slightest sound variations and ensure perfect sound synchronisation. Headphones are also the right solution for playing and editing sounds in crowded places. On the other hand, a music studio, with a good amplifying system to hear the work in the studio environment, is hard to beat.

Personally, I suggest avoiding, where possible, a home-stereo set-up in favour of a studio audio-monitor set. In my case, as I also use an electric guitar and other instruments, I use a stereo multifunctional amplifier Dual Cube LX.

This device can accept a direct electric guitar as input or a stereo signal from other sources. It has the ability to set the final stage sound by operating on some effects – including a Bluetooth connection and an app to create presets – and emulate some iconic amplifiers.



Left: The back side of the Dual Cube LX shows the external connectors. Input and output signals can be mono on the left channel or stereo on both 6mm jack plugs. The USB connector gives access to a laptop application for creating and saving amplifier configurations on the computer instead of using the Bluetooth connection with the iOS app.

The amplifier also accepts an aux input to connect a playing device, such as a smartphone or an iPod. When a headphone is plugged into the amplifier, the output circuit is excluded (to avoid noise), but what is then heard is the final stage, the same sound as the amplifier processes.

The choice of studio amplifier is guided by the musicians' practical needs, the instruments and devices they will use, and their preferred genre of music.

Regardless of the specific choice, these guidelines remain valid as a helpful tip for deciding between market options.







Above: The phaser splits the audio signal into two paths. One path remains unchanged, while the other passes through a series of filters that shift the signal's phase at various frequencies, creating a unique range of effects.

Guitarists and bassists, playing in a '70s–'80s musical style, frequently use long effect chains that modify the instrument's audio signal to create the sound they want to play.

I use a few single-effect pedals in my set-up, as I always try to find simpler alternatives, plus I pay attention to budget.

However, this phaser effect pedal is an exception and a good example of how adopting a specific effect is actually worth it. The Waylon Jennings Phaser is an analogue electronic device that can generate an iconic sound from the '70s.

It is important to consider the order in which the effect devices are joined; the effects chain order can drastically modify the final result. Every effect pedal processes the input signal exiting from the previous one; for example, adding a gain effect before or after a distortion can add more or less of a metal sound style.



Above: We will probably include a good laptop in our set-up. It can be used for on-stage execution, post-production, or arranging and preparing sounds for the composition. In some cases, after the laptop has been used to create the right sounds and virtual instruments, it is no longer needed in the final execution.

Nowadays, the trend – which I like – is the use of small portable laptops with external audio boards instead of big desktops with powerful internal audio boards.

The reason is simple: external audio boards are more efficient, can be replaced without installing software applications and drivers, and can be easily used on multiple devices. This image shows the MOTU M4 audio board that I am currently using, but I don't exclude replacing it with something different in the future; other mid to high–range brands, such as Focusrite, offer similar performances.

After using several different brands, I decide on the parameters that count on the choice. First is good USB-C support and compatibility with the major computer DAWs. Then there is the digital-to-analogue converter (DAC) bit resolution. The most diffused commercial quality of audio productions is 48 bit, so a DAC with a maximum of 96 bit is more than sufficient to produce quality audio works. Indeed, the higher the conversion bit rate, the more powerful the computer should be to avoid glitches (small interruptions) in the audio while playing and recording.

In my case, I considered two input/output stereo audio channels – or four mono channels – sufficient; I work alone, and I rarely need to play with multiple channels at the same time.

In the case of a band, the choice should take into consideration the fact that the audio board is not the only mixing element in the set of tools.

My previous audio board models required a computer connection to work properly. Then I realised that stand-alone audio boards such as the MOTU M4 fit multiple set-ups, including times when I am not planning to use the laptop.

The guitar is my primary instrument. After abandoning the classical guitar, I built my electronic music ecosystem around an electric Fender Stratocaster.

Using my minimal knowledge of the piano keyboard and other traditional instruments, such as the harmonica, I started finding ways to create the desired sounds for the pieces I decided to produce, mixing the electric guitar sound with traditional instruments.

As mentioned, knowledge of one or more of the traditional instruments is not essential. It doesn't limit the possibility of creating original sounds, arranging known pieces in a new way, and more.

Dominate the sound

This is an essential factor, independent of the kind of instruments and tools you use. ▶





Left: Repeating the advice once again, I suggest choosing the effect pedals carefully. A long effects chain frequently makes it difficult to obtain the desired sound, and effects are expensive. Most devices have echo and delay effects, as they are a standard part of the sound designs: amplifier, looper, sound processor, and the same DAW can't be considered complete without them.

The reason that I bought the Roland Space Echo RE-202 (other brands offer similar ones) is that it is an uncommon one. This box reproduces the iconic Space Echo RE-201 (using the same Roland proprietary circuits).

Introduced in 1974, the Roland Space Echo RE-201 is one of the most legendary effects units ever produced. This tape-based echo and delay remained in production for more than 14 years, and its distinctive rhythmic echo sound and warm character inspired musicians, producers, and audio engineers over four decades.

Right: The loop feature is present in many devices and software. It records a segment of audio then plays it back in a continuous loop of anywhere between a few seconds and one minute. Therefore, it is possible to record multiple short music sequences (overdubbing) so that the live playing can evolve in real time.

Loopers with this time limitation are perfect for recording rhythm sequences and layering multiple chords, but they do not cover a wider range of possibilities. I experimented with several loopers, including those included as an extra feature of other devices, before opting for a more complex and flexible one: a loop station.

The Roland RC-500 that I am using covers all my needs and is useful as an example of the completeness of what is available on the market.

To select the right looper, you should consider the kind of music and instruments you are playing. The most important parameters to consider are the maximum time duration of the loop, the number of loops that can be stored, the possibility of synchronising the timing with other devices, and the number of available channels.



Producing new sounds and sonorities cannot be achieved with random experiments. It is possible that, by modifying the sound parameters through electronic effects and filters, you will reach a pleasant tone, but it is not the same.

If we want a particular sound 'flavour', we should be able to reach and refine it until it is precisely what we have in mind. To achieve this goal, it is necessary to know the parameters that can control a waveform and how these parameters modify the sound. Facing some theoretical aspects of waveform editing, we can dominate the sound, defining an exact and repeatable configuration to achieve the desired result.

When exploring some sound machines (pedals, effects, sound processors, etc.), we will see the impact of these on the final soundtrack.

To simplify the concept: consider a set of sound machines that can modify the original waveform from an instrument or a sample – for example, a gain pedal, a vibrato effect, an echo, and a compressor. For now, it doesn't matter what these effects mean.

Every effect can receive an audio signal in input and produce a modified audio signal for output. Here, we focus on another crucial aspect: the effect chain. Applying an effect before or after another one can drastically change the musical result; for this reason, choosing the best ▶

Below: This Teensy-based MIDI hub answers a simple question: why a dedicated MIDI hub when I already have MIDI bus features on some of my devices?

The answer is also simple: depending on the kind of music, not all the pedals, loopers, and other hardware tools are always used simultaneously.

When I started my maker experiments with electronic music some years ago, I thought a MIDI hub was unnecessary. Almost all devices include at least a MIDI in/out port (USB MIDI, Bluetooth, traditional MIDI cable plug, and more); regardless of these specific MIDI ports, it is useful to have an independent hub with which I can connect the controls of different devices – or a group of already-MIDI-connected devices – to manage the MIDI paths as well.

When I realised the need for a MIDI hub, I initially aimed my choice at automatic MIDI switching; depending on the in/out connected to the device, it was automatically able to take a master MIDI to control the others. Unfortunately, the enthusiasm lasted only a few days; this fully automatic switching mode did not fit in several configurations, and every configuration change required plugging and unplugging the cables in the hub. For this reason, I returned the device and moved to the MRCC 880 by Conductive Labs. It is a reliable and stable MIDI hub controlled by a Teensy microcontroller, and I discovered it is very popular. The advantage is that the MIDI chain and the in/out settings can be configured with temporary switches, saving up to four custom presets.

Of course, there are good alternatives on the market, including models supporting more MIDI connections; my experiences have taught me that a digital switchable MIDI hub is preferable to fully automated ones.



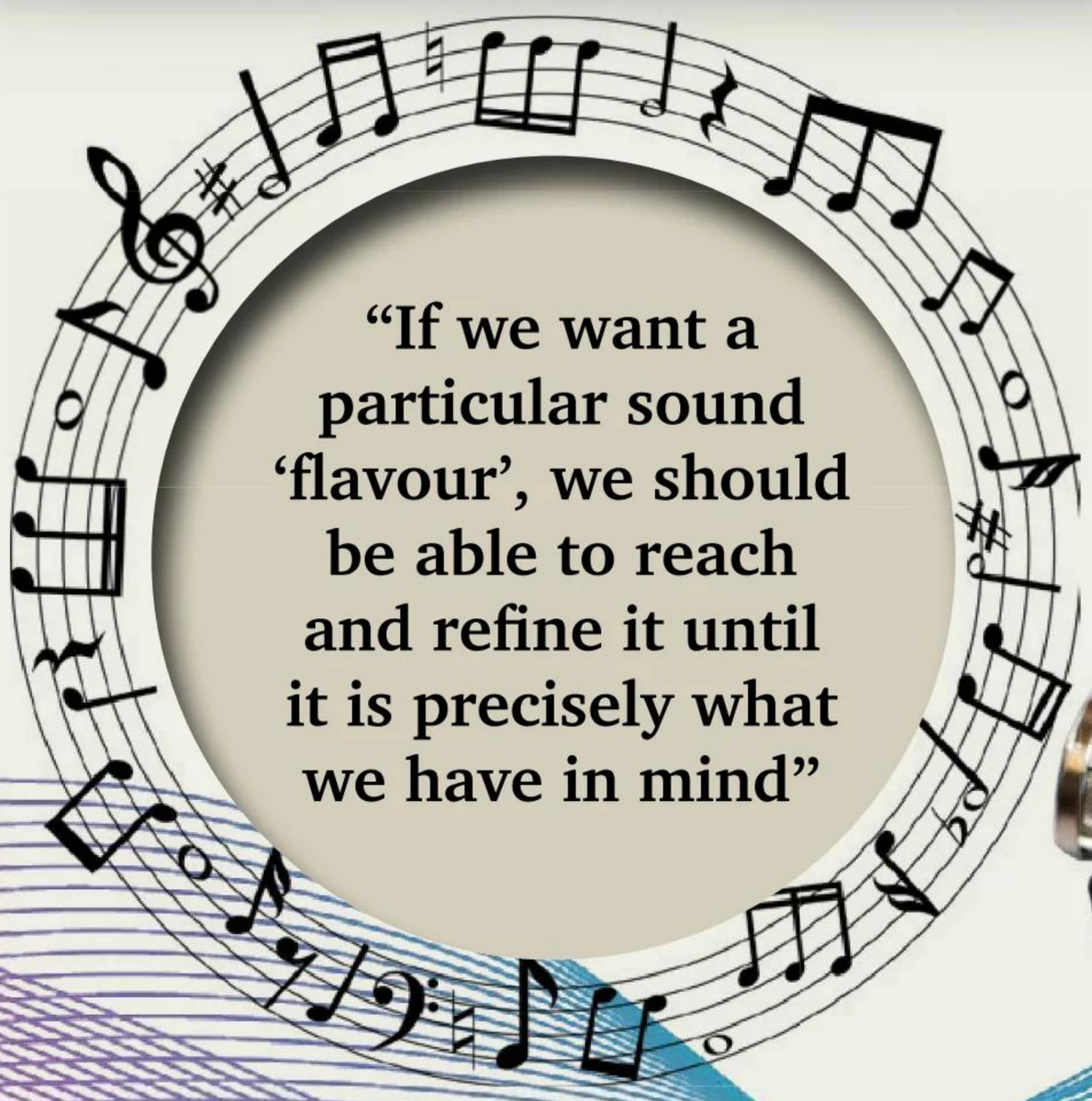


Left: Technically, the Elektron Digitakt is a drum machine and sampler, but it includes many interesting features, making it one of the essential tools in my set-up.

The first is the ability to manage samples and convert them into sounds that can be immediately used as drum components. Any sound can be customised by modifying its waveform parameters in a way very similar to a synth.

With the only condition of always including the device in the set-up, Digitakt also provides eight MIDI ports – with different configurations – to control other devices: it can be considered an extra MIDI hub. All the samples and settings can be exported for backup purposes, and samples can be uploaded using a USB port and a laptop application.

These characteristics and its 64 steps make it possible to create any chainable rhythm. Multiple-step sequences can be configured to be played like components, making it one of the most flexible devices of its genre.



“If we want a particular sound ‘flavour’, we should be able to reach and refine it until it is precisely what we have in mind”



Right: I got this Tascam sound recorder for a specific project that I worked on after trying to use the smartphone voice recorder with poor results. Until then, I considered this small accessory – the cheaper one of the Tascam series – unnecessary; that was, until I started handling it.

The online market offers thousands of audio samples of all kinds – high-quality audio waves ready for use. This is one of the handy tools that I use to record sound daily.

effects chain is another crucial aspect of dominating the sound.

Electronic instruments, traditional instruments, and then?

Until now, we have been discussing how to make electronic music – or, better, produce electronic music – using any mix of electronic instruments: synths and traditional instruments, electric guitar, bass, drum, etc.

An optional series of electronic effects can also be set to modify the audio signal through an effects chain.

There is a third group of devices that can elevate your creation's originality and unleash the maker's fantasy and creativity.

These are electronic musical instruments, or effects created by modifying, recycling, or upcycling electronic devices initially created for a completely different use. I refer to this kind of making as 'circuit bending'. ▶

Below: Synthesisers are the most fascinating product of electronic music's evolution. All the other products, tools, and instruments started from creating sounds with electronic circuits.

I started experimenting with computer-generated music and electronic circuits that could generate sounds in the early 1980s. The two decades before that were the period that produced the most iconic synths, from Moog (Robert Moog, 1964) to APR (Alan R Pearlman, 1971) and EMS Synthi AKS (Electronic Music Studio, 1972).

Starting from the second half of the 1970s, many brands entered the electronic music market, with high-rated quality products: Yamaha CS-80, used by Vangelis in the movie soundtrack for *Blade Runner*; the first fully programmable polyphonic synthesiser Prophet-5 (Dave Smith, 1977), used by Michael Jackson and Madonna; and Fairlight CM-1 (Peter Vogel, Kim Ryrie, 1979), used by Peter Gabriel and Kate Bush.

The Japanese Roland entered the market between 1973 and 1974 with the SH-1000 and SH-3, two monophonic synthesisers that quickly became very popular. Among the models produced by Roland until the end of 1980, those that had the most impact in the evolution of electronic music are the SH-series, the flagship Jupiter-8 in 1981, the Juno series, and the Roland JX-3P.

The image shows the Roland SH-4D model launched just two years ago. It is incredibly powerful, and includes the circuits of the oscillators used in the original iconic models (Juno, SH, Wavetable, and others) from the '80s, plus a new class of oscillators specific to this model. The SH-4D offers an incredible number of possible sound settings. For me, it represented the happy medium between the cost and the possibilities constrained by budget.







Above: I resisted using a mixer for about a year; producing music without one is possible. To do some experiments without always being obliged to use the laptop DAW to manage multiple tracks – and to save time – I got a Yamaha analogue mixer, and my approach to managing the track radically changed.

A mixer may be avoided when making music solo, but it becomes indispensable for a band. Of course, the number of channels and the control features depend on the number of instruments and musicians. My first Yamaha had eight tracks and supported internal features like send-receive.

The unsatisfactory aspects of this mixer are the impossibility of connecting it to a computer and the absence of a MIDI port. For this reason, after using it extensively and always suffering from these limitations, I moved to a full digital Zoom eight-channel mixer, as shown in this image. Designed for a flexible job, including podcasting, the Zoom digital mixer includes some extra useful features: when it is connected to the laptop, it acts as another audio board, it can be configured with a series of presets easy to recall, and it can record every separate track on an SD card.

This technique consists of modifying the original electronic circuit or the mechanics of a device, such as a washing machine, a fan, an ’80s video game, or a child’s toy, to generate sounds.

Circuit bending is one of the most fascinating ways to create electronic sounds, and I plan to introduce it and present some exciting projects in the upcoming instalments of this series.

The one-man band

I will conclude this series introduction with a simple listing that I consider the base for producing a song, whether it is a cover, a piece we want to revisit and arrange, or a raw new musical idea.

In my opinion, minimal elements should be involved in the production. We should be able to manage a rhythmic part, not necessarily a conventional drum session, and an instrumental part. Around these two combined elements, depending on our capabilities, knowledge, and technical possibilities, we can add lyrics, variations, multiple instruments, and more.

A band can create an ensemble musical piece where all the elements play together. A one-man band experiences some limitations, but this does not represent a constraint that prevents anything, including playing on stage. A solution can be achieved by creating the tracks that a single musician can’t play simultaneously and running those in a live session using a digital audio workstation (DAW) with the help of a computer. Using a laptop, an audio board, and a DAW configured with all the presets is very different from playing a pre-recorded music set.

This approach gives the musician a wide spectrum of possibilities for interacting with the system while playing his instrument.

The MIDI protocol can interface musical elements based on physical computing (microcontrollers like Arduino boards and embedded Linux devices like the Raspberry Pi) to create interactive complex sonorities.



Above: I consider my Boss GT-1 to be the replacement for many effect pedals. It saves me money as well.

This device, the smallest of the series, is a sound processor. It is a complex device, with which it is possible to design complex sounds through a series of effects chained in a chosen sequence to create a desired sound. It includes a well-designed software interface.

Sound processors can be used as the unique effect pedal (it is possible to create any custom preset and select them while playing) or as the first effect pedal in the chain.

The sound processor accepts a mono input from the electric guitar – but bass versions exist as well – and provides a mono or stereo output that can be sent to other effect pedals or directly to the amplifier or the mixer. The only real difficulty is setting this kind of device; the more you know what every parameter means and how it influences the sound, the better you can achieve your desired audio result.

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The team has a mission and that is to provide the best second-hand tools that it can source from the best international suppliers



Since 1996, Tool Barn has been a staple in New Zealand for anyone seeking quality second-hand tools.

As a family-owned and -operated business, Tool Barn has developed a strong and loyal following, thanks to its commitment to excellence and passion for tools. Founded by the father-and-son team of Ross and Roger Exley, the company quickly established itself as New Zealand's premier second-hand tool dealer, known for its dedication to quality, service, and customer satisfaction.

Ross Exley, who has since retired to pursue his love of fishing, remains an active supporter of the business, while his son Roger continues to drive the business forward.

The company mission

The Tool Barn team maintains the original mission: to provide customers with the best tools from trusted makers across the US, England, and Western Europe. This focus on quality has become a cornerstone of the business, ensuring that every tool is up to the highest standards before it reaches the hands of a customer.

At Tool Barn, the process begins with sourcing tools from a variety of places. Once acquired, the tools are meticulously refurbished by the team to restore them to their former glory. The result is a wide selection of reliable and affordable tools for every need, whether for automotive work, gardening, home improvement, or any other project. Customers can explore the extensive inventory online or visit the shop in person to find exactly what they need.

Exceptional customer service

The business prides itself on exceptional customer service, offering personalised assistance to help each customer find the right tool. If a customer cannot find what they are looking for online, they are encouraged to call or visit the shop for a more personalised experience. Tool Barn's knowledgeable staff is always on hand to answer questions, provide advice, and help customers make informed decisions.

Tool Barn welcomes inquiries about specific tools and is always eager to assist with any questions. Customers can reach out through the website or call directly on 09 570 8064. With its unwavering commitment to quality, service, and customer satisfaction, Tool Barn continues to be a trusted name for tool enthusiasts and professionals throughout New Zealand.

TOOL BARN
The Home Of Preloved Tools

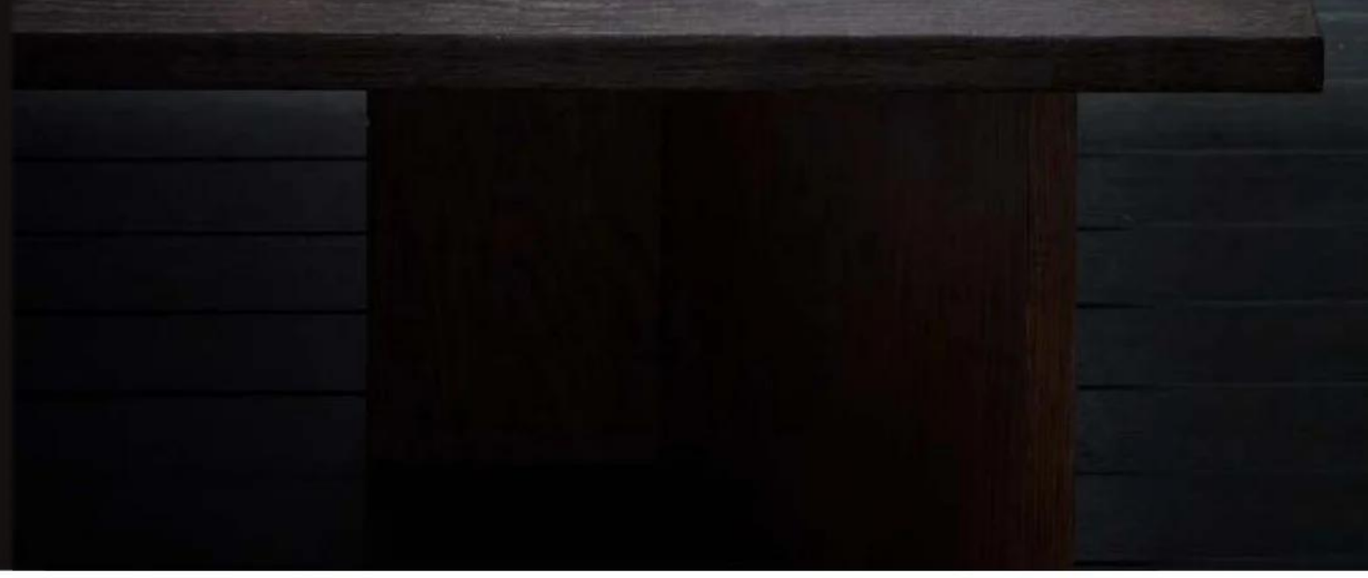




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Available from Resene ColorShops and selected resellers, resene.com/colorshops.

ALL HANDS ON DECK

On the neglected site of a former rubbish dump, hundreds of staff and volunteers have lavished their energy and love on the machines of the past – creating an Auckland landmark that entertains, educates, and sparks the imagination

By Chris Hegan | Photographs: Chris Hegan, Graham Anderson, MOTAT



It is Tuesday evening: volunteer night at the Auckland Museum of Transport and Technology (MOTAT) rail workshop. Marty Radford (*The Shed* That Ate the House, *The Shed* Issue No. 114) is the head workshop volunteer here and has invited me to come and look at their work. Marty has been volunteering since 1987 – back when "all we had was a lathe and two benches".

Marty introduces me to Jacob Stuart and Cameron Teague, who are working together on a trailer for one of the museum's many railway jiggers – once a familiar sight on New Zealand's railways. Railway workers rode jiggers from job to job; some were motorised, but others were manually propelled by the cranking of a handle in the centre.

Jacob took up volunteering here two years ago, having spent a decade with the Glenbrook Vintage Railway. His reason for the shift?

"That's a loaded question. Friendlier team here, and, er, politics would be the best way to put it," he says.

Like most of the crew, he is here every Tuesday and at other times when his job in childcare allows, as well as on the third Sunday in every month, when MOTAT goes live.

