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APR./MAY. 2024
ISSUE 114
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THE STUFF OF LEGENDS

Who would have thought that a car designed and created in 1922 would still be inspiring young achievers to replicate it more than 100 years later. Astonishing, don't you think?

After WWI, Herbert Austin was in awe of the success of the USA's Ford Motor Company in mobilising the working classes; he set about doing the same for his countrymen. The Austin Seven was born, and instantly had the racing fraternity seeing what they could do with it – hot rodding it, in effect.

Lighter bodies replaced the already light body, and were lowered for even better handling. Axles were changed and the engines tweaked for greater performance.

What this all meant was that motoring fans could put their own stamp on their Austin Seven and make it truly individual. These cars began the ritual of modifying and racing for the ordinary British man, and the legend of the little Austin battler was born.

So, how appropriate it is that, 100 years later, this automotive legend inspired a young Kiwi sheddie to have a crack at building a replica from the golden age of the Seven.

Our cover story is about this remarkable Kiwi, Athanasius (Athow) Santamaria, who came across a pile of bits, had no experience with car building, and decided, "That's a bit of me."

Athow has always been a keen learner, and is no stranger to making things, so he sought the help of experts far and wide to show him the 'how tos' and advise him on the whys and wherefores. His results are remarkable, and we are full of praise for his achievements, especially as they have come from an almost non-existent knowledge base.

Ever since its inception – right up until today, obviously – this legendary small car has inspired many to create and recreate it. None of us will be under any illusion that this romance between man and motoring machine will continue 100 years from now with, e.g., the Tesla. That romance can never be replicated because the invention of the motor car was earth-shattering, and making it available to the ordinary man even more so.

When I was a nipper in the '60s, we were taken for Sunday drives as to have a motor car was still something special – even though a four-door Wolseley arouses none of the adventurous feelings that an Austin Seven race car can.

I do find it hugely encouraging to see young sheddies like Athow sensing that historical importance and continuing to recreate the magic of the early days of motoring.

Good onya, mate.

Greg Vincent
editor@the-shed.nz

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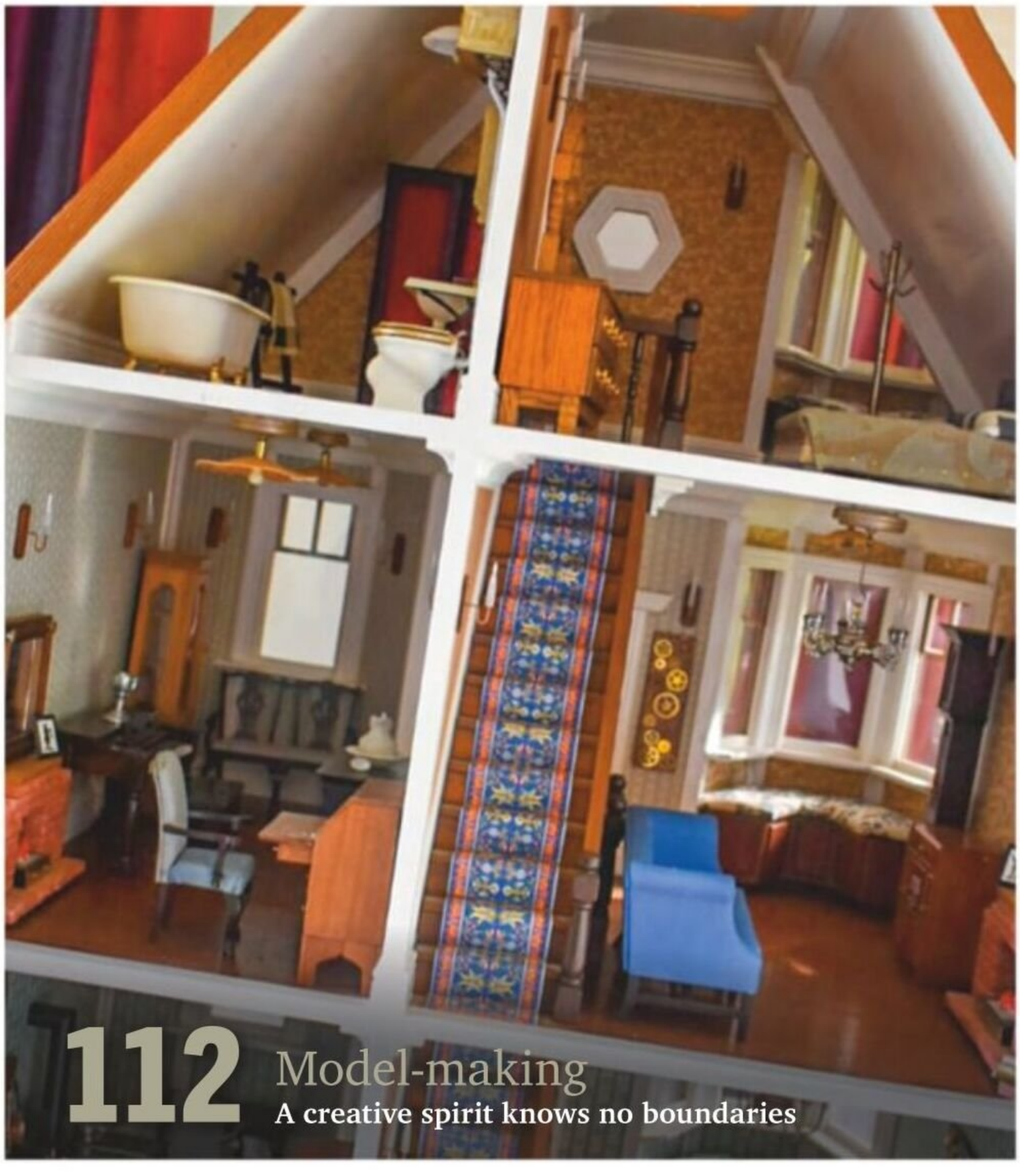

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A creative spirit knows no boundaries

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Athow keeps it as true to original Ulster design lines as he can get

THE MAGNIFICENT SEVEN

Research and planning key in fabricator's quest to make his scratch-built Ulster as authentic as possible

By Jason Burgess
Photographs: Jason Burgess
Additional photography courtesy of Athanasius Santamaria

When Athanasius (Athow) Santamaria made an "impulse decision", to buy a pile of old Austin parts in 2015, he didn't really have a project in mind.

At the time, he was a freshly minted DOC ranger working in the Nelson Lakes National Park, with a strong hobby interest in making things. However, for $1500 he had landed himself an original chassis, a radiator, three cylinder heads, a crankcase, and 10 wheels from a 1929 Austin Seven.

"Most of it wasn't very good," he admits, "somebody's junk from their project. They'd picked off all the good stuff."

Athow rented a storage unit until he figured out what to do with it all.

Fast forward a few years, and Athow is now working for DOC on Motutapu Island in the Hauraki Gulf. In his downtime, he is well down the track to completing an authentic reproduction Austin Seven Ulster; a scratch-built, boat-tail, two-seater sports car that, in its supercharged form, was a regular podium finisher in the late 1920s and early '30s.

First attempt

The Ulster is Athow's first attempt at a complete car build. Research and planning have been key in his quest to make the most accurate facsimile he can. He is driven by learning. The more detailed the process, the more comfortable he appears to be in accepting new challenges.

Athow is no stranger to creating contrivances. He has been making things since he was a nipper, and reckons he has always been good with his hands. He believes he gets his creativity from his mother, who is an artist, and his nimbleness and attention to detail from both his father, who was a hobby jeweller, and his grandfather, a dentist.

At school, it was geometry that set him off, he says – he sees the world through shapes. As a teenager, he was building dioramas and making models of NZ Railways scenery and rolling stock. Then he moved from train sets to steam technology, volunteering at Glenbrook Vintage Railway and Mainline Steam. His partner, Lou, is a writer and also volunteers on Motutapu. The couple divide their time between the island and a brand-new KiwiSpan shed on Hauraki Plains.

Lou says, "If he gets noisy, I just put my headphones on." ▶

Cross checking his details with Ulster builders in the UK

What is it about vintage?

Great design is what inspires Athow, and, for him, early racing cars capture the singularity of their creators.

"There is a handmade feel to them; they all have their quirks. In the '20s at Brooklands motor circuit in the UK, there was such an array of hand-built racing cars, individually made cars that had the signature of the maker. I think that was what drew me in. There were so many variations, really wacky shapes – long tails, short tails, exhausts out of the side. Some of them are comical, but all of them were really interesting. Today, everybody's car looks the same."

Athow credits three men equally as inspiration and as mentors: engineer Ian Williams, the late Joss Campbell, to whom Athow served an "informal panel-beating apprenticeship", and artist and sculptor Richard McWhannell, who commissioned Athow to finish the bodywork on a Lotus Mark 6 that Joss had begun 20 years earlier.

Athow regards these men as, "A powerhouse trio for building vintage cars and getting stuff done."

Ian was assembling an Austin Special of his own when he suggested to Athow that he might like to try a sought-after Ulster, because he already had the bones.

Go north, young man

When Athow quit his job at DOC in the South Island, he needed space to work on his Ulster project full time. He got his grandfather's blessing to move into the family bach at Whitianga, then moved everything from St Arnaud to Whitianga – "with a support convoy of some great friends and my mum".

Athow stayed in the bach for two years, doing extensive R&D, drafting plans, and corresponding with three owners of original Austin Seven Ulsters in England.

One of them had found an original chassis, engine, and gearbox, and commissioned the body to be built. He took pictures of the whole build process, and then generously transferred a file of 500 images to Athow with a plethora of notes and photos of original cars.

"That helped a lot," Athow says.

> "I have asked Stuart everything from bolt types and sizes, to measurements between rivets"

More valuable advice

Ian Williams introduced Athow to another Englishman, Stuart Ulph, by email. At the time, Stuart was converting his original car from high compression to super-charged. The two corresponded for four years.

"When I contacted him, his car was in bits," says Athow. "I have asked Stuart everything from bolt types and sizes, to measurements between rivets, right down to: how high is that flange? He has measured it all. I'd write it in and draw a diagram and then send it to him for corrections."

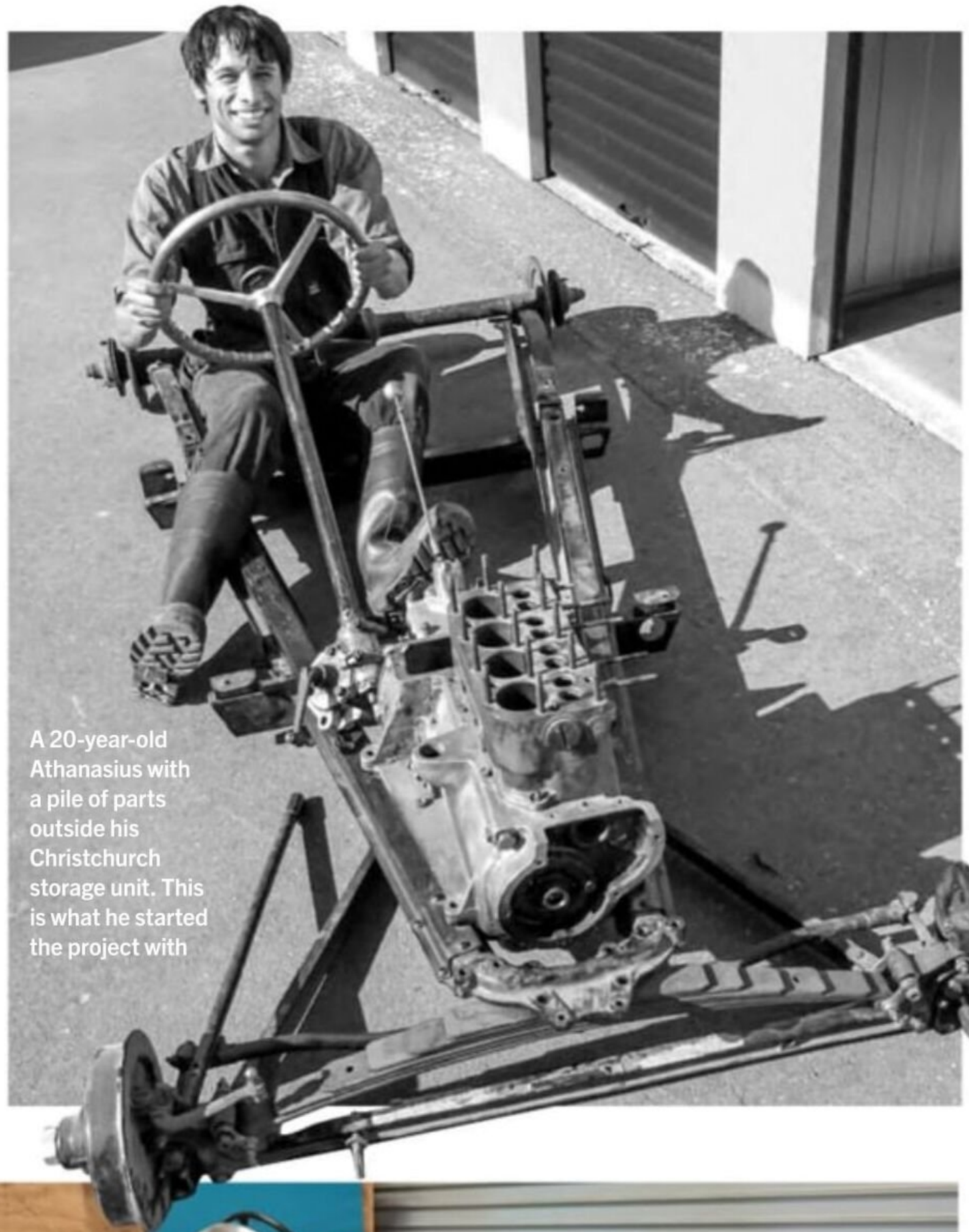
Athow initially began toying with his ’29 chassis but ended up working from a 1930 frame, which is correct for an Ulster.

“Ian has a hoard of stuff. He can’t bear to see things thrown away or mangled, so he has kept amazing things. When I needed a chassis for this, I asked him and he said, ‘I might have one.’ He looked under his house and he had three! Two were a bit butchered but he sold me this one.”

Athow made the floor out of steel, before tackling an aluminium body.

“I contacted Joss and he said to bring it all up to his garage. ‘I have cancer,’ he said, ‘but we won’t let that get in the way of anything. I’ll teach you what you need to know. I won’t do anything, but I’ll guide you.’

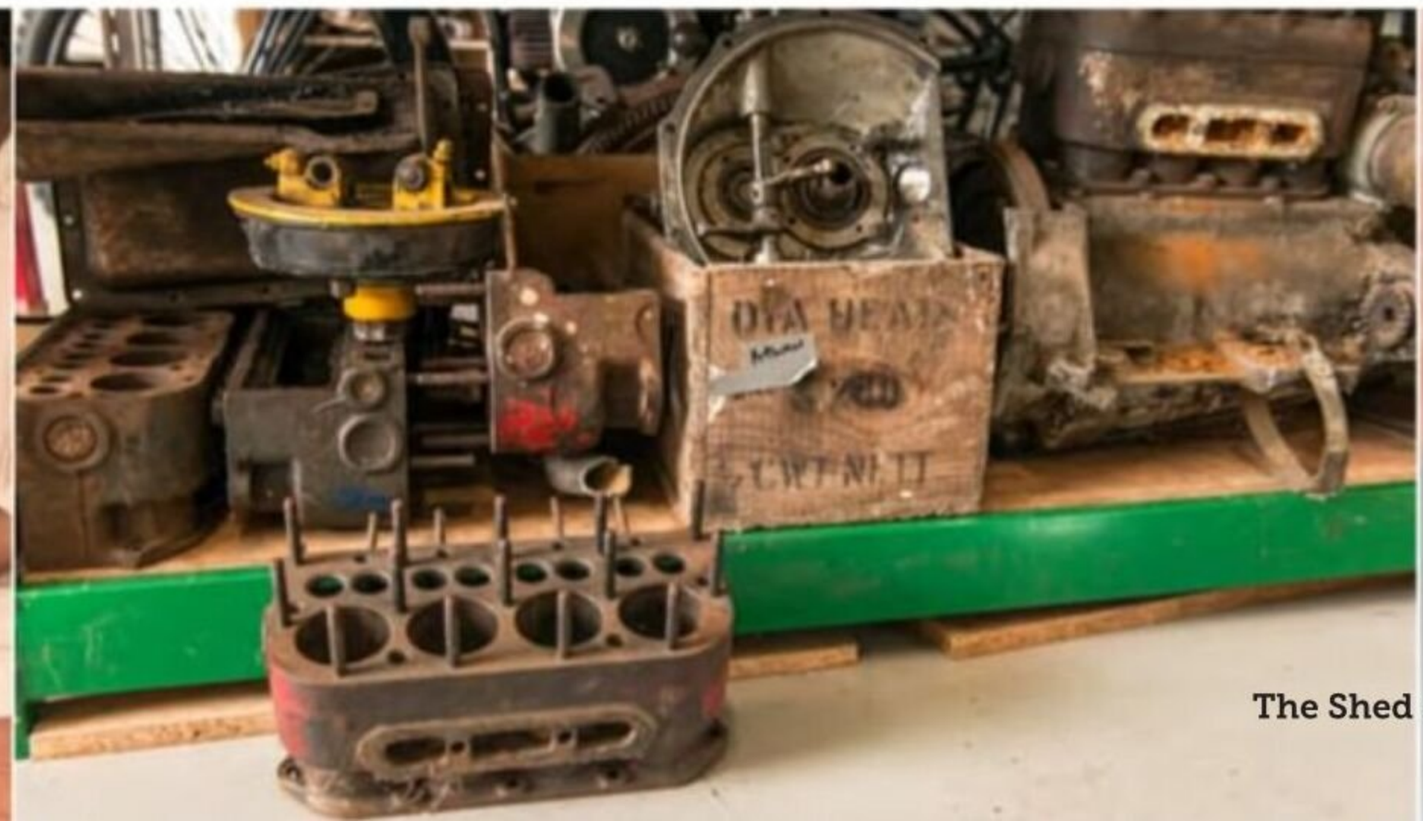
“That is what he did. He made me do it all, while he patiently watched me make the mistakes, then told me where I was going wrong. We had a fantastic bond, until the day he died. That process gave Richard the confidence in me to take on the Lotus.” ▶



A 20-year-old Athanasius with a pile of parts outside his Christchurch storage unit. This is what he started the project with

Richard McWhannell’s Lotus Mk 6 replica. Richard says, “Athow wire-edged the guards, created a scuttle, chopped the nose cone into several pieces and reformed it over the buck. Essentially, in 18 months he made it wonderful, which was more than had happened in 20years”

Below: A collection of original parts: a fuel tank; cylinder blocks and assorted mechanical parts; a wingnut screw to adjust the windscreen



Athow at work

Plans to folds

The Ulster body is shaped from 5005 aluminium, which is a little harder than industry standard 3003.

Athow lays up his draft drawings – angles, curve lines, step-ups – on sheets of ply. He says he will eventually convert them to CAD.

"I trace the drawings onto baking paper, transfer them onto sheet steel, cut it out with combinations of shears, a nibbler, and some good old Gilbos, then finish with a file.

"I don't have a folder; I will get one, but sometimes they can limit you to size and dimensions. I was taught to do it by hand. Clamp the work using angle iron, then tap a piece of wood to 'bruise' the fold line into it."

Athow says this is easy for straight folds.

The tunnel was bent over a piece of pipe straddling two sawhorses. He made a wooden buck to shape the aluminium.

"Like a glove to a hand. I shape the aluminium and bring it up to the form to check and adjust. It's a guide, really, a series of vertical stations/cross-sections of the profile.

"I didn't know how to weld when I started this project, so I taught myself gas welding for sheet steel. That is all I needed for the bodywork, brackets, and forming the skin. I now have a TIG welder."

> "I didn't know how to weld when I started this project"

One of Richard McWhanell's poster designs for the Roycroft Trophy

Design sketches with measurements from the scratch-build project of UK Ulster owner, Stewart Ulph

A 1920 Douglas from a family friend that Athow has given a new lease of life with the help of a Thames-based motorcycle collector. “I like riding this but I prefer building cars”

> “Athow admits to being a bit pedantic”

Exact measurements

Athow admits to being a bit pedantic in achieving the exact measurements of the original Ulsters, and always cross-references his source information with original photographs. He has even tried to keep details like the spacing and the finish of the rivets the same as they originally were.

“You can get a reproduction car from England but it won’t have the detail. I want to get mine as close as I can. I can control this; the bit I can’t control is the mechanics. I am not a machinist so I can’t just go and make the parts I want. If that was my trade it would be a fantastic thing to do, but you need a lot of money, a lot of gear, and the training behind you.” ▶

The main floor pan being folded showing the hand techniques used

He knows the cast-iron block will need machining, the bores re-honing, the valves reseating, and the face machining.

"I'll clean and prep the parts and take a roadie to see Ian. He is great at building fast Austin Seven motors, and is happy to provide guidance on machining and engine assembly."

Engine differences

While the bodywork is a faithful replica, Athow's Ulster will have a few differences in the way it is powered.

The engine looks like an original Ulster, but internally it will feature a larger crankshaft, an improved oil pump, and a redesigned cylinder head to achieve extra power. All modifications are authentic to the period. The gearbox will remain the same, but have Ulsters ratio gears.

"I have a brand-new diff and axle half-shafts. They still make the ratio the same. The original lubricating systems of the un-supercharged Sevens were 'spit-and-hope' jets that squirted oil at the crankshaft as it turned, lubricating the rods and the pistons. The Ulsters are high revving, and were raced. That splash-fed system didn't cut the mustard. I have got brand-new parts to pressure feed the crank."

An original 1930 Austin crank case

Keeping it real

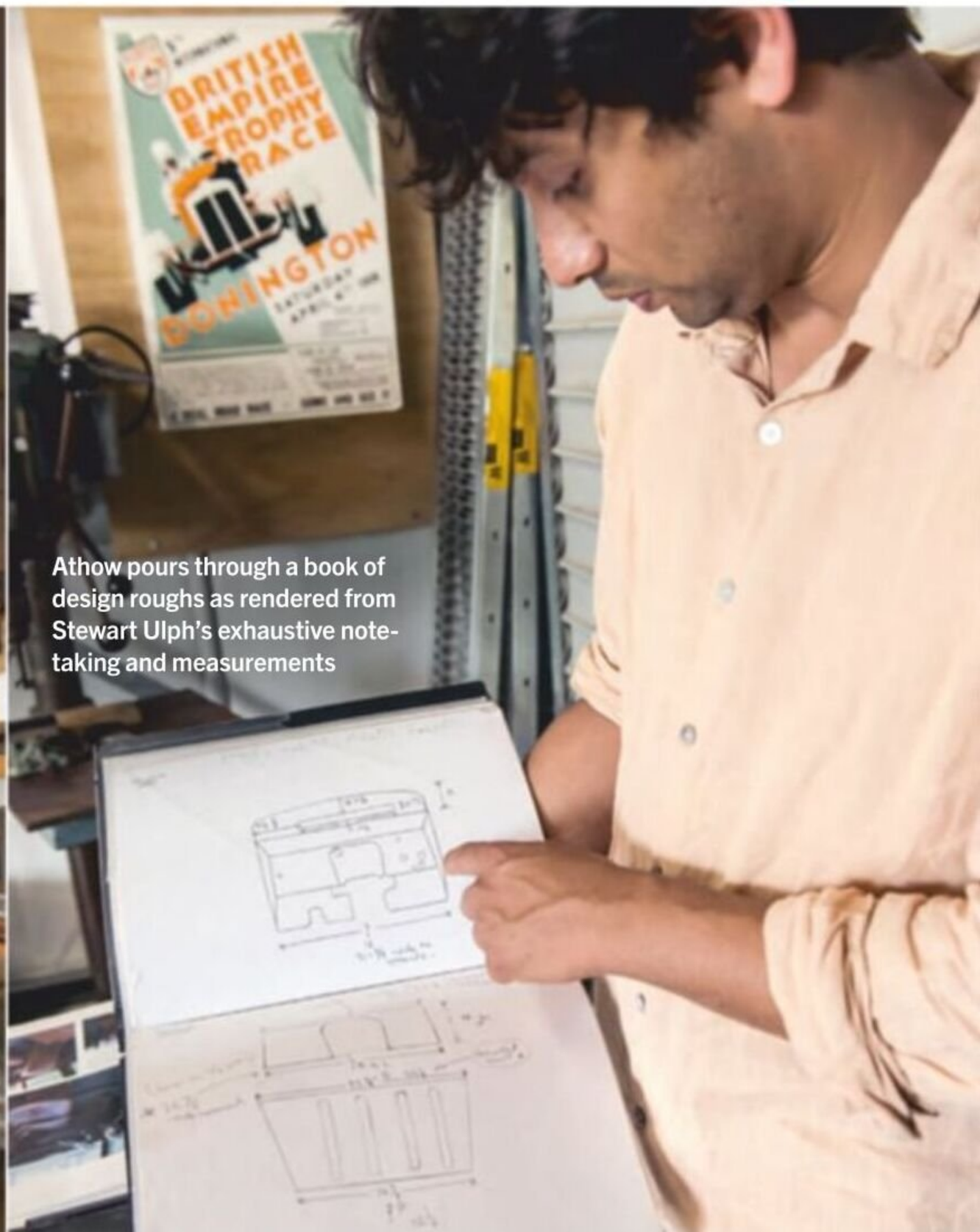
To date, the radiator, back axle case, and steering column are the only parts Athow has used from the original donor car.