Cameron has been coming here since last November, usually working on carpentry projects. At present, he is working on the carriage and helping Jacob on the jigger trailer. He has finished high school and is currently looking for a job. ▶





Pranz Cortez and Cameron Teague jigging under the full moon

Enthusiastic high school kids

"Jiggers," says Marty, "are really, really good at keeping high school kids enthusiastic about coming here. Everyone has a go, regardless of age. It's particularly good because our rail line isn't flat; it has a 1:50 incline. It's all right going down but you have to work to get back up again."

Next we meet Alex Smith, the team's stencil specialist, and the railway crane – a project finished in 2014 when Alex made and applied the stencils. It is massive, able to rotate 360 degrees and lift five tons. Incredibly, it is hand operated.

"It's massively geared, of course," Alex explains. "It's the oldest activity on the site: a Ransomes & Rapier made in 1874."

The crane can lift a whole track set – two rails with the sleepers attached.

"Before this, they had nothing," says Marty. "So the crane was a massive leap forward in its day."



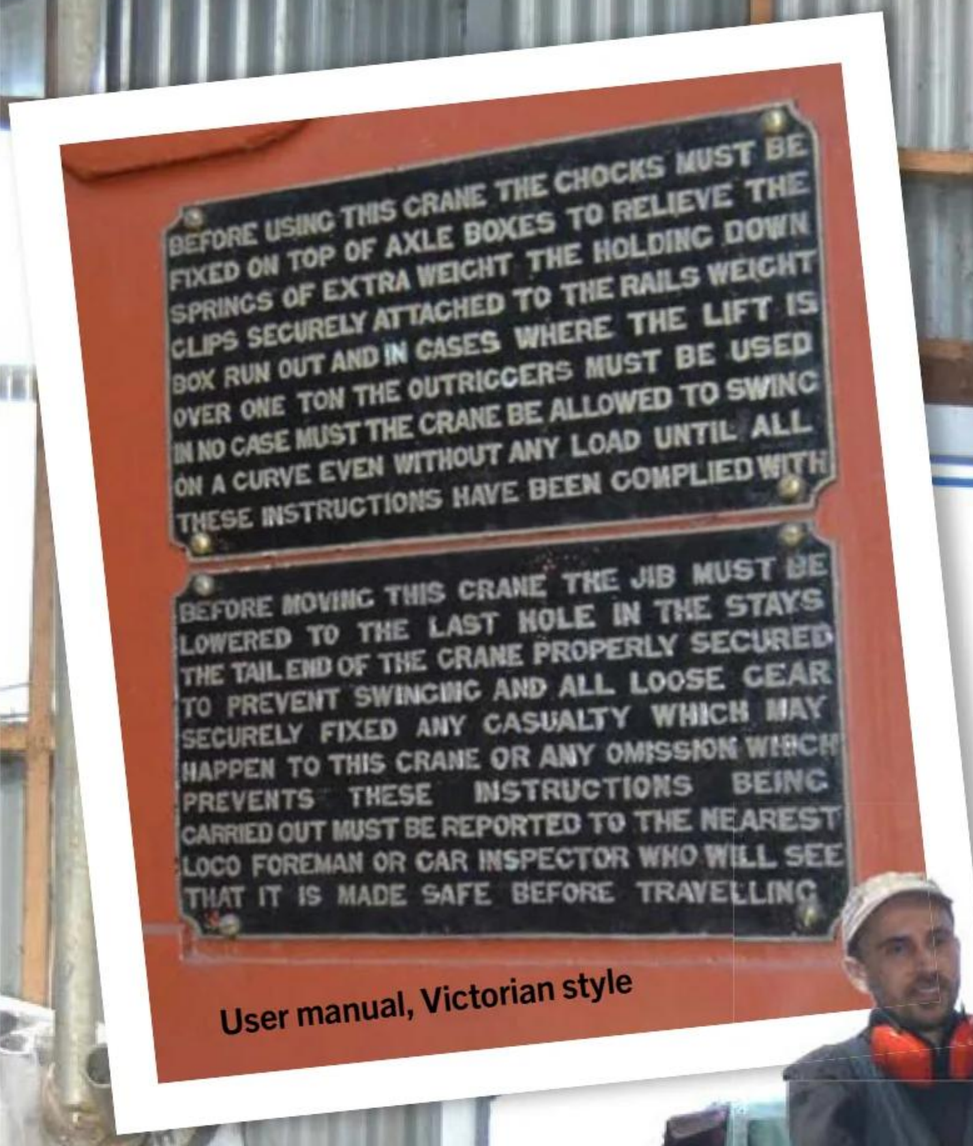
Cameron Teague and Jacob Stuart

The makers weren't taking any chances of misuse or accidents – two big plates on the back made sure that the instructions would last as long as the machine did, and, as it's a classic piece of Victorian big iron, that may be a very long time.

Yarn-swapping time

The call goes out for dinner. The volunteers take it in turns to do a run to the takeaway and gather in the mess shed for a shared meal. Several men and one woman gather around the table to swap yarns and talk enthusiastically about an upcoming away event. A steam traction group called 'Maewa', just out of Fielding, is having its annual live day. A group from the rail workshop goes down every year to help out – driving, stoking, and getting to play with someone else's toys at The Great Manawatu Steam Fair.

> "Everyone has a go, regardless of age"



User manual, Victorian style

Alex Smith operates the 1874 railway crane capable of lifting five tons by hand

The rail team at dinner (photo: Graham Anderson)



The jigger kids, 1988 – Marty Radford in the white hat

Jodie Humphrey is going.

Jodie is one of the team restoring 'Bertha', the 1904 steam locomotive that is the pride of the fleet; she also helps with the group's admin. She's in her fourth year and points out David Graham, who joined at the age of 11, 18 years ago.

'The Big Push'

Some of the older hands remember 'The Big Push' in the early '80s. The present site of the workshops and the Aviation Hall was still a landfill dump with a couple of old planes sitting to one side in the weather. They called in every Auckland contractor with a bulldozer willing to volunteer, and a crowd of 8000 people watched 22 bulldozers, one driven by celebrity jockey Grenville Hughes, level acres of ground.

"The council leased the land to MOTAT because it was of no use for anything else. You couldn't put houses on it because of the methane gas from the former rubbish tip on the site," Marty explains.

The council put in drains and capped it with clay to stop water getting down and activating decomposition but the emissions are still monitored, with gas alarms all over the place.

Now, the site is home to structures ranging from canvas marquees and shipping containers to warehouses and workshops, a fully equipped railway marshalling yard, with a diesel-powered shunter and bunkering and an elevated timber tank for the steam locomotives.

Biggest team

The rail volunteers form the biggest single workshop group at MOTAT, probably helped by the variety of work and the opportunity to learn new skills, but they would still welcome more hands.

Because of the skills required in

restoring and operating MOTAT's four steam locomotives, the rail group is the museum's de facto steam group, looking after steam-powered traction engines, stationary engines, and a steamroller, with more machines on hand awaiting revival.

A walk around the numerous workshops and storage buildings behind the scenes at MOTAT reveals a large and varied stock of machinery awaiting restoration, dating across most of New Zealand's history and greatly exceeding the labour available to do it. That does not take into account the big warehouse in Penrose, which holds even more. At last count, the museum had approximately 300,000 items on display or in storage.

The stencil guy

A few days later, I find Alex Smith restoring the markings on one of the last railway goods wagons to remain in service when containers ended the loading and unloading of wagons.

"It's difficult, but not impossible, to



The marshalling yard

"The crane was a massive leap forward in its day"



Lowering F180's boiler onto the frame in 2011 (photo: Graham Anderson)



A dab hand with a stencil



Bright, white lead

get all the markings right," he points out. "They tended to vary according to where they were done, and the original specs from New Zealand Rail weren't necessarily definitive because people had their own ideas.

"We had a lot of trouble finding a paint that would give a good, dense cover," he explains. "The acrylic paints are too thin."

He shows me a small tin.

"This is used to paint on cars. It's lead-based, and covers completely in one coat. I suppose one small tin of lead paint, which goes a long way, is OK."

The glamour machines

The aviation workshop, home to the most glamorous machinery of all, struggles to maintain a satisfactory roster of volunteers. It does not take long to find out why: aluminium corrodes and there are acres of it – Sunderland flying boats, Douglas DC3s, and Lockheed Lodestars are large planes, often with every square inch needing to be sanded, patched, primed, and painted before the plane is put out to display.

Such labour is not everyone's cup of tea but Mike Smith has been at it for 21 years, working on the flying boats, and still counts it an "absolute privilege to be working with these priceless machines. The Solent [the other huge flying boat] is the only one left in the world."

The smallest team

The smallest workshop team consists of two members: John Triggs, the



Acres of it – NAC DC3 nearing completion

motorcycle restorer, often aided by Dan Healey – both former race competitors. They are currently bringing a 1920 Douglas motorcycle back to life.

John is a motorcycle guy from way back. He is a mechanic, and he would need to be – the Douglas engine looks nothing like any motor I have ever seen.

"A lot of motorcycles back then used proprietary engines. Norton, for instance, started out using Peugeot-supplied motors but this is typically Douglas," he says.

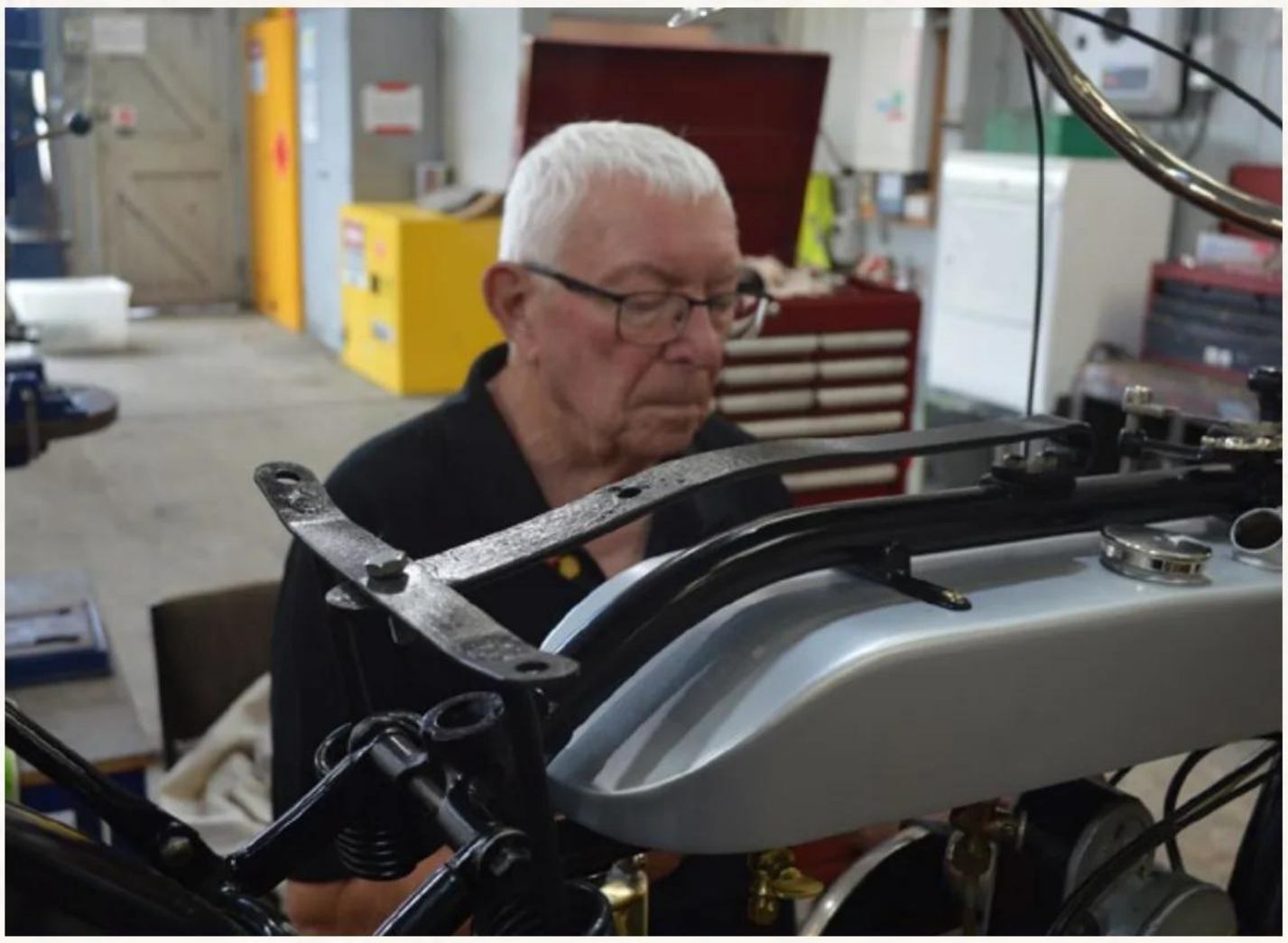
John takes me through the strange layout of the engine parts – magneto on top; a single carburettor feeding a rather crude-looking pipe that feeds both cylinders; a huge clutch, unusual for the period. The placing of the valves and pushrods might well qualify it for the unique descriptor 'underhead valve', which you have to see to make sense of. It all looks very odd but it worked.

"I'll show you its sister, an earlier model. I've actually ridden that, and I don't want to do that again. It's horrible," John says.

He takes me through the numerous controls, including a compression-release valve. The 350cc engine is relatively low compression, but, because it is started by pushing, you needed to get it turning over at speed because "the petrol in those days was rubbish – about 80 octane."

The tyres, surprisingly, are brand new and locally sourced.

"They weren't cheap, at $400 each, but you can get them. The 26-inch diameter was a standard size," he says. ▶



John Triggs working on the 1920 Douglas



An engine like no other

> "Absolute privilege to be working with these priceless machines"



Not far to go now

Where do you get a 6V battery?

One of the hardest things to source is the battery.

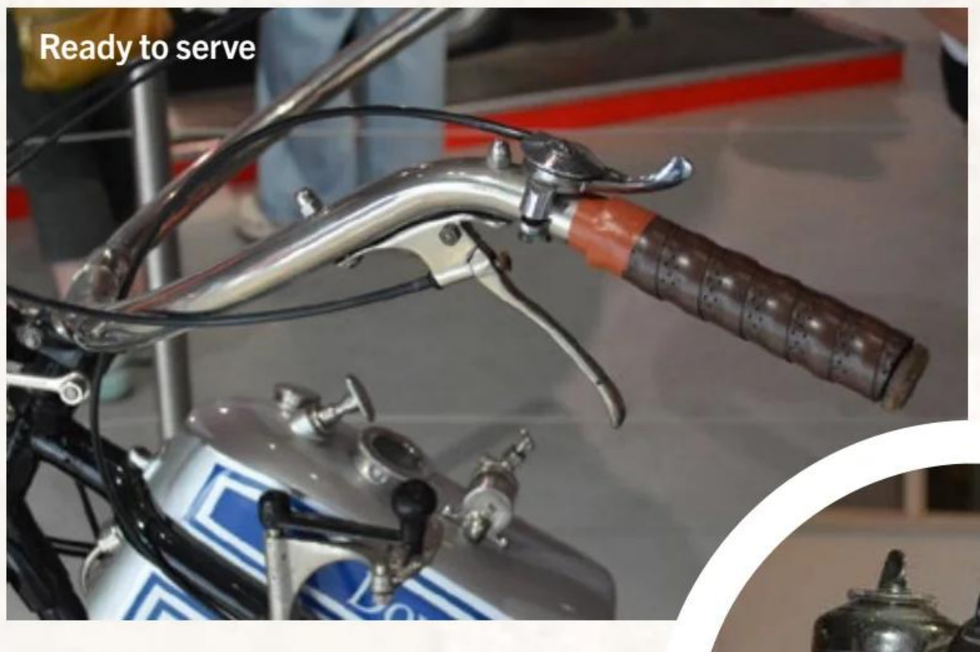
"The older English motorcycles all ran on 6V," John comments. "You try and find a 6V battery these days! Fortunately, I found a place in Lower Hutt that got it for me. That's all it does: supply batteries. Whatever you need, it'll source it and get it in for you."

Oddly enough, getting parts for older English bikes is easier than for modern Japanese bikes.

"Every year, something changes on a Japanese bike – not necessarily interchangeable. That Triumph there has got a new carburettor – a brand spanking new Amal. It wasn't that expensive," he says.

The bare handles (nickel plated, not chrome) on the current Douglas will

Lovely, but a tricky ride


Ready to serve


Idiosyncrasies abound


Have acetylene, will shine

Twist a stud and off it comes



not have grips but be wrapped in the tape used on the handles of tennis rackets, which is how Douglas originally did it.

"They still use them in some industries," John says. "The metal studs holding them together make them easy to remove or resize. I'll darken them using a Raven dye."

The transport display

We head over to Accelerate, the transport display, where the 1912 Douglas Ladies' Motorcycle occupies a well-deserved prominent position. It is an exquisite machine. The silver and blue panels are new, reproduced from photographs.

"I made them," John announces with some pride. "I learned folding and panel beating over at Aviation. The seat we had done at a saddler's, hand-stitched and stuffed with horsehair for authenticity."

The gleaming headlamp is a genuine Lucas acetylene lamp, and it works.

"We don't know if that would have been the model on the original but it is

"You've got so much to do to ride these old bikes"

of that period and it would have had something similar, quite probably a Lucas," he says.

The machine bristles with levers and buttons.

"You've got so much to do to ride these old bikes. That's your spark advance and retard; that's your valve lifter to release compression; throttle and choke on that side; brake here and hand gear change," he points out. "They haven't got an oil pump so you have to pump the oil. There's a sight glass that you pump with that button to fill it from the tank, and there's also a little tap at the side so you can adjust the drip as it goes into the engine. Then there's the hatch in the frame that gives you access to a little nozzle where you can pour petrol in to prime the cylinder."

When all that was ready, the rider would push the bike along to get up speed then leap on and close the compression valve for a jump start.

"Those footboards and the step-through frame were designed for the long frocks that were standard women's wear of the day," John tells me, "but it still called for a bit of strength and skill."

Long restoration

The restoration of this 1912 Douglas started in 2017. John showed me a picture of the bike as they received it, with many parts missing that had to be found or made.

"We got some parts from Holland, from a museum that makes things only for other museums," he says. "The original footboards were ruined, and they made us new ones. The pistons were shot too, so they made us new, blank pistons – just castings. We machined them and had piston rings made."

The identification plate – '1912LM' – marks it as a 1912 Ladies' Model.

"We know that's right because it has '1912' stamped on the crankcase," John tells me.

The Douglas factory was established in Bristol in the early 1900s and continued into the post-war years, as evidenced by another Douglas in the collection: a 1948 350cc model.

It still features an oddish engine but it has lost much of the elegance of the early models. The last Douglas model was the Dragonfly – not a success because, during the war, Douglas had converted to manufacturing electricity generators and used that engine on its motorbikes. Designed to run at a steady pace for long periods, the engines did not handle acceleration well and vibrated uncomfortably. That, and the high sale price, ended the company.

The go-to bike guy

The 1920 Douglas will be John's fifth bike restoration, with plenty more waiting in the wings. Why motorbikes?



The 1912 Ladies' Model as received, cleaned, and painted



The 1948 Douglas 350cc – the end is nigh



Jolly Douglas, proud of his wee engine – decal reproduced by the oddly named British Only Austria



A party every year (photo: Graham Anderson)



Ex-Army 1944 AEC Matador 4X4 artillery tractor (photo: Mike Beck)



World War II 40mm Bofors light anti-aircraft gun

> "I gave up riding a few years ago – I think I lost my nerve"

"I grew up with bikes," he says. "I gave up riding a few years ago – I think I lost my nerve. I thought, *I'm getting older and if I fall off it's going to hurt.* It was a pity. I had a Suzuki 650 Bandit, a lovely bike that I used to take to race meetings, the Auckland Motorcycle Club, and all that."

John has been volunteering at MOTAT for 10 years and commutes from Warkworth, where he also volunteers at the district museum. Although he is focused on motorbikes, he is often seconded to other tasks.

"That's the beauty of volunteering here; you never know what you're going to be doing," he says.

Different strokes ...

Meeting up with the small but dedicated team at the military workshop, I find there seem to be different approaches to curation and restoration among the various groups.

The rail group aims for restoration to a pristine working snapshot of a period in the vehicle's life. The military group is happy with equipment that is clean and operates properly, but shows its years of service.

The aviation team, understandably, is focused on preservation of the object and an immaculate display of the exterior. No one is going to try to fly these precious relics that go back almost to the very beginning of the age of aviation, nor even run an engine in the carefully controlled atmosphere of the Aviation Hall – although there is a regular demonstration of the folding wings and working bomb bay of the Grumman Avenger World War II torpedo bomber.

Other volunteers run the print shop and the collection of boilers in the

pump house, and fill visitor-facing roles as docents, tram drivers, and tram conductors.

Every team has stories to tell, immersed as these volunteers are in the history of the machinery and the challenges of rediscovering skills and techniques no longer in use. In upcoming issues, *The Shed* will meet some of these eager volunteers and look at their work through their eyes.



Grumman Avenger – folding wings, bomb doors open

MOTAT is born

Sixty years ago, the Old Time Transport Preservation League, the Royal Aeronautical Society (New Zealand) and the Historic Auckland Society got together on a joint preservation venture.

MOTAT came into being on the site of the steam-powered pump house that had supplied potable water from Western Springs to central Auckland.

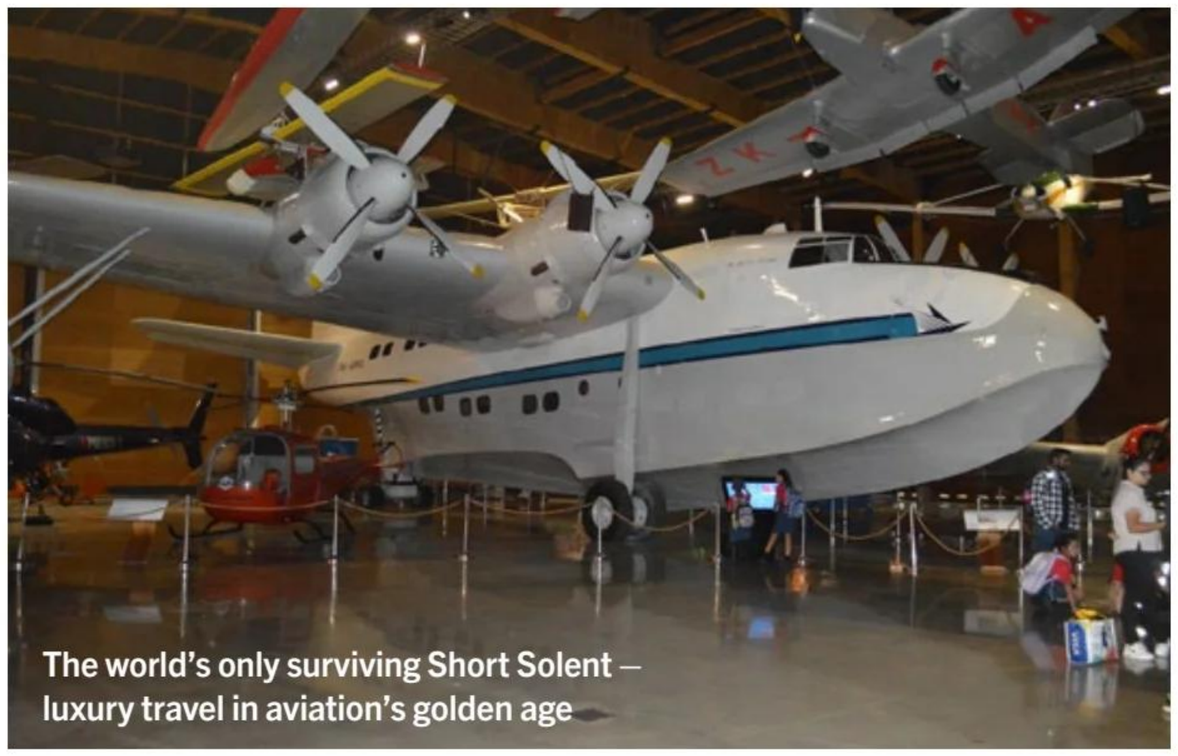
There have been periods of great energy and development and those when the effort and public interest flagged. Then, in 2000, Parliament passed an act that assured funding from every Auckland local body, and today MOTAT has never looked better.

Two hundred staff and a similar number of volunteers restore, curate, and display a collection chosen from hundreds of thousands of historic items – from typewriters to enormous World War II aircraft – many of them now in state-of-the-art preservation.

Most older Aucklanders remember the sight of the sadly deteriorating aircraft beside the Meola Road rubbish dump. Those planes now sit at the heart of one of the biggest and most diverse aircraft collections in the Southern Hemisphere, shining in near-original condition under the largest ClearSpan timber roof in the country. Most of this epic feat of preservation and restoration has been achieved by, and continues in the hands of, volunteers, managed and supported by the staff, particularly Graham Anderson, the volunteers manager and enabler-in-chief.

For many of these city-living volunteers, MOTAT is their shed – one where they may enjoy the chance to relearn and reinvent lost skills. It is unquestionably one of Auckland's success stories.


In at the start – volunteers in the late '60s (photo: RC Mann)


The world's only surviving Short Solent – luxury travel in aviation's golden age



Steam tram, one of three working models in the world (photo: MOTAT)

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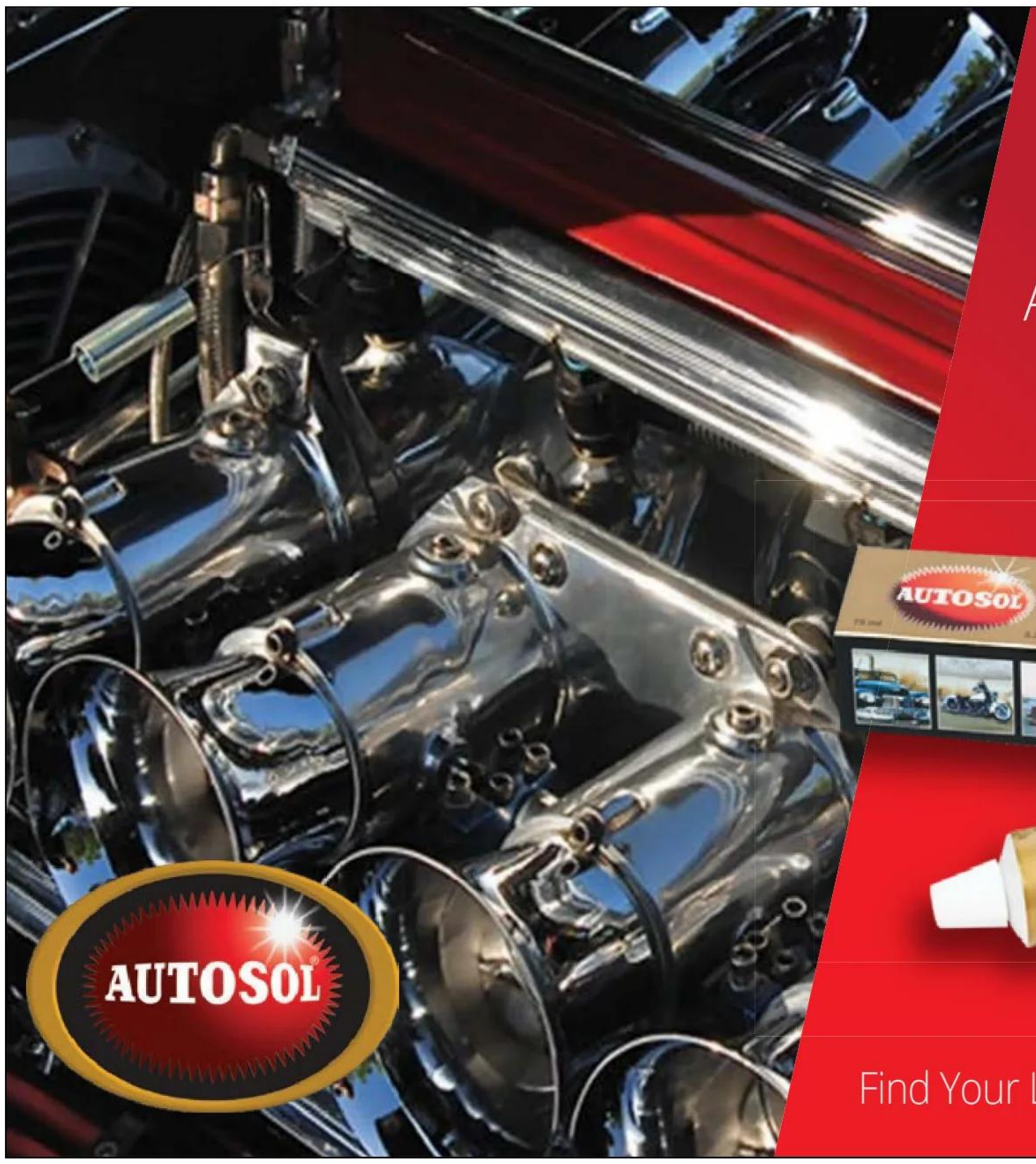


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A MUSICALLY INSPIRED STEAMPUNK CHANDELIER

A mind-blowing live performance sets the stage for a mind-bending creation

By Murray Grimwood | Photographs: Murray Grimwood

Music is a big part of my shed time and I can handle anything from baroque on – apart from most disco and all hip-hop.

I tend to choose a style to fit the work in hand – although sometimes you could accuse me of choosing the work to fit the music …

Recently, my better half was away catching up with family, leaving softly gloved instructions, such as: “We could do with more light over the coffee table.” I filled the void by playing my – but not her – favourite piece of music, and learning all I could about it. One version begins with a steampunk scene – an airship moored next to a castle – which gave me an idea for a chandelier. Funny how things trigger things … trigger things.

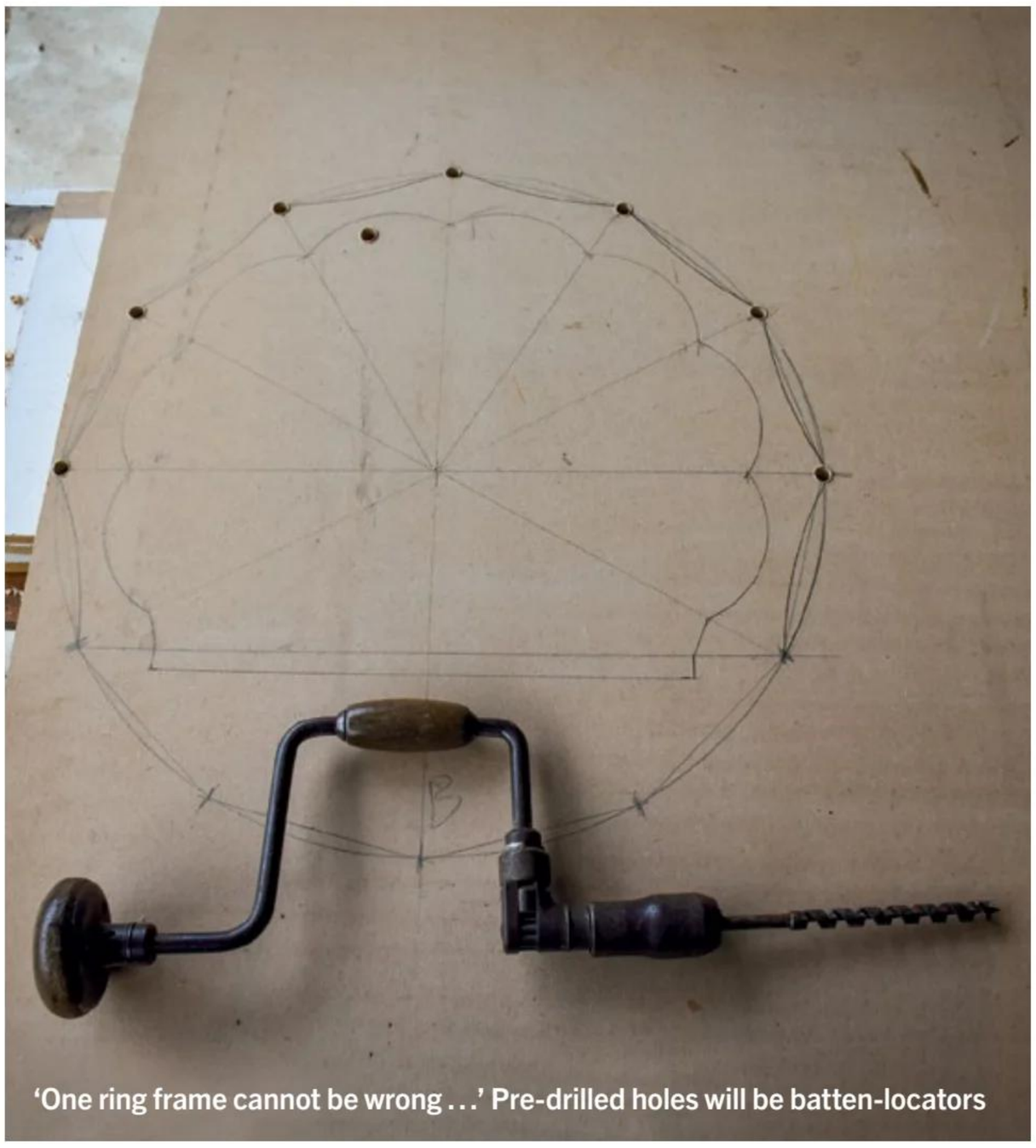
Options galore

I turned over the options in my head. I could make a passable airship out of hang-glider battens, plus, I’ve owned an unassembled Heller 1:50 *Le Chebec* kit for 40 years; time enough to tell me I’m never going to assemble it in formal form.

How about I sling the ship under a dirigible and light the whole caboodle with LEDs? Sounded like a passable plan – well, she did want more light over that coffee table. So there I had it: an almost legitimate excuse to get a little creative.

The song in question is Ghost Love Score, by Nightwish; the band’s Wacken 2013 version is one of those rare live performances that out-delivers the studio recording. I got it up on YouTube, hit ‘loop’, and left the laptop close to where I was working.

I’ve probably watched it 100 times – maybe more – but even now I still stop to watch the last



‘One ring frame cannot be wrong …’ Pre-drilled holes will be batten-locators



“Funny how things trigger things … trigger things”



. . . we were on a road to somewhere . . .

part; how often do you see that kind of chemistry between the stage and an 82,000 strong crowd?

How can a band – and singer – who have already been on stage for an hour-and-a-half knock out something like that? We are an amazing species.

Construction begins

Anyway, I started with a pile of gold anodised battens and a mental image of a curve. Bent a batten until it looked right. Drew around it on some scrap MDF. Bent up more battens to the pattern, until I had seven. Now for something to splay them around. I'm quite capable of lofting boats and suchlike the old-fashioned way – there's even a stack of spline weights in the back of the shop – but one ring frame cannot be wrong, and one is quicker than several.

I jigsawed it out of MDF, sketched and cut a longitudinal keel frame, glued them together, and, well, we were on a road to somewhere.

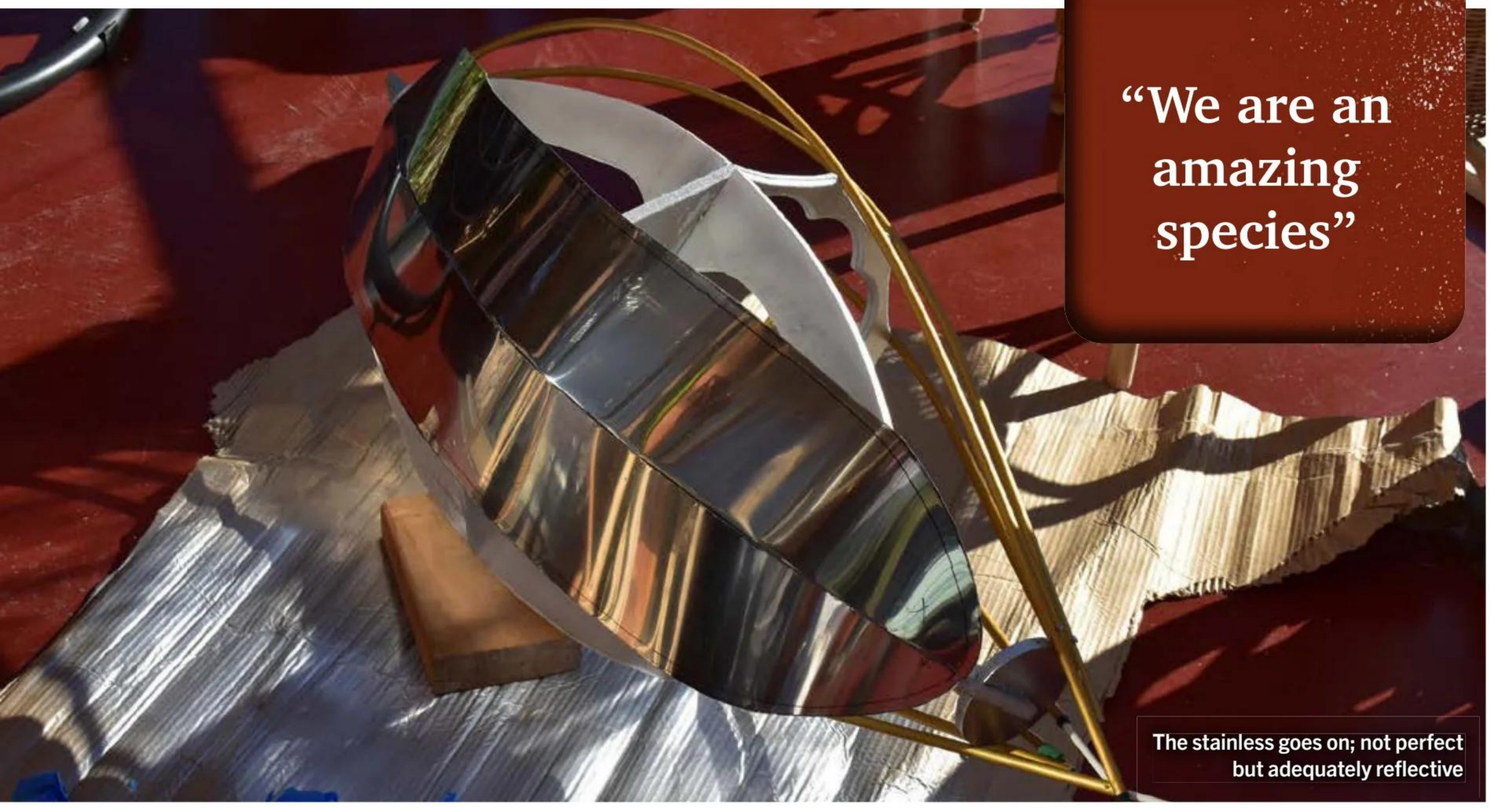
As I worked and listened, I also did some thinking about what constitutes a tool (guitar? synth? voice?). The technical professionalism behind that Nightwish performance still leaves me in awe (and I've known the piece for years). The 10.5-minute backing track has a full orchestra (London Symphony) and two full choirs. I'm not sure if it's a MIDI or a partly MIDI track, but it clearly has a drummer's 'click track' – you can see the wire running up his back, and he times the rest of the band. The track also runs the pyrotechnics and the lighting, which are beautifully synced. Hats off, too, to the person mixing on the night;



The Heller *Le Chebec* that I once pined for. Longboat lower left



Naff jug into hyper-drive



The stainless goes on; not perfect but adequately reflective

genius. In fact, every one of them is at the top of their game (to the point where they don’t ‘prima donna’).

They even have fun at this level; the guitarist was known to pull the others’ earpieces out; the singer was known to spike his beer with apple juice, which he detested.

Back to the chandelier

Now I had to start thinking about LED placement, light – reflection, diffusion – all those things. The top of the airship could be translucent fabric, which would bounce light off our white ceiling.

The shadowed undersides of the airship were another matter; shorter of focus and big on shadow. The idea of filling the boat with LEDs to illuminate the underside of the airship suggested that the dirigible underbody should be reflective. I reflected on that for a while, and went rummaging in my stainless collection. To carry the stainless sheet, an MDF ‘floor’, suitably curved, was added to the framework.

Getting the stainless to conform to my mental image (of a perfect multi–chined canoe shape, not a waver or ripple in sight) was a bit taxing; let’s just say that steampunk quality control turned out to be a little more relaxed than I’d hoped. No matter; it will still reflect light, which was the idea all along.

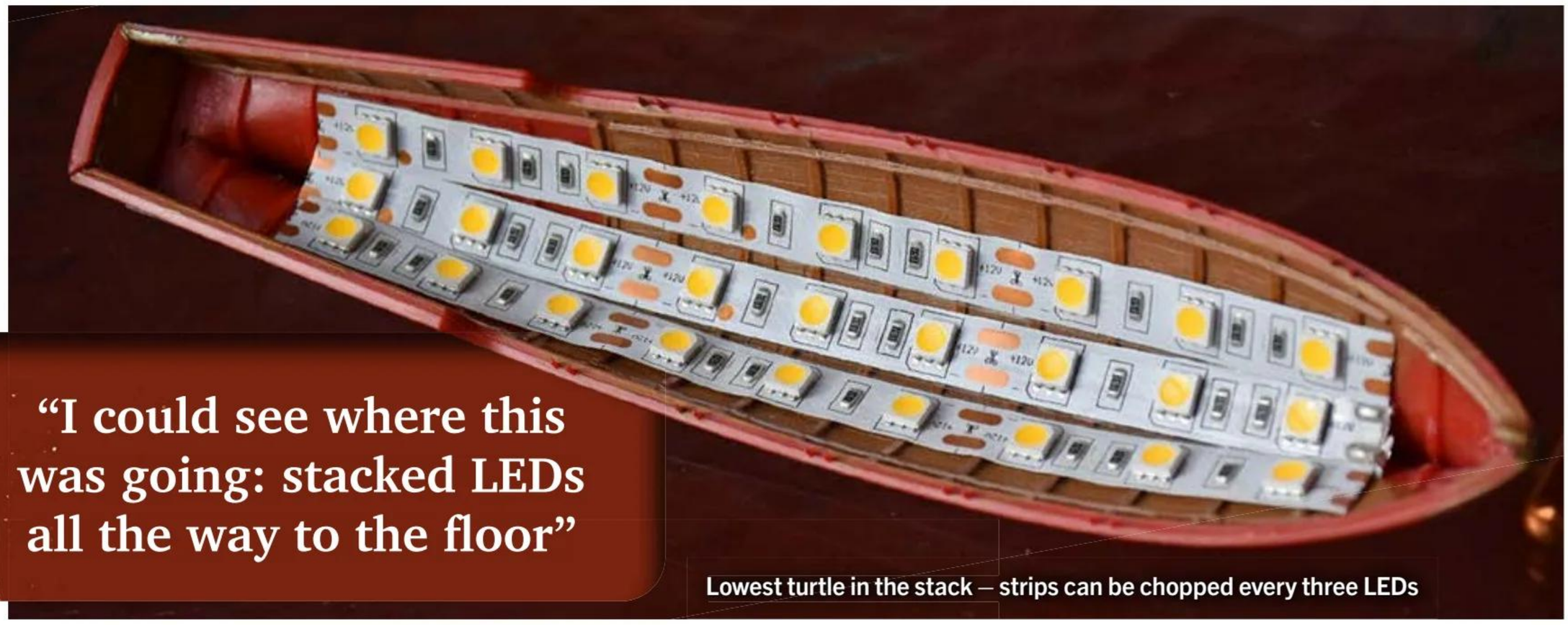
Stacks on the mill

Pulling out the Heller kit – oh, how I once pined for it! – I quickly assembled the hull, added the appropriate parts, and applied a little paint.

Then I realised I’d created a never-ending problem. Sure, LEDs set into the




Squares of sticky-backed aluminium tape

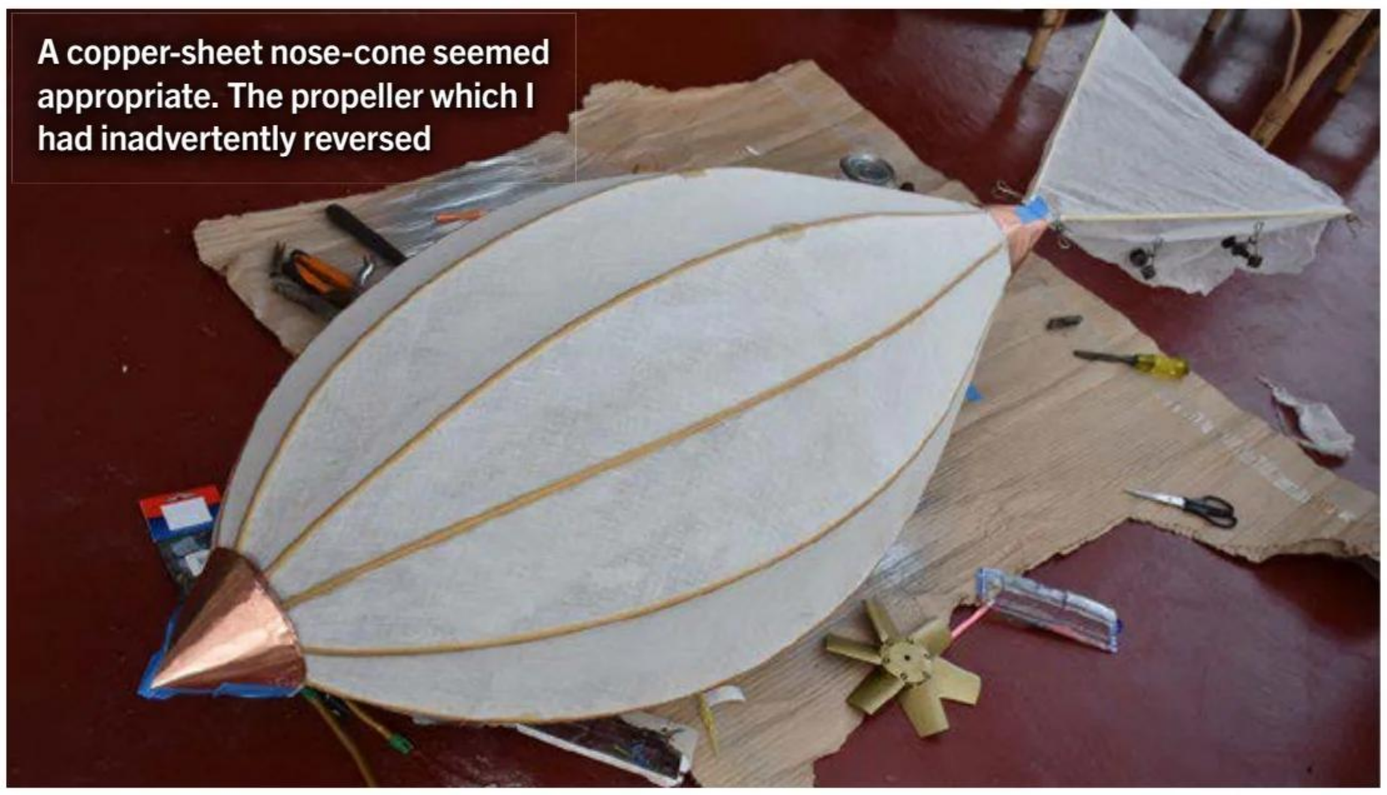


“I could see where this was going: stacked LEDs all the way to the floor”

Lowest turtle in the stack – strips can be chopped every three LEDs



Her old scarf, pegged while I daub varnish along the battens to glue it, before spraying with polyurethane



A copper-sheet nose-cone seemed appropriate. The propeller which I had inadvertently reversed



Garden frost-cloth covers the tail; pegs and bolts keep it tight while varnish is applied

boat would illuminate the underside of the airship – the stainless – but now the underside of the boat would be in darkness. I could see where this was going: stacked LEDs all the way to the floor. (Which reminds me of the old joke about someone opining that Earth is supported on a stack of turtles. Asked what supported the bottom turtle, she replied: “You don’t catch me out like that; it’s turtles all the way down.”)