The original Austin Seven steering column had well-worn factory paint and he says he will leave it as is, as it is an authentic part – as are the horn, the advance/retard mechanism, and the floor-mounted lubrication inspection hatch cover. The bonnet hinges still have their patent numbers on them (1914).

"Joss gave me these hinges," Athow says. "He had a treasure trove of lovely jewels like this." ▶

"To date, the radiator, back axle case, and steering column are the only parts Athow has used from the original donor car"

Athow is rebuilding this rusted out 1927 Triumph Motorcycle fuel tank complete with oil baffle for a Thames motorcycle collector's restoration



Athow pours through a book of design roughs as rendered from Stewart Ulph's exhaustive note-taking and measurements

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The non-nonsense racing dash

Athow has built the no-nonsense instrument panel, using a reconditioned speedo and oil pressure gauge from the UK. These are specific to Ulsters because no ordinary Austin has a speedo that clocks 100mph.

"The rev counter goes up to 6000rpm, and the oil pressure should run around 60psi. On a standard Seven, you wouldn't have that."

The wheels were built at Vintage Rims, in Mount Lyford.

"The guy was a bit reluctant at first. He did a great job. He had a stack of Austin Seven-sized rims – same profile – without the spokes."

"Turns out he was building up a stock for Peter Jackson's WWI Fokker Triplane collection"

Turns out he was building up a stock for Peter Jackson's WWI Fokker Triplane collection. Athow imported the tyres from England. ▶

Athow admits that he is no machinist and is thankful that new Austin 7 engine parts are still made in the UK

Austin Seven

"The Austin Seven Special sets the pace that thrills." That was how a 1930s newsreel reported on the dynamic racing Ulsters.

However, as an everyday runner, the diminutive Austin Seven was first designed to, "Put the man in the street on the road for £100"; a small, low-cost British answer to the Model T, offering more comfort than its main competition, the motorcycle and sidecar. Some say it was the car that saved Austin from folding.

With a 3ft 4in track and a 6ft 3in wheelbase, 'the baby Austin' was designed in about six weeks in 1921 by an 18-year-old draughtsman, Stanley Edge, and Sir Herbert Austin, in Austin's billiard room. The Seven was released to the public a year later. As its prototype 696cc four-cylinder engine generated 7.2 RAC-rated horsepower, it became known as 'the Seven'. The Seven later evolved to a 747cc inline four-engine. Production of the Austin Seven in various body styles – including tourers, convertibles, saloons, coupés, and vans – lasted until 1939, with an estimated 290,000 models built.

The model's popularity and reputation really took off in 1923, when Sir Herbert appointed his race-car driver son-in-law, Col. Arthur Waite, to design a miniature speedster. The performance and reliability of the side-valve engine, with its pressure-fed lubrication system, was legendary, but it was unsuitable for the rigours of racing. A Roots-type supercharger was fitted to the front of the engine, achieving 34hp, and giving Waite power to hit a top speed of 94.44mph.

The sports model

The Austin Seven sports model was introduced in 1930. A limited production run lasted until late 1932. The public had the choice between non-supercharged and supercharged.

Its ancestry stemmed from the 1928 super sports. It was built to TT (Tourist Trophy) Grand Prix and Brooklands RAC race specs. The racing cars were owned and raced by the Austin company, and were significantly souped up with Cozette Superchargers. The cars became

A 1929 Austin Dieppe was the basis for this Special

known as Ulsters after their success at the 1929 and 1930 TT races held in Ulster, Ireland.

The consumer sports versions were fitted with pressure-fed engines, had a rev range up to 5000rpm, produced 24–33bhp, and were capable of 80mph (128.74kph). Sports models were factory fitted with a hood and full touring wings but it is estimated that only 300 were ever built; of those, maybe half a dozen made it to New Zealand. None has survived here in running condition.

More than a few champion drivers cut their racing teeth on Ulsters, including Bruce McLaren, whose first car was an Austin Seven Ulster that he modified with help from his father.

Colin Chapman, founder of Lotus Cars, also started out in an old Austin Seven that he rebuilt as a trials car while studying at the University of London. He modified the engine and suspension, and made a body from sheet aluminium over a wooden frame.

Richard McWhannell pictured with his Austin 7 Special crafted by Richard and accomplice, Joss Campbell. Anthow is now working on a Lotus Mk6 Replica for Richard's collection

The gull-wing bonnet on original (1914) patent numbered Austin hinges, courtesy of Joss Campbell

A workstation featuring a Sheraton lathe that came to Athow covered in dirt. “Unlike a new lathe, this one has a bit of feel to it.” He has stripped, serviced and repainted it and now, “It goes like a dream”

An Ulster shell is born

The front end takes shape over Bob's flattened springs and lowered suspension

Suspension tweaks

For optimum performance, the Ulster chassis has a lowered suspension. Athow initially took his springs to a blacksmith to be flattened. When the job was bodged, it was suggested that he visit "a guy called Bob in West Auckland", to get it done right.

"Bob lived in a residential house, with no street number. Out back, there was this big dark shed. As I got close, there was black oil in a bath; black everywhere. Out of the gloom came this guy in jeans, no shirt, a great yellow beard, wild hair. He asked, 'What do you want?' I told him that I'd heard he could flatten springs. He said, 'You're not another one of those Austin Seven guys? They are always coming to me.'

"Bob made out that he wanted to go fishing but I think he secretly enjoyed doing springs. He did it first shot; he knew what he was doing, and for such a low price. Bob turned out to be a really good guy." ▶

> "You're not another one of those Austin Seven guys?"

The distinctive and aerodynamic Austin Seven Ulster tail end

Room enough for a fuel tank and the 747cc straight four engine

The cardboard petrol tank mock-up and the resulting pattern, already drawn onto aluminium and ready for shaping

Finishing

At the time of writing, Athow was confident that he was about two months from finishing the bodywork, completing the tail, and tying it all together. There was still riveting needed front and rear before the guards, running boards, and lights could be set up and made.

"I have a box full of lights; I will get the best ones resilvered."

It's Athow's ambition to paint the Ulster himself, but he reckons he might crumble if the process drags on too long.

"I'll prep it. I want it to look old – not candy-dipped; primer and one coat of an acrylic lacquer. Green and primrose yellow. Some people use a two-pack epoxy, but that can look quite heavy. The beauty of these sorts of cars is that there is no need to hide the imperfections. Alfa Romeos were the pinnacle of racing cars in the 1930s, and were sprayed with one coat. I want it to be authentic. The paint will wear, and sunlight will take its toll, but I'm building an old car." ▶

The template for the tail traced onto ply

One of a collection of original lights that Athow plans to get re-silvered

The advance and retard control, which allows for adjustments to spark and gas settings while accelerating

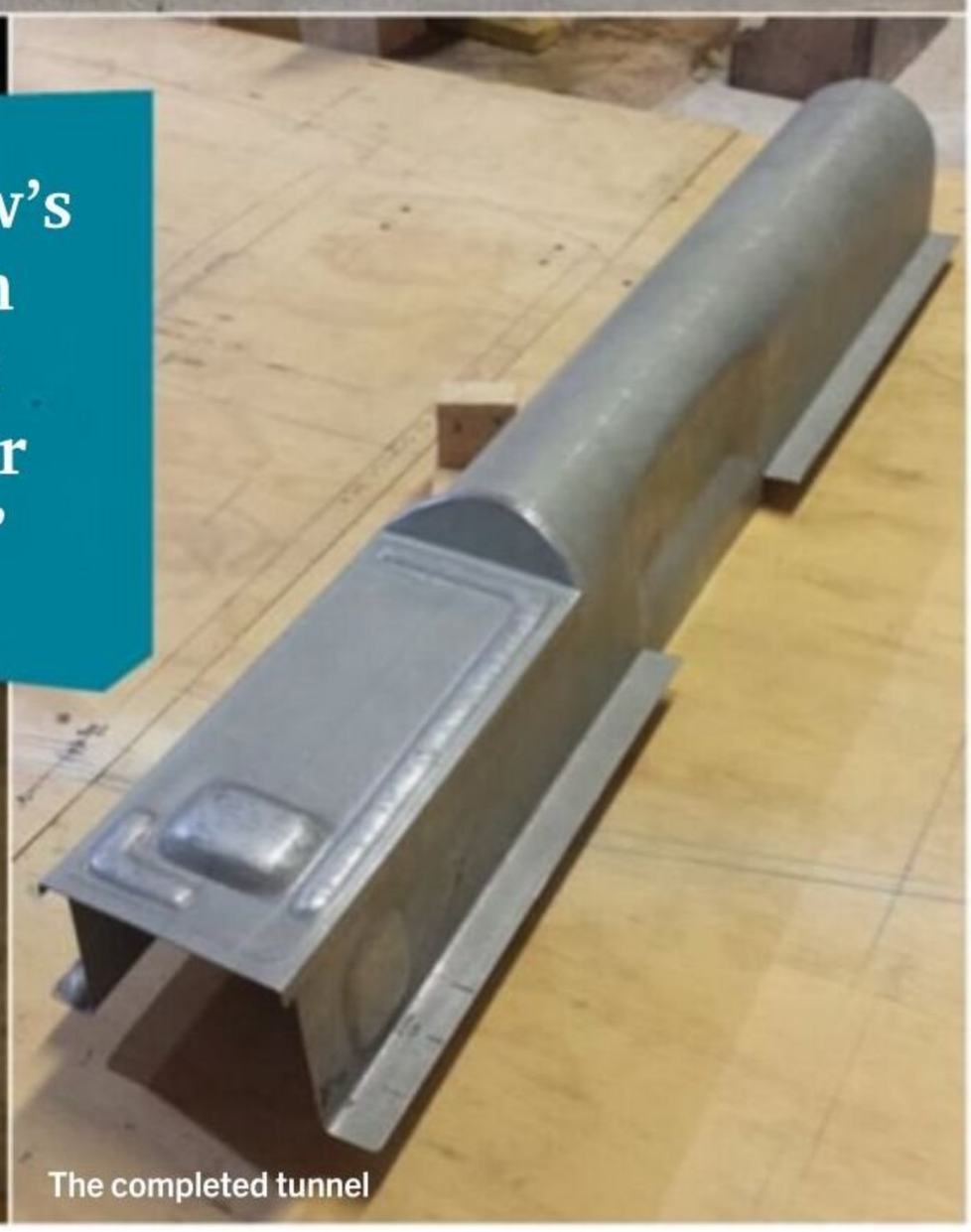
Right: The jig/former used to hammer out the front firewall pressing, copied from an original pressing also seen in this photo

Below: The finished firewall top ready to be folded, and the backing jig made from MDF and plywood

The top of the firewall with its swages being hand formed with hammer and plastic chasing tools made from a chopping board from The Warehouse

Forming the tunnel over a steel tube

"It's Athow's ambition to paint the Ulster himself"



The completed tunnel

Hard at work, "Wiring the edges like piping in sewing"

Ash seat frames

In the absence of European ash – the choice for the original Sevens – Athow has sourced American ash for the seat framing. Fortunately, Joss had saved some big Austin seats from the dump, collected all the horse hair, wadding, and innards from them, and kept most of the worn leather upholstery. Athow will use the leather as a template, to work out the stitching and spacing of his new seats.

"I have a friend with an industrial sewing machine so I will probably borrow that and figure it out. I've done a bit of sewing."

When Richard McWhannell bought Joss's unfinished Lotus off him, he asked if Athow wanted to finish it, then towed it down to him. Athow believes he was lucky. The Lotus took up all his spare time for a year but, he says, "It felt like a nice transition between Joss, who started it, myself, and Richard."

> **"He made it wonderful in 18 months, which was more than had happened in the previous 20 years"**

According to Richard, "Athow has a great eye for beauty as well as functionality. He wants things to be just so; authentic. He can see and think in 3D, seeing that things look right from all angles, and he welds aluminium extremely well. On the Lotus, he wire-edged the guards, created a scuttle, and chopped the nose cone into several pieces and reformed it over the buck. Essentially, he made it wonderful in 18 months, which was more than had happened in the previous 20 years."

Athow says, "I love working on cars. There is always something new that I want to master. You get close, but there is always something nagging at you, that you could have done better."

Now he is close to finishing the bodywork and is looking forward reconnecting with Ian Williams to get things going under the bonnet

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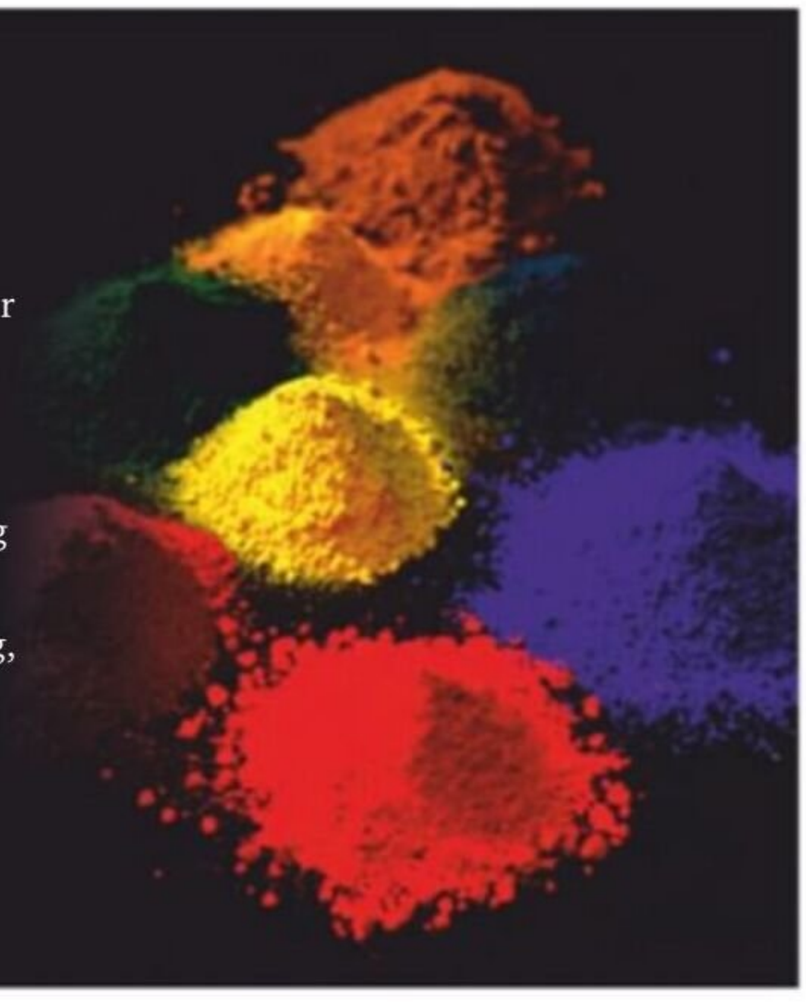


EASTER RETURN FOR EPIC WHEELS EVENT

Join the roaring celebration

Get ready for the wheels and tracks extravaganza as Wheels at Wanaka makes a triumphant return next year, promising petrol and diesel heads an unforgettable experience.

Nestled against the stunning backdrop of Lake Wanaka, Australasia's largest all-vehicle event celebrates the diversity of vehicles, from classic cars to cutting-edge earthmoving innovations. Enthusiasts can revel in non-stop parades, jaw-dropping displays, interactive exhibits, the legendary Terra Cat Earthmoving Extravaganza, tractor pull and Enduro X competitions, heart-pounding live demonstrations, and so much more.

With a commitment to showcasing New Zealand's agricultural and construction vehicles and the characters who operate them, Easter 25's edition of Wheels at Wanaka guarantees a thrilling blend of history, technology, and pure adrenaline.

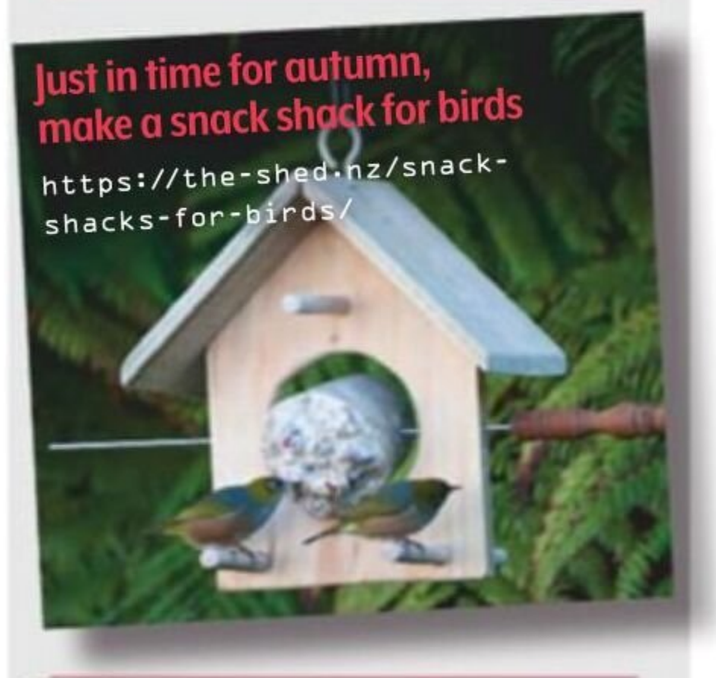
Mark your calendars for 18–20 April 2025, and join the roaring celebration for an unforgettable all-wheeled adventure.

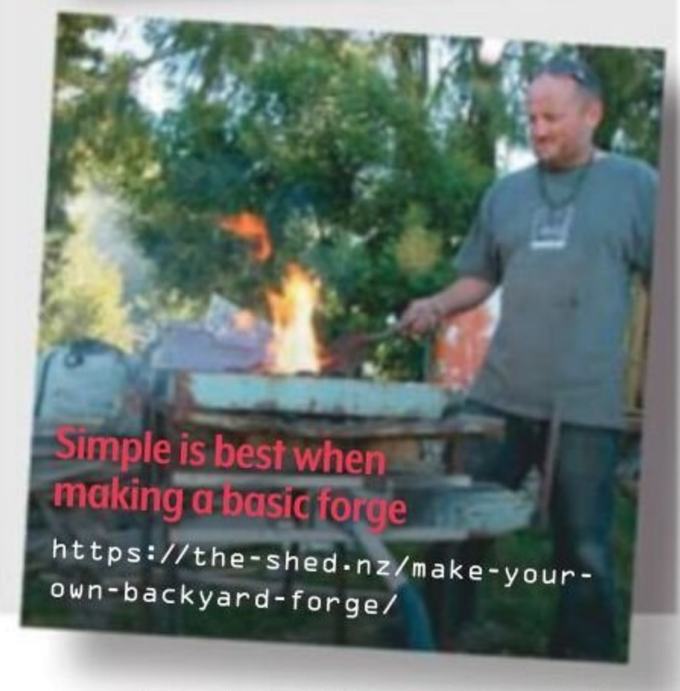
www.wheelsatwanaka.co.nz

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:*





THE VISIT

Project display

Recently, I visited Hokitika. Forty-three years ago, I was appointed teacher of technical drawing and metalwork/engineering at Westland High School. The workshop was brand new. It was my job to set it all up and create the courses appropriate for each of the Years from Form 1 to Form 5.

The room was well equipped: five lathes, a shaping machine, two drilling machines, welding gear, foundry, and forging equipment, and all the hand tools and measuring equipment. Now, it's all gone. The room is now carpeted and fitted out for Outdoor Education.

In the end, the school had no option. It had tried, unsuccessfully, to attract a teacher for three or four years, and so the room gathered dust. The equipment has all gone into storage at a local museum.

So, for me, big questions loom. I am describing the situation as it was 40 years ago. Much has changed. We now live in the digital age. What has not changed? Kids are much the same. They each come with their individual potential for growth and development. And we still need, on every hand, people who can do practical things.

Much was achieved in those early 1980s years. Rachael was in Form 3. Her class was working on the design and making of a personal pendant in cast pewter. Rachael's result was outstanding. I remember writing on her Report, "Rachael should explore the possibilities of pursuing qualifications in the area of three-dimensional art.

She did just that. She is now an associate professor.

School cert

My fifth-form students prepared for their written School Cert subject 'Engineering Shopwork' by each constructing a small wood lathe. This involved making alloy castings for headstock, vee belt pulleys, and a face plate. The shaper was used to machine the headstock base. This was drilled, line-bored, and fitted with bronze bushings. The spindle was turned to fit and threaded.

Heat-treated turning chisels were an option for those who could squeeze them in before the year ended.

Out of that class came two doctorates earned in later studies. Shane is now a head of department in the Faculty of Engineering at the University of Canterbury. Hilary won a doctorate at an American university and for a time worked for NASA. Jeff is now a leading plumber servicing Hokitika and South Westland. Hamish is now well qualified in the electrical distribution industry. Richard earned 100 per cent in School Cert Tech Drawing. Chris is a successful builder in Brisbane. Glen very successfully mastered the art of carving jade. Joe went off to a maintenance engineering position in Queensland.