Anyway, I figured that the hull would look nicer illuminated than not, and initially eyed up the ship’s longboat from the kit; maybe I could hang it underneath, filled with LEDs? Yes, I could, and did … but, no, it wasn’t really long enough to do the job.

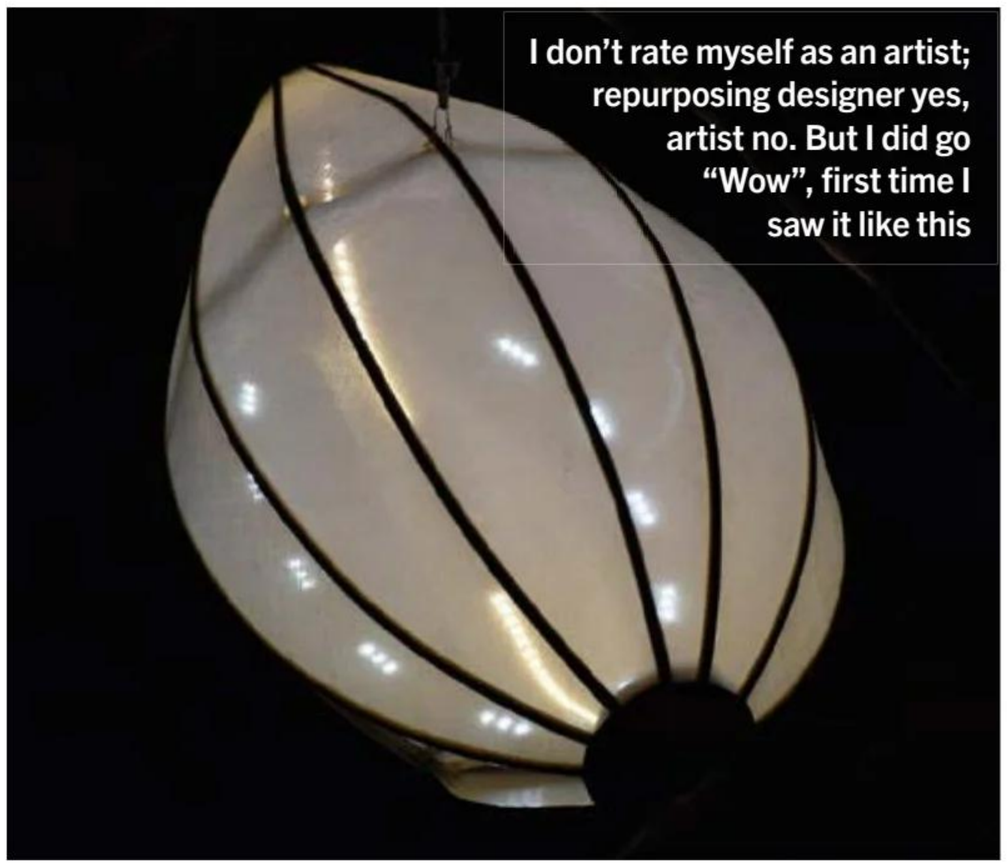
How many turtles to stack, I wonder?

While I was pondering how to make a longer turtle (and, indeed, how many to stack), I decided to make the underside of *Le Chebec*’s hull reflective. First I tried silver paint, but soon dropped that idea. Then I tried sticky-backed aluminium tape, but it tantrums once you get into 3D curves. The compromise was 50mm squares of it, overlapping just like the iron plates of the era that we were mimicking. They went on a treat, and looked not too bad.

By now I’d come up with a loose plan for the next turtle down: combining a couple of unused pieces of the kit, some chopped-down sprue, and a little imagination. Glued it all together, induced a little bend in the plastic arms, draped it in LEDs, hung the longboat



Interior view, trialling LEDs



I don't rate myself as an artist; repurposing designer yes, artist no. But I did go "Wow", first time I saw it like this

in the middle of it, and decided against any more turtles (head banging is OK musically, but would be a pain every time you had a cuppa).

Hyper-drives

Of course, a thing like this needs to be driven; preferably 'hyper'-somethingly. Casing the second-hand stores, I spied something with promise: optimistically labelled a 'salad set', it was hyper-ugly, so we were off to a good start. (Turns out these were popular in Canada in the '70s; reminds one of Michael McIntyre's condiment sketch – worth a look if you haven't already seen it).

I found a couple of plastic fans, and a nice wee variable angle bladed one, for propellers.

Very quickly, a visiting friend pointed out I had the prop reversed. How it would have flown like that I hate to think; lucky he spotted it!

As I mounted the hyper-drives, the forward cross-tube wanted to go clean through between two teeth on the (MDF, mock) big central gear. A little lateral thinking solved the dilemma: hyper-drive is, of course, so fast that gears would need to transmit their force without having time to turn. So it doesn't matter that they don't. That would also explain how the outer props drive with zero angle of attack; they can't waste time auguring their way through the air. Conventional physics is soooooo limiting, eh? E really equals MC skewed …

Now this took a while

Hanging the thing, then hanging the thing on the thing, then hanging the other thing on the thing on the thing, took a day – and a bit.

I tried rope but fake gold chain



Looking promising, but needs that next turtle down

Soundz!

Ghost Love Score by Nightwish

Album: *ONCE*, 2004

Best version: Wacken 2013, Official Live

Best cover: Panos (try it at least twice)

youtube.com/watch?v=t4qcwSiExvU

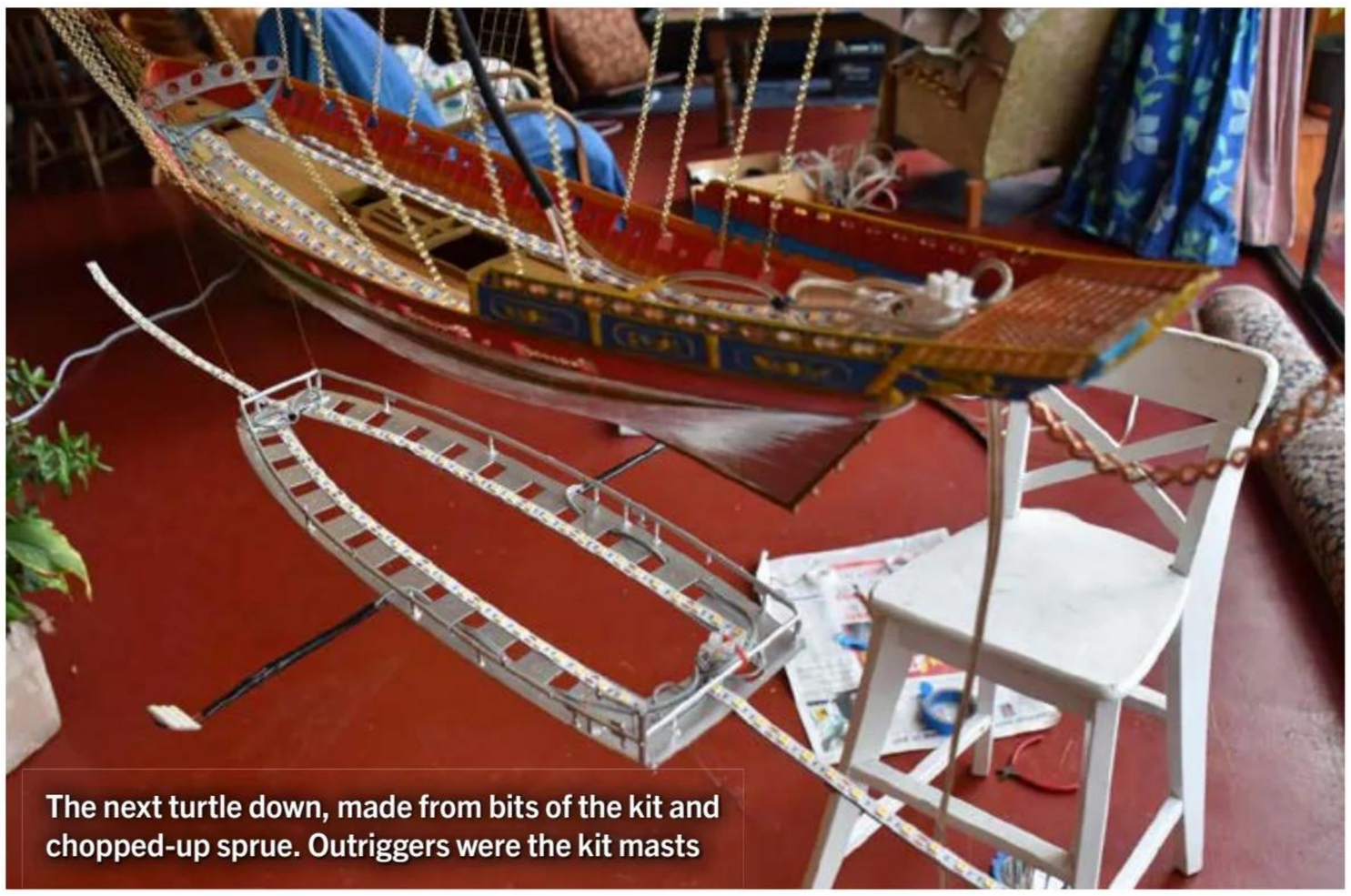
youtube.com/watch?v=OopKTL0OM3o

youtube.com/watch?v=4iRGyO5HxWo

Old and Wise by the Alan Parsons Project

Album: *Eye in the Sky*, 1982

Best cover: Adi Hayat and Inbal Paz



The next turtle down, made from bits of the kit and chopped-up sprue. Outriggers were the kit masts



Subtle steampunk touches



I've owned this unassembled Heller *Le Chebec* kit for 40 years



"When illuminated, it looks stunning"

worked better. The unanticipated bonus was that, when illuminated, it looks stunning. I set it off by adding ratlines (how else does the crew get to the airship?) made of stripped-up galvanised mesh.

Soldering all the LEDs was a pain – keeping track of all the positives was enough to induce more than a little negativity; indeed, things were close to becoming terminal at one stage!

At this point in proceedings, I was a little like the builders of R101 at Cardington in the late 1920s – too committed to bail. (A really good book on that era is *Slide Rule* by Nevil Norway, otherwise known as Nevil Shute, the novelist. He was an engineer – indeed, chief calculator – on the more successful R100, working for Barnes Wallis.) R101 crashed into a hillside in France; I stood up too fast and broke one of the hyper-drives off – it's all a matter of degree.

The sounds go off

Time to shut the laptop – and Nightwish – down.

For those who thrive on the nuts and bolts side of music (the theory), Ghost Love Score changes key 16 times and time signature nearly as often. In none of those does it 'resolve', leaving us hanging on in a rollercoaster ride until it does resolve and, in doing so, knocks the ball clean out of the park. Stunning construction, stunningly delivered by a singer who, when asked her range, simply answered, "Yes."

Time to moor this thing; luckily – remembering the *Hindenburg* – it is its own hanger.

So there we have it: a piece of total whimsy, assembled mostly from on-hand materials, vaguely addressing a need. All to the background step changes of one of the best pieces of symphonic metal ever.

I can see my younger self – the one who bought *Le Chebec* model 40 years ago – playing Alan Parsons' Old and Wise while shaking his head at my antics, but I can't make out whether it's in despair or awe. Who cares what he thinks, anyway? I'm still having fun!

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Mitutoyo micrometer 25-50mm



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TIME

This article covers the use of the Arduino internal timer, and shows how time can be used to change the function of a button press

By Mark Beckett | Photographs: Mark Beckett

Time is important to everything we do. It controls when we wake, sleep, work, and more. Mostly we use 'absolute time' – for example, we have an appointment at 2pm or leave at 4pm. We use 'relative time' more than we realise – for instance, heating something in the microwave for xx time or leaving a note saying that we'll be back in five minutes. We also use relative time in other ways – for example, have you ever held a button for x seconds until it performs some other function?

This article covers the use of the Arduino internal timer millis(), which counts the number of milliseconds since the code (sketch) started running. The variable is set at zero whenever the board is powered up or reset. It can be reset, but we'll touch on why this is not a good idea later.

Things happen quickly

On most Arduino boards, the Atmega328 microcontroller runs at 16MHz and therefore things happen very quickly. It is capable of detecting an input state change in 4.9 microseconds (µs), which is 200kHz or 200,000 times per second.

We don't need that sort of speed to detect whenever someone presses a button or to see if the temperature has changed, so we use something in the code to limit the 'are we there yet' scenario.

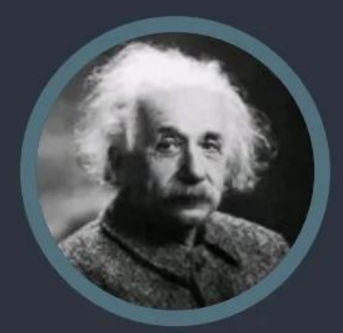
The simple method is to note the time, then, after a predetermined period, check again.

Example: you need to fill a swimming pool with water. Rather than stand there filling it, you can simply go over every minute and check. You may go over multiple times, but, since it's not full, you simply return and carry on with something else.

I've seen this referred to as 'throttling', but



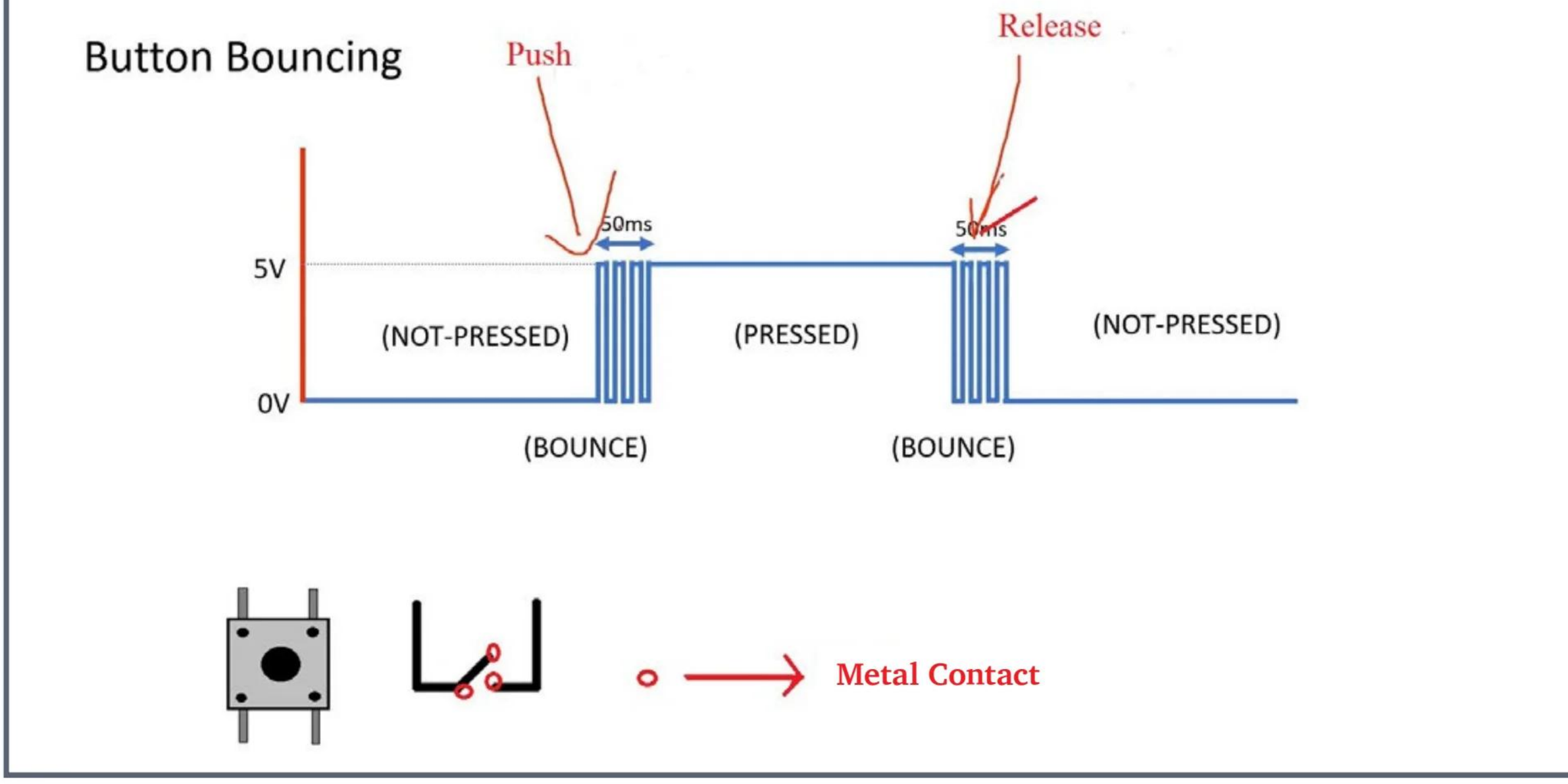
"Time is absolute"
– Isaac Newton



"Time is relative"
– Albert Einstein



"Time was invented by clock companies to sell more clocks"
– Karl Marx



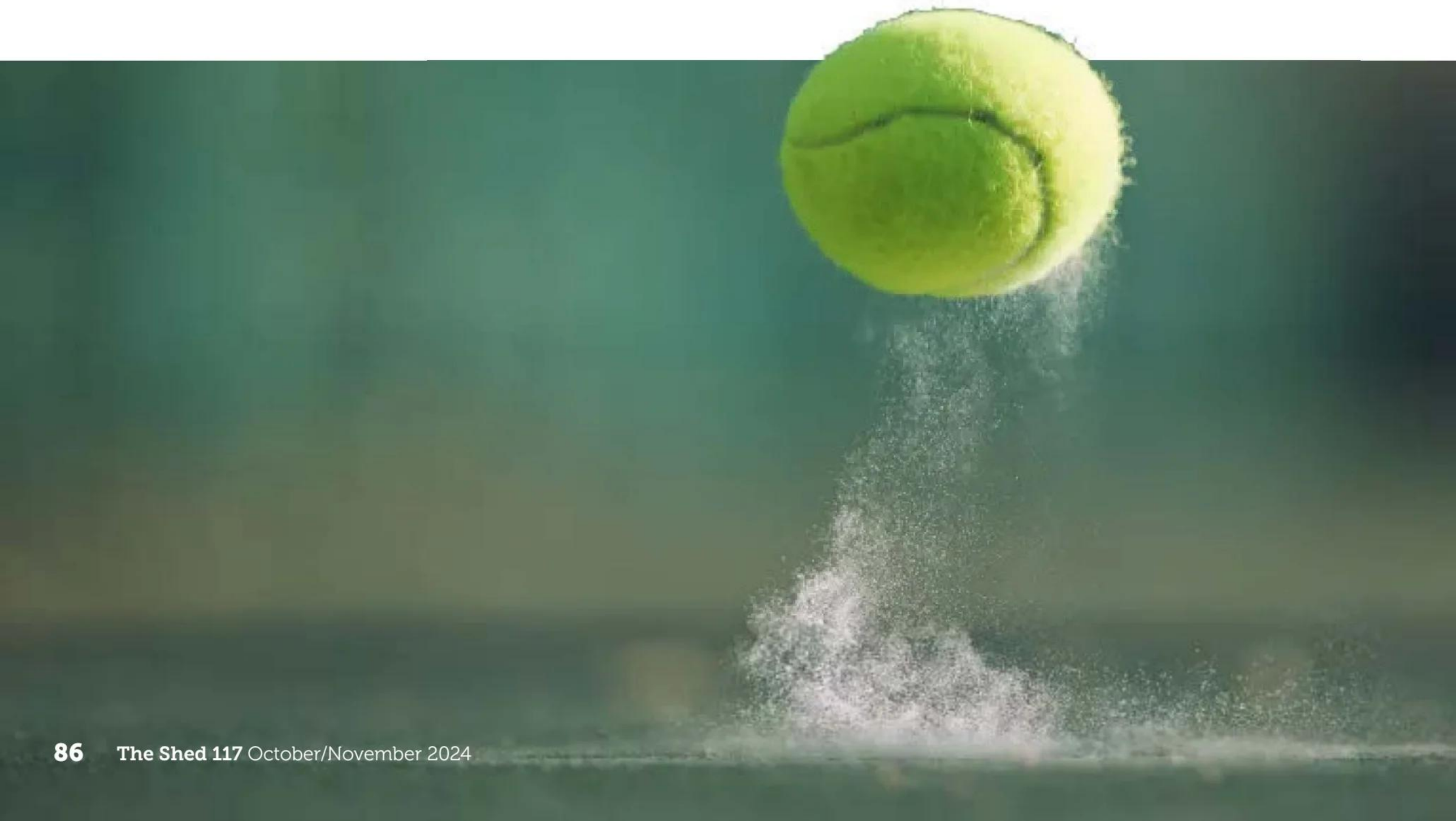
it seems that that term is mostly used when talking about bandwidth control or GET requests on servers.

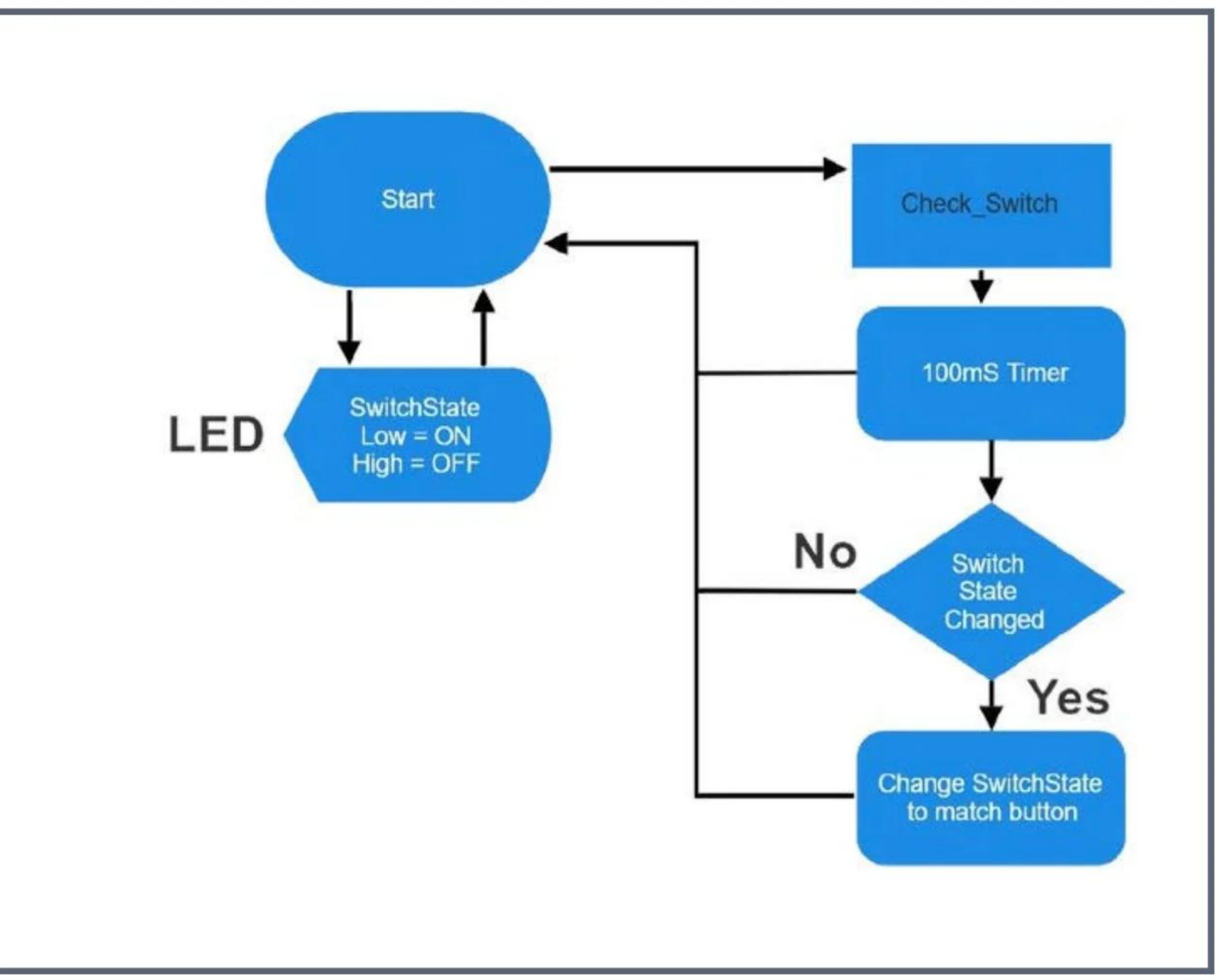
De-bounce

Push-buttons are often connected to an input. The user presses the button and something happens. Since push-buttons are generally mechanical, they 'bounce'. That is, they change state multiple times until settling on the steady state. Think of a ball dropped onto a hard surface, where it strikes then lifts and strikes again until eventually it settles on the surface.