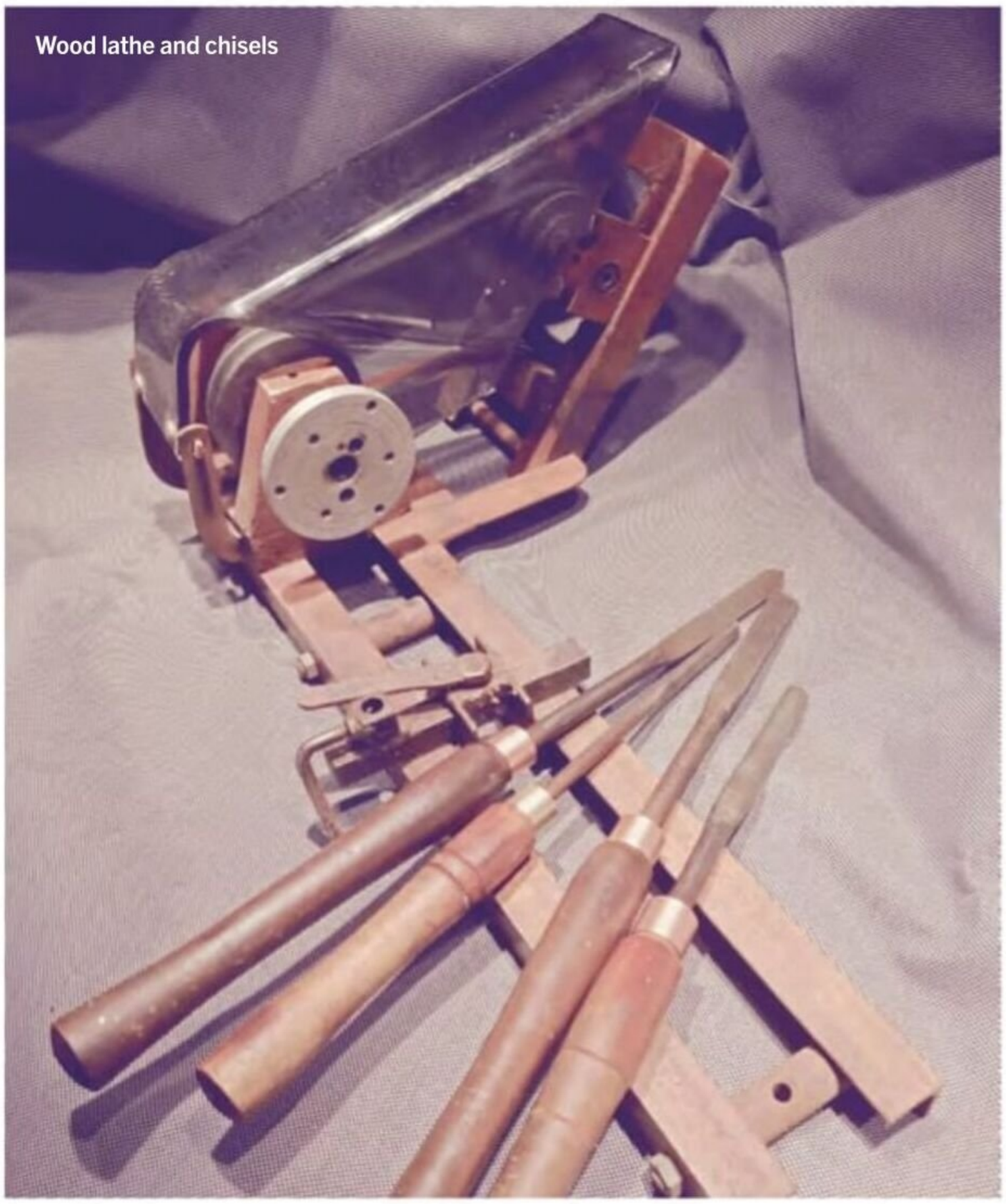
Yes, their teacher was but a tiny cog in a much bigger machine, but the education system of 40 years ago provided the facility that enabled all that achievement.

> "What has not changed? Kids are much the same. They each come with their individual potential for growth and development"

So how have we arrived at the situation as it is now?

A key 'marker in the sand' was the decision that all teachers in secondary schools would be university graduates. This was a shallow decision and overlooked some important realities. Of course, all teachers need to be competent. Competency is an all-encompassing measure. But not all competencies can be achieved by studying at university.

The teacher conducting school workshop classes of yesteryear did so with confidence. That confidence had been hard won, and rested on years of practice manipulating materials with tools and machines. That experience probably originated in either a construction or a manufacturing pursuit.



Wood lathe and chisels

Out of this experience emerged the norms which prevailed in each practical class at school.

There would be a level of exploration accompanying all student-centred learning, as students developed solutions to practical problems, but such ventures were always conducted with the knowledge that the teacher was keeping a watchful eye and would act to prevent any action which was potentially harmful.

This confidence is not unlike the trust we place in airline pilots. Certainly, pilots must demonstrate their command of aviation knowledge via exam results but their competence rests largely on their years of experience. In the end, it is a question of trust.

This hard-earned experience continues to be at the heart of all apprenticeship and technician courses to this day. It is a denial of that trust that has seen a never-ending list of prohibitions applied to school workshops.

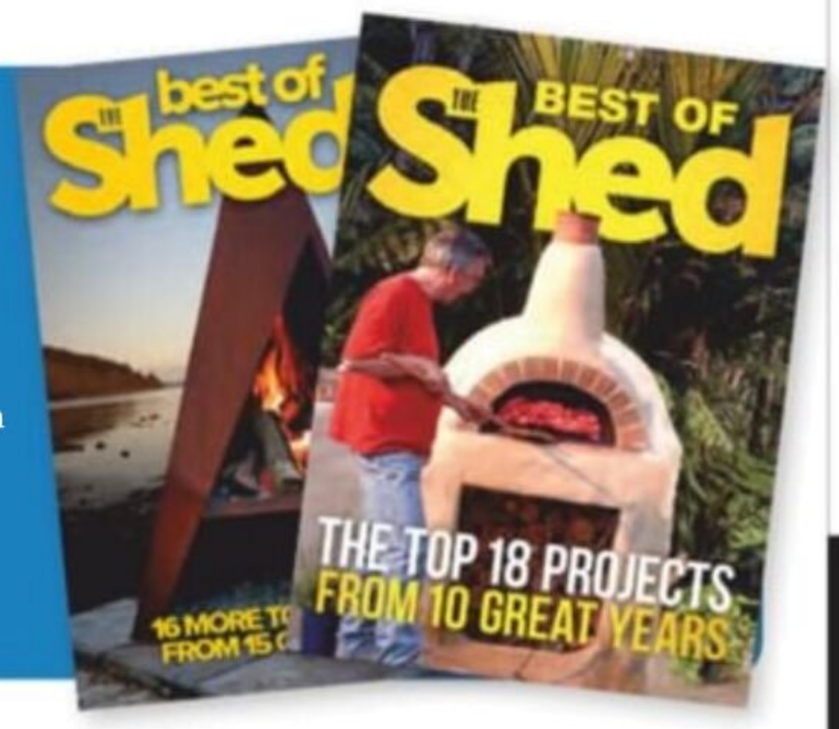
"We can't let students near that process. They might get hurt."

That decision meant there was no longer the need for Colleges of Education to offer training for teachers of workshop subjects. ▶

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,



Pewter pendants

Complete set-up

One can conjecture that a further decision for change was economic.

In my teaching career, I had the responsibility of setting up and commissioning four school workshops: Mākoura in Masterton, Westland High School in Hokitika, Girls' High in Christchurch, and Kaiapoi Borough in Kaiapoi. In each case, the set-up task was from the varnished floor upwards. In the first two there was a full range of engineering equipment – machine tools, foundry and welding equipment, and a generous supply of hand and measuring tools. I can only wonder what fraction of the cost of setting up a new secondary school this facility consumed. At Girls' High, the list extended to a CNC milling machine and a suite of CAD computers.

A further strategy was framed as "keeping up to date" and a search for relevance. "We have moved on." This is the digital age. There are sharper ways of doing things. We can get machines to do all the making.

So, it was no surprise that when the new Technology curriculum arrived it aligned workshop programmes to these themes. The new statements were structured around a series of objectives. They ensured that the actual making of a product was well down the list. Students were required to give close attention to stakeholders and issues like sustainability and the environment and the ways in which manufacturing might affect the lives of people. It is acknowledged that each of these are important topics and well worth discussing. If only the curriculum could have been restructured as a modification of existing curricula rather than a completely new document.

Degrading the value of skills

The outcome was to degrade the value of the skills and knowledge required to fashion materials to create designed products.

We might consider the James Webb telescope. For years, practical engineers worked alongside the disciplines of astronomy and physics and materials scientists. Their objective was to get bearings, pulleys, cables, motors, and fastenings to work reliably in a hostile environment. And they succeeded brilliantly.

> "The local community lost out as well with the demise of the workshop"

Things that function will always need maintenance. At every point in our built environment, in our infrastructure and the means we use to move about, there needs to be teams of competent people who know how to keep things working efficiently and reliably.

The local community lost out as well with the demise of the workshop.

Progress?

So, to conclude, my final question. Have we made progress in education?

Of course, priorities change over time. But some things do not change. Kids are much the same. They come full of potential to learn and develop and succeed. And the opportunities have not changed. For those whose inclination is to develop their manipulative skills, to continue to hone their fine motor control abilities, and to absorb the basics of good design, there will always be productive and rewarding avenues to explore, be they artistic or technical.

I conclude that these really were 'the good old days'.

To have class after class fully engaged with the tasks set before them, and then see them move on to face the future with confidence and optimism, keeps me supplied with valued memories.

Russell Gifford

An advertised 'Silversmithing Skills' weekend was well attended in Hokitika.

Community funding was used to invite a professional Christchurch silversmith to come over and provide encouragement and instruction to a very appreciative class. For a time, an evening class was offered offering instruction in introductory engineering skills. This was well supported by an enthusiastic class.

Westland High School workshop

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BUILDING AN ACOUSTIC GUITAR

Only feel truly alive while strumming a guitar? How about taking that self-expression a step further and building your own

By Rob Bentley

Building an acoustic guitar is a very satisfying project that is within reach of most people with a modicum of woodworking experience. I have speed-built a guitar within a week, but for a more considered approach, it is more usual to take three to four weeks. Most tools required are in the general woodworking shop; some simple ones that are luthiery specific can be easily made or adapted from other tools. Access to a thickness sander is almost essential, but with patience, there's not much that can't be achieved by planing/scraping/sanding.

Photographs for this article are from student guitars built during the acoustic guitar building courses at the Centre for Fine Woodworking and from guitar builds I have completed.

Tone wood selection

Tone woods are named for their ability to contribute their own tonal character to the sound that your guitar produces, and should be selected to suit the overall sound that you are looking to produce from your guitar.

Traditionally, the back and sides are made from the same timber (usually a dense hardwood). Commonly used exotic woods for backs and sides are East Indian rosewood (bias towards lush dark tones), mahogany (brighter than rosewood, quite punchy sounding), maple (can sound a bit thin and trebly), and walnut (somewhere between mahogany and rosewood).

Native New Zealand timbers could also be used if you can find a wide enough quarter-sawn plank. For example matai, totara, or even rimu can make a fine-sounding guitar. The guitar soundboard or top is made from resonant softwood such as spruce or cedar.

There are several species of spruce, all with slightly differing qualities and prices. Sitka or Engelmann spruce are the most commonly available species of spruce from luthiery-supply companies, and these will produce a top-quality instrument. Adirondack or red spruce was used on highly sought after pre-war Martin guitars, and is considered by some to be the best spruce for guitar tops, but it is getting rare – and therefore expensive and somewhat variable in quality.

The indications about how these woods sound is a bit of a generalisation,

Building up the guitar mould

and the way that the guitar is built (size, bracing, wood thicknesses) and the skill of the luthier in using the qualities of these woods also play a major part in the final sound.

Other important points to make about the tone woods is that, ideally, they should be perfectly quarter-sawn (grain lines at right angles to the surface), air-dried, and book-matched. For a first guitar, I would recommend mahogany for the back/sides and sitka spruce for the top.

Guitar design

The guitar we build on the Centre For Fine Woodworking course is a small-bodied guitar ideal for fingerstyle playing or strumming. The body of the guitar is built up in a mould made of layers of 18mm MDF, which are accurately copy-routed to a master template defining a half outline of the guitar, then screwed together on a baseboard, working to a clearly marked centreline. Parcel tape is used to cover the area of the baseboard that will be under the heel and tail blocks, and a strip is also run up the inside wall of the mould on the centreline to avoid glue squeeze-out sticking the sides to the mould.

Template

Prior to building, make an accurate template out of 4mm ply that defines the outline of the body shape. On it, mark all important dimensions from your plan: centreline, centre of sound-hole, sound-hole dimensions, rosette dimensions, bracing, and also where the bridge plate, saddle, and bridge pins will be. Throughout this article, the words 'strut' and 'brace' for the support strips of timber are almost interchangeable, although it is conventional to consider the back to have struts and the top braces.

> "For a first guitar, I would recommend mahogany for the back/sides and sitka spruce for the top"

Preparing the sides

Blanks for the sides are normally cut to approximately 820mm long by 110mm wide, and at a thickness of 3–4mm. They are book-matched pieces of wood. It is important to mark them in some way to ensure that the book-matched sides are on the outside in order to get a visually pleasing match up at the bottom of the guitar.

The side to which the soundboard will be glued is planed flat. The edge that is going to be glued to the back is not straight, as the guitar body is thicker at the bottom (tail) than at the heel (where the neck joins the body).

This lengthwise taper is not even; there is a high point at the waist, which helps spring the back into a lengthwise arch. Also, when the back has struts glued on, these also have an arch in them. The crosswise and lengthwise arches combine to give the back a slightly domed shape, and the guitar is shallower at the heel end than at the tail end.

Because of this, the sides have to be shaped to accommodate the dome of the back, resulting in the sides being trimmed lower at the outer point of the curves of the upper and lower bout of the guitar, and being tapered lengthwise. Taking measurements from plans or from an existing guitar of similar body style will serve as a good approximation that can be refined later when fitting the back.

When taking measurements, remember to take into account the top and back

Template

Checking fit on sides in mould

thickness to get the width for the sides or you will end up with a guitar that is approximately 5mm thicker overall than planned. Once you are happy with the measurements, draw onto the side blanks and bandsaw off the excess.

Sides are thicknessed to 2mm; a thickness sander is ideal. Running wood to this thickness through a thickness planer is not really viable; there is too much danger of the spinning blades flexing the wood to the point that it breaks.

Bending the sides

Make a half guitar template out of 1mm ply that is 2mm smaller all around than the outline of your guitar.

Bending the sides involves developing a feel for how the timber you are using will respond to heat and moisture. Some practice using narrower offcuts is a worthwhile investment of time and effort. We use an aluminium heating block supplied by one of the luthiery-supply companies. It is possible to get by using a blowtorch and some steel pipe clamped in a vice but, aside from obvious safety issues, it is difficult to regulate the temperature so that the wood doesn't get scorched (this would need heavy scraping/sanding to remove), bearing in mind that you have only 2mm of wood to work with.

I normally start bending the sides at the waist of the guitar. Mark where the waist of the guitar will be with pencil on the outside face of the sides, moisten the wood with a spray bottle, and, placing the side on the hot bending iron, move the side to and fro on the hot iron to distribute the heat and moisture.

> "Increase the pressure slightly as the top surface of the wood starts to steam and dry out"

Apply light pressure with a hand either side of the hot iron, and increase the pressure slightly as the top surface of the wood starts to steam and dry out.

At this point, the wood starts to feel more flexible or a bit plastic. Don't try and force things to get the curve for the waist done in one fell swoop. It usually takes three to five applications of water and reapplication of heat to get the curve right.

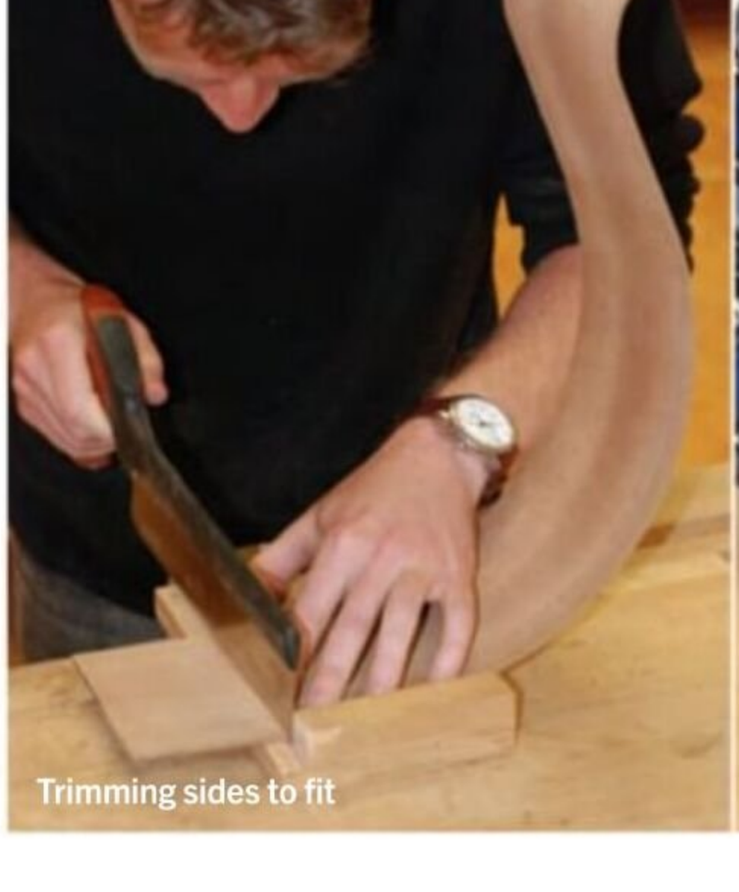
Some moisture is essential to the bending process. Too dry, and the wood becomes more brittle; too much, and the heating iron cools down and the wood doesn't reach the point at which the lignin fibres can slide over each other.

Once the waist curve fits the template, you can flip the side over and start moving around the curve of the upper half, then the lower half.

It is tempting to try to rush things, but accept that it will take some time initially (several hours). It is important to get an accurate fit to your template, as this will define the outline shape of your guitar.

Fitting sides to mould

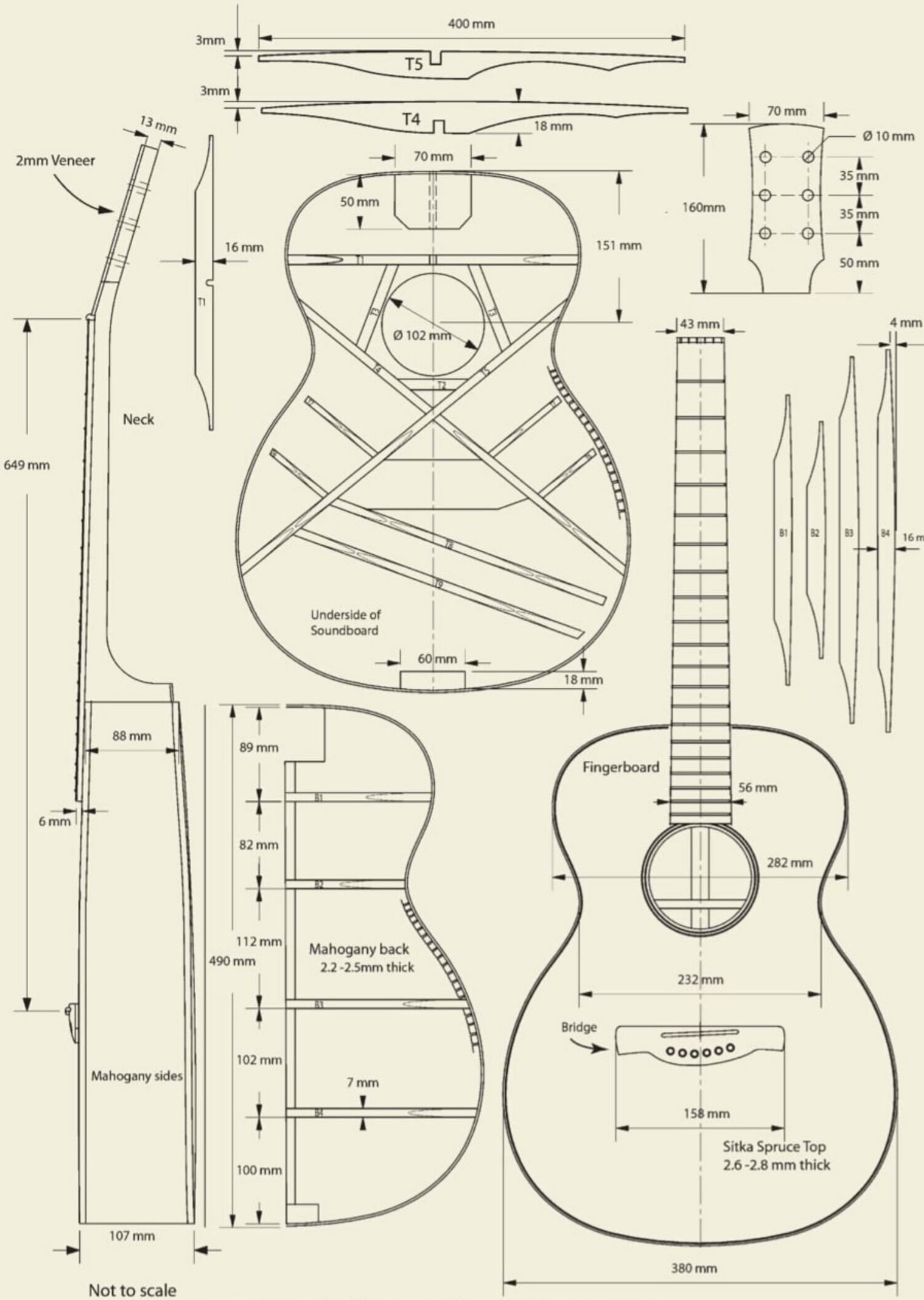
The guitar will be built face down, so place one bent side into the mould with the straight soundboard edge facing downwards. The side should be a fairly snug fit to the sides of the mould. Any major discrepancies might need a bit of tweaking on the bending iron to ensure a good fit. Clamp this side in the mould and transfer the centreline (at both ends) from the baseboard to the inner surface of the side. ▶



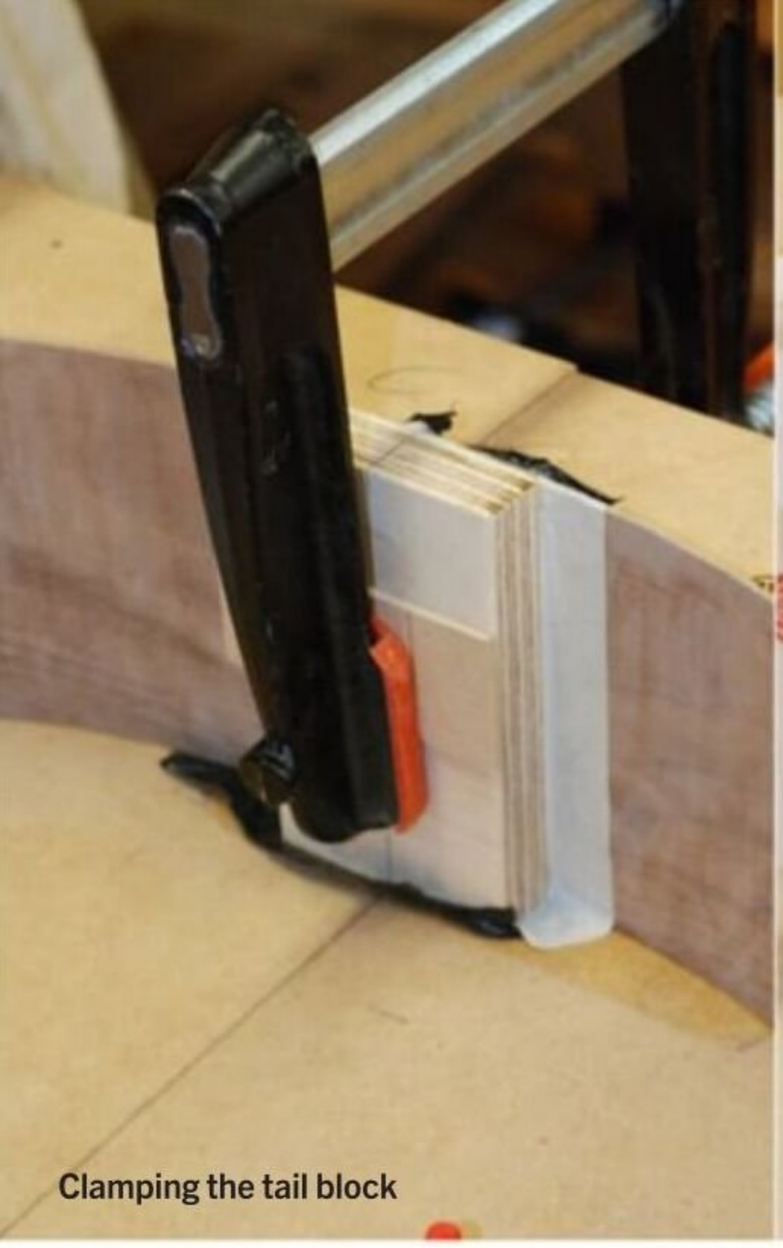
Trimming sides to fit

Planing heel blocks

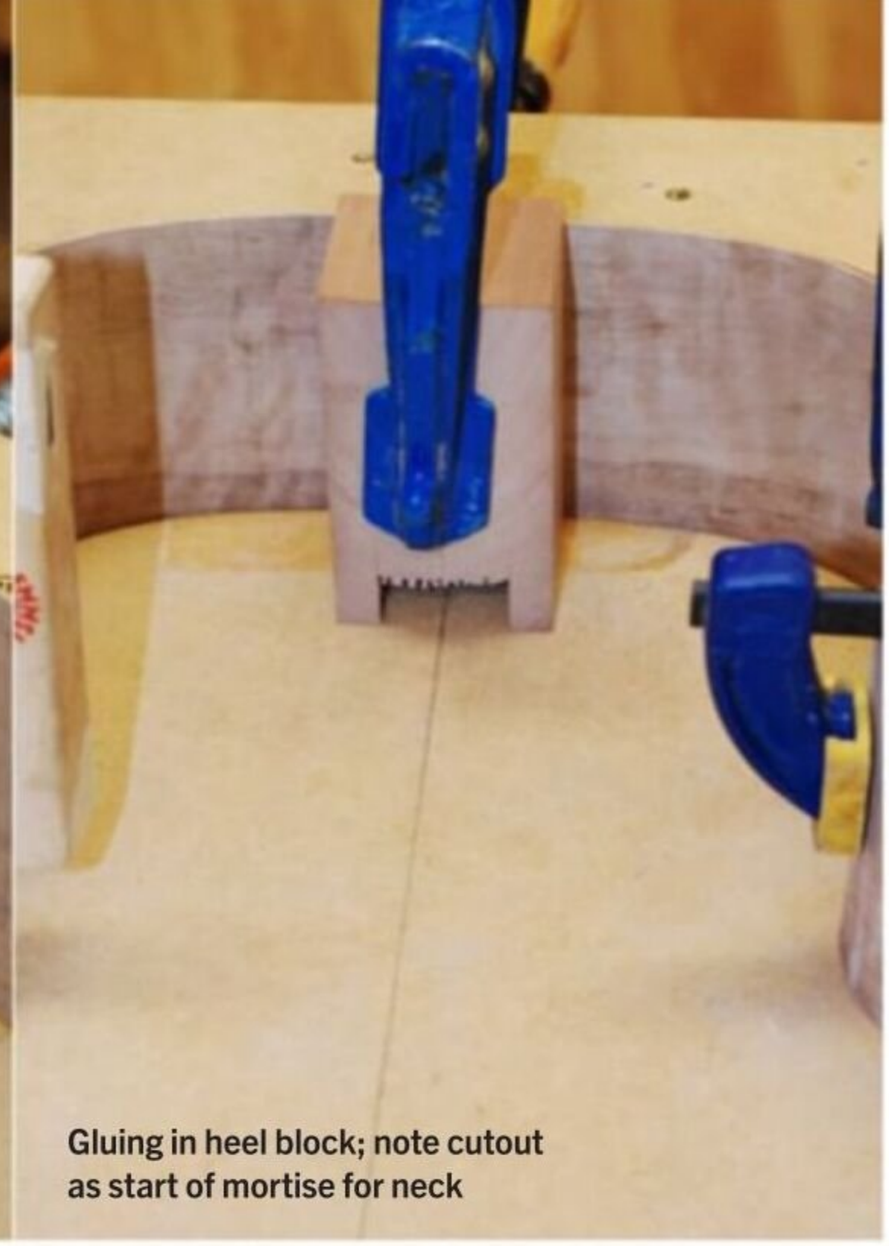
Acoustic guitar specifications



Not to scale
Dimensions are approximate and will vary according to individual preference



Clamping the tail block



Gluing in heel block; note cutout as start of mortise for neck

> "Dry-clamp the heel block into position and check that the centreline of the block matches up with the centreline of the baseboard"

Remove the side, square the line across, and trim to the line with a razor saw. Repeat for the other side. Both sides should now be a snug fit in the mould.

Making and fitting heel and tail block

The heel block (at the neck end of the body) dimensions are 70mm wide by 50mm long; depth to suit the guitar being built.

It is best to make them over-deep by 5mm or so in order that the edge that the back is glued to can be planed to suit the arch of the back. I usually laminate two longer pieces of wood together to give an overall thickness of 7mm, then square up and use the table saw to cut off 50mm lengths to make several blocks at a time. The heel block is drilled (6.5mm diameter) on a drill press to maintain square, with two holes to receive the neck bolt. I also remove some material on the bandsaw to create a rough mortise that will later be trimmed by hand to receive the tenon on the neck.

The heel block is glued onto the sides such that the end grain of the heel block is the glue surface. This is not a particularly strong way of joining wood, but there are also two bolts running through it into the neck. In addition, the top and bottom surfaces are also glued, so there is plenty of strength.

Prior to gluing, plane the glue surface of the heel block to give it a curve to match the outline shape of the guitar. Dry-clamp the heel block into position and check that the centreline of the block matches up with the centreline of the baseboard, the block sits down flat on the baseboard, and the curve planed into the glue surface is accurate and a good fit to the sides/mould. If all is OK, remove clamps, apply glue (Titebond or similar), and clamp back in position. Clean up excess glue with a damp cloth.

Using the two pre-drilled holes in the heel block as a guide, drill through the sides from the inside.

The tail block can be made of plywood, or a 3-ply laminate of spruce or similar, normally about 60mm wide and 18mm thick, and about 2mm greater than the depth of the guitar being built. This is shaped in a similar way to the heel block to match the outline shape at the tail end, and then glued in. Ensure it sits down flat and tight against the baseboard of the mould.

Linings

Linings are glued onto the sides to add stiffness and to give a wider gluing area to which to attach the back and soundboard.

The linings are thin strips kerfed (cut nearly through) at regular intervals. Kerfing the linings makes them flexible so they can be glued on without steam bending. Many wood species can be used: spruce, walnut, mahogany, Tasmanian blackwood. Lining is dry

Dry fitting kerfed lining to trim to length

Linings glued in

fitted and trimmed to length to fit between the heel and tail blocks for both halves of the guitar; glue is brushed onto the glue side of the lining, which is then attached using clothes pegs or small spring clamps. It is important to glue the lining on so that it stands proud of the side by approximately 2mm, so that it can be trimmed back later to accommodate the back doming. Now is the time to clean up the glue squeeze-out below the lining.

Back and top glue up

Normally, the back and top are made from book-matched pieces of wood, so that the grain pattern runs symmetrically about the centreline. The two halves are edge-glued before the pieces are brought down to their final thickness (for the back, approximately

Shooting edges in the soundboard

Gluing while weighed down

> "After placing weights either side of the centre join, tap them inwards to push the two halves together closely"

2.5mm; for the top, 2.5–3mm). Before edge-gluing, the centre joint is 'shot' with a long plane to give a smooth and true edge that can be glued to give an invisible join. For gluing, pressure has to be applied inwards. This can be done using wedges that are tapped in against a rail at either side or by using small nails that are placed just to the outside of the back or top to be joined. After placing weights either side of the centre join to prevent lifting as pressure is applied, tap them inwards to push the two halves together closely. Remember to place greaseproof paper or something similar under the centre join to prevent gluing it to the baseboard.

Thicknessing the back

Once the glue has dried, lift off the baseboard and use a cabinet scraper to remove the larger blobs of dried glue, as it will clog the thickness sander.

Run through the thickness sander until the outside face is sanded evenly all the way across. Turn the back over and thickness to somewhere between 2.2mm and 2.5mm. Using your guitar outline template, mark the outline of the guitar and bandsaw the waste off about 5mm outside this line.

Scrape and sand the inside surface of the back until it is smooth, and reinforce the centre join with a strip of spruce. This can be made up of 10mm strips approx 4mm thick cut cross-grain from the excess soundboard material. It is trimmed to length later, so make it overlong at this stage.

At the CFW, we use a vacuum bagging system for gluing on most of the reinforcing and bracing of the back and the soundboard. It allows strong and even clamping pressure without distorting the thin wood. To glue on the strip, apply glue to one side of the reinforcing strip and use masking tape to position it centrally over the glue join of the back. Insert it in the vacuum bag and turn on the vacuum pump. Check


Back reinforcing strip

that nothing has moved, and leave to dry.

Clean up the glue squeeze-out. Plane the centre strip down to approx 3mm in height, and shape it so that the top is rounded crossways (using a chisel, small plane, and sandpaper).

Place the back with the centre strip on the guitar (be careful to align it with the centreline of the body) and make a pencil mark at each end of the centre strip at the heel and tail end of the guitar. From these marks, transfer the measurements for the inside surfaces of the tail and heel blocks to get the internal length of the guitar.

"Choose a low humidity day to glue on the back struts"

Positioning the struts

Space the struts equidistant in this length, and mark out their positions out on the centre strip. Use a razor saw to cut through the reinforcing strip either side of the strut, and chisel out the waste in order to create a notch in which the strut can sit.

Back struts (spruce, mahogany, walnut) are cut from quarter-sawn stock so that the grain stands vertically in the strut for maximum stiffness. The dimensions are roughly 7mm wide, by 16mm high and length to suit the width of the guitar. There are four struts, and they are spaced equidistant in the gap between the tail block and the end block. The struts have an arched glue surface to the back so that they induce a crossways arch in the back when they are glued on.

To do this, make a template from 3–4mm-thick ply to the length of the longest strut, mark the centre point, and draw a curve on the template to give a 4mm arch (i.e. the line ends up 4mm away from the baseline at each end of the strut), and cut to this line using a block plane. Mark this curve on the side of all four struts using a fine pencil, and plane the strut to the line, ensuring that the glue surface is kept square to the sides of the strut.

It is worth writing 'glue' on the curved surface to ensure that the strut is used the right way up. Choose a low humidity day to glue on the back struts. The struts can now be glued on in the vacuum bag, ensuring that they are square to the centreline. Once dry, the ends of the struts need to be scalloped (chiselled down to approx 3–4mm in height), and the top of the struts shaped to give a rounded profile.

Back struts and notches in reinforcing strip

Gluing on the back struts prior to vacuum bagging

Back struts glued on and being tidied up

Gluing the back

Place the back onto the sides in the mould.

At this stage it will be obvious that the tail block and heel block are too high, and also that the scalloped ends of the struts prevent the back from sitting down on the linings.

Using a sharp block plane, plane down the heel block and the tail block until they are a similar height to the linings, and so that they help support a lengthwise arch in the back. Realign the back on the sides and mark on the side of the guitar where the sides of each strut fall.

Using a coping saw, cut a notch 4mm deep through the lining and the side to house each strut end. It is important to go no deeper than 4mm as the bindings on the guitar edge will be 7mm deep and will cover 4mm plus back thickness (2.5mm). Any deeper and the ends of the struts will not be covered.

Refit the back, and check that the strut notches are in the correct place and that they allow the back to sit

“Do not overtighten the clamps; they are squeezing down onto the edge of a piece of wood that is only 2mm thick”

perfectly on the centreline. The centre strip on the back will need trimming to length so that it will sit down between the heel and tail blocks.

Trim linings and blocks

At this stage, the linings will still be slightly high, as will the tail and heel blocks. Use a block plane to trim the top surface of the linings and the blocks to suit the dome of the back and to enable it to sit tight down on the sides. The strut ends or notches may also need tweaking to get the right fit.

When the fit is good and the dome of the back is maintained, it is ready to glue on. Apply glue onto the surface of the lining, and to the top surface of the heel and tail blocks. The back is lowered into place and clamped at the heel and tail block first (using large 6mm-thick clamping cauls to spread the pressure over the block).

Check centrelines, and then clamp around the body, using 30mm square clamping cauls of thin ply – it is important to position the cauls and clamps so that the clamping pressure comes down onto the lining and the side, rather than too far inboard, which would depress the back, or too far outboard, which would induce too much arch. Do not overtighten the clamps; they are squeezing down onto the edge of a piece of wood that is only 2mm thick.

When the glue is dry, remove the clamps and ease the body out of the mould.

Glue kerfed linings onto the soundboard edge of the sides and, once dry, plane these smooth and flush to the top, with a slight bevel upwards to accommodate a slight dome in the soundboard.

In the next issue of *The Shed*, issue 115, we finish the soundboard and add the neck.

Trimming the reinforcing strip

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Building a child's hut

THE BEST HUT EVER!

For a DIYer who has left-over bits and pieces lying around, building a playhouse need not be a costly undertaking

By Nigel Young

Photographs: Nigel Young

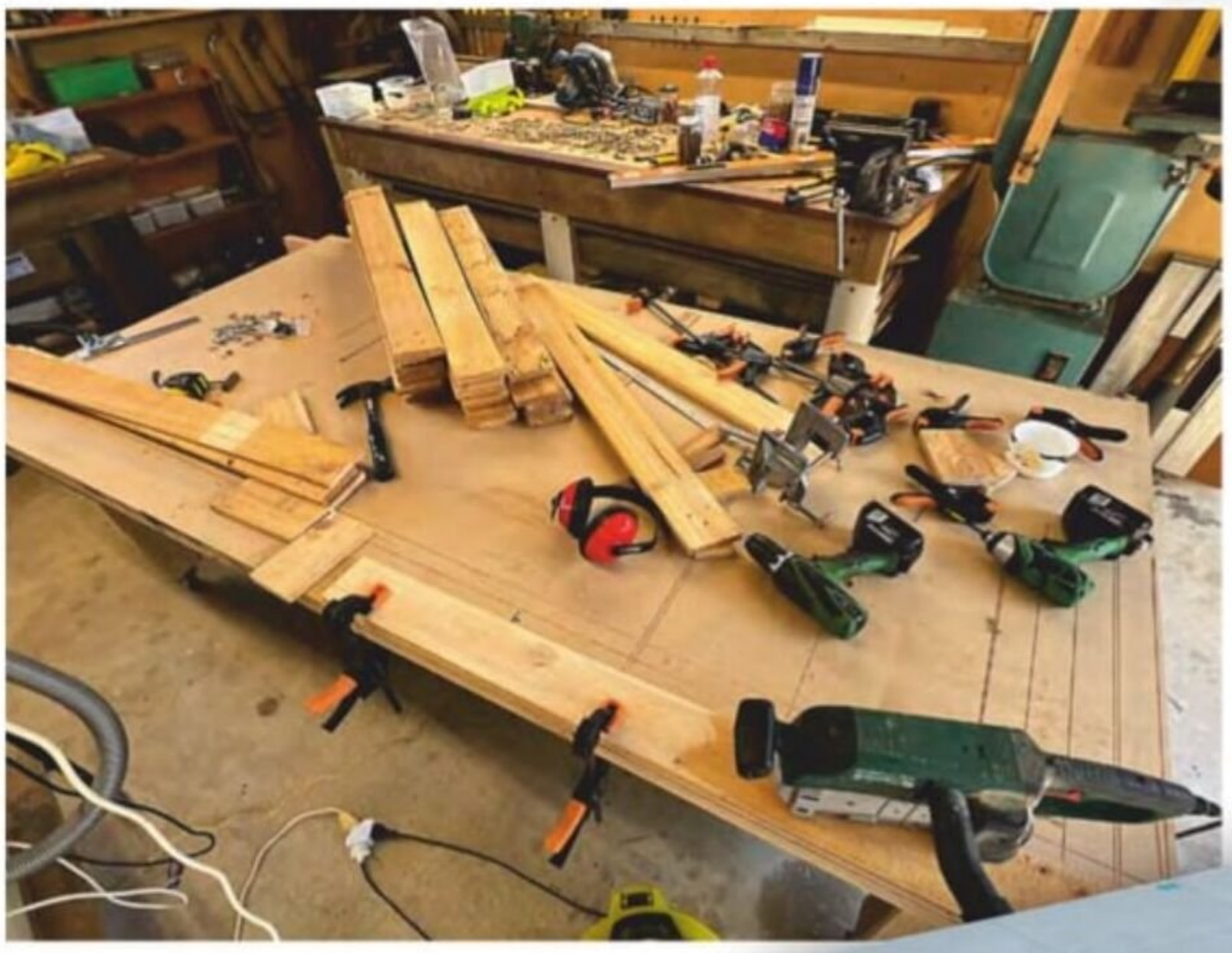
My six-year-old grandson, Mars, has been diagnosed as autistic. With his birthday coming up, I decided to build him a hut – one that could go outside or in the garage; one where he could do whatever he wanted to and it wouldn't be a problem.

Mars likes tools, so a place where he could randomly hammer some nails, for example, was part of the thinking. Mars is always on the go, bouncing from one activity to another, to the point at which I've taken to calling him 'Jumping Jack'. After a brief conversation with his parents, I set to work.

It began with a pallet

I decided to start with a pallet; I had a number on hand as I like to work with pallet wood – you never know what you're going to find, but some of it is just beautiful.

This pallet was a fairly typical 1200x1000mm, which proved to be a perfect size. I would prepare it as a floor, so I turned it over and started with the three pieces that spanned the underside. I sanded them down smoothly and then curved the ends so they would act as skids, making it easier to drag the hut across the lawn or any other surface. ▶



"Mars likes tools, so a place where he could randomly hammer some nails, for example, was part of the thinking"

The hut started on my assembly table you can see behind it. Now it was on a piece of carpet on the floor in order to protect the grey latex paint from getting scratched. Note also two of the 40x40mm plates I've used to hold the edges of the rubber flooring down

> "Keep in mind that I made this up as I went along"

I painted them with a grey latex roof paint in order to seal them, and then proceeded to paint any other part that was exposed, such as timber ends. Keep in mind that I made this up as I went along – there was no planning or sketching, and it all came down to whatever materials I had around me.

A playing surface

I covered the top of the pallet with some 12mm ply, screwing it down along the pallet structure. This wasn't treated, so I painted both sides and the edges with two coats of the grey latex. These would subsequently be covered from the outside, but I hadn't got that far yet. Finally, I glued some non-slip rubber over the ply, to provide a safe yet comfortable surface for Mars to play on.

This was 1200mm wide, so I only had to buy a metre – one of the few costs in the project. I used a spray-on contact adhesive; however, my first attempt was not successful as I had been sold the wrong product. I took it back and it was swapped for another. The edges also had 40x40mm timber plates screwed over them, so that, if there were any other issues with the rubber, at least it was fixed all around. (As it turned out there were, but I'm ahead of myself here.) I used roofing screws to hold them down.

The 40x40 was quite rough, so I cleaned it all up with my belt sander.

Part-way through, the paper I was using became too worn, so I replaced it with some Diablo 36-grit 'quick removal' paper. They're not kidding! What had previously been a time-intensive and laborious job all of sudden came back with a much quicker – and slightly rougher – result. For this job, it was perfect. Edges became rounder, which fitted in with my intention of making the hut as safe yet robust as possible.

The end of one of the four corner posts I made up from the 40x40mm timber I had on hand. These were glued and screwed to make them 80x80mm on two sides. These were subsequently painted with the grey latex paint and then screwed onto the pallet ends on two faces

Next, the sides

Having established the floor, next came the sides.

Some time back I had built some wind-screens around our deck from some lengths of 40x40mm pine that I had acquired, and I still had quite a lot left over. It had been sitting around for a while and I hadn't quite known what to do with it. Now I did – it was perfect for the hut's structure.

I decided to form four L- shaped corners, which I would then fix to the sides of the pallet floor. These 'Ls' were three lengths of the 40x40mm glued and screwed together, giving an overall width of 80x80mm showing on each side. They were 1450mm high, and I would sit them 12mm off the ground in order to prevent any direct contact with wet surfaces, which could bring about rot.

The ends were also painted as I described previously.

To achieve the clearance, I sat them on some 12mm scraps of ply, before screwing them in place. Two of the pallet ends had some rot, so I ended up buying eight 8-inch landscaping bolts and just screwing through the rot into the solid wood beyond. With two of these in each and further 100mm screws coming in at 90 degrees from the other direction, these posts weren't going anywhere.

Access

So, the floor and core structure were established, and the bottom plates were fixed. I had left an opening of 600mm for access, and allowed the rubber to roll over the pallet edge for a smoother entrance. What was left over I fixed down with a strip of aluminium. It already had holes in it, and I was able to match it quite closely to the entrance.

Next was a matter of tying the top together. Again the 40x40mm was used. By the time I had finished, I had two layers interlocking with each side. Once they were clad, they were very solid. Now for the roof. ▶

> "With100mm screws coming in at 90 degrees from the other direction, these posts weren't going anywhere"

The bare structure ready for the next stage – the roof. Notice the four clamps holding down the rubber floor at the doorway – I hadn't decided yet how to finish the entrance step, and I didn't wan't to risk tripping and tearing the edge. Notice also the two 8-inch (200mm) landscaping bolts holding the post back into the pallet. These weren't going anywhere

> “I formed a simple 30-degree roof using a centre post between the top rail and a ridge beam”

When I had painted the ply for the floor, I had also prepared some for the roof. I formed a simple 30-degree roof using a centre post between the top rail and a ridge beam. This had been specifically requested by Mars’ mum as she had a sling-type swing that she wanted to install from the centre.

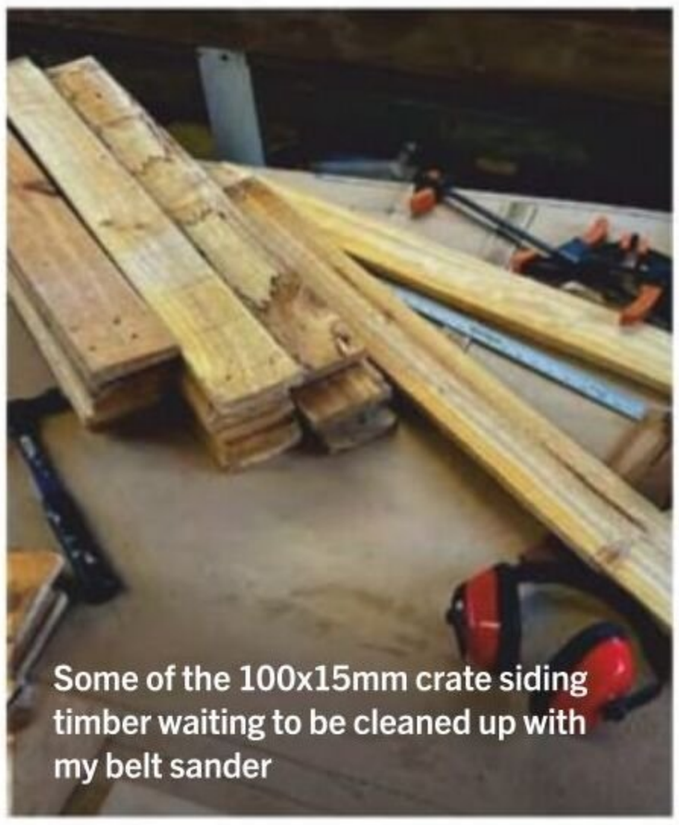
The beam was a piece of 75x50mm, which I overhung at either end, with the end over the entrance being 250mm longer to act as a slight shelter over it. The beam only required a rafter from the 40x40 framing on either side at each end, so, between the 40x40 centre post and the four rafters, it was well secured.