While you can add damping components, the easier and cheaper solution is to let the software do the work.

There are plenty of solutions, but a simple method is to note the state and come back in xx period to see if it's in the same state. Another is to start a counter and after x counts you know it's steady. These methods are referred to as 'de-bounce', and even cheap push-buttons will have settled within 50 milliseconds (ms) (50 thousands of a second), which is much quicker than your finger. Increasing the de-bounce time is a useful





trick to ensure that the button wasn't pushed accidentally.

Function change

The timer makes many other functions available. You can have different 'On' and 'Off' times, or determine whether the button/input has been in a certain state for a set period of time.

It can control returning the code back to normal/default settings after a certain period.

Many readers will be familiar with a single button that does something different when you hold it for xx seconds. Reset buttons or vehicle odometers are common examples. One way to look at it is that our two-state button/input can be more than On or Off, depending on how long it's pressed.

So, as you can see, this timer is very useful. The sketches linked in the article will provide examples that you can manipulate to see the effects.

Variables

The millis() timer resets every time the Arduino is powered or reset, and is a 32-bit number. Therefore, the value is from 0 to 4,294,967,296 before it overflows and starts again at 1. If you do the maths, it works out to 49.71 days from sketch startup/reset.

You use an 'unsigned long' to hold the value, which means that it treats positive or negative numbers the same and becomes important in the next paragraph.

Always compare your stored value by subtracting from millis(). There are many discussions on the internet, but the examples by Nick Gammon are easiest to understand: gammon.com.au/millis.

The first example below shows what not to do and the second shows how to do it correctly.

What not to do

```
if(millis() > time_now + period){
    time_now = millis();
    Serial.println("Hello");
```

This will result in an error if the millis() has overflowed.

Correct approach

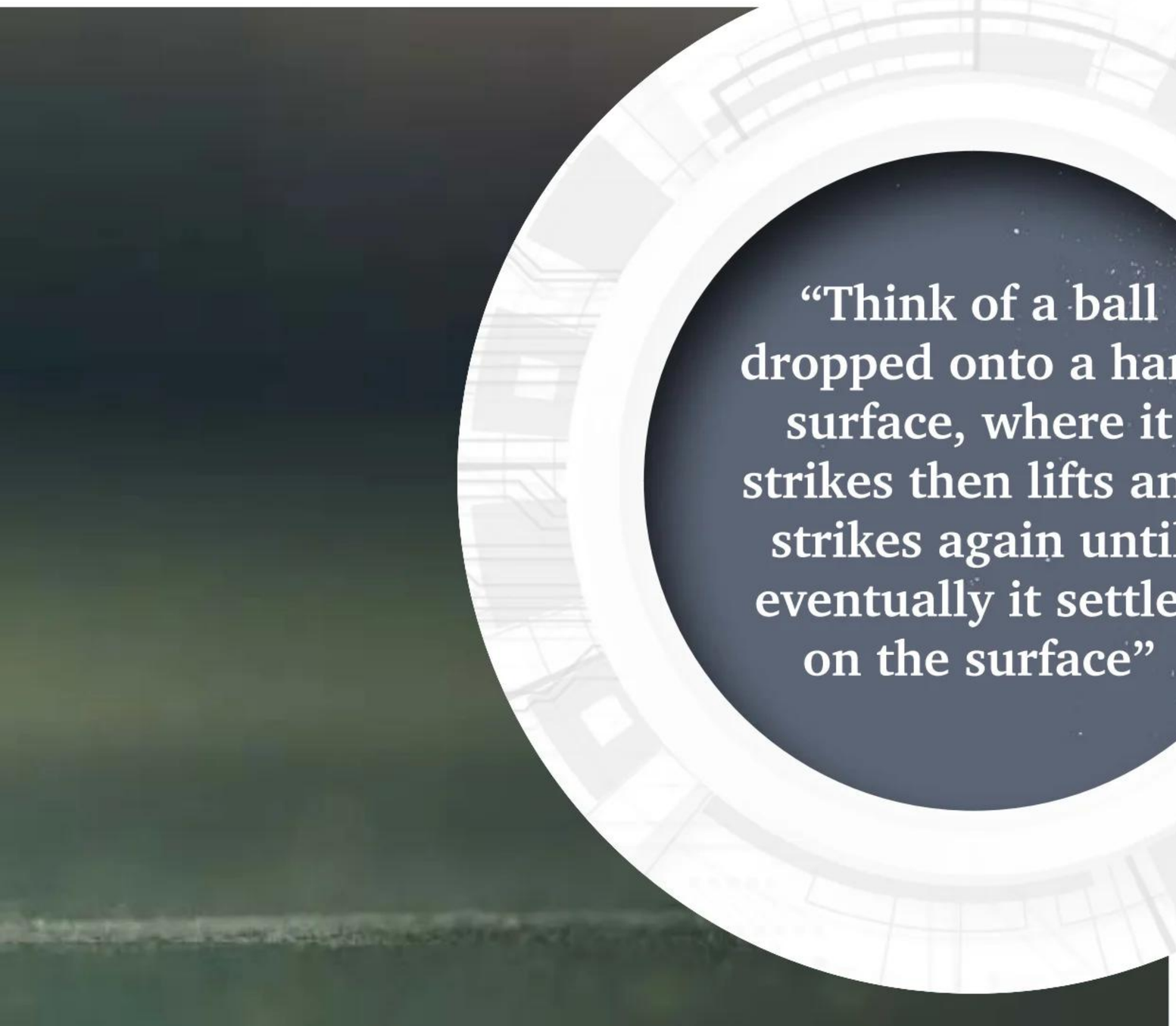
```
if(millis() - time_now > period){
    time_now = millis();
    Serial.println("Hello");
```

In the examples, we compare the current time, 'millis()', with something we stored earlier, 'time_now', and check if the result is greater than the 'period'. Since it is greater, we store the new millis() value in 'time_now' and serial print "Hello" just for fun.

The trick is always to assume the value millis() is the larger number and subtract from it.

De-bounce sketch

The 'De-bounce' sketch demonstrates using the millis() timer to ensure the button press is longer than the switch bounce time (usually 50ms). ▶



"Think of a ball dropped onto a hard surface, where it strikes then lifts and strikes again until eventually it settles on the surface"

The code below is from the 'De-bounce' sketch and demonstrates the principle.

```
void Check_Switch()
{
if (millis() - LastSwitchCheck > debounceDuration)
// Reads button state every 100 mS.
{
SwitchState = digitalRead(Push-button1);
// Reads the state of Push-button 1
LastSwitchCheck = millis();
// Set the timer

if (SwitchState != LastSwitchState)
// Checks to see if it doesn't match
{
LastSwitchState = SwitchState;
// Record the new state
LastStateChange = millis();
// Set the timer
    }
  }
  return;
// Ensure we go back to where we were called.
}
```

The Check_Switch() routine is called from the main loop and we want the program to go back after it has done its instruction; hence the 'return;' command.

While the main loop can call this routine as fast as it wants, we only check the switch every 100ms.

The 'debounceDuration' was set to 100ms to ensure accidental button presses are ignored.

The second sketch 'Debounce_Delayed' has a 2000ms (two-second) delay.

When you press the button, the internal LED is On but the external one takes two seconds before any change is detected.

You can set 'debounceDuration' to different values to see the effect.

Function sketch

The 'Function' sketch uses time to change what the button press does. If the button is pressed for one second, it turns on both LEDs; if the button is held for five seconds, then it alternately flashes the LEDs.

The method of checking the time that the button is pressed is slightly different. We

FILES

This demonstrates simple software de-bounce.

Arduino on time:
https://drive.google.com/file/d/1-Rd6GlGqj4OX1Gtj7XsBhKbXS8dwBiIB/view?usp=sharing

Similar, but the onboard LED shows the push-button state.

Arduino time de-bounce:
https://drive.google.com/file/d/1-K7P33_8cdIMXYQvjJbhaBanXYDh3sUa/view

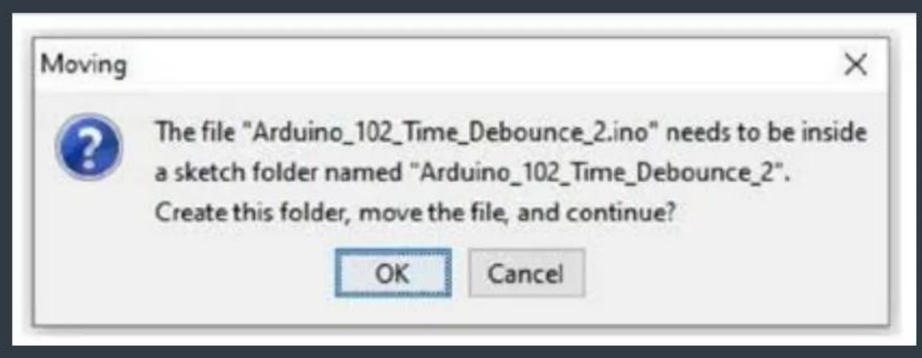
Swaps the state of the LEDs.

Arduino time de-bounce 2:
https://drive.google.com/file/d/1-Z-N_MnnT1IjeGuJ6NK_7-r-FZHfyxKq/view?usp=sharing

Shows how a longer press does something different.

Arduino time de-bounce toggle:
https://drive.google.com/file/d/1-Xv7P9ghy2DARpmHn7vItvlhdIEf4sMv/view

Arduino IDE always places a sketch in a folder so when you open the saved link it will ask:



> “Then it’s a good use and takes minimal code”



check every 100ms but increment a counter and use that to determine what to do.

There is a third timer (ONTime) involved, which determines the length of time the LEDs operate (10 seconds).

I also introduced some code in ‘void setup()’ to turn the LEDs on for five seconds prior to it running the loop code. This runs once and can be similar to the POST (power-on self-test) function in a computer. In some of my programs, I’ve used it to confirm a setting or detect a switch to allow something to be changed before the code runs.

What about Delay()?

The issue with delay is that it stops the other code from running. This may be fine in your sketch but you need to be aware that you will effectively pause the sketch and nothing else will occur. Think of our pool-filling example; you stand and watch until it’s full.

If your shed catches fire, then you won’t know about it until after the pool fills.

If the sketch simply blinks a LED and does nothing else during the Delay() period, then it’s a good use and takes minimal code.

Reset millis()

As mentioned earlier, the millis() timer can be reset, but it can result in unexpected consequences, and the consensus from the software gurus is don’t.

The argument is that some libraries may not expect a reset, so, while you may code correctly (the subtraction method), they may not for all variables.

Unless you’re doing testing and don’t want to wait for 49.7 days, then there is no benefit. ▶

Really long periods

The only issue with the millis() rollover is if you have a period that is greater than the 49.7 days. Example: you only want to check something every 60 days.

The subtraction trick won't work, as the 60 days number is greater than 32 bits.

You can increment a variable whenever it reaches a certain point (similar to hours and minutes on a clock), but that is for another series.

You could also add a Real Time Clock, but even then you need to store the start time and do a comparison, which may involve even more maths.

Books

Some Arduino books are available as a free download. *Get Started with Arduino* is available at dbooks.org/get-started-with-arduino-1912047632/.

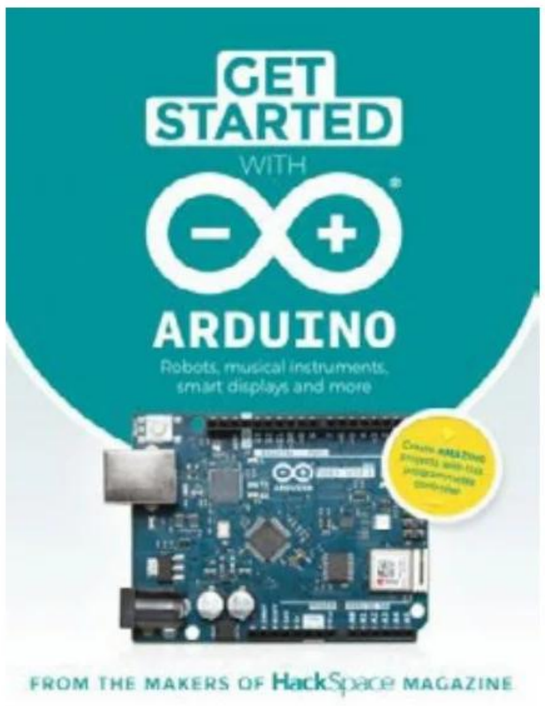
The *Arduino Cookbook* by O'Reilly (including the third edition) is also available if you search around. Be aware that this book is for more advanced programmers, but it covers a lot.

Pinouts

During our series, we'll look at the various pins and the alternative use for some pins.

Alberto Piganti has produced an excellent series of pinout diagrams that were originally on his website. They are now archived on Github: https://github.com/BelKed/pighixxx-uploads-archive/tree/master/pinouts. Be aware that the diagrams include numbers for the ATmega328 as well as the IDE, so read the legend.

Hopefully this has whetted a few appetites to get into coding with these very useful microcontrollers. In the next issue, we'll cover inputs (both digital and analogue).

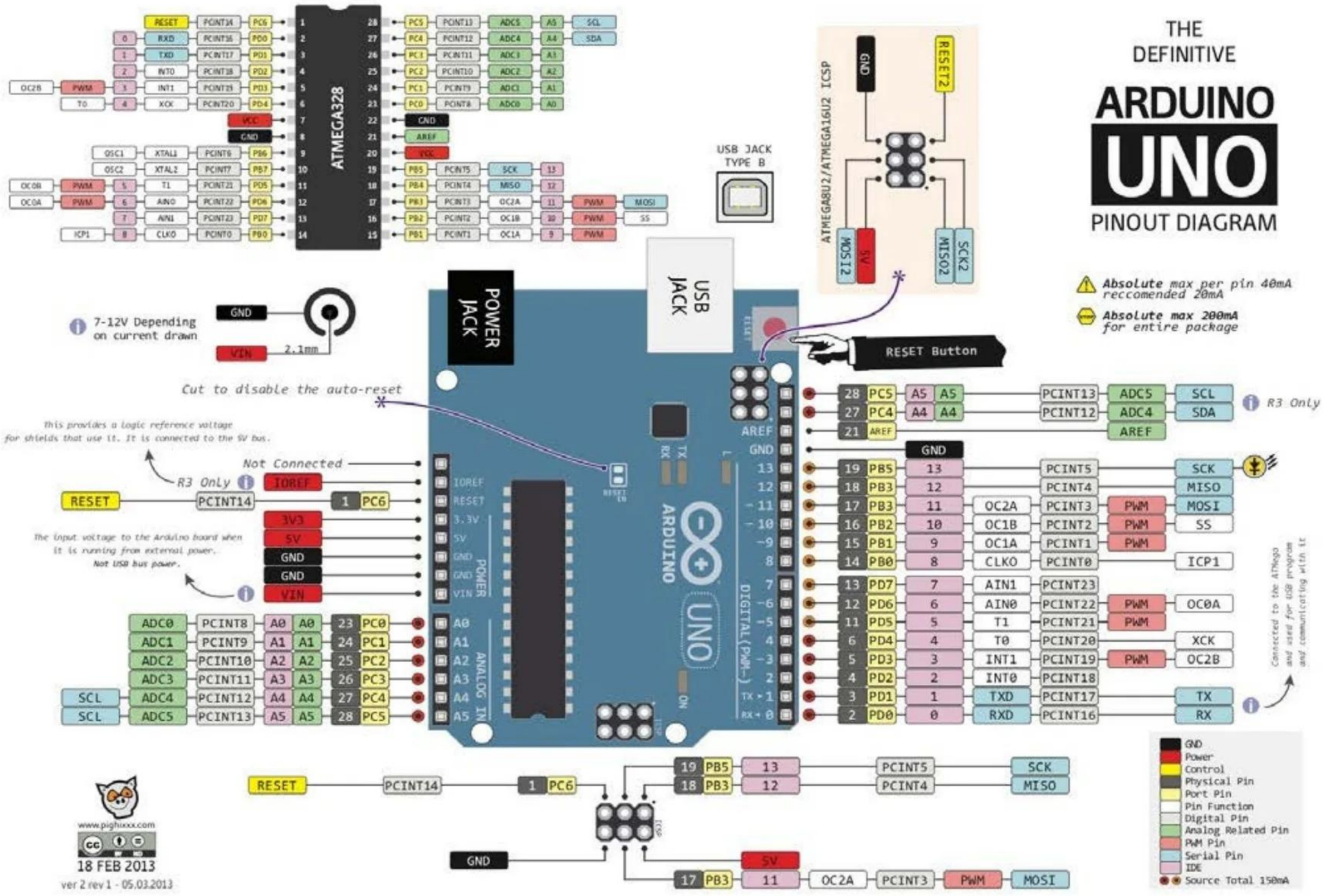


Internal timer and code links

NOTE: There is also another internal timer **micros()**, which is the number of microseconds since the code started. However, I suggest you check on this if you want to use it, as the resolution is not necessarily one microsecond.

Books

Pinouts



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CLEVER STUFF IN THE HANGAR

For some people, a problem is just a challenge for which they haven't yet found a solution

By Andrew Broxholme
Photographs: Andrew Broxholme



Whakatāne Airport and the Aeroclub are a regular haunt. Since I reactivated my private pilot's licence, I've taken part in as many of the local flying events as I can – many of which I helped to organise.

I have a part share in an aircraft that is currently based in Tauranga. I'd really like to have a plane at the airport but the biggest problem we have at Whakatāne – and an issue shared by many small airports – is lack of hangar space; there is just no free long-term hangarage at the airport.

The Whakatāne Aeroclub has been around for many years, beginning life as a microlight flying club. We have had a sealed runway at Whakatāne since the 1960s but the club added a grass runway and relocated a small building from a school to be the clubrooms.

Some years ago, it bought and assembled a kitset half-round metal hangar, with the costs being shared by the four aircraft owners who

“It means they can easily be pushed into and out of the hangar and avoids the dreaded ‘hangar rash’ from unintended collisions”

The aircraft on the lift, showing the wheel chocks; you really don’t want it to roll off, as that would result in severe damage to the aircraft

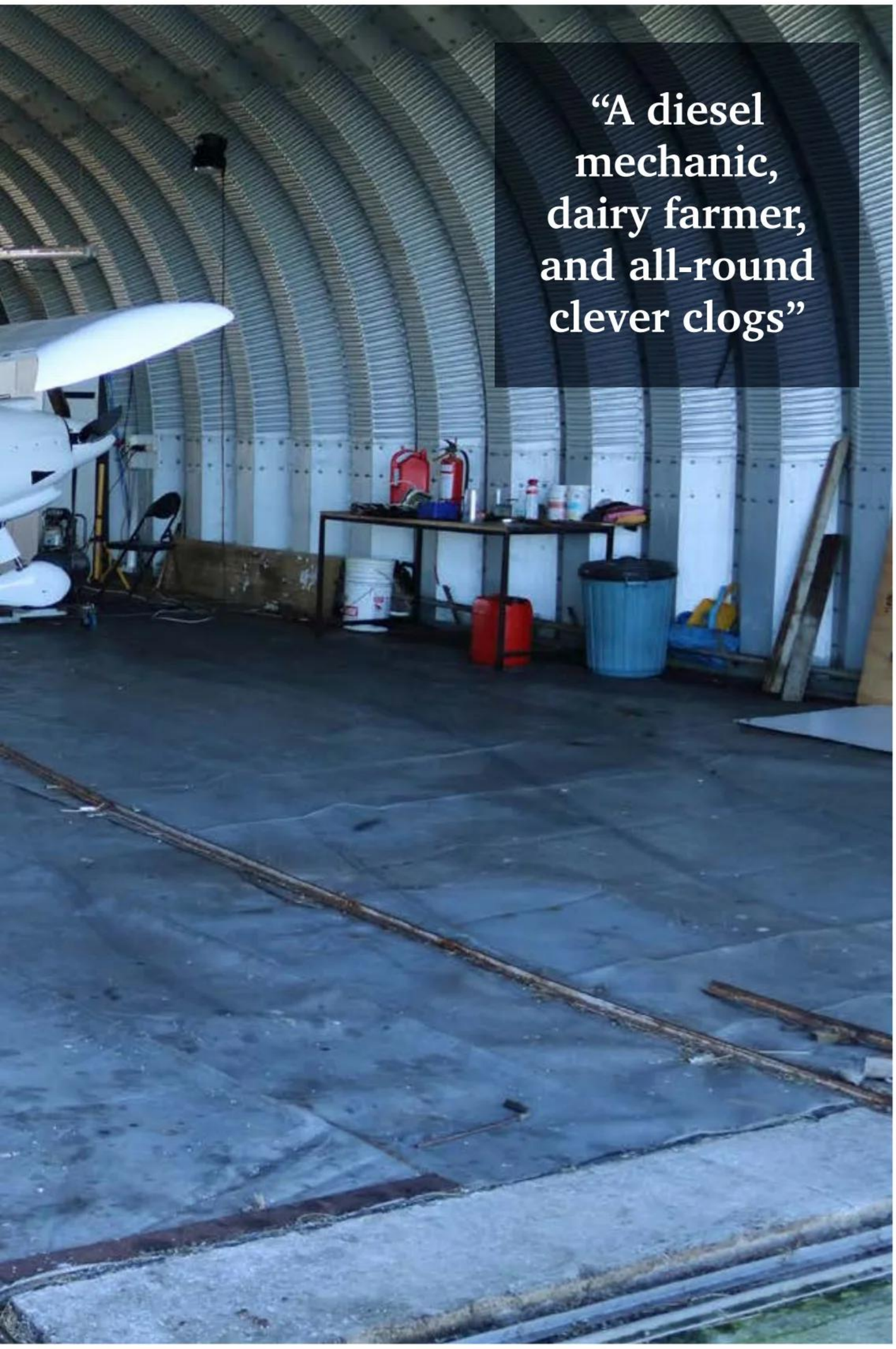
Aeroclub hangar with the rails – each aircraft trolley is guided by a single rail. If the aircraft changes, the rail position and trolley can be altered to suit the new occupant

cooperated to build it. One of the hangar's clever features is a rail system and simple carriages that the aircraft sit on; it means that they can easily be pushed into and out of the hangar and avoids the dreaded 'hangar rash' from unintended collisions with other occupants, this being a common problem when manoeuvring aircraft with tricycle undercarriages in constrained spaces.

While efforts are under way to get additional hangars built, my friend and local aerobatic ace Chris Schadler couldn't wait. A diesel mechanic, dairy farmer, and all-round clever clogs, who has built no fewer than six aircraft, he saw a way to squeeze his second aircraft



The carriage fully lowered for getting the aircraft on and off the lift. To load, the aircraft is positioned outside the hangar and the trolley deployed underneath the aircraft, which is then pushed back, up shallow ramps, and secured in place





The cable and pulley arrangement, with very few moving parts and easy access for maintenance and checks



View of the winch and power set-up; the battery is trickle charged to keep it ready to go as required



The carriage is basically a single-stage scissor lift but, rather than using hydraulics to lift and lower the cargo, Chris has powered it with a heavy-duty electric vehicle winch and cables. Here, it’s shown at full height without the aircraft on board



Low-cost and practical extra security: along with chocks, Chris uses car seat belts as tie-downs. We get regular earthquakes in the Eastern Bay of Plenty; if a decent shake hits the area, Chris doesn’t want his aircraft to jump off the carriage



Chris's two-seater Storm 300 on its carriage, making good use of the 'air space', which also allows him to work on both aircraft simultaneously as required

in with a custom-built aircraft lift and storage carriage.

Chris designed and cut the parts for the carriage but outsourced the welding. While the Storm isn't a particularly heavy aircraft – 322kg without fuel and 425kg fully fuelled – he future-proofed the carriage, as it's clearly capable of lifting and storing a much heavier aircraft.

Chris wasn't sure what the project cost. The heavy-gauge steel wasn't cheap but he picked up the winch at a very good price. He would tweak the design if he built another, but it definitely meets the criteria for being good old Kiwi (or, in this case, Swiss) ingenuity.

Variations on the carriage also have potential to be used in the hangars that we are trying to get built at Whakatāne Airport.



The Storm on its carriage and ready to be lowered and prepared for a local flight

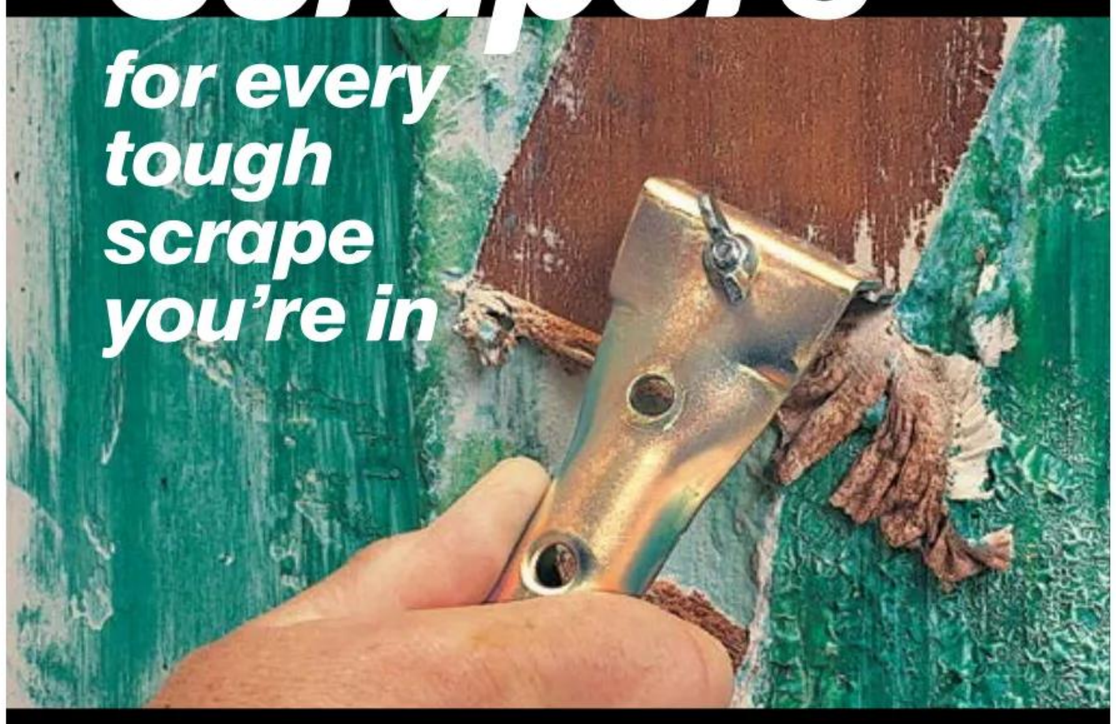


Robert van Beek's Storm microlight rolled out and being prepared for flight. The light weight of the aircraft makes it easy to move on its carriage, and to wheel it onto the carriage once flying is over for the day

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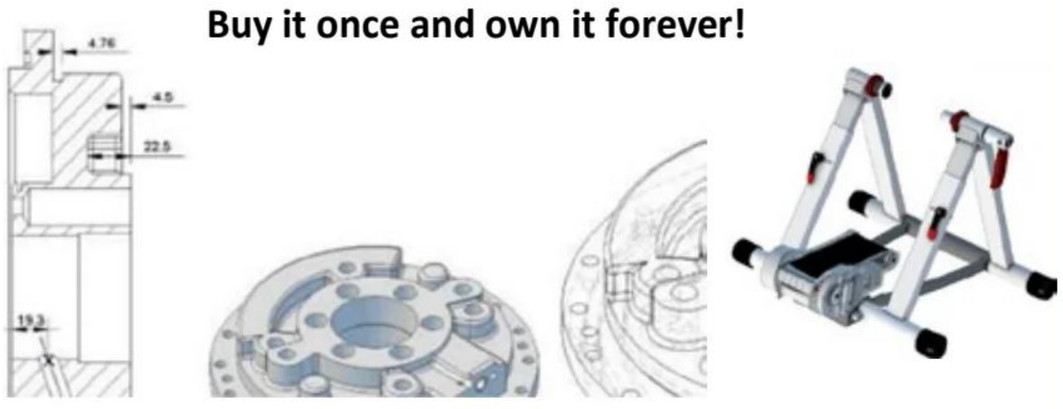
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KEEP CALM AND CARRY ON

Could tea be the magic elixir to solve all problems, heal all rifts among family and friends, and enable all of us to live to a healthy, active 100?

By Mark Seek | markseek@rocketmail.com

Life's simple pleasures should not be taken for granted: for instance, a good cup of tea.

I was always under the impression that tea originated in India, but no, it was the Chinese we need to thank, and – surprise, surprise – the English are the world's biggest guzzlers of tea. A reliable source suggested that, on average, the British consume 165,000,000 cups a day. Blimey! That's a lot of tea breaks.

Some years ago, I had the good fortune to meet one of the most iconic faces of tea, all-round good chap Mr Dilmah: "Do try it". I recollect that he was a regular visitor to these shores; his philanthropic generosity extended to supplying all of New Zealand's hospices with free tea.

Mr Dilmah told me that he understood tea was a simple therapeutic offering to the patients and families while under hospice care.

I must admit that my intake of sugary tea has increased for no conscious reason. Maybe it's a new-found appreciation.

Tea is good for you

Whether made from a teabag or loose leaves, tea has some wonderful properties. Here are just a few of its health benefits:

- Tea is a flavourful way of getting enough fluid into your body.
- Studies have shown that tea can help protect your teeth and your heart, as well as possibly helping to stave off cancer.
- Tea contains antioxidants; antioxidants work to prevent the body's version of rust and thus help to keep us young and protect us from damage from pollution.
- Tea contains less caffeine than coffee; herbal tea blends have no caffeine, and traditional teas have less than 50 per cent – that's right, less than 50 per cent – of the amount of caffeine typically found in coffee. This means, according to nutritionists, that you can drink it without as many effects on your nervous system.
- Tea may even reduce the chances of a heart attack.

Tea has had a bit of a resurgence with the introduction of infusion teas, iced teas, bubble teas, and shops that sell just posh tea.

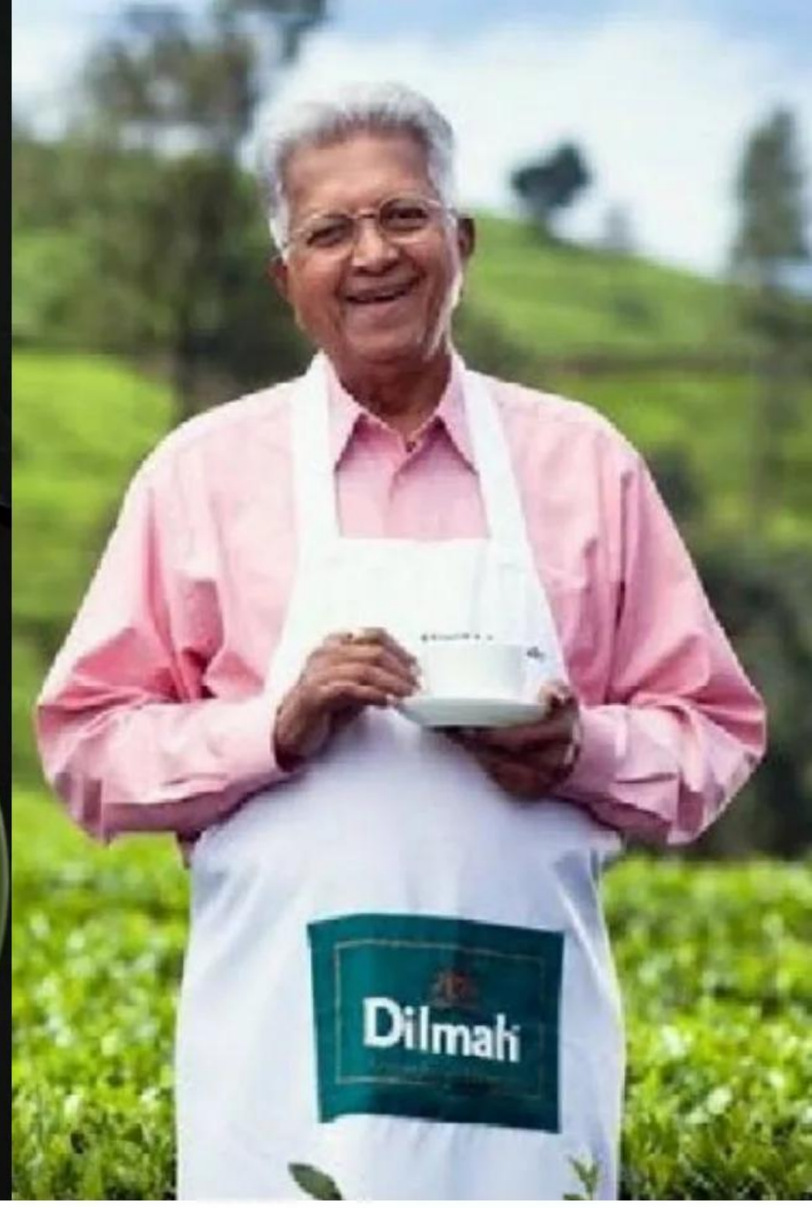
Keep calm; have a cuppa

The witty David Walliams – of *Little Britain* fame – wrote in his recent book *Mr Stink*: "In Britain, a cup of tea is the answer to every problem. Fallen off your bicycle? Nice cup of tea. Your house has been destroyed by a meteorite? Nice cup of tea and a biscuit."

Tea has been referred to as the drink







to help you keep calm and carry on – an attribute that I can attest to on more than one occasion: "Keep calm, Mark!"

If you have read accounts of war time, or lived through a world war, you'll know that tea was the great cheerer upper; survivors often reminisced about how the mobile tea urn was a gathering place for many and a solace for most.

Burt's secret weapon?

Drinking tea and sheds are a great combo. Let me elaborate; it often goes like this: Saturday morning, up with the 'farting sparrows', reacquainting myself with those bloody annoying motorcycle repairs strewn all over the bench, and hoping that, with a cup of Choysa, all things will make sense.

My head starts to clear after a couple of dunked ginger nuts. I can now see the wood from the trees – or was it simply a matter of overthinking the day before? I dunno! It's as if a mystical incantation takes place. Things are now moving in an orderly direction and my problem is solved – for now, anyway.

Maybe that was Burt Munro's secret weapon: a pot of tea in the 'shed of all sheds'.

I glance out the shed door and watch the world whizzing past my mailbox. Saturday mornings are always amusing; occasionally, little children pass by on those balance bikes. There's often one kid who wants to drag the parent up the driveway, pointing at the row of vintage bikes or shiny car parts adorning the shed walls. I've been known to hand out the odd Hot Wheels car as a kind of reward to the kid for spotting the cool '70s vibe going on inside.

New bike, new stories

Over the past few months, I have been poking around a few sheds in the Selwyn district looking for some stories for Greg, editor of *The Shed*. On this occasion, I was out on my newly acquired Moto Morini. I headed out to a very interesting community that is getting a lot of media coverage due to the landowners not extending the lease, which means dozens of residents must leave. You can pick up the story as it unfolds on the internet.

Greenpark Huts is a long-established community, with some interesting sheds and bachs. I had parked the bike under a cabbage tree to take some photos when a friendly looking gentleman wandered over.

"What's all the commotion?" he asked with a grin.

I duly apologised for the noisy exhaust pipes on my bike, and we shook hands.

An Aussie cuppa impressed

Introductions over, this chap explained that he had a few bikes across the road, so, at his invitation, we strolled over to the shed where he was working on a classy Norton.

"What a machine!" I said.

As we continued poking around, I spotted what looked like a Ducati partially under a blue tarp. Well, I had been privy to these machines and felt

> "Maybe that was Burt Munro's secret weapon: a pot of tea in the 'shed of all sheds'"

pretty honoured, to be fair. Some folks are generous, genuine, and have time to have a conversation about their passions, hobbies, and life experiences. What an entertaining afternoon I was having – and gathering some notes for future articles in *The Shed*.

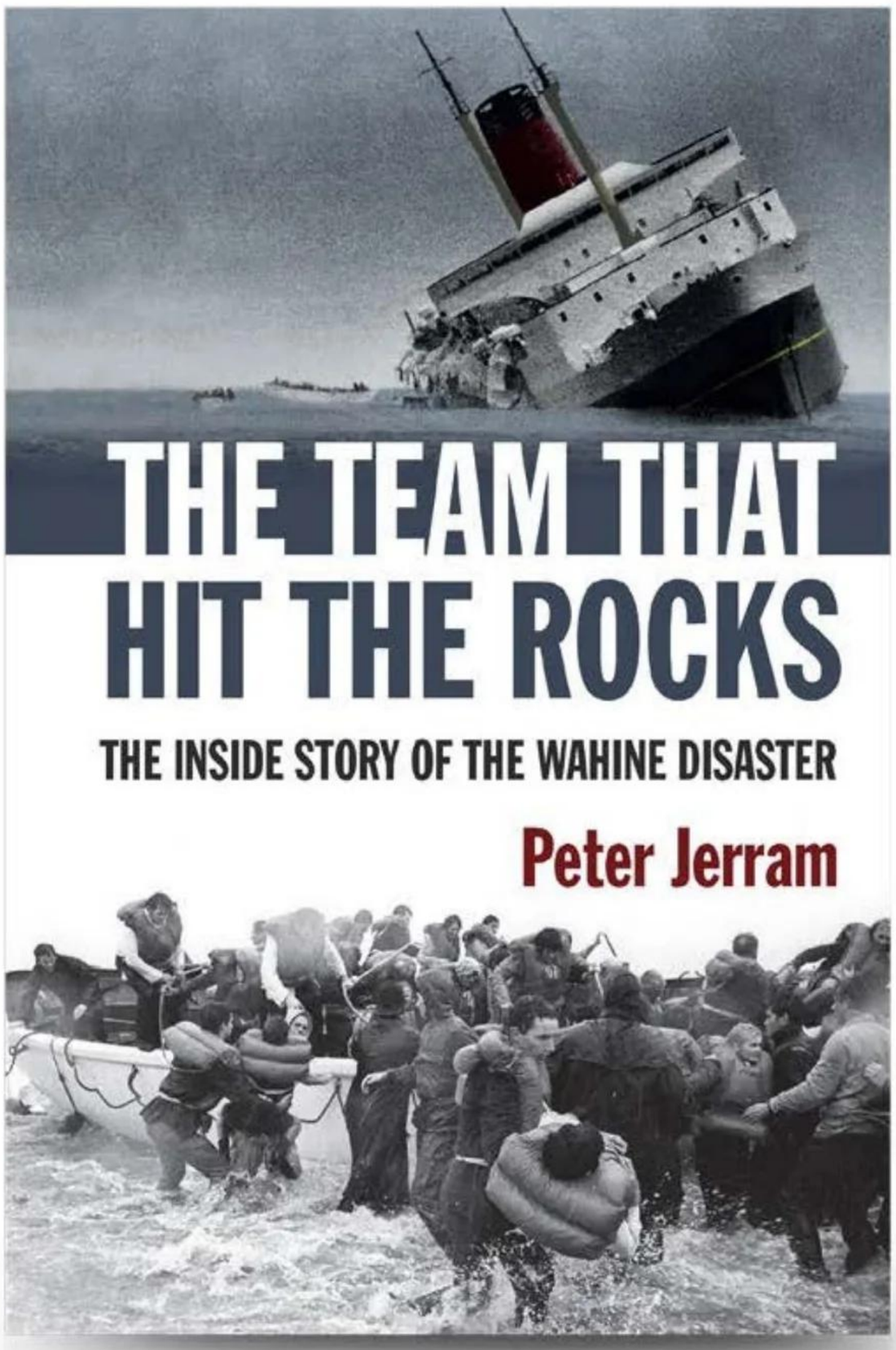
My new acquaintance offered me a cuppa.

"Righto," I said.

Apparently, he only drank tea from Australia. I think he referred to it as 'Arnhemland' tea. I was intrigued – anyway it tasted bloody good.

A good hour later, I pointed the bike in the direction of home, gave the bike a kick, and roared off, telling myself that I will have to head out there again soon.

Well, readers, see you in a few months. I am heading off to Brunei – and, yes, they have tea there as well. Thank God for that! Ten days in the jungle without a cuppa wouldn't be ideal.



The Team That Hit the Rocks

By Peter Jerram
Review by Ritchie Wilson

Paperback, 240x160mm,
240 pages. **RRP$39.99**
Published by Bateman Books, April 2024
ISBN: 978-1-77-689-1078

Tropical cyclones that form over warm ocean waters, far to the north of New Zealand, usually track south-east and miss this country.

The water that they are travelling over gets cooler as they move south, and they usually decrease in intensity and eventually lose their official tropical cyclone status.

In early April 1968, late in the season, Cyclone Giselle had a much more southerly path and was much more intense than expected. It moved almost due south down the North Island. At the time that the inter-island ferry TEV *Wahine* was approaching Wellington Harbour, after an overnight voyage from Lyttelton, the storm centre is estimated to have been just north of Cook Strait. It is often described as the worst storm that New Zealand has ever experienced; certainly, the wind speed reading of 275kph recorded at 10am at Wellington Airport was the highest ever measured in New Zealand.

University cricket teams

Among the *Wahine*'s 610 passengers were three university cricket teams, travelling north to take part in a tournament in Palmerston North.

The wicketkeeper of the Lincoln College (now Lincoln University) team, Peter Jerram, has written an account of the team's experiences as the *Wahine*, entering Wellington Harbour; struck Barrett Reef, dragged its anchors as it was blown up the harbour; and, because of the huge amount of water that had got onto its extensive vehicle decks, eventually ended up lying on its side on the harbour floor.

Jerram describes the experience as the most terrifying of his life. Fifty-three people died as a result of the disaster, but all the Lincoln team survived, although some sustained injuries.

The team never got to the tournament and didn't ever play together until Jerram organised a 25th-anniversary match in 1993 in his hometown of Blenheim. All but five of the 15 players and officials turned up. Although now in their 40s, most still played regular cricket, and the team gave a good account of itself.

Unexpected recounting

At the after-match celebration, after the wives and children had gone back to their motels, bowler John Glasson unexpectedly stood and read his recollections of the day, which he had written down shortly after the loss of the *Wahine*.

Emotions ran high. Others recounted their experiences – perhaps for the first time. When another match was organised in Blenheim five years later, the whole team attended. They all recognised that being involved in the dreadful experience had made a special bond between them.

Over the years, the team got together to play other cricket matches. Some members took part in official events commemorating the tragedy. Jerram was part of the Wahine 50 group



Exhausted survivors (photo: Archives New Zealand)

“It is often described as the worst storm that New Zealand has ever experienced”



Peter Jerram

that organised the 50th-anniversary commemoration events in Wellington in 2018. He gave a speech at the event, thanking the organisations and individuals who participated in the rescue operations.

Jerram had intended for many years to write an account of the team’s experiences of the shipwreck, and so sent questionnaires to the team members. All responded – some in great detail. Wanting to get the men to give a fuller account of their feelings about what had happened, he travelled, between Covid lockdowns, to interview them in their homes. He was surprised at the sometimes differing accounts of incidents that they had all observed.

Memories differ

This is an idea that threads through the book: the imperfection of our memories.

On the day that the *Wahine* hit the reef, amazingly little information was passed to shore and very little was recorded on the ship. We only have the crew’s memories, and the ship’s logs, which were recovered by divers in the days after the tragedy, to give us an idea of what happened. Jerram writes that his recollection is that he hadn’t acted as well as he might have during the abandoning of the ship; his memory is that he was seized by panic. None of his teammates remembers this. Jerram himself has no memory of carrying a woman passenger through the waves to shore from number-four lifeboat. A photograph of him doing just this, which he saw for the first time comparatively recently, is on the cover of the book he eventually wrote.

Many recall that day

My own memory of 10 April 1968 is that my father came into my bedroom and said, “The *Wahine*’s gone onto Barrett Reef.”

He had heard a report on the radio, so it must have been mid-morning.

That Wednesday before Easter would have been a school day, so why was I still in bed? Was I sick? Had school been cancelled? I can’t remember. I had travelled on a Lyttelton–Wellington ferry the previous year to attend a Sea Cadet camp at the Auckland naval base. Was it the *Wahine* I travelled on? If it was, I’ve forgotten.

I do very clearly remember a special edition – an ‘extra’ – listing the names of the deceased, being put out two or three weeks later by *The Christchurch Star* newspaper and people lining up in a city street to buy a copy – an occurrence unique in my experience.

The engine logs

Because of his involvement in official commemorations, Peter Jerram met Captain John Brown, who was the skipper of the Wellington Harbour pilot boat that towed number-four lifeboat away from the dangerously listing *Wahine*. Forty years after the event, Brown analysed the ship’s engine logs. He concluded that the ship’s engines had been slowed to half-speed as she entered Wellington Harbour.

Brown, a very experienced mariner, was of the opinion that slowing a vessel with a massive following sea, such as was experienced that day by the *Wahine*, would make the rudders ineffective, increasing the danger that the ship would broach – be slewed side-on to the waves – which is what happened to the *Wahine*.

Peter Jerram hadn’t previously known that the ship had reduced speed. Few who read his book will disagree with his conclusion that this was the action that



Team photo, 25 years later


The team sailing, 30 years on


The team 50 years after the disaster

started the chain of events that led to the ship's loss.