Bracing the roof

The rafters were screwed both to the ridge beam and the corner posts. All that was needed now was a 40x40mm purlin spanning between the rafters at top and bottom. The roof ply could then be screwed on all four ends, and would act as a diaphragm brace across the hut. A ridge flashing was folded up, painted grey, and fixed in place. If the hut ended up outside, it certainly wouldn’t leak. The opening was 40x40mm posts running from the floor to the underside of the doubled top plates. This was also used horizontally around the structure for additional strength.

The roof structure in place prior to fixing. Note the grey latex paint on the top ends of the corner posts. The rafters and ridge beam would also get the same treatment

The roof installed over the two inline (between the rafters) purlins at top and bottom. The sling hook has also been added in the left hand one. The 250mm ridge beam and roof overhang over the entrance – note the grey latex paint on the end of the beam on the right-hand photo



Some of the 100x15mm crate siding timber waiting to be cleaned up with my belt sander

Cladding

The cladding followed, and for this I had some approx 100x15 crate siding timber, which I cleaned up with my belt sander in the same way as I did the 40x40.

I clad either side of the door, the opposite end, and one other side completely. The other side I trimmed out as a window opening. I finished it with some pink timber – I think it was mahogany – so that knees and elbows couldn't get hurt while Mars was climbing in and out of it.

I didn't clad the gable ends, as this lets extra light in as well as providing an eyeline for keeping watch on Jumping Jack. I didn't have quite enough of the cladding to be able to fully enclose the sides, so I put a 15mm gap between each – it achieved the same end. For that, I just used a piece of the 100x15 edge on.

Apparently one of the first things Mars wanted to do was to climb the sides and sit on the roof. You can see why the need for clear supervision was important.

The hut still on its carpet, with two sides complete. The window opening has been trimmed with some pallet mahogany (I think) for easier access and climbing. Note also that the floor edge on the window side has now been covered over, so there is now no chance of the plywood flooring soaking up water through the edges. Note also the roof flashing is now in place

Extracting the finished hut

When I started building the hut, I had it on my cutting bench. However, once the corner posts were attached, I had to shift it to the floor.

That was fine – I even managed to get the roof on there – but as it was directly under my garage door, there was virtually no clearance. I had been building it on a piece of old carpet, so when it came to be moved outside, it was just a case of carefully dragging the carpet.

Luckily, it stayed on there until it was transferred to the trailer, just prior to its delivery. Now that I had the clearance, I could fix the roof ridge flashing. All that was left was to complete the cladding described earlier.

I mentioned previously that there were some issues relating to the rubber safety mat. Once the hut was outside in the sun, the rubber started to rise in places. I found this a bit concerning as it pointed to bad adhesion between the mat and the ply underneath. I should point out that, prior to applying the adhesive to the painted ply, I had given it a good sanding to break down the surface to allow better bonding between the two surfaces. ▶

The roof flashing painted and ready for fixing to the roof

No nails

No nails were used in the project, apart from two small ones that prevented a small split from getting bigger. Otherwise, it was all screws that I had on hand, some PVA for the corner posts, the contact adhesive for the rubber matting, a large hook for the sling in the ridge beam, some 12mm ply for the floor and roof panels, and some grey latex roof paint.

My only construction costs were the rubber matting and contact adhesive – approx $50 – and the eight large 8-inch landscaping screws, which cost around $18.

While it was easy enough to get the hut onto the trailer, it took four of us to get it off again and into the garage, where it currently lives.

Wee Jumping Jack's response was, "This is the best hut ever!" – client satisfaction at its best.

The roof flashing clamped in place, and the pencil lines for the screws to fix through into the purlins below. The corner was hammered up and under so as not to cause an injury. I had originally made the flashing long enough to hammer the ends down over the ply roof, but this turned out to be an impractical idea

Interestingly, he decided it needed a door – I had run out of time for the birthday deadline, and wasn't sure whether a door was a good idea, given the supervision comments above.

Mars enjoying his hut – that pretty well sums it all up

> "Despite our thinking of the hut being a place to hammer nails and the like, it has turned into a safe space that he can call his own"

Mars had other ideas, and found a box from inside the garage that fitted the opening perfectly. Due to his boisterous behaviour, we hadn't been sure whether a wooden door or just a curtain would be the better idea, and I gather the jury is still out on that one. For now, however, Mars has his own safe space, and I'm reliably informed that he's in there all the time.

Despite our thinking of the hut being a place to hammer nails and the like, it has turned into a safe space that he can call his own. His sister has also taken a shine to it. However, I had previously built her a desk and she has to be satisfied with that.

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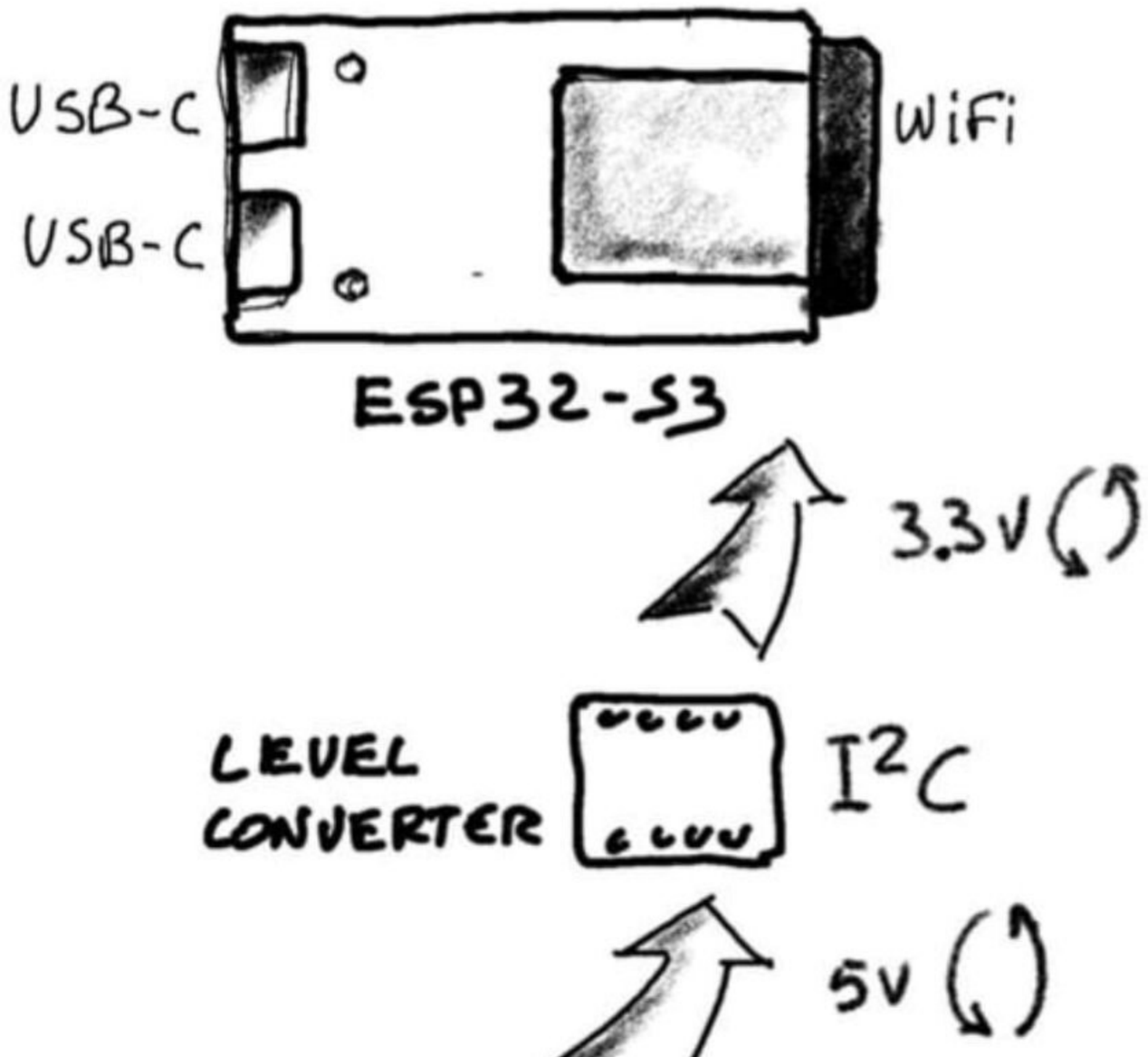
Below: In this instalment, we will see how to replicate the features of the Arduino WiFi board version using Arduino UNO R4 Minima connected to an external ESP32 S3 via the I2C protocol.

The MCU on the two models is the same, and this makes it possible to also have the Minima board playing chess via telnet

INTRODUCTION TO ARDUINO UNO R4 (PLAYING CHESS) – PART 2

How to the replicate the features of the Arduino WiFi board to enable a game of chess using the cheaper Minima version

By Enrico Miglino and Luis Garcia



Left: The scheme architecture of the connections between the two boards: the Arduino UNO R4 Minima and the external ESP32 S3.

It was also possible to connect the two boards via the serial port, but, as it is being used to configure the parameters of the Arduino board, configuration of debugging and WiFi parameters is actuated from the USB serial connecting the Arduino board to any serial terminal, including the Arduino IDE.

While the I2C protocol on the Arduino UNO R4 works at 5V, the ESP32 S3 works at 3.3V; for this reason, a level-converter IC has been necessary to enable I2C communication between the two boards

"The only challenging issue is the incompatible voltage level of the two boards"

In this second instalment, we will see how we achieved the same consistent result playing chess with Arduino UNO R4 Minima, the cheaper version of the new Arduino board, without the LED matrix display and the ESP32 S3 on the board.

While Enrico was developing the software implementation on the Arduino UNO R4 WiFi, Luis worked to create a sort of 'advanced' Minima board. The main problem of the Minima version concerned the inability of managing a WiFi connection, which, in the WiFi model, is covered by the ESP32 S3 being included on the board. To keep the same environment, and leave both boards as much as possible compatible with the same software architecture and design, we chose to add an ESP32 S3 to the board.

ESP32 S2 and Arduino UNO R4 Minima

The hardware connection of the two boards is extremely simple, and a breadboard and a few wires have been sufficient.

The only challenging issue is the incompatible voltage level of the two boards: while Arduino logic is 5V, the ESP32 needs 3.3V; this negatively impacts on the communication between the two boards. On the Arduino UNO R4 WiFi, which includes the ESP32 S3, of course, there is a level adapter session on the PCB to solve this issue.

In our case, to deal with the voltage incompatibility, Luis added a level-converter integrated circuit between the connected power lines of the two microcontrollers; the communication worked beautifully.

Serial and I2C protocol

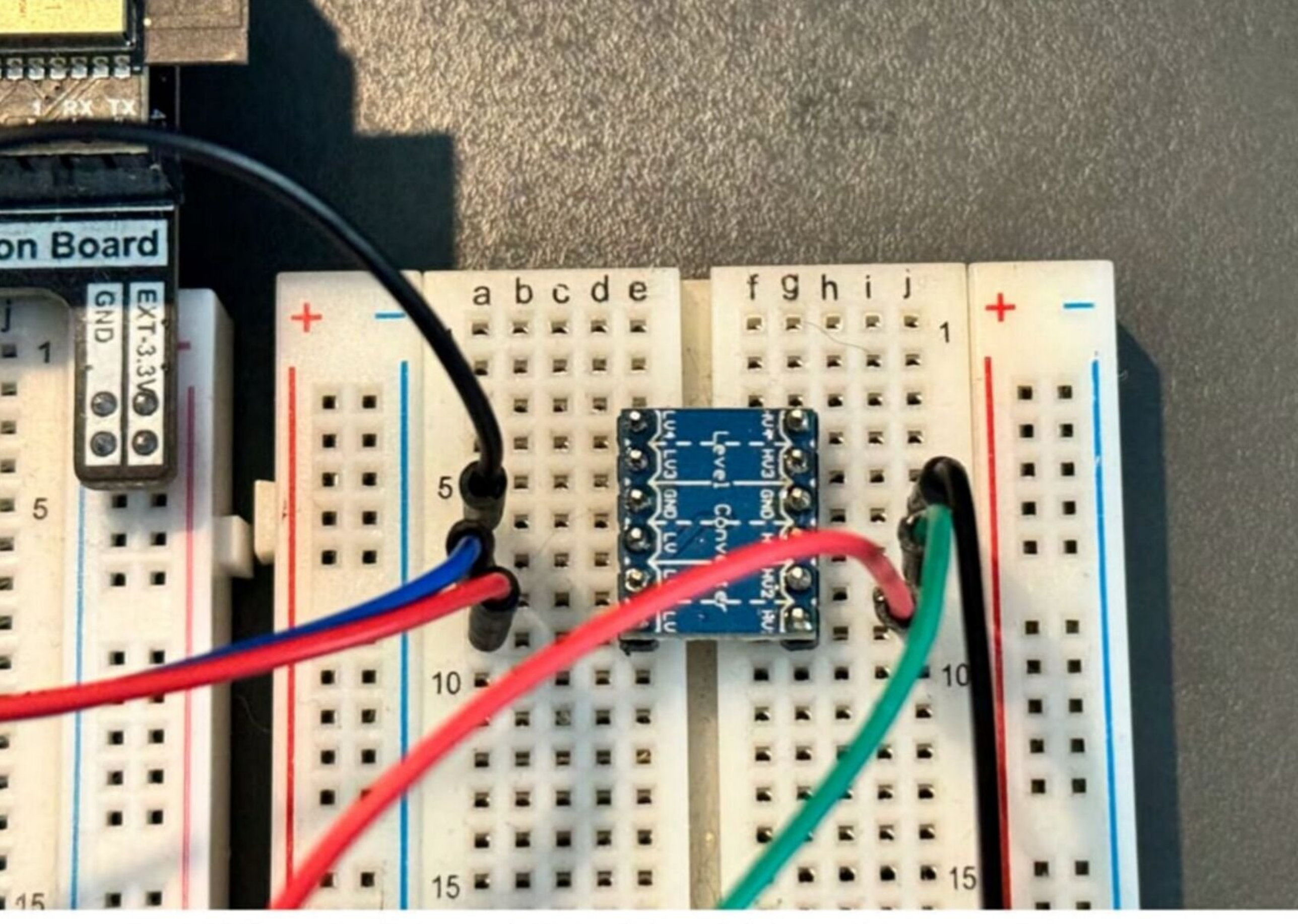
Considering that relatively little information should be exchanged between the two microcontrollers, and that it is not needed at high speed, adopting the serial protocol for communication may be more than adequate.

This had to be excluded, however, as the Arduino UNO serial should be used for the software configuration and some basic display functions, so the I2C option has been adopted.

The I2C communication protocol is not particularly complex, and, to make things easier, the software layer has been based on text-only commands; two different features have been developed:

1: The WiFi name and WPA security password configuration:

a: Ask the ESP32 S3 for the list of



Above: Detail of the connections of the level converter IC between the two boards. The two wires, black and red, connect to the power lines – 3.3V on the ESP32 side and 5V on the Arduino side – while the third cable (green and blue) is the I2C protocol line.

Note that the small PCB has some unused PIN. If used for the serial protocol, two lines should be level-converted: Tx and Rx. In our case, the I2C protocol needs only a single wire

available wireless access points;
b: Send to the ESP32 S3 the desired access point and the WPA password – this parameter can be saved in the non-volatile memory of the Arduino UNO for future use;
c: Ask the ESP32 S3 the retrieved IP address assigned by the access point after the connection has been completed.
2: Chess moves sending and receiving by the Arduino (which runs the chess engine) to the wireless connection:
a: Send the next move to the ESP32 S3 in a standard chess notation;
b: Receive the next move from the remote opponent connected to the WiFi, and validate the chess move before processing it by the engine.

As explained above, the roles of the two microcontrollers are extremely clear:

- ESP32 S3 is the telnet server, and manages the connection and data exchange;
- Arduino UNO R3 Minima is the main processor unit that controls the configuration of the system and plays chess.

Make the I2C communication reliable

As it is a high-speed communication protocol, using the breadboard wiring is a great idea as a proof of concept and for testing the circuit, but for reliable communication we strongly suggest soldering the wires (a breadboard PCB is an excellent solution).

The old-fashioned display

Our assumption was that neither model of Arduino UNO R4 should require any other extra component. However, we agreed that a small OLED display can make things easier.

> **“Using the breadboard wiring is a great idea as a proof of concept and for testing the circuit”**