Court of Inquiry

The ship's master, Captain Robertson, told the Court of Inquiry (COI) into the ship's loss that he ordered the reduction in speed to improve the ship's steering. Unfortunately, he didn't say why he thought this, and his statement wasn't challenged by the Marine Department prosecutors.

Jerram's book offers a possible alternative reason for slowing the ship that seems a better fit with John Brown's analysis of the engine logs: that the *Wahine* was ahead of time because of the following seas; therefore speed was reduced as she entered Wellington Harbour so that she would arrive at her Wellington berth exactly on time.

The Team That Hit the Rocks is divided into several sections. There is a charming introduction by outstanding test cricketer Jeremy Coney, then a short overview of Wellington Harbour, followed by a narrative of the unfolding catastrophe – mainly from the team's point of view – and then a description of the team's various reunions.

Part two, What the Hell Happened?, is a detailed examination of the COI – its make-up and findings – and of the views of those who had reservations about its conclusions. The book finishes with a thoughtful afterword by Captain Brown, two appendices, and a useful index.

Appendices

Appendix one contains team biographies. I found this fascinating for its insight into a group similar in age and background to myself, yet quite different, most obviously in their seemingly lifelong devotion to sport, especially cricket.

"Few who read his book will disagree with his conclusion that this was the action that started the chain of events that led to the ship's loss"

All completed their agriculture studies; Jerram and another member eventually became vets. They all seem energetic and ambitious. I gather from the book that agricultural students were required to work on a farm for a year before commencing their studies. Did this shape them? Or was it the *Wahine* experience that made them who they are?

Appendix two is the text of Peter Jerram's speech at the 50th-anniversary commemorations. It's very, very good.

A great read

I read the whole book in a couple of evenings. It is thought-provoking and leaves no doubt that a multitude of things could have been done a great deal better. A few examples: the lack of children's life jackets is particularly – gravely – disturbing; the reassuring tone of the all-too-few announcements made to the passengers seems completely wrong-headed; the failure to pass appropriate information to authorities on shore defies comprehension; the inexperience of the crew with the inflatable life rafts is simply outrageous.

I suspect that if Peter Jerram had been in charge of the COI, a much more hard-hitting verdict would have been delivered.

The Team That Hit the Rocks is now in its second printing. The publisher, Bateman Books, has done a very good job with the book, particularly with the many illustrations. Peter Jerram personally gained permission from Welsh photographer Dai Hendy to use his evocative colour photos taken on the ship.

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Dave and Catherine Parker's 1958 Buick Century Caballero Estate was found in Arizona somewhere and purchased from a guy who had dug it out of the desert. It arrived in New Zealand in 2005 but spent the best part of 17 years in an Auckland shed. Typically for a car found in desert conditions, it turned out to be structurally sound but in need of a full restoration.

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THE SCOOTER DOCTOR

A shed-based business, with plenty of social contact, is a dream come true for this sheddie

By Vicki Price | Photographs: Vicki Price



After enduring several rounds of redundancies in the corporate world, Martin Smith of Auckland found the ticket to freedom in a home-based – better yet, a shed-based – business.

When Martin and his wife Jan spotted an advertisement for a mobility scooter repair and service business for sale, they knew it was just the thing for them.

"Having worked in large sales and service-oriented companies, I gained a good understanding of sales processes as well as the importance of service support when dealing with equipment and machinery," Martin says.

Although Martin had no formal qualifications, he says that he has always had an enquiring mind and he likes to know how things work. Fortunately, he has the support of his wider family members, one of whom is an auto-electrician, whose assistance at times is invaluable.

A new bench and work begins

Martin's son-in-law built a workbench for him, so that he can work on the scooters at standing height and not have to be on his knees on the floor.

On one end of the bench is a built-in hydraulic jack; at the other end are an under-bench toolbox and an electric winch. The latter, with the aid of two ramps, allows Martin to pull non-working scooters onto the bench. Scooters that do work can use their own power to drive up the ramp.

Martin explains that the main way to care for mobility scooters is to treat the battery well. They are the most expensive part of a scooter to replace. Most scooters use lead-acid sealed gel batteries, but some use lithium-ion batteries.

Educating helps users

One of the things that Martin does is educate customers, especially people who have inherited or bought a second-hand scooter. These machines are often in poor condition and Martin tweaks them into good usable order – a new foot-peg here, a new handlebar control there, new wires or a new battery, for example.

"As many of our customers are not very mobile, we regularly take scooters to them so they can see and use them in their environment," he says.

To do this, he has made a pair of foldable ramps that he carries in his vehicle: "My vehicle is large enough to accommodate all but the longest of our scooter models. By using folding ramps, I am able to drive them up the ramps by standing beside the scooter and operating the controls."



As a sole operator, Martin Smith of Auckland has had to develop a way to get large mobility scooters into his 4WD

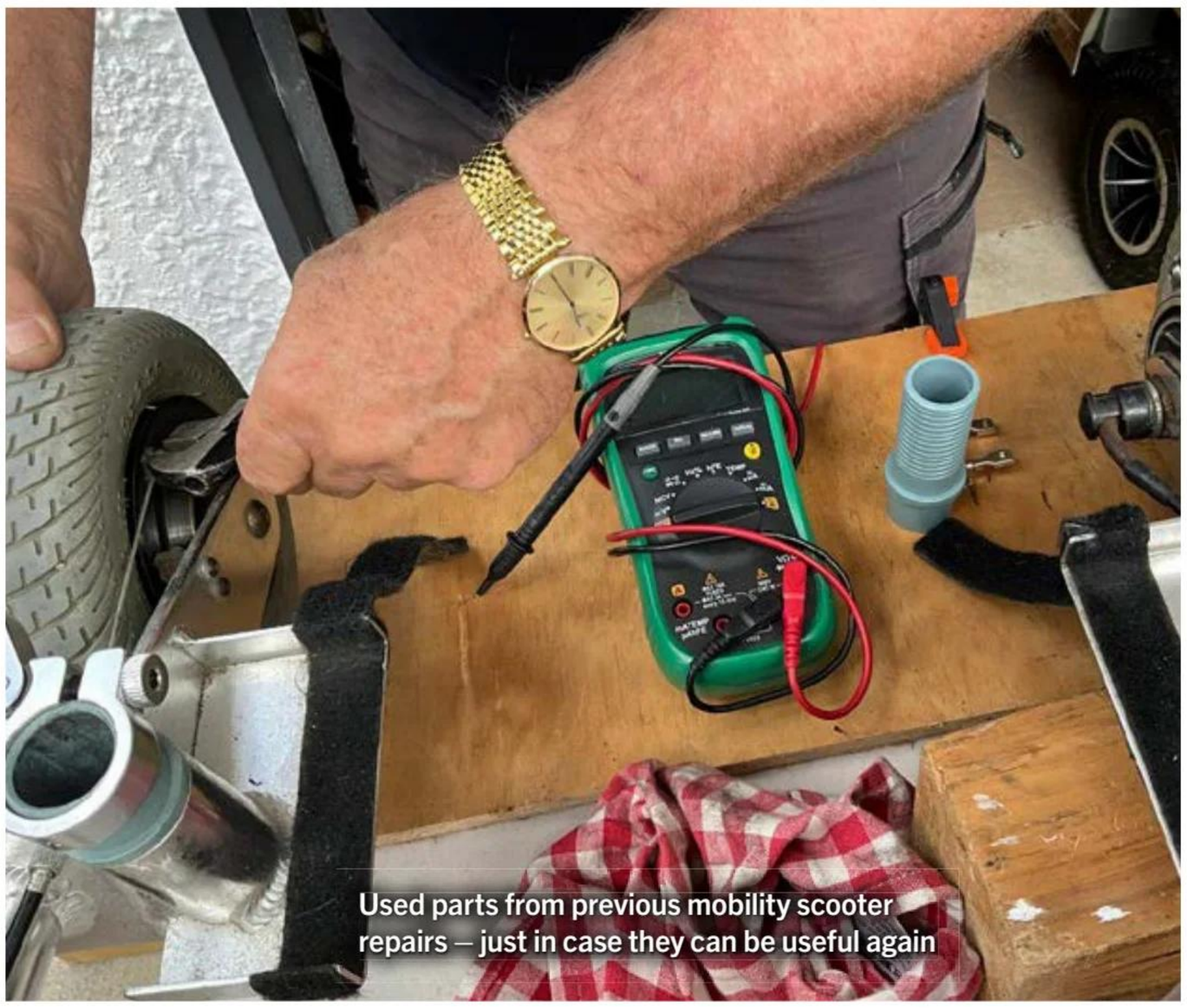
If the scooter is not functioning, the only option is to put the scooter into free-wheel mode and manually push it up the ramps. Martin tries to avoid this whenever possible, as many of the scooters weigh more than 100kg.

Carbon build-up and sticky brushes

One of the jobs that Martin performs on mobility scooters is stripping down, cleaning, and rebuilding a brushed electric motor. After a long period of use, an electric motor can build up a significant amount of carbon internally, as a result of the carbon brushes wearing down.

"These need to be replaced as they are a consumable part of the motor" he says. "Motors we work on generally have either two or four brushes. These are rectangular blocks of carbon that slide down a channel and are pressed against the commutator by a spring-loaded brush cap."

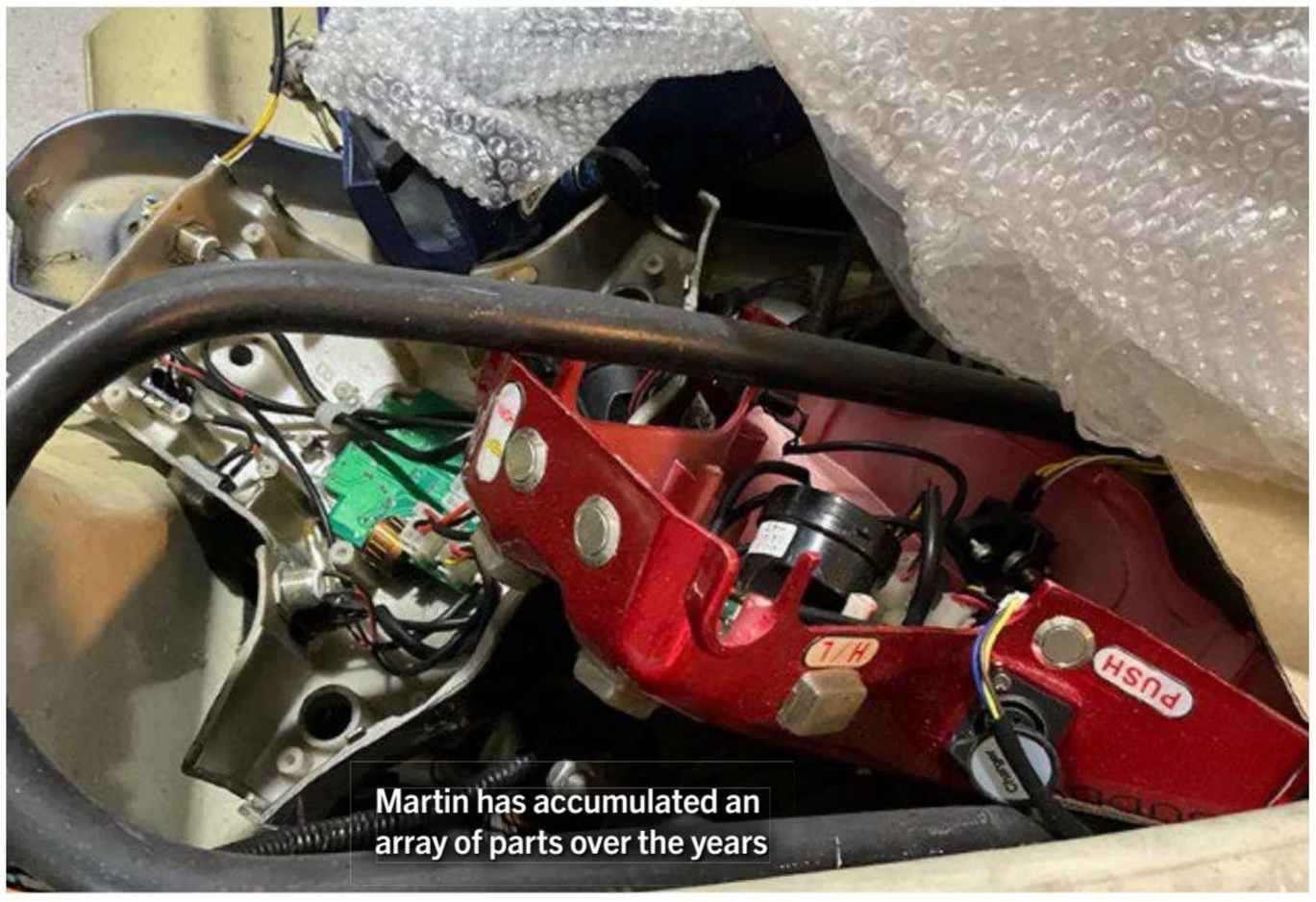
Martin uses an air gun to remove loose carbon dust and fine-grade sandpaper (800–1200 grit) for the hard carbon deposit that forms on the commutator. ▶



Used parts from previous mobility scooter repairs – just in case they can be useful again



Martin adjusts the brake system on this TravelScoot, a small mobility scooter



Martin has accumulated an array of parts over the years

Cleaning techniques

Wrapping a strip of the sandpaper around the commutator and gently sanding off the build-up in a circular movement is the technique that Martin employs.

"The aim is to remove the build-up, while keeping the commutator undamaged and smooth," he explains. "This will provide a better connection between the brushes and the commutator."

Ensuring that the brushes have smooth travel through the channel is an important factor because a stuck brush can result in a gap between it and the commutator, making the motor less efficient and creating excessive heat, which can create further problems.

"If the brush feels sticky in the channel," he says, "the use of a fine file on the sides of the brush will provide smooth passage for the brush through the channel."

Top tip for cable ties

Another of Martin's tips – no less useful – prevents the essential but fiddly cable ties from spreading themselves around the toolbox or shed.

"Do not open the cable-tie bag; instead, put a piece of fabric or gaffer tape across the middle of the plastic bag, cut a slit across the tape and bag, and take cable ties out from the middle of the bag. The cable ties cannot escape through the opening."

Parts, parts, and more parts

Another side to the business is importing mobility scooters.

As Martin's shed is at capacity, he has a storage facility where he keeps excess scooters. However, he unpacks new shipments in his shed and tests the scooters there to make sure they are in good condition after transportation.

Apart from being full of scooters, Martin's shed has every nook and cranny filled with tools and parts: wheels, electric motors, wires, foot pegs, circuit boards, LED lights, walking-stick holders, lamps, paint, key barrels, mirrors, springs, and the ubiquitous tape and CRC.

Martin enjoys the people side of his 'sheddie' business: interacting with customers. He often finds himself familiarising them with their new wheels,

New scooters await their new owners as the fishing rods wait patiently on the wall

A tidy shed is a sign of a tidy mind

Martin knows where everything is

“Another side to the business is importing mobility scooters”

Scooter spare wheels

Ah, golf …

and can help those who have swapped driving a car for riding a mobility scooter. Some may have unmet expectations of what their scooter is capable of and may be unaware of how to look after it or even where it is legal to use it.

As with any device used for transport, mobility scooters must adhere to the road rules, even though the scooters are mostly used on footpaths. Safety is very important, and a visible flag can help with being seen. Keeping to a walkable speed is also polite on a footpath, and can make for a safer ride for both rider and pedestrian.

Have scooter, will travel

Many people travel with a small, foldable travel scooter, which has a battery suitable for airline travel.

One night, Martin received a phone call from a man in Singapore who was having difficulty convincing airport staff that the scooter battery was certified and allowed on the plane. Martin was able to send him the official documentation, showing clearance for his scooter battery, and the matter was settled. ▶

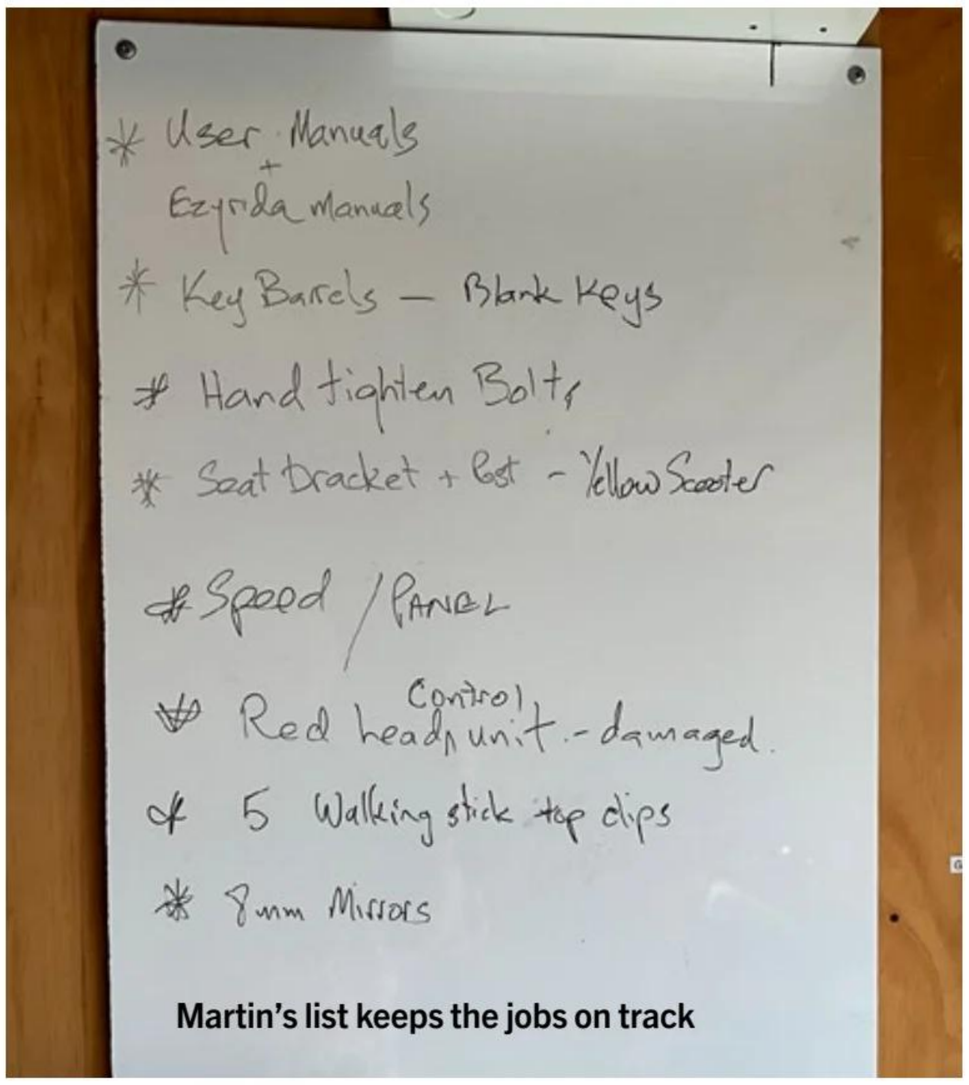


With electronics in the shed, a filing cabinet is just the thing for storing tiny components

"Although Martin had no formal qualifications, he says that he has always had an enquiring mind and he likes to know how things work"



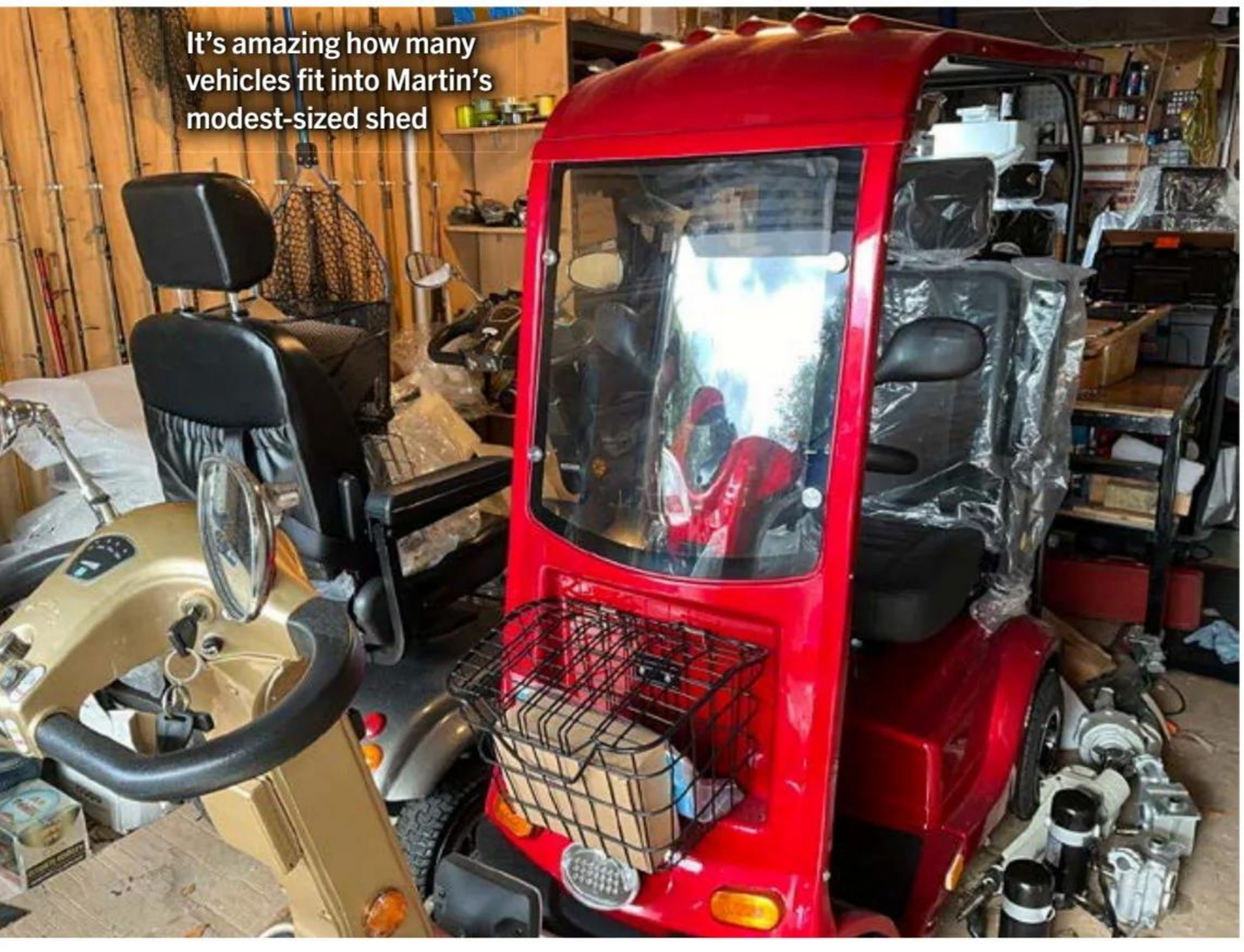
The winch helps take those scooters that can't be driven up onto the workbench



Martin's list keeps the jobs on track

Having a workstation at waist height saves Martin's back

"He can help those who have swapped driving a car for riding a mobility scooter"