A piece of game play

```
Welcome to Chesstelnet
 +----------------+
8| r n b q k b n r |
7| p p p p p p p p |
6| . . . . . . . . |
5| . . . . . . . . |
4| . . . . . . . . |
3| . . . . . . . . |
2| P P P P P P P P |
1| R N B Q K B N R |
 +----------------+
   a b c d e f g h
d2d4
1. d2d4b8c6
 +----------------+
8| r . b q k b n r |
7| p p p p p p p p |
6| . . n . . . . . |
5| . . . . . . . . |
4| . . . P . . . . |
3| . . . . . . . . |
2| P P P . P P P P |
1| R N B Q K B N R |
 +----------------+
   a b c d e f g h
b1c3
2. b1c3e7e5
 +----------------+
8| r . b q k b n r |
7| p p p p . p p p |
6| . . n . . . . . |
5| . . . . p . . . |
4| . . . P . . . . |
3| . . N . . . . . |
2| P P P . P P P P |
1| R . B Q K B N R |
 +----------------+
   a b c d e f g h
g1f3
3. g1f3f7f6
 +----------------+
8| r . b q k b n r |
7| p p p p . . p p |
6| . . n . . p . . |
5| . . . . p . . . |
4| . . . P . . . . |
3| . . N . . N . . |
2| P P P . P P P P |
1| R . B Q K B . R |
 +----------------+
   a b c d e f g h
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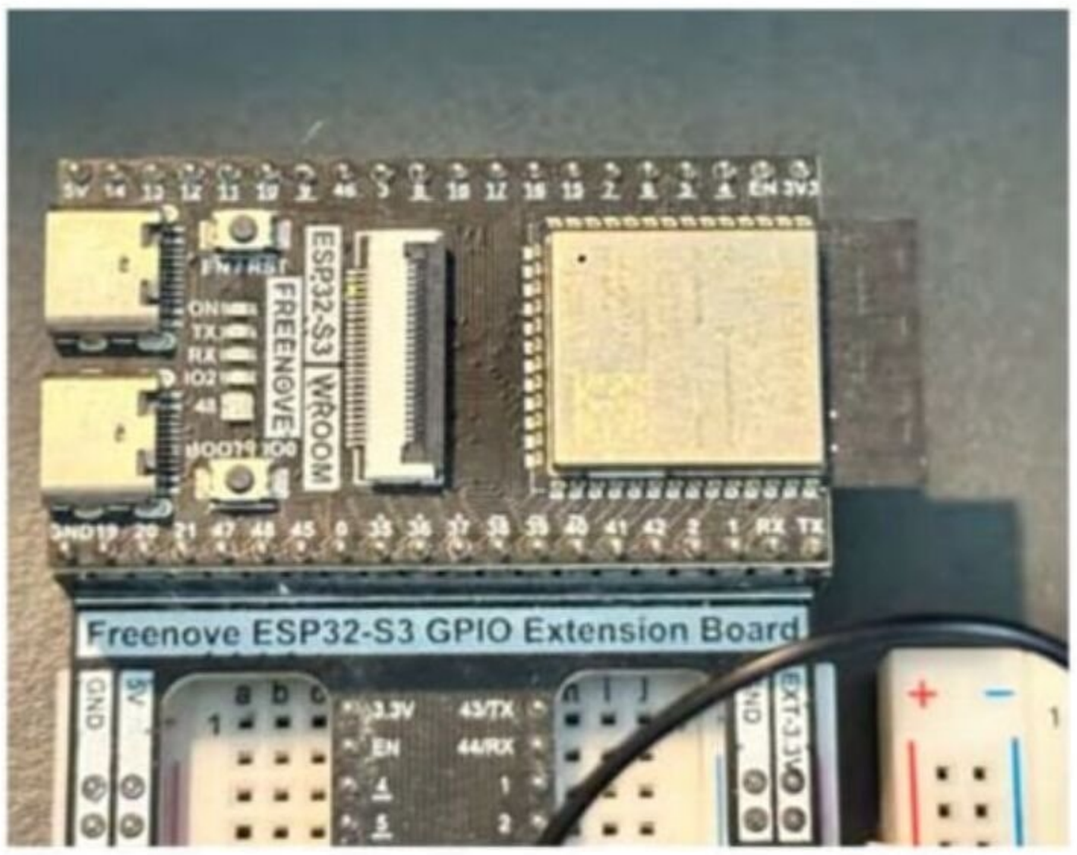


Left: Detail of the external ESP32 S3-WROOM model of the board.

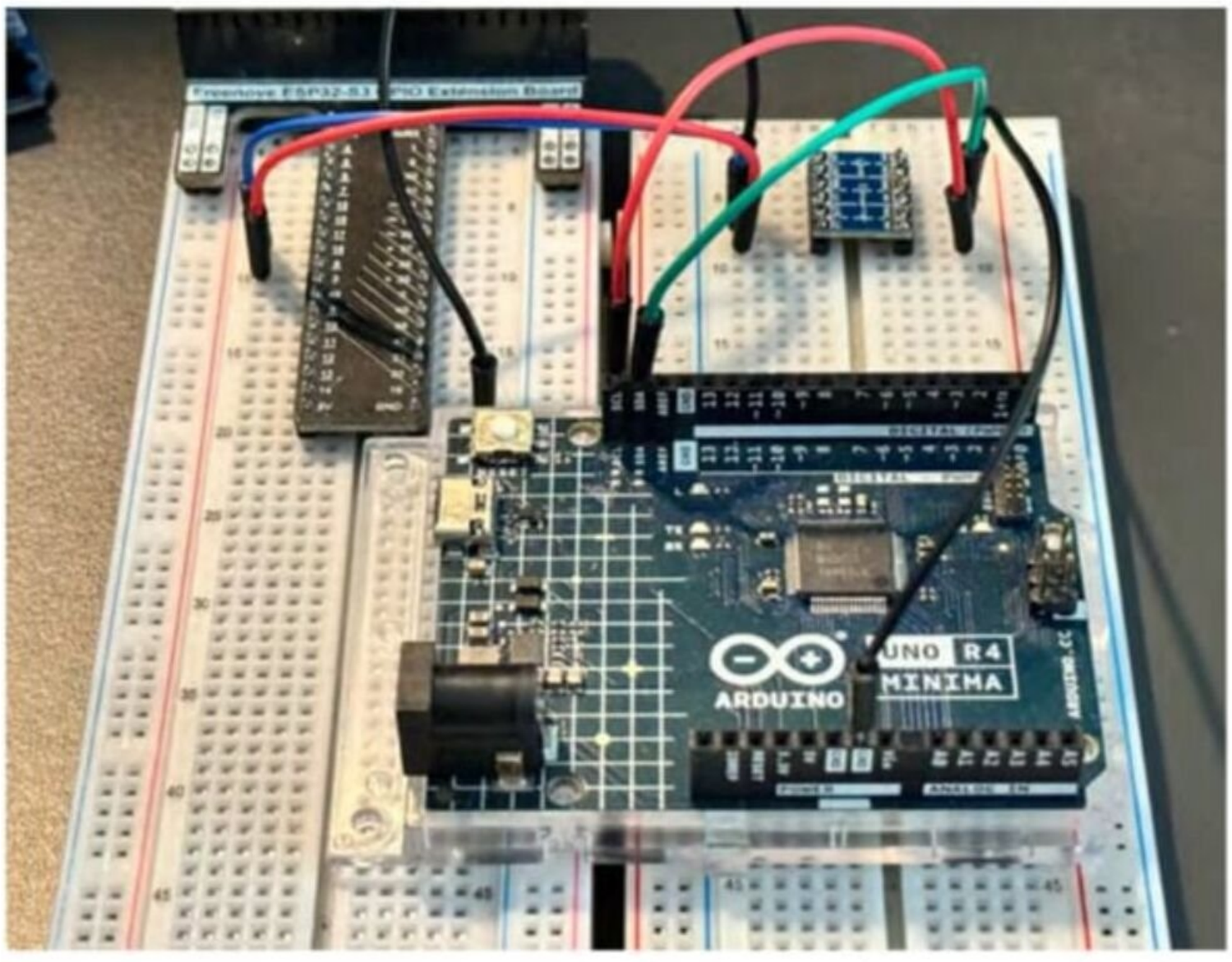
The characteristics and the code are identical to the ESP32 S3 on the board of the Arduino UNO R4 WiFi. In this set-up, the ESP32 S3 receives commands from the main processor on the Arduino UNO R4 Minima board and manages the WiFi communication implementing a telnet server, in a very similar way to the Arduino UNO R4 WiFi

The text to the left reproduces some moves on the player's telnet terminal. When a terminal is connected to the Arduino board via WiFi telnet, every move is represented with the piece from position and to position. Every chess piece is a single character: 'r' (rook), 'b' (bishop), 'p' (pawn), etc. The upper-case characters are the white pieces and the lower-case characters are the black pieces.

After every move, a whole text-only chessboard is redrawn with the updated position.

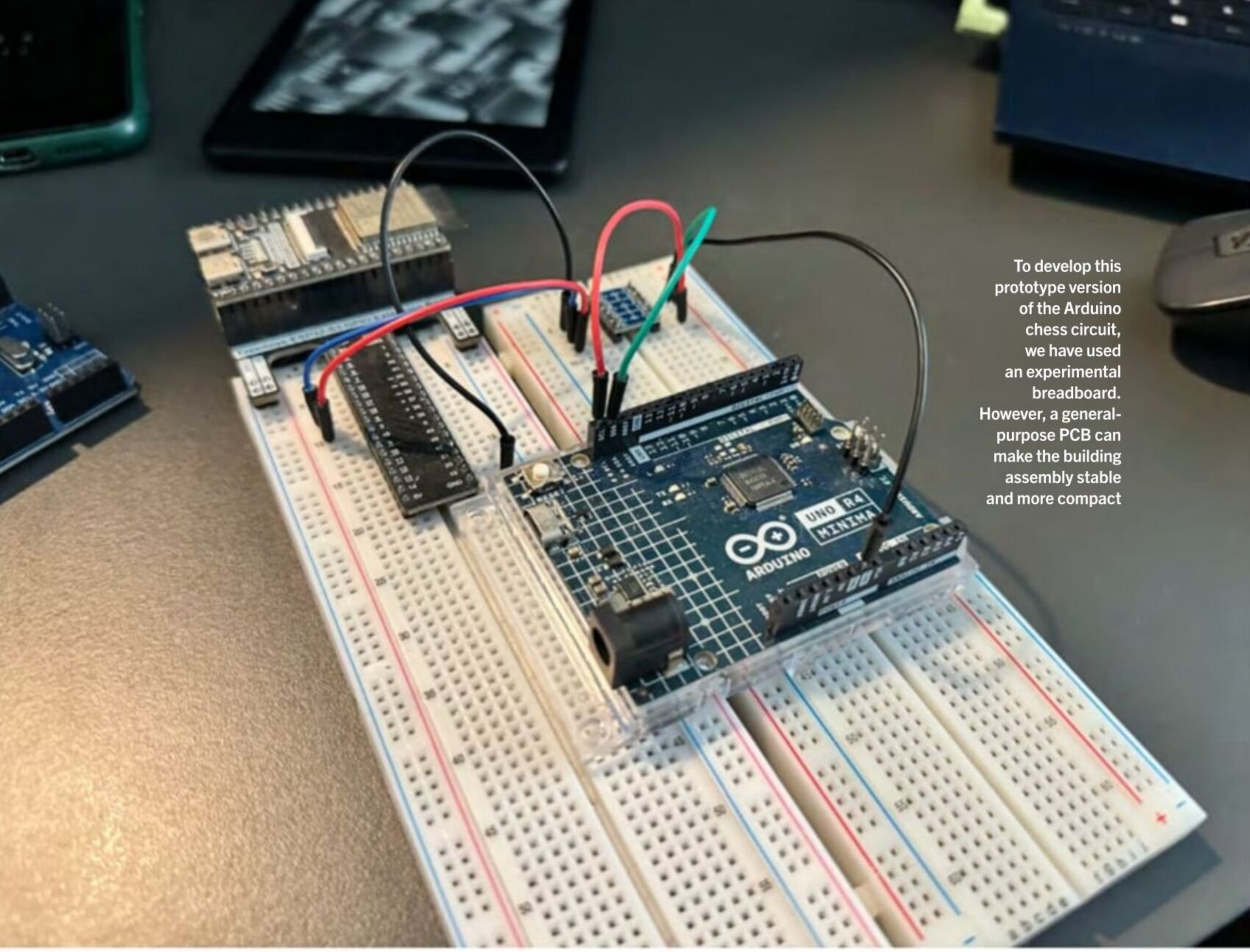
When the player types a wrong move or a checkmate is recognised, a proper message is sent. ▶

> **"When the player types a wrong move or a checkmate is recognised, a proper message is sent"**



Above: Thanks to the completeness of the two boards, Arduino UNO R4 Minima and Esp32 S3, very few wires are needed to make the hardware work.

For better prototyping, a breadboard circuit extension of the ESP32 S3 GPIO has been used, so the pins of the microcontroller are accessible from the breadboard with their correct PIN names



To develop this prototype version of the Arduino chess circuit, we have used an experimental breadboard. However, a general-purpose PCB can make the building assembly stable and more compact

> "If the Arduino board detects the serial connection on startup, a menu is shown with three commands"

Configuring the WiFi connection via serial

The Arduino UNO R4 serial connection is needed to make the application run, modifying the code every time we change the WiFi access point, and to let us know the Arduino telnet server IP address.

Until we have set the Arduino UNO R4 board with the right coordinates for the WiFi access point (name and WPA password), we are unable to connect to the Arduino telnet server; in addition, it is mandatory to know the dynamic IP address assigned by the WiFi access point in order to start a player telnet session from the terminal.

If the Arduino board detects the serial connection on startup, a menu is shown with three commands:

1: Configure the WiFi access point;
2: Set the WPA password;
3: Get the telnet server (running on the ESP32 S3) IP address.

The last WiFi configuration settings (access point name and WPA) are saved in the Arduino UNO R4 flash. Until the WiFi access point changes, these parameters are automatically reused for the next connection.

If the serial connection is connected to a terminal, the game-play output to the telnet terminal is replicated on the serial terminal, without the board being redrawn after every move, to save it as a text file of the whole game.

The full software

The most up-to-date version of the software – some parts are still a work in progress – is available on the GitHub repository: https://github.com/alicemirror/Arduino-Telnet-Chess

In the next issue of *The Shed* magazine, we will explore in detail how the Arduino UNO R4 chess program works and how it can be interfaced with a smartphone.

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For a couple of pointy-ended coffins, these boats are amazingly capable; photo taken during 2009 Nationals, off Nelson

CLASSIC DESIGN

Murray proves a home-build can still take line honours

By Murray Grimwood
Photographs: Murray Grimwood

Photo: Rachel Leatham

The 14-foot single-chine hulls were initially built of plywood; my mid-80s hulls were factory-built in fibreglass/foam sandwich

In the Kiwi sailing world, there are a handful of evergreen designs; ones that got it so right that they've stood the test of time. The Starling dinghy, the Noelex 22, and the Farr 727 come to mind; but the one I have the most affection for is a wee catamaran known as the Paper Tiger.

I noted the design when I was 20ish but didn't get to sail one until I was 46; I mildly regret that delay, and from here on I'll sail one until I can't. Given that I've been putting most of my sheddie effort into my own Paper Tiger lately, it seemed an obvious topic for this issue's column.

History

Designed in 1966-8, reputedly on a beer coaster, and aimed at beating the then-formidable Javelin, the PT's simple lines, DIY-compatible construction, development potential, and speed per buck have seen it outlive almost all its contemporaries and grow well past 3000 in sail numbers.

The single-chine 14-foot (4.26m) hulls were initially built of plywood, but lightweight plys are getting harder to come by and recent hulls are typically constructed of carbon/foam/carbon sandwich. The two cross-beams that connect the hulls are simple 50x50mm alloy box sections, between which a small trampoline stretches. There is one six-metre mast, one fully battened sail, and one person aboard. ▶


It's a friendly, down-home class; here National Champion Dave Shaw rigs while chatting to a fellow competitor. Note the carbon sail

Class rules

Something that contributes to the Paper Tiger's longevity/popularity is that the class rules are not prescriptive; if it's not disallowed, then it is allowed. Over the years, this approach has seen a progression from round masts to teardrop ones, thence to internal sleeving. It has seen a plethora of approaches to mast-rotation control, and a trend to narrower, deeper centreboards and rudders. Rigs have progressively sloped backwards, as have the centreboards. Carbon sails are predominant at the front of the fleet nowadays, and they're loose-footed, attaching only at the outer end of the boom. Hulls have trended from empty coffins to being braced with stiffening devices: sub-decks, bulkheads, and stringers.

The traditional Paper Tiger spanner (lower left) and vang (blue rope etc.) set-up.

> "I sail through Dunedin winters, ice and snow included"

Murray's approach

My penchant is to run a cheaper boat and build the add-ons myself. I'm never going to outlay the price of a front-of-fleet boat ($10,000–$20,000) but I still have a lot of fun.

Thus, over the years, I've built two sets of centreboards – one fibreglass, one carbon – and a lot of bits and pieces. My current boat was factory built in fibreglass/foam/fibreglass back in 1984, and we first united to get gold in the 2006 Masters Games. I borrowed the platform (because it was light; only a whisker above the minimum weight of 50kg) and used my own rig. I bought her a few years back and she'll probably see me out – we're a comfortable team. (I talk to 'her', and – as I'm a doting grandparent – the phrase 'wee girl' figures frequently.)

Locally, I don't get to compete with Paper Tigers very often, usually ending up trying to gauge my performance against a mixed-class fleet. However, this summer season (I sail through Dunedin winters, too, ice and snow included!) I decided to up the ante and go and race with the PT fleets further north. That 'mix it with the real yardstick' effort was a lot of fun, and spawned an enthusiasm to improve both *Hijinx* and her passenger; the next national championships will be in the South Island and I'll be 70. It seems a logical target.

An evolution of centreboards, left-to-right: Traditional, production, production, 180mm V-moulded version, 150mm carbon

Plenty to do

I'll list our shortcomings: lack of sailing skills and lack of boat speed – but apart from those …

First on the wish list after I sortied north for the Nationals was separating the mast rotation from pulling the boom down (separating the spanner from the vang or kicker, in sailor speak). It went like this: all the good sailors do this, and they're all ahead of me, so that means I need to – you see the logic, right?

For years, I ran the traditional combined system: a rope pulley purchase from the end of the mast spanner to the boom. Going up wind, you slacked the purchase off to allow the spanner to rotate to leeward, relying on the downward pull of the mainsheet to hold the sail down. Often, when going down wind (when the mainsheet cannot help), I would want both a tight sail and a rotated mast – a combination often crudely achieved by pushing the spanner sideways with my foot. I tried to separate them years ago, using a wide stainless spanner, but gave up. I tried again now – and nearly gave up again! I thought I could do the 'pulling' with a loop of Spectra (incredibly strong rope) around the mast. Turns out the pull has to be from behind, not in front of the mast. I couldn't grunt it across in a tack, no matter what I did. It took four iterations to get something that works fuss free, and I like it all the more because it incorporates a cut-down leg of a camera tripod – that's so me.

Old-style crossbeam and (foreground) my long-ago first attempt at brackets

The traveller

As built, the traveller car had a swivelling cleat on top of it. That meant you pulled the rope directly from wherever the car happened to be; sort of a 2:1 purchase with your bum friction being one of the purchase points.

The swivel had seen a lot of miles and was more than sloppy; no chance of fixing it, either. A nice little alloy angle bracket dead centre, a nylon bush, new rope, and a better cleat, and suddenly life is very different; it's much easier to be accurate. While I was at it, I found a loose hull/beam bolt (which went through the traveller track). ▶

Mast pivot (top) and adjustable supporting strap (bottom)

Mid-evolution spanner development

A different approach: spanner up near the boom, completely separate from vang

> "If you lift one bow of a front-of-the-fleet boat, the other bow comes up with you"

Let's (not) do the twist

Next on the list was increasing her torsional rigidity – if you lift one bow of a front-of-the-fleet boat, the other bow comes up with you. Lift one of mine, and the other will follow sometime later tomorrow. That means wasted energy – and we aren't starting with much!

One way of stiffening is to rigidify the hulls internally. I did that with my previous boat, cutting the decks off between the cross-beams for access and inserting bulkheads and stringers – a lot of post-hoc palaver, not to mention extra weight. This time I decided just to fabricate the allowable external beam brackets which, to be honest, do much of the job. This collaterally removed the perpetually loosening single bolt I mentioned earlier. I hope I haven't replaced it with four smaller loosening-prone ones!

Shifting the mainsheet pulley forward – to give me more space to cross through when I tack – seemed like a good idea. In theory, it had the collateral advantage of pulling the boom forward, helping to keep the mast rotated. In practice, there seem to be conditions where it is better forward (light wind/flat water) and others (strong, lumpy) when it works better back where it was. Don't ask me why. However, it's a simple clip-snap shift, and it's nice to have both options. Thanks, Rachel, for the tidy sewing job.

It's not all happy sailing

Not every happening is a positive, and the ability to adapt on the fly is often in demand.

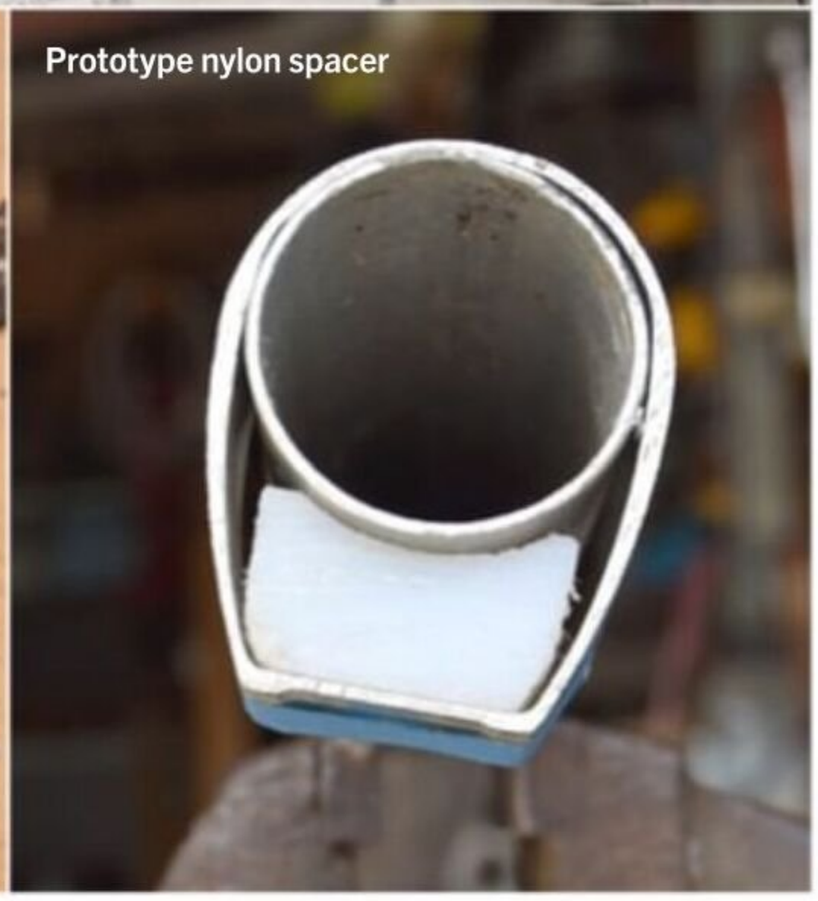
At the South Island champs in Nelson, I finished the second race wondering why the boat fell off the pace. I looked

How the champion does it – spanner related to the deck, rather than to the boom. Yellow tackle (upper left) is vang

The old-school flogged-out traveller (right) and centre-pull new set-up (left)

Rebuilding the best bits into a boom – I didn't think it a priority but she insisted ...

The last of the 3-metre sleeve being eased up the new mast



Prototype nylon spacer

at the odd shape of the bottom of the sail, where it meets the mast, and traced that to the outhaul (the pulley at the outer end of the boom) which does what its name suggests – or should. It had torn clean out of the boom and gone walkabout. As I informed Race Control that I was heading for home, my mind logged its way through the bits and pieces I'd brought up from Dunedin. That night, on the camp-ground cabin floor, I jury-rigged a replacement – just in time for the following day to be abandoned. So it goes; a pity, as the jury-rig is still working well.

Later in the season, I was waiting for a local race, hove to (parked), with starboard right of way. A Finn barrels down onto me on port, and capsizes. My bow drops off a wave, slithers down his upturned hull, and my deck/hull join parts; it looks like a little shark mouth, open. I do the race, making sure that 'mouth' stays above the chop! Thanks, Richard, for the glue-up (see pic).

Back to the build

Those barn-door centreboards had to go; comparison with front-of-fleet boats had made that clear.

The first, higher-aspect pair I'd built, back in '09, were 180mm across and laid up in a sheet-metal V-mould, which was then clamped shut (like shutting a book) over a timber stiffener. They weighed nothing and did the job – until a regatta, when half of one floated up astern of the boat. (The rescue crews fished it out and presented it, suitably inscribed, at the prize-giving.)

To replace them I'd made a male pattern 150mm across, took split female plaster of Paris moulds off it, and laid up carbon in them. They glued together

Running repairs; glueing the bow back down

After 20 years it was time to retire the slogged-out outhaul (lower) with a slicker unit (upper). These slide at the outer end of the boom, flattening – or not – the sail

perfectly, ending up a tad too heavy but the right shape. I decided to refit those into *Hijinx*, and maybe one day I'll build a lighter pair of the same profile. Fitting them took a day – with a race looming; drilling, filing, and sanding profiled slots through the epoxy/microballoon mix I'd dribbled down the cases the day before. A knowledge of Anglo-Saxon helped!

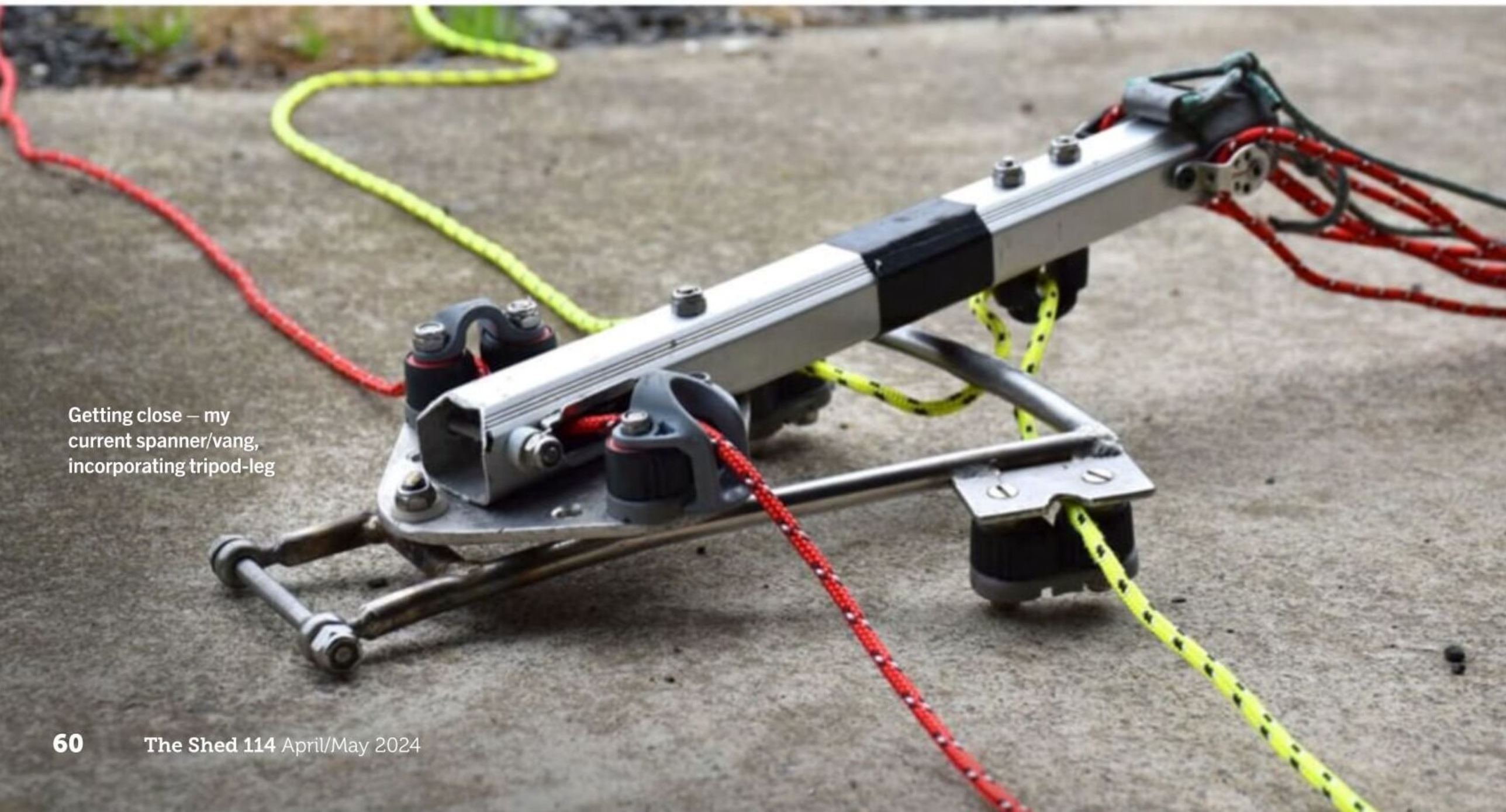
Now for the mast

Next came the mast. Paper Tigers originally had round masts, then progressed through a smaller teardrop to a more substantial one, but it's still a piece of spaghetti.

Looking up one in the heavy going, you wonder why it isn't failing – and they often do. People started to sleeve them; first with old/small mast sections shoved up them with car jacks, then with carbon tubes. Nowadays, some folk even insert a still-wet carbon lay-up and inflate a mandrel inside, forcing it to marry to the aluminium. The consensus seems to be that three metres of sleeve – half the total mast length – is optimal.

Complicating this, older sails tend to have been cut for unsleeved bendy masts, modern sails for the sleeved ones. My very old, many-times-restraightened mast was/is a compromise; it sports one

After some Anglo-Saxon conversations. the 150mm board finally fits



Getting close – my current spanner/vang, incorporating tripod-leg

A different traveller treatment; sliding nylon blocks rather than stainless rollers

I wondered where that sponge had gotten to! Camera lowered into one of my hulls, showing there's a centreboard case and not much else. Layup is fibreglass/foam/fibreglass.

metre of aluminium sleeve at the lower hounds (lower rigging attachment point) but mostly as a splint; that's the most restraightened point.

Time to replace the mast

That has probably saved it more than once, but it was time to use the new blank I'd bought and brought south to sleeve it and use it, retiring the other to spare status. Scuttlebutt says that you can't use an old-style sail on a sleeved mast, whereas I'm thinking it'll just need more pull on the mainsheet to bend the stiffened mast in the heavy going. Carbon sails cost a bomb and last for about five minutes; good for the sailmakers, perhaps, but – as readers will have gleaned by now – that's not quite my style.

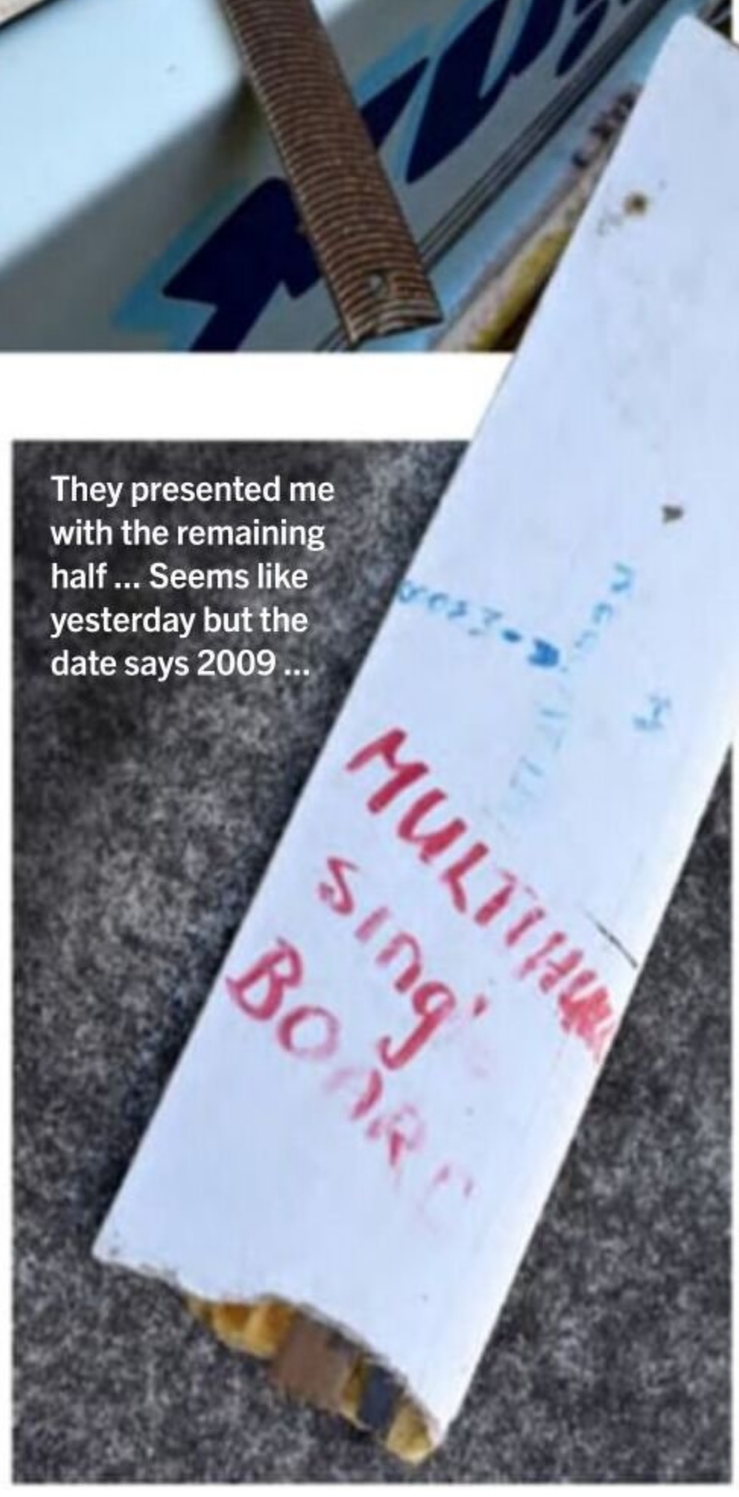