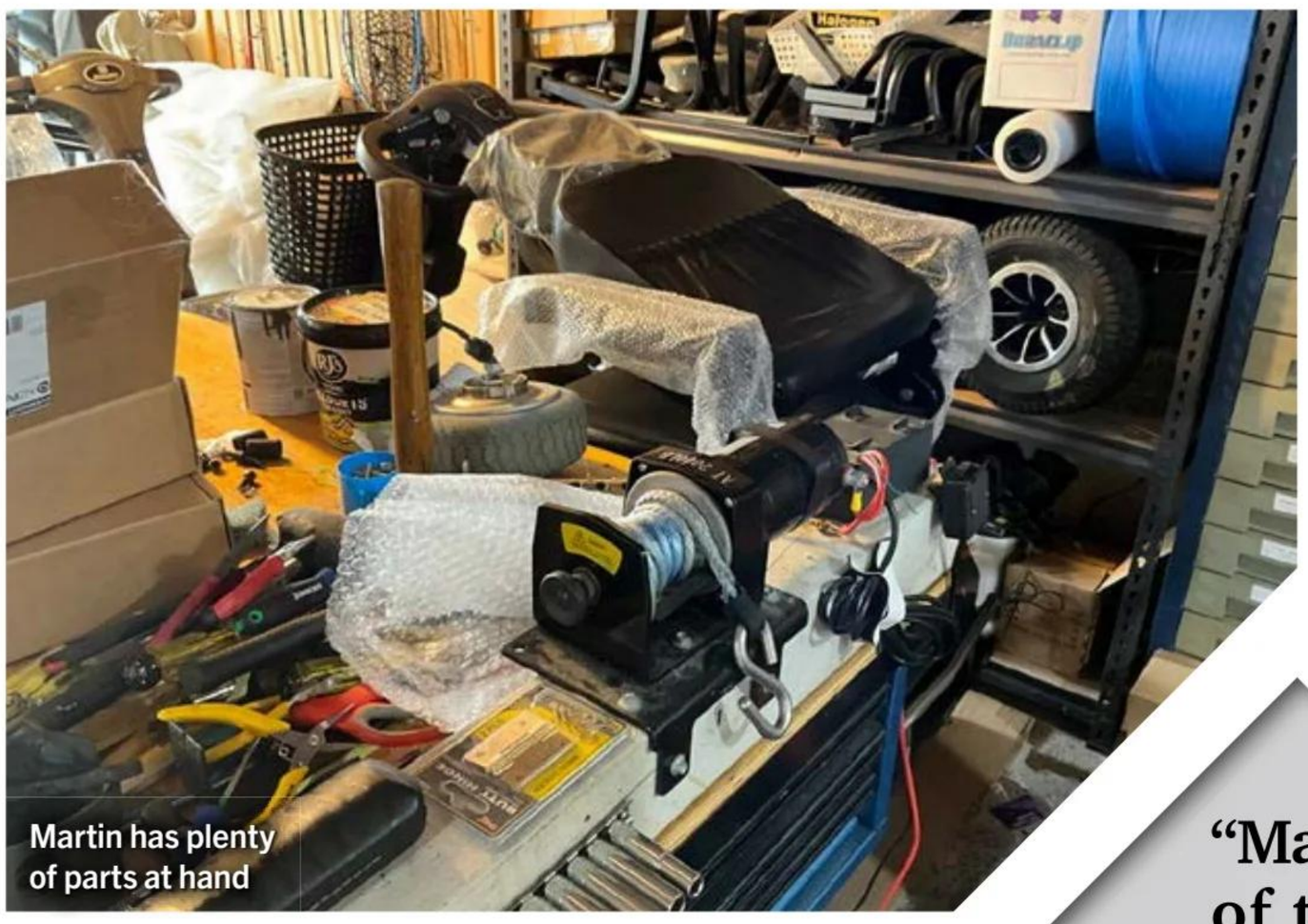
It's amazing how many vehicles fit into Martin's modest-sized shed



The invaluable ramps for getting the scooters up to working height or into the back of the car



A roll of cleaning cloths means Martin's never searching for a rag



Martin has plenty of parts at hand

On another occasion, Martin needed to rent a scooter to a visitor from the UK who had taken her scooter to the airport only to discover that her battery was not certified for airline travel, so needed to leave it behind. Martin's rental scooter came to the rescue, and she was able to enjoy her New Zealand holiday.

Fishing for fun

Scooters and their parts aside, Martin has found room in his shed for his fishing gear. One part of the wall has rods and nets hanging on it. While he doesn't find much time to use them, he does enjoy some interaction with them from time to time.

"When time permits, I quite enjoy stripping down my fishing reels for maintenance," he says, "although I would prefer to be using them for what they were designed for."

Similarly, three sets of golf clubs sit next to the fishing gear, awaiting some action. No doubt electric golf carts will be next on the agenda for Martin.

"Many of the scooters weigh more than 100kg"



Martin works on many types of scooters to get his customers moving again

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Wood-turning

HOOKED

A showcase for the efficient use of space, this shed is immaculate. Everything is in its place – visible and easy to reach

ONWOOD

By Helen Frances | Photographs: Mark Bellringer



The practical simplicity of wooden sliders makes it easier to access essentials in the rear of Tony and Petro Ashton's camper-van

"Then he said, 'Why don't you join the New Plymouth MenzShed?'"



Tony was given tools and replaced the rotten handles with new ones that he made

On our way to Tony Ashton's shed in Bell Block, New Plymouth, Tony stops beside the rear of a large camper-van and pulls out a wooden slider. It's one of two that he has made to avoid whole body dives for essentials into the bowels of the van. The slider is among many projects, simple and complex, that he will show us during the visit.

Behind the van sits the pride and joy that he built with mates, "the two Davids", from the local Menzshed. This large, steel kitset shed is a place for creative meditation ("What will I make next?") and the making of whatever he dreams up or that takes his fancy on YouTube.

Five years ago, Tony was a shed newbie, but then he heard about Menzsheds and the rest is this story – well, some of it.

Taking an early retirement, Tony and wife Petro had moved from Auckland to New Plymouth, living on a farm in a caravan for 18 months while their new home was built. They moved in and Tony said, "I'll have a small shed."

At the time, he had a drilling machine, a grinder, a few hand tools, and a fridge, "to keep a couple of beers in".

"I started getting into a bit of just pottering around the garden, making some small stupid things," he says. "Then I went into Bunnings one day, and the guy said, 'Oh, are you into woodwork?'

"I said, 'Yeah, not in a big way, but I'm quite enjoying it.'

"Then he said, 'Why don't you join the New Plymouth MenzShed?'

"I asked, 'What's that?'

"He said, 'It's where all the retired guys go and they've got all the machinery. You'd love it.'

"So I shot over there. I met Phil, he showed me around, one thing led to another, and that was that; I was hooked on wood."

Inside Tony's shed

Tony's shed is a showcase for the efficient use of space. The order is immaculate. Everything is in its place – visible and easy to reach and use as required.

When Tony did his apprenticeship as a fitter and turner in Australia – his family moved there from England when

A whole wall system of French cleats holds tools organised in groups, allowing easy storage, access, and manoeuvrability

The power tools that he prefers to hand tools are stored in a cabinet at the end of the shed

All tools are super organised and super easy to see



Tony Ashton at the door of the kitset shed that he built with help from mates at the New Plymouth MenzShed

he was 11 – good housekeeping was instilled, along with the catchphrase, "a place for everything and everything in its place". At night, everything goes back to its designated spot in his shed.

"My dad also used to drum it into us that if you use something and you put it back in the same place all the time, you'll never lose it," Tony says – something he recommends to Petro when she mislays her keys.

Following online instructions (familyhandyman.com/project/how-to-build-a-french-cleat-tool-storage-wall/), he has made a system of French cleats along one wall to hold tools organised in groups. Making the cleats involved matching 45-degree bevels – one on the wall, the other on the tool holder. They lock together to form a solid connection.

"You just drop the tool holder over the cleat and can lift it out to move it to the workbench," says Tony.

He made his workbench, which stands in the middle of the shed, from matai rescued from a building site.

Shed layout

All of Tony's machines, ranged along the other wall, are mounted on cabinets made of MDF. He sourced the MDF free from a kitchen joinery next door to the Menzshed.



The manoeuvrable cabinets are mounted on wheels and have drawers and an extendable bench on each end. When Tony wants to use a specific machine, he wheels it out into his workspace and unfolds the bench arms.

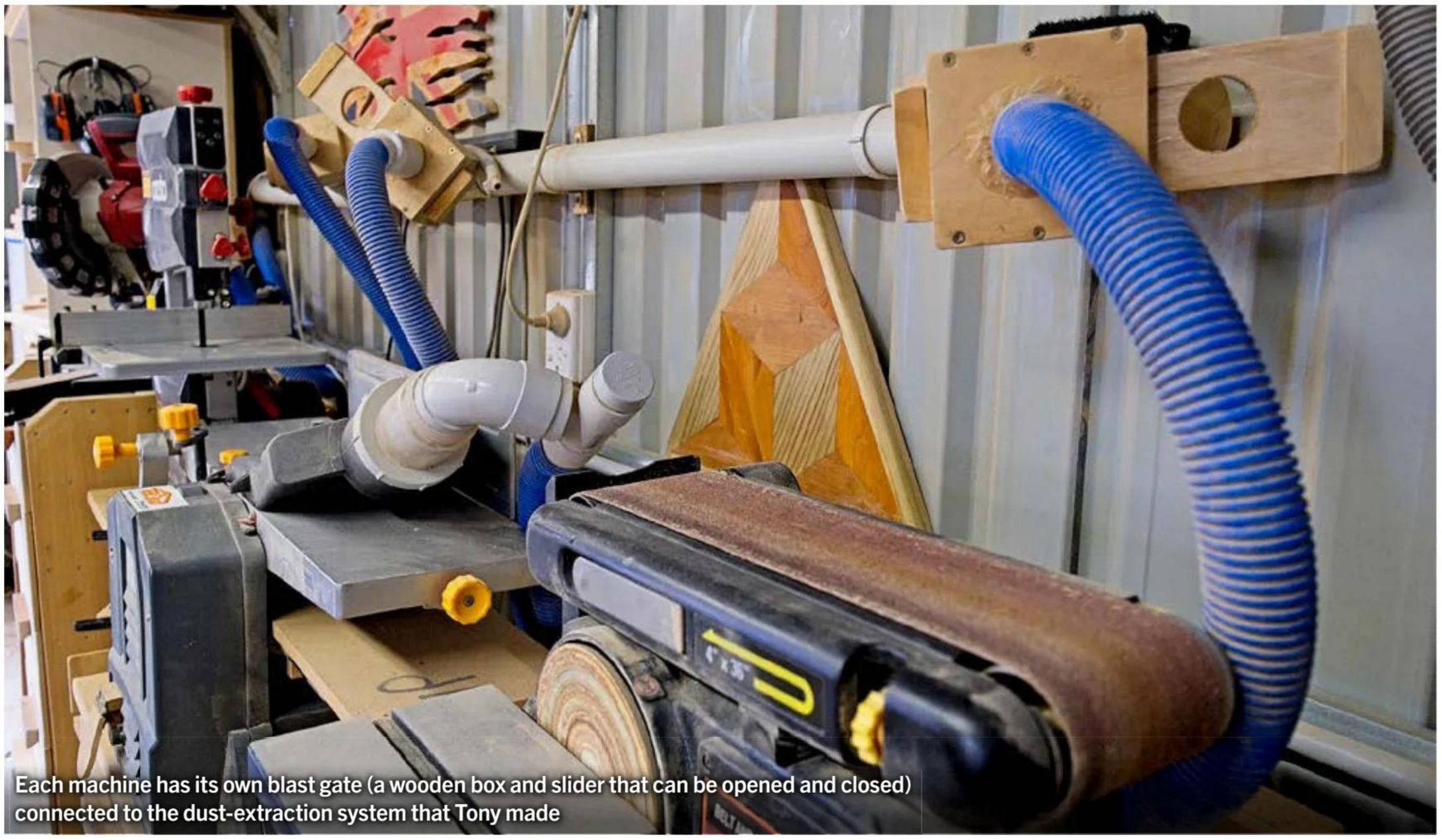
"I think it's easier to work with instead of a thing being fixed in one particular place," he explains. "You can move it around. If I wanted to cut a long piece of wood into strips, I wouldn't be able to use the machine if it was in a fixed space."

On wheels, he has a thicknesser with planer and jointer, a scroll-saw, a sander, a router, a grinder, a drill press, a lathe, and a table saw – a favourite because he can cut wood to the size he wants.

Dust extraction and power tools

A dust-extractor system that Tony made from an old air-conditioning unit

"This large, steel kitset shed is a place for creative meditation"



Each machine has its own blast gate (a wooden box and slider that can be opened and closed) connected to the dust-extraction system that Tony made

> "I come into the shed every day, get my radio going"

cleans the air, sucking up the dust and blowing out the cleaned air to where Tony works at his bench.

Each machine has its own blast gate, a wooden box and slider with holes that can be opened and closed, connected to the pipe that removes dust while Tony works. He turns on the system with a remote control. In addition, an extractor fan hangs from the ceiling.

Tony made new handles to replace the rotten ones for tools he was given, a new handle for his vice, and brackets for his clamps. He also made a safety feather-board for the table saw; it keeps the wood pressed in place.

Power tools, which he uses in preference to hand tools, are stored in a cabinet at the end of the shed. There are sanders, a Skilsaw, a circular saw, an angle grinder, a planer, a hand router, and a drop saw. A favourite is an air-compressor brad-nail gun that his daughter gave him.

"You plug your compressor on the gun and it just shoots out nails," he says.

Nails, screws, washers, nuts, and bolts are stored in a red metal cupboard in mayonnaise bottles with blue tops that Tony saved up – they love their mayo!

Also stored in his shed is a set of



Cyclone dust collector



Daily company in his shed: radio and Mini Me sheddie



Wings installed on both sides of the mitre saw for working longer lengths of wood



wooden ramps that he made following a YouTube video (youtube.com/watch?v=2tMp_IBvlbo), the base of which swings back on a hinge. The ramps improve access to the underneath of the car and camper-van and "make life a bit easier".

Tony says, "I come into the shed every day, get my radio going, and, if it's cold, turn my heater on."

Looking down from a shelf, his sheddie-mate doll 'Mini Me', greets him with a grin.

A love of wood

Tony has a work background, more recently as a real-estate house renovator and café owner. His earlier career in Australia as a fitter and turner / mechanical engineer means that he is no stranger to highly accurate manual work.

Wood, his material of preference now, is vastly different from metal: "As a fitter/turner, you're on a lathe and you're making things out of steel and with steel – turning everything to microns. Wood is a little bit more forgiving. You're down to portions of a millimetre, or as close to a millimetre as you can get. It's just different."

Instead of considering a crusty old piece of wood as fuel for the fireplace, Tony wonders about what may lie beneath.

"I used to look at a piece of wood and think, *Ooh, that's horrible*, but now I can look at a piece of wood and think about what I might make; how it could look once it's cut and shaped, cleaned up, and sanded back. You get some beautiful grains; that's what I like about wood," he explains.

House renovating developed skills

Tony stores long lengths of wood in the ceiling of his shed. He also has a few pieces in a box on the floor, including some walnut that his son-in-law gave him when they felled a tree and some swamp kauri.

"That has been underwater for thousands of years, and it's dried, but when you clean it up, it comes out absolutely beautiful," he says.

Tony's experience doing up houses and selling them is another set of skills that he brings to the shed bench.

"I did most of [the house renovations] myself in the early years. I'd be ripping the kitchens out, installing kitchens, ripping the bathrooms out, installing [new ones] with a bit of help from a plumber. I'd get carpet layers in, but I'd rip the old carpets out and I'd do

"You get some beautiful grains; that's what I like about wood"



Small pieces of wood in waiting are kept in an open box



Plant holders are among the many pieces Tony makes that add a decorative note to the garden

all the painting myself, all the fencing myself, until I started making a bit of money. Then I hired a crew of guys and I just basically project managed them," he says.

House and garden

Tony's house and garden are a showcase for objects both useful and decorative, many of which he makes with Petro in mind.

Outside, there are landscaping features that Tony has made, such as a bird feeder, a little arched bridge, pot-plant holders, a bench, tables, a Cape Cod chair that he made at the Menzshed, a barbecue frame, and a water feature with a fish pond. He dug out and lined the pond, then installed a bog filter with a pump that purifies the water then returns it, refreshed, to the pond.

Inside, all around the house, there are beautifully turned pieces, including wooden vases, bowls, a clock, jewellery boxes, and pot-plant holders. A linen chest with sliding drawers at the end of their bed doubles as a seat when he puts on his socks.

In a window sits a 'sunrise' such as he saw on YouTube: "I just got all different types of wood, cut them into wedges, and glued them all together. Then my grandson came to visit and



A wooden sword and sheath ordered by Tony's grandson. A miniature cannon sits beside the TV



Inside and outside the house, Tony's work has added decorative features: a pond with bog filter, a dish holder, a vase with tulips, a clock, and plant holders



he wanted a sword." So Grandpa Tony obliged, making a wooden sword with a sheath. Bearing in mind the war theme, he also made a miniature cannon.

Curves on display

A bowl that undulates like a waveform is among the many curving, rounded pieces that Tony displays.

"You cut all the wood one way on the table saw. Then you turn it over and you cut the wood the other way. Then you turn it sideways and cut it







A 3D optical illusion from YouTube that Tony made early on





Tony's wife Petro has received some stunning jewellery boxes. Tony sources many of his projects from YouTube

"I love my shed; I really do. Even if I haven't got a job on, I can come in here, sit down, and just look at it and think, *Right, what can I do next?*"

Bowl

Optical illusion

this way and then that way, and it becomes flexible" (scan the above left QR code).

Another piece that he made following YouTube instructions is an optical illusion that incorporates three different timbers – rimu, pine, and matai. Appearing three-dimensional, the piece is actually flat (scan the above right QR code). "I wanted to do this when I was learning woodworking in the early days to get my wood cutting accurate so the joints line up as best as one can do," he says.

Christmas pressies

Tony's daughter is a primary school teacher and he cuts pieces of wood for her students to work with.

At Christmas, instead of stockings for family members, he makes a box that Petro fills with goodies. One year, he made round boxes that can be reused as pot-plant holders.

"I love my shed; I really do. Even if I haven't got a job on, I can come in here, sit down, and just look at it and think, *Right, what can I do next?* Then something will come up," he says.

At day's end, 4.30pm, Tony finishes work in his shed and goes home. Petro makes her man a cup of coffee, and then he starts dinner: "I've done that for years; I love cooking as well."







Making a leaf jewellery box

When Phil Taylor, coordinator of the New Plymouth MenzShed, set up a woodwork competition for members, Tony won gold.

"Phil gave us all a big chunk of wood and said, 'Right, guys, make anything – something small, something nice, something that we could sell at the end as a fundraiser,'" Tony says.

First, second, and third placings for the anonymous, numbered entries were decided by a secret ballot.

Tony made three boxes and sold them to members. He also won $50 for first place at the end-of-year barbecue attended by members and their partners.

To make the boxes, one of which he gave Petro, he used a template and followed a 'How to' video on YouTube: *Building the Leaf Box* (youtube.com/watch?v=dU16gbhZxSE).

A lot of cutting, glueing, clamping, and sanding goes into making this exquisite little box; not a nail or screw in sight – or in the wood, for that matter.

Tony already had Phil's piece of rimu, and he chose two additional pieces to complement and contrast with one another: rewarewa (honeysuckle) and maple, both lighter woods. The rewarewa, in particular, has a beautiful grain and glows like honey when it is varnished.

The base and top are rimu, with the maple as a central, curving decoration in the convex lid. The sides, interior, and exterior of the box are built from three layers of rewarewa.

Tony started from a square for the different parts of the box. He made the interior first.

"It's easier to cut the wood when it's square," he says. "You drill a hole in one end and you draw the shape of the inside of the box. Then you cut it out on either a bandsaw or a Skilsaw. You do that three times so you have three layers about half-inch thick.

"Now you've got a hole right through the three layers. You glue them together and clamp them until the glue is dry. Then you cut the centrepiece out and sand it. Once you've cut that centrepiece out, you cut the outside of the wood to make the shape of a leaf."

Tony glued a piece of rimu underneath to make the base. While that was drying, he made the lid from another rectangular piece, through which he made a wavy cut from one end to the other.

"You do that on a bandsaw so you've got two pieces. Then you get a thin piece of maple that is flexible and will follow the curve along the centre of the leaf. You put that in between the pieces that you've just cut, and then squeeze it all back together again with glue and clamps. That makes the line going right through the centre of it.

"Once you've cut that centrepiece out, you cut the outside of the wood to make the shape of a leaf."

To keep the lid in place inside the box, Tony cut a piece of pine and glued it underneath the lid. That stops the lid from sliding around.

"You sand the hell out of it. Then you've got to shape the lid so it's convex – not flat on top any more but rounded. Then you varnish it. It takes about a week to make."

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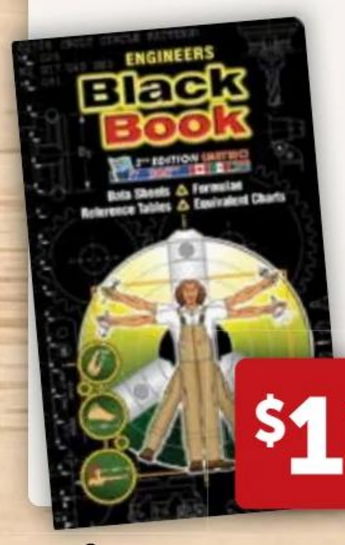
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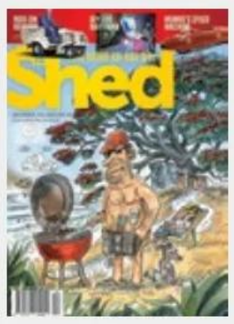
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A shed brings men together in one community space to share their skills, have a laugh, and work on personal projects or within a group for the shed or community.

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Neuro nuovo

Is neurodiversity actually the new neurotypical?

By Jude Woodside



Every now and then something comes along to upset my apple cart. Such as when, for example, you discover that you were not quite as 'normal' as you thought. My daughter suggested to me recently, having come across a list of the symptoms of ADHD, that they reminded her of someone – with a meaningful glance in my direction. Who me? *Quelle horreur!*

However, I googled the symptoms and she might have a point. Impulsiveness, poor time management, problems with prioritising, disorganisation, easily distracted, difficulty focusing on a task, not following through or completing a task, low frustration tolerance – I could go on. In fact, I did. All this was ringing bells within.

My symptoms

One of the outward symptoms is a plethora of hobbies with many abandoned or half-completed projects. I have a room full of those. I do get bored easily. I hate doing administrative paperwork. I am a champion procrastinator.

ADHD NZ has an online test to assess how likely you are to have adult ADHD. It's not a diagnosis in itself. If you score 14 or more, you may have the syndrome; I scored 22.

However, in many ways this has been a revelation. I have begun to understand myself better – my motivations, my weaknesses, and my strengths. I never thought I had a syndrome; I thought I was just lazy.

It's not me; it's my job!

It just happens that I have always been in employment that catered to my particular mindset. Media and entrepreneurship are areas where ADHD sufferers do work well.

We work well under stress, often being the only people not losing it when all about are losing theirs. I have always had deadline-driven jobs and tended to flail about without the discipline of a deadline looming.

People with ADHD are essentially dopamine junkies – that hormone that gives you a boost from doing something for the first time. So we need constant stimulation. We also have a voice in our head that never stops; it's either a constant flow of ideas, often not connected, or an annoying earworm song. I thought everyone had that. It's the sort of thing that makes you suddenly need to expound on some obscure knowledge you possess, just as your partner is about to fall asleep.

> "You discover that you were not quite as 'normal' as you thought"

Totally focused

I can focus, especially when I need to. I remember at university, when I would start the 10,000 word essay the night before it was due – on a manual typewriter.

There are so many people that I know being diagnosed with ADHD lately that I thought it was the syndrome *du jour*, but now I think that, as with dyslexia, it's a neurodivergence that has been underestimated. It may be that more of us are neurodiverse than we ever thought, and it tends to call into question what neuro-normal actually is – although it sounds a bit boring to me.

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