I wasn't into the wet lay-up/blown mandrel approach; that process costs three times what I paid for the whole boat! Nor did I think that paying hundreds for a carbon tube justified the slight weight saving over alloy.

An old hang-glider pilot often has a collection of high-tensile alloy tube hanging around. Turns out that 44mm tube with one wrap of duct tape is a snug fit. A few nylon spacers, two placed at particular load points (boom, hounds), and we were in business.

At the time of writing, I'm still to decide which masthead halyard lock to go for – the higher you can get the sail, the better (more wind, better underneath clearance) but it has to hang from the top, not cleat from the bottom, to relieve mast compression. ▶

I poured epoxy and micro-balloons into the old centreboard slot, then hand-carved the new slots. Batten saves scratching the gelcoat

> "Turns out that 44mm tube with one wrap of duct tape is a snug fit"



They presented me with the remaining half ... Seems like yesterday but the date says 2009 ...

> “Off the line I’ve always been faster, but now I could retain the speed and climb to windward of the whole fleet”

Postscript

All this preparation is, of course, almost as much fun as the sailing – I guess it’s like that with a lot of equipment-based sports.

With the carbon boards newly installed, I turned up for one of my favourite races: the Otago Yacht Club Cross Ditch Race for the Miller Cup – essentially a circuit of half the harbour. Off the line I’ve always been faster, but now I could retain the speed and climb to windward of the whole fleet.

The tacks all went smoothly; Jonathan Livingston Seagull would have been proud. Then: crack! I’ve hit the unmarked groyne off Roseneath. Up pops the port rudder, its pull-down rope torn out. Uh, oh, the centreboards are deeper – yes, the port one’s up a bit; push it back down (later I will find it hardly scratched) and truck on.

Down-wind trick

I’ve occasionally sailed down-wind legs on light-wind days with one rudder purposely raised, but never up wind; this is unknown territory. She walks it in, never missing a tack, which I put down to the new boards being further aft, taking some of the sideways load off the remaining rudder.

We scoot across the Cross Ditch, shimmy through Macandrew Bay (and a local racing fleet), then surf on down harbour – until a big nothing. Whitecaps ahead, whitecaps behind, a flat calm in between systems. Then, blam! The nor’wester, which soon backs west and settles into 20 knots and gusting. I can’t let her heel too far; that remaining rudder would be of little use in air! I don’t want to capsize, either, so, traveller well down, sheet well in, play it like a fish.

Turn for home; the last leg is a reach and we’re flying. The bow wave is horizontal mist, there’s a long flat wake behind the leeward rudder, the rig is singing, I’m fully stacked out and well aft (keeping that bow up today, not tomorrow).

We slash across the line – not just line honours but handicap as well, it turns out; so cool when your home-build efforts deliver as envisaged. I ease off and pat the deck: “Thanks, wee girl, we nailed that one.”

Sometimes it’s good to be alive. Just ahead there is an appointment with a surgeon in Christchurch, but this is now – and I’ll take it.

First outing with the 150mm boards in this boat; we’re in a happy place. Minutes after this photo was taken, that rudder was pointing skyward, as it would for the rest of the race ...

Photo: Peter Wilhelmson

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My shed

Marty working on the Camaro

THE SHED THAT ATE THE HOUSE

Living the dream – a factory-sized shed crammed with a diverse array of treasures

By Chris Hegan

Photographs: Chris Hegan, Zoe Radford

If your shed is larger – much larger – than your house, is it still a shed?

This is a question Marty and Zoe Radford might well ponder in their spare time – if they had any. Their house, a well-furnished, modern two-level dwelling, is built into a corner of the sizable factory unit that is their shed.

Let's start at the beginning. Marty's petrolhead father had a strange love affair with the German automaker NSU, home of the Wankel rotary engine. A frugal man, he worked two jobs and would never pay for something he could do or make himself, meaning he had little time for the kids (or for the wife, who left) – although that does not seem to have stopped Marty from turning out in a similar mould. Through car club connections, the young Marty, driving his massively overpowered Capri V8, met Zoe, a young solo mum in a luxurious, throbbing Camaro. A petrol-soaked romance became a 23-year relationship, and still counting.

NSU forever

Relics of the Radford Snr's NSU enchantment can be found amidst the overwhelming array of projects, from finished to almost started, that literally line the couple's giant shed from floor to ceiling – a shiny NSU Quickly moped, still in regular use; another Quickly gathering dust, parts on the shelves somewhere; and the erstwhile pride of the fleet: the NSU Prinz 1000, still functioning, but hoisted to a high storage shelf with the family forklift (an old Datsun called Tetanus, beautifully refurbished) because it's not up to the requisite standard.

This was the car in which Marty's mother drove him to school, a former showroom sample that failed to set New Zealand alight back in the '60s. It had its virtues, staunchly defended by Marty, but the fact that hot air from the air-cooled rear engine was cycled to heat the interior meant that a leaking exhaust manifold or head gasket could give the passengers a knock-out dose of carbon monoxide. Sub-optimal, can we say?

"A leaking exhaust manifold or head gasket could give the passengers a knock-out dose of carbon monoxide"

The to-do list

The Prinz was restored in the early '80s by Marty's father, and is now showing its age.

"The last time we used it was at Caffeine & Classics. We went off somewhere and came back to hear two old geezers just grilling the car. 'How on earth could someone let a car like that get in such a condition, blah blah blah.' ▶

An oldie but a goodie

Boiler, V8 engine, and the NSU Quickly moped

They didn't know it was ours, obviously. So we took it home and stuck it up there with the forklift. Another of many things on the to-do list."

Priorities there are in abundance. On the day of my visit, Marty has his nose in the partly stripped big block engine in his 1979 Chevrolet Camaro – Marty's teenage dream come true. In the 20-odd years he has had the car, this is at least its seventh engine – he has lost count.

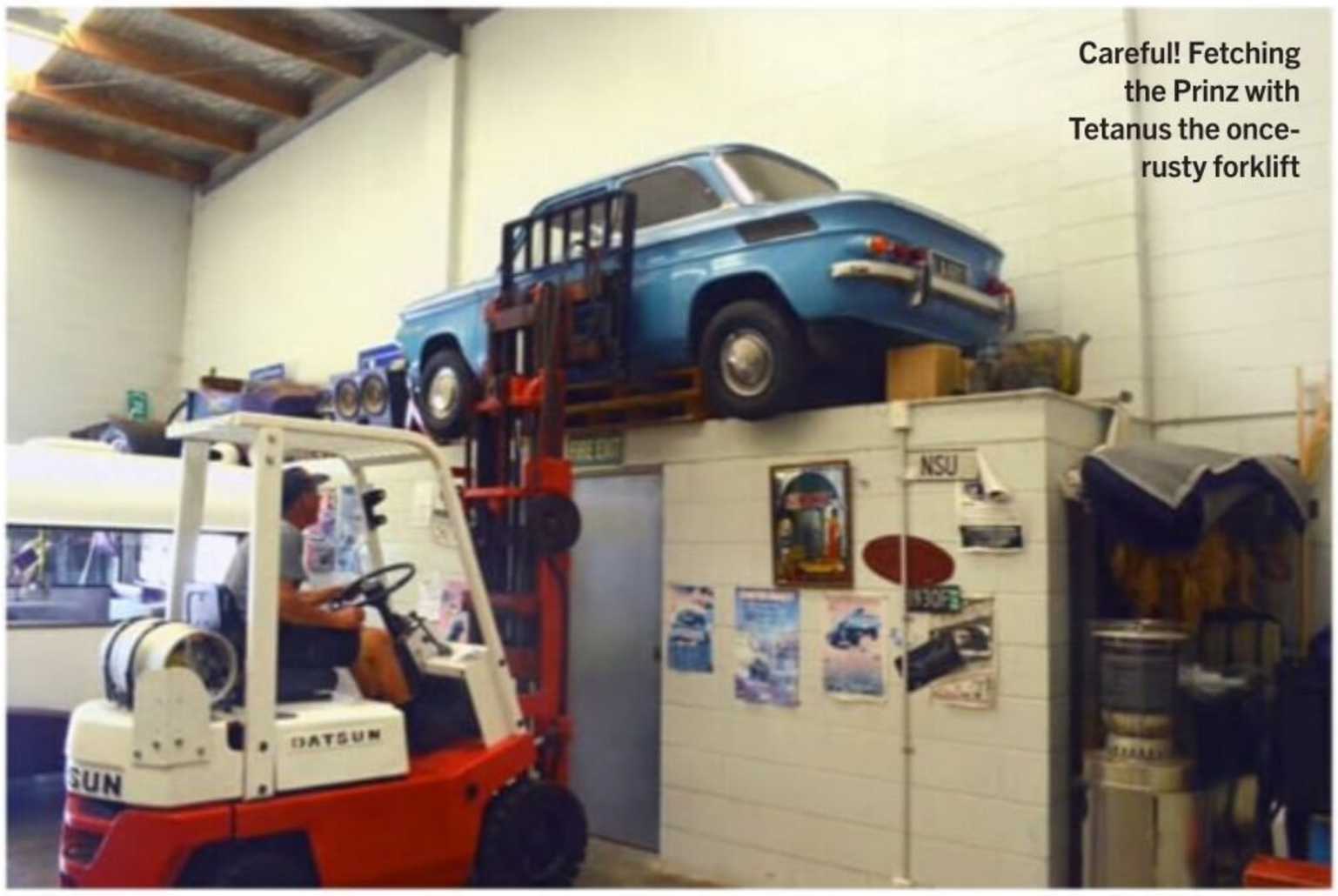
On the hoist beside him is a big American-made Ford Falcon Sprint with a wheeled, sprung extension sticking out the back to stop the car flipping over backwards under full power.

"This was rebuilt as a drag car in the States. It's what they call a pro-streeter – big wheels on the back, little wheels on the front, big engine poking out of the bonnet, back's higher than the front, makes a lot of noise, has heaps of go.

"This is my Queen St tribute car. If you had this car in that era, you would have been a god on the streets."

I remember those days – Friday nights in the '70s and '80s, when Queen St in Auckland was a thundering parade of gleaming cars and motorbikes shuttling testosterone-dense young males relying on their 'wheels' to 'pull chicks'. In 2024, that seems more than half-way back to the time of the cave dwellers. I can't help pointing out that some people grow out of those dreams.

"Some do," Marty replies with a grin.



Careful! Fetching the Prinz with Tetanus the once-rusty forklift

Self-taught

Looking at the three functioning hot rods, the two steam engines under restoration (or is it three – it's hard to tell), the immaculate classic caravan, the Prinz, the stripped cars in the stacks, the coffee cart, and who knows what else, I assume that Marty has, at least, a mechanic's training. Not a bit of it.

His only formal training was a night course in spray painting at Manukau Tech. For the rest, it is mostly thanks to MOTAT (Auckland's venerable Museum of Transport & Technology).

"Dad did find time to help with my model aeroplanes, and I suppose because of the planes I volunteered after school at MOTAT's aviation workshop. The planes were badly neglected in those days, a bit boring for a 12-year-old

> "If you had this car in that era, you would have been a god on the streets"

Power to spare – the T-bucket and the Falcon Sprint

“He finally saved enough money to buy his first V8, a Ford Capri, his weekend warrior wheels. He has had two, and they – or at least their stripped bodies – are up there in the stacks”

kid who wanted to be busy. But over in the railway section they were flat out, operating locomotives and rolling stock, working on all sorts of things, so me and my mates changed workshops. We got the railway jigger working and charged for rides on the weekends. We filled in rosters selling tickets or shovelling coal on the trains, often arrived on Friday evening and wouldn’t go home till Sunday. We’d try anything; ask the older guys how to do things, pushing boundaries to learn. Oh, you need to weld that? Well, first you need to, etc. sort of thing.”

Marty’s first job

Thanks to the time at MOTAT, Marty talked his way into his first job as a fitter and turner with a company that sold and serviced air compressors. For them his lack of a trade certificate simply meant they could pay him less. Even so he finally saved enough money to buy his first V8, a Ford Capri, his weekend warrior wheels. He has had two, and they – or at least their stripped bodies – are up there in the stacks. Then he switched jobs to work for an importer of American cars where he discovered the glories of the Yank tank.

“My first one was a Pontiac Laurentian. It looked all right but it had been used to tow a big boat and everything behind the front seat was shot. So I bought another and turned the two into one but I never got it right. That’s the only car I’ve ever given up on.”

Marty and Zoe

When Marty met Zoe she was working at a gym and making extra money flipping cheap cars bought at Turners Auctions.

“I’d buy one for $500, clean it up, and sell it for $1000,” she says. “I would have made more with better cars but I never had enough money.”

Getting together with Marty opened up new possibilities for the ever-entrepreneurial Zoe.

“We actually got a good bit of the house deposit dealing three Camaros.”

What is it about these Camaros?

“I like two-door cars – Monaros, V8 coupes, Camaros – comfortable, luxury cars. We’re both addicted to over-size engines, and we both like to be busy – I’ve always got to be doing something.”

By the time they bought their first house (with no garage), Marty had one commercial unit full of his projects and had inherited another from his late father. They spent years looking for a house with a big enough shed or garage

Awaiting resurrection – Marty’s weekend warrior Capri, top right

Orenstein & Koppel workhorse. Decades of shunting cement, five years of loving restoration at MOTAT – Marty's pride and joy.

but, thanks to all the in-fill housing in Auckland, these have become an extreme rarity. After some agile negotiation they landed the former upholstery works that the owner had modified as a home and business. It is not ideal – Zoe would dearly love a garden – but their vast collection left them little choice, and it is one that has worked out well in the end. ▶

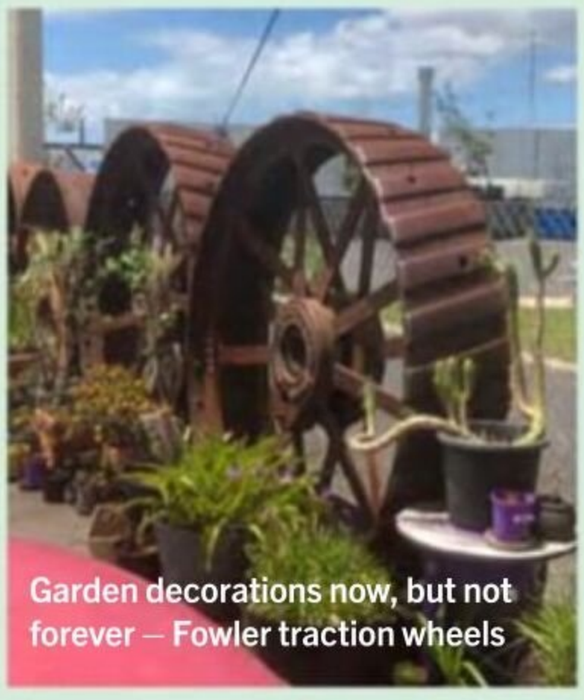
"Zoe would dearly love a garden – but their vast collection left them little choice"

Everything, everywhere, all at once

MOTAT

Marty's decades-long devotion to MOTAT has seen it grow an impressive steam collection.

"We have 10 working boilers. There are two stationary boilers, a portable steam engine – which is a boiler on wheels with flywheels on it to power a variety of things – a traction engine, a steam roller, four railway locomotives, and a steam tram. The tram is very rare – they were made in America and three survive, two in Australia and one here. There are none in the UK, I think, but an English-built steam tram runs in Christchurch. It's amazing. New Zealand does have some unique steam gear if you know where to look. Per head of population, we outdo most of the world in working steam."



Garden decorations now, but not forever – Fowler traction wheels

Setting off for a big fright

The jewel in the crown

We naturally gravitate to the most spectacular item in the collection: the T-bucket '23 hot rod with its huge, gleaming supercharged V8 engine, enormous back tyres, and immaculate high-gloss finish. It came to them through a friend who had bought it through Facebook.

Marty explains. "We both thought it was a good buy because it had been pieced together to look like a car but it wasn't. Plenty of the bits didn't match. Metric bolts in imperial holes. Front brakes were new but weren't what was on the certification, which you need if you're going to drive it on the road. When he realised how much needed doing, he offered it to me for what he paid for it. We had consolidated our house and workshops into this place, and had a bit of spare money, so I took it on.

"I thought I'd do one expensive thing that I can't do myself at a time, so I started by having the radiator ▶

> "Maybe crack the world record. They eventually got more than 50 of them together for the photograph"

Marty and Zoe not quite ready to hit the town

For the love of steam

"I'd been working with steam for years at MOTAT and decided I wanted to restore one of my own. I spent two and a half years looking for a steam engine to restore. I went on wild goose chases around the North Island until I found a guy with an unfinished steam bus based on a steamroller boiler. [When Marty says 'boiler', he usually means a whole steam engine.] He was one of these guys who puts something up for sale and then changes his mind. He had this one for spares and advertised it for sale. I went and had a look, we agreed on a price, and I came back with a trailer, but he goes, 'Oh, now that I've dragged it out, I'm not sure I want to sell it.'

"I had come all this way, hired the trailer, so I pulled out his hand, put the cash in it, and said, 'It's on the loader; put it on my trailer, please.' Very reluctantly he did, and I drove off. It's an Aveling and Porter, a British company that was the biggest manufacturer of steamrollers in the world.

"The name rang a bell for me. I pulled up the pictures from my 2018 walk across northern Spain. Sure enough, there I was sitting in a rusting steamroller in an abandoned park outside Vilalba. I had photographed the nameplate: No. 6566 – Aveling & Porter Limited – Rochester, Kent."

Sourcing parts

Marty started combing the world for parts and information. "I've met a lot of people because of this. A guy in Tasmania had a CD of 400 original drawings from Aveling and Porter. They enabled me to make a new horn plate, which I've welded on.

"I found one brand-new gear in Holland, another in the UK on eBay. I had an inspector look at the boiler. There were a couple of bits he wasn't happy with, so I've had those repaired, through mates. I found a guy in Christchurch who used to own one, and he had a few bits and some patterns he had used to make other parts, so he onsold those to me and we've been mates ever since."

Marty found a headstock in the UK, and shows me – an enormous piece of cast iron inches thick. I point out that it must cost a fortune to ship something like that.

"It would if I didn't know someone," he says with a grin.

When I ask if he has all the bits he needs, he concedes that lots of it is still missing.

"They're out there, but you have to work on people to convince them that you're the

The once and future steamroller

person that should have the parts that they don't really need in the first place. It can take years. In some places these parts are worth really good money, and that's often why they're reluctant to let them go.

"I started to get really frustrated, thinking maybe I should get one that's more complete, because there's a chance that this won't get finished in my lifetime."

We walk across to the other side of the shed.

"So that's where this one comes in."

Now we are looking at another huge convoluted lump of iron.

"I tracked this Fowler traction engine down to Gore in Southland. It was a project that the owner had given up on. They pulled it to bits then saw what a massive project it was so they bought one that was going, or nearly. It's fairly complete but rusty.

"The water tank is rusted out but all the fixtures are there – the wrought iron work, the brass fittings and decorative edges. I've just got to make a new water tank and put all those bits on it."

Right. Just make a new water tank …

Wait, we have another one

In fact, Marty will have more than enough parts because the family from Gore heard a rumour that there was another one buried on the property. They located it, dug it up, and found it was exactly the same make and model; the deal was that Marty and Zoe had to take that as well. It is now sitting in a container in their yard, but Marty knows his limits.

"That's one project too far. I'd quite like to get rid of that. The only interest I've had is someone in the UK, and I don't want to do that. I don't want to be part of exporting steam stuff out of New Zealand. The only way it would come back would be to buy it back, and a going traction engine in the UK is twice what you'd get one for here. With the freight and the GST, you're talking hundreds of thousands of dollars – not going to happen."

For people whose projects keep them permanently poor, this is a considerable show of loyalty.

"To be honest, I would gift that to someone who wanted to get it going and keep it in New Zealand."

"With the freight and the GST, you're talking hundreds of thousands of dollars – not going to happen"

I suggest that such a person might then be tempted to sell it to a rich overseas buyer.

"I'd have to get to know them, know what sort of a person they are."

This is a constant theme that seems to run through the steam community, which clearly runs on values other than money, even though a fully restored working steam engine is as valuable as an elite-marque car. In fact, as I listen to Marty, I realise that the glue that holds New Zealand's steam engines together is friendship. Marty vigorously concurs.

"If I get the roller up and running, well, if I didn't have a circle of friends who were interested in that as well, to help me get it going and help me use it, it's kind of pointless, because one person couldn't run it down the road on their own anyway. It's similar with the hot rods. It's why I've never gone down the Harley route. The only person you can share the Harley thing with is another Harley owner. My family would never want to own something like the Falcon or the T-bucket, but they'll happily come for a ride to a restaurant in it and really enjoy it. I can share that experience with them, or a couple of mates."

You want my bus?

All this had already taken years, and meanwhile the owner of the steam bus had been trying to sell it.

"He kept harassing me about buying his bus, but I told him I now had a traction engine and was working on that. He would ring around and everyone kept telling him that the only people in NZ who would want this are Marty and Zoe."

They ended up getting the bus, but they had to take the whole thing.

"Some friends with a trucking company relocated it for us at a really good price, but it upset the neighbours because it blocked up the forecourt."

Marty chopped it up for firewood and scrap metal, and now has enough bits to make a stationary traction engine, which he can put on wheels to make it portable.

So many parts, so many plans – where is all this activity heading, I ask.

"What I want to achieve this year is to get one of these two boilers steamable."

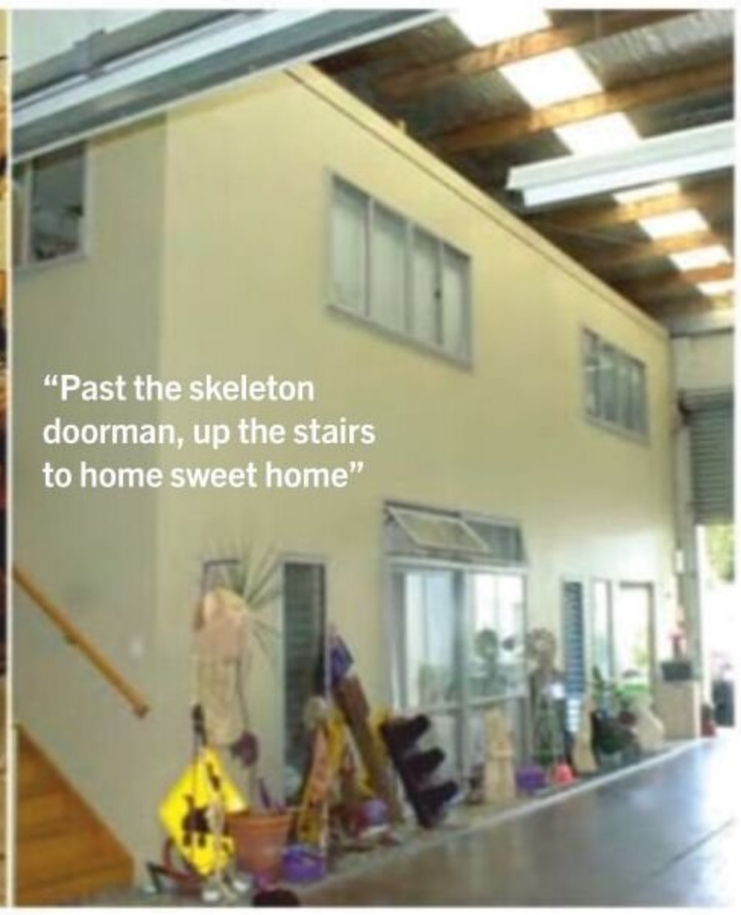
"Is that realistic?"

"Well, we just have to say this is what we're doing and get on with it."

The Shed will be watching.

Step 1: the chassis

“Hold it steady ...”



“Past the skeleton doorman, up the stairs to home sweet home”

reconditioned and put it on the shelf. A mate did the gearbox in his spare time; that takes longer but I wasn't in any hurry. Then in 2022, a friend pointed out that the next year was going to be the centenary of the 1923 Model T Ford, on which these cars are based. He was planning to get as many of them together as he could for an event. Then Beach Hop said it was going to do the same, maybe crack the world record. They eventually got more than 50 of them together for the photograph.

Budget blowout

We gave it a bloody good nudge; a lot of friends came and helped, a mate did the upholstery. In the end, we didn't make it but it moved the project along much quicker than I expected. It also hammered the budget. I've spent so much money on it all. The other projects have been pushed back. It hasn't helped that the cost of automotive parts has doubled, if not tripled, since Covid.”

My cynicism leads me to conclude that, since so many companies went to the wall, the lack of post-pandemic competition has led to ruthless profiteering, but I can't get the ever-generous Marty to agree.

“I guess the companies that survived want to survive well,” is as far as he will go.

I ask how much of an original '23 T is in the car.

“None,” he replies.

However, the car is registered and has its own plates, so how does he get a VIN

Five seconds of sheer terror!

when there's no original car to measure it by?

"You have to get it certified as a replica. The certifier checked it out, found a couple of things, which we fixed, so it's registered as a 2024 replica of a 1923 Model T Ford. The owner has to be certified, as well, to drive a car with no fenders, which means you have to prove that you're a genuine enthusiast, and be a member of a club for more than 12 months. They actually check that with the club."

Ya just know

"Is it competitive?"

"I haven't raced it, to be honest. We've driven it 300 miles, but every time I take it out there's something I'm not happy with; the performance isn't there."

"You haven't raced it," I object. "If you're just driving it on the road, how can you tell?"

"I just know," he replies with a grin. "You

It's a frame-up!

> "The seats, cupboards, door frame, etc. are what stiffen the thing"

feel it in your bones when you're driving it, that no, we can do better than this."

Considering that on a nearby back road I would soon experience five seconds of sheer terror when Marty briefly planted his foot to the floor, I wonder what better might look like.

Later, back leaning over the beloved Camaro, Marty tells me that the responsible thing to do would be to sell it.

"But you'd sell the T-bucket, surely? This Chevy is your dream car."

"Yeah, but I'm still not happy with it. I couldn't sell something I'm not happy with."

The caravan

We move on to another completed project, the exquisitely finished caravan.

"Zoe was desperate to get a little 10-foot caravan, something a bit older with a bit of style. Did no research, saw it on Trade Me and bought it for 16 hundred bucks; unfinished project. How hard could it be? Well, it can be quite hard, apparently.

"We brought it from Te Awamutu on a trailer, and it was already falling to bits when we got here because the timber frame was all rotten. We got into the interior and started ripping everything out. We thought it was like a house – just get in there, tear it all out – but we soon realised that all that interior fit-out is what gives the caravan its structural integrity. The seats, cupboards, door frame, etc. are what stiffen the thing, and, thanks to the rotten frame, it started to collapse.

"It sat in a corner for six months while I packed a sad over the fact that we'd bought a lemon. But I'm so tight I couldn't bring myself to write off all that money. So we took it all apart, carefully preserving the tin parts, which were nailed onto the wooden

Spreading the joy at Beach Hop

frame. Getting the nails out was a bit tricky, so I used an angle grinder with a worn-out stone to take the heads off and popped the aluminium over the nails. It was the least destructive way of getting it off. Moving the roof in one section meant I had to get a group of mates around to move it every time, but that's what you have good friends for. I got a bit carried away and made a whole new frame. You can't use H3 or H4 because it will react with the aluminium, so I used boric treated. It's only 20x30mm pine.

No knots

"We bought a whole lot of ceiling battens, ran them through a bench saw, and picked all the best bits, because you can't have a single knot in it. The door and window frames are original, one cupboard, too, and a couple of cupboard doors. We used the aluminium sides to make a jig to make a new wooden side frame. I made a big MDF table the size of the caravan, and steam-formed the framing onto the rim. With it all in bits, we could reverse engineer how they made it in the factory. We beefed up parts that made it better; the factory was trying to make it cheaply but I wanted it as strong and as hard-wearing as possible.

"We laid it out slightly differently, the way we wanted it, mainly to work around a fridge because it never had one. It has two on-board batteries that you can plug into a solar panel. It's all set up with its own everything – towels, toiletries, cooking utensils, plates, etc. So, to go away in it, you just pack the clothes you need for the trip and it's a home away from home."

Cuppa Zo

The coffee cart sitting next to the caravan is not a Radford project but has the trademark high Radford shine.

Marty fitted it out with a generator, liberating it from the need to use designated powered sites. 'Cuppa Zo' can go anywhere, and does – The Trusts Arena in Henderson, where Zoe has a

Good looks not just on the outside

Arrrr mateys!! The Cuppa Zo pirates

part-time admin job, MOTAT, car club meets, Beach Hop, anywhere. Since everything has to have the 'firm's' trademark, it is hooked onto a beautiful, sky-blue Chevy pickup, an '89 with a '95 grille.

"It's not a classic yet, but it goes to car shows; still quite collectible. It's got air con, electric windows, power steering," Marty explains. "Zoe wanted an older truck to go with the cart but I said, 'You really don't, they're just old trucks.' This has all the comforts and you can get the parts, which is why I did a lot of work on these when I was working on the imports. We made a lot of money out of these trucks."

Cuppa Zo is never just about coffee and snacks; it's always a show with a theme – fairies, pirates, rock 'n' roll. Zoe's mates often turn up in costume to create an event.

"I like to make people smile," Zoe says.

She also acts in TV commercials or as an extra – performance is in her blood. Her father, Dave Sheridan, is an old performing mate of mine, his street-show strongman act a major crowd draw in his day. I suspect there's a gene for showing off and Zoe has it in spades.

Mr Sooty

All this has to be paid for. Marty is on contract to MOTAT, sometimes for as little as 10 hours a week and sometimes as much as 60.

"That's on top of my volunteering. This Sunday I'll be driving the train, although I only do that when there's a gap in the roster. Some guys only want to drive, and I don't want to take that from them. I prefer the behind-the-scenes stuff, making sure the mechanicals are all working properly."

Zoe, who has no mechanical skills, does more than her share in bringing in the cash. When she's not behind a desk at the Arena she's off somewhere, shifting the coffee, putting on a show. In a short period before last Christmas, she ran through 24kg of beans – all to stay poor but revel in the love of their lives: big, shiny motor cars with huge motors. And steam engines?

"No, not at all. That's Marty's thing. I don't want to shovel coal. Marty comes home looking like a chimney."

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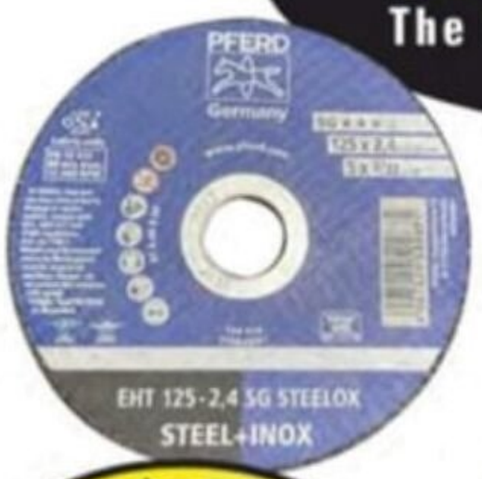

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MAKING SOMETHING OUT OF NOTHING AT ALL

Among their many other uses, unwanted timber pallets make great wind-breaks, plant shelters, and compost bins

By Andrew Broxholme
Photographs: Andrew Broxholme

The first iteration of the compost bin structure had three bays; the cat is just curious

When we first moved to our lifestyle block, there wasn't a single tree or shrub – or a house, for that matter

About eight months ago, the groundworks contractor that rented my yard went out of business. Among the many things left behind were dozens of wooden pallets – some in good condition, some not so great. I do hate waste, but it's not always easy to use them as anything other than, well, pallets, unless you get creative.

The timber isn't high quality. If the pallets have been outside, the nails will be rusty; the nails are also ribbed, so they don't come out cleanly and will leave large, rust-stained, ragged holes. The timber is rarely treated, so the bottom planks will rot if left in direct contact with the soil. That said, I've made good use of pallets on my lifestyle property. Before I get into the most significant project, let's look at some things I have repurposed them for (or upcycled, to use the latest lingo).

We had dozens of trees and shrubs with us, in pots, until we figured out where to put them – they needed to be protected from both wind and overly hot days. In about a day, I built a very simple plant shelter using pallets screwed together to form a base. On top of this I added a basic frame and draped it with thick, wind-break material. It has been up for five years and has stood up to some really bad weather. We are trying to empty it but keep buying more plants, and somehow haven't found the time to build a greenhouse and a proper potting shed yet. ▶

> "I added a basic frame and draped it with thick, wind-break material. It has been up for five years and has stood up to some really bad weather"

Three pallets screwed together around a young tree will break the wind nicely

> “By then have done their job and can be broken up and burned”

I built a lot of tree shelters using pallets as a base. They are easy to attach ties to, to stop the sapling from being beaten up in the wind. After a few years they tend to rot at the bottom, but by then have done their job and can be broken up and burned. The little one above was cut down from the original and is helping contain the mulch around the tree and protect it from careless use of a mower.

The regular rain through the early summer, interspersed with lots of sunny days, in my local Whakatane area meant that I have struggled to keep ahead of the weeds and long grass around the edges of our property.

Compost bin not big enough? Just add another section or two

Three good-sized screws down the frame – top, bottom, and middle – are more than enough

I've been experimenting with making compost over the past few years in a very non-scientific way. You can get some good compost by just piling up weeds and grass in a big heap and leaving it for a few years, but it's a bit ugly and the top levels dry out. It works better if you contain it in a structure of some kind and cover it. It should be turned as it breaks down and not allowed to dry out too much.

The initial idea was to make three bays, which would require seven pallets. It doesn't matter what size pallets but it's much easier if they are the same size. I chose ones that were 1x1.2m, of which I had more than any other size – in case you are wondering, there seems to be no such thing as a standard pallet.

The gaps in the bottom of the pallet will become the inside of the bays, and need to be mostly filled in with pretty much any wood you have lying around (not plywood or MDF, however). It just needs to be the same thickness.

I left narrow gaps to allow air movement and excessive moisture to escape and stop the rotting material from overheating. The front of each bay was planked with rough-sawn timber that had been used as concrete edging. These planks were individually screwed in place, and a few at the bottom can be removed later to dig out compost that is ready.

It didn't take long to fill the first two bays so I decided to add extra bays, one at each end. The whole structure has pavers under each pallet corner. This lifts it clear of the soil so the bottom of the pallets won't rot out. The ground I built mine on was fairly level, but the pavers also helped line everything up so it actually looks good as well as being functional.

Because all the pallets are the same size, it is easy to line them up and screw them together. The bins end up 1x1x1.2m.

I only put the first few front strips on until I start filling the bay; it's easier to fill that way. You add the rest of the planks as you go

"In case you are wondering, there seems to be no such thing as a standard pallet"

The first bins have been filled to the top about five times already. The current dry spell means I need to give each bay a good soaking once a week. I've topped up the bays quite a few times. After each added layer, I add some compost accelerator to speed up the decomposition of the material. ▶

The fourth bay almost ready to go

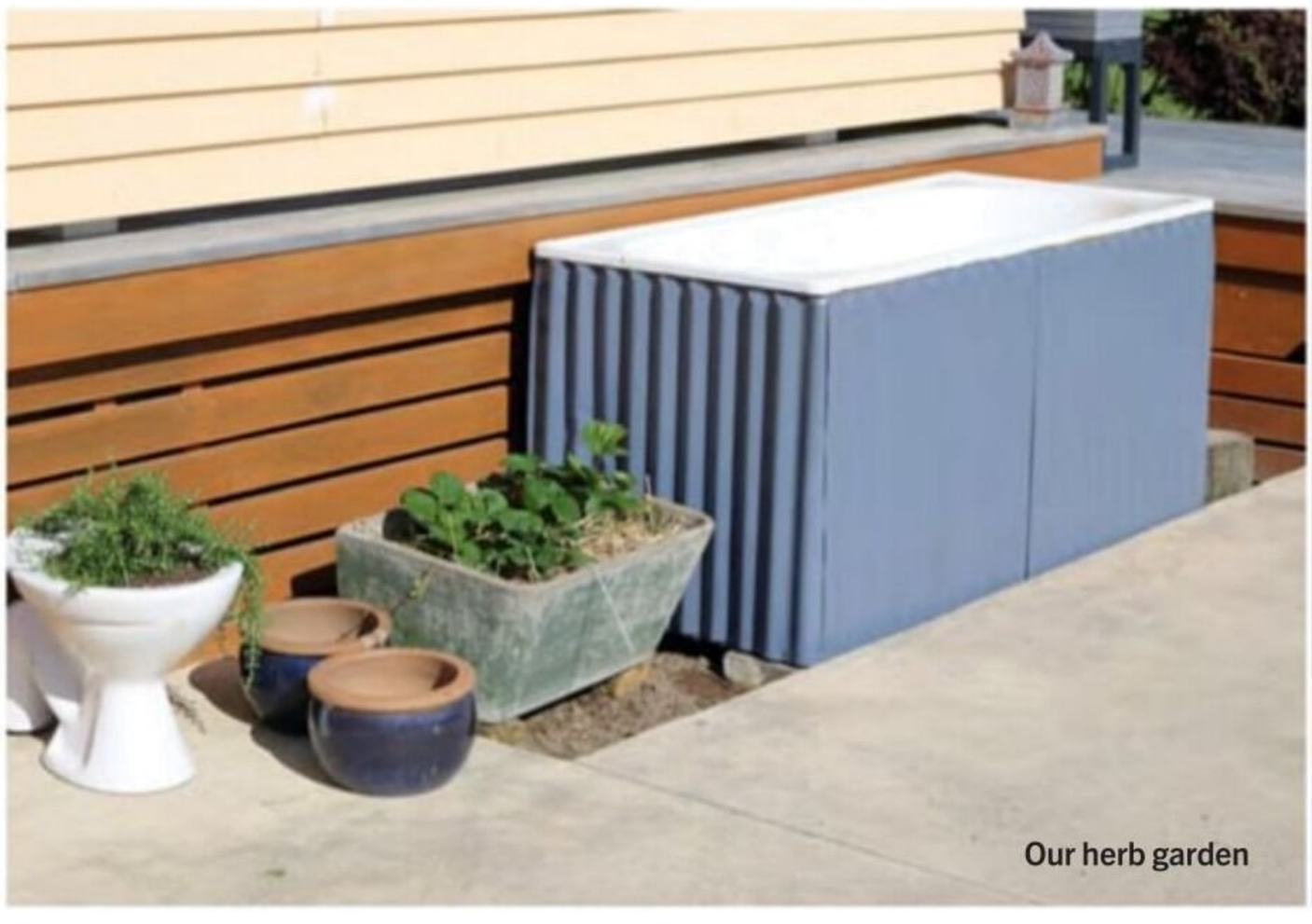
Composting under way; the first two bins starting to break down

> “We had two garage sales before Christmas and needed a temporary table”

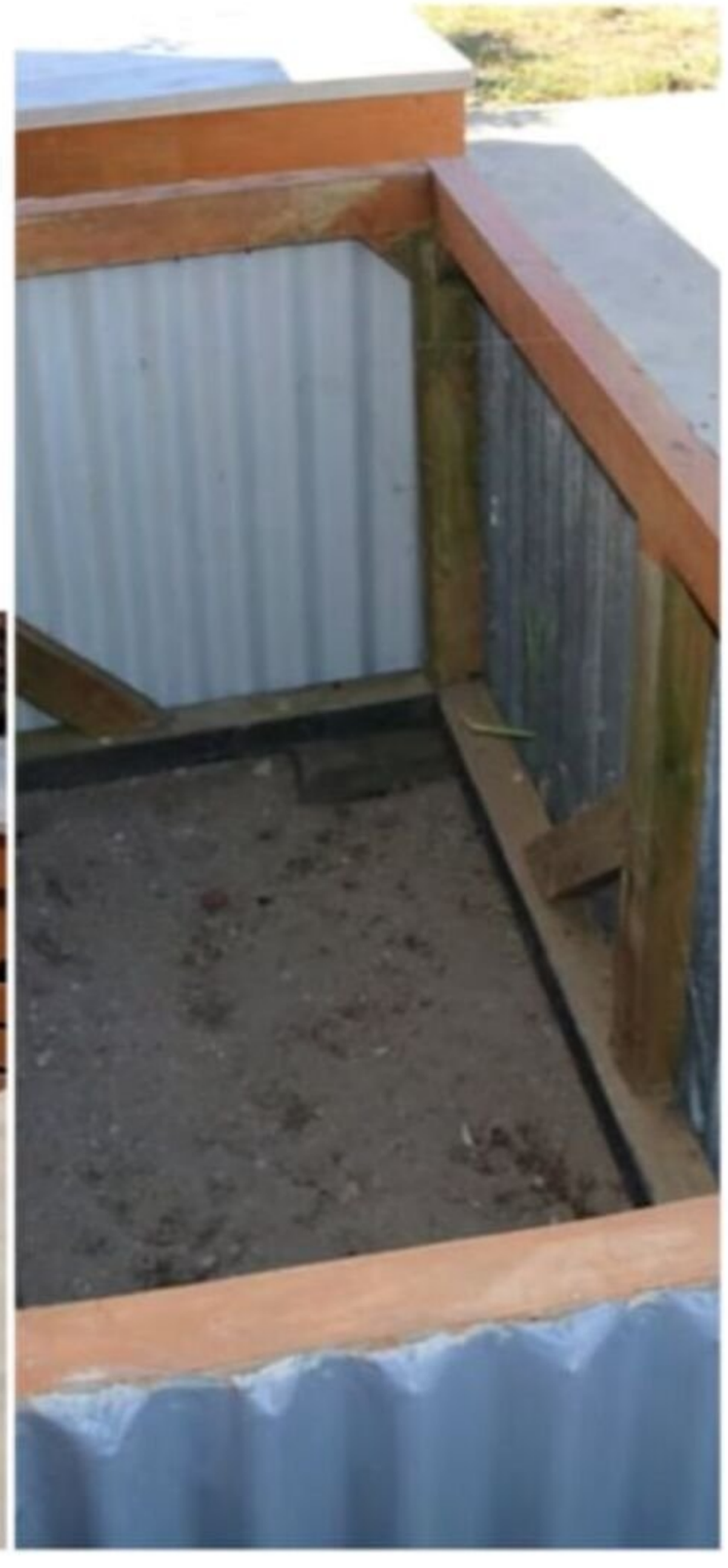
Something a bit different

We had two garage sales before Christmas and needed a temporary table. I grabbed some partially broken and rotted pallets and one long one and assembled this temporary structure. Covered in cardboard from some appliance boxes, it did a great job

Our final bit of upcycling involved our old steel bath – removed when we renovated our bathroom – and the creative use of an old toilet. I turned the bath upside down and built a simple frame from 75x50mm timber, which was then clad in some old but serviceable galvanised iron. It’s just been moved to a new location. As we used good-quality paint on the steel, it was a quick job to give it a fresh coat. It’s now ready to be used for growing our herbs.



Our herb garden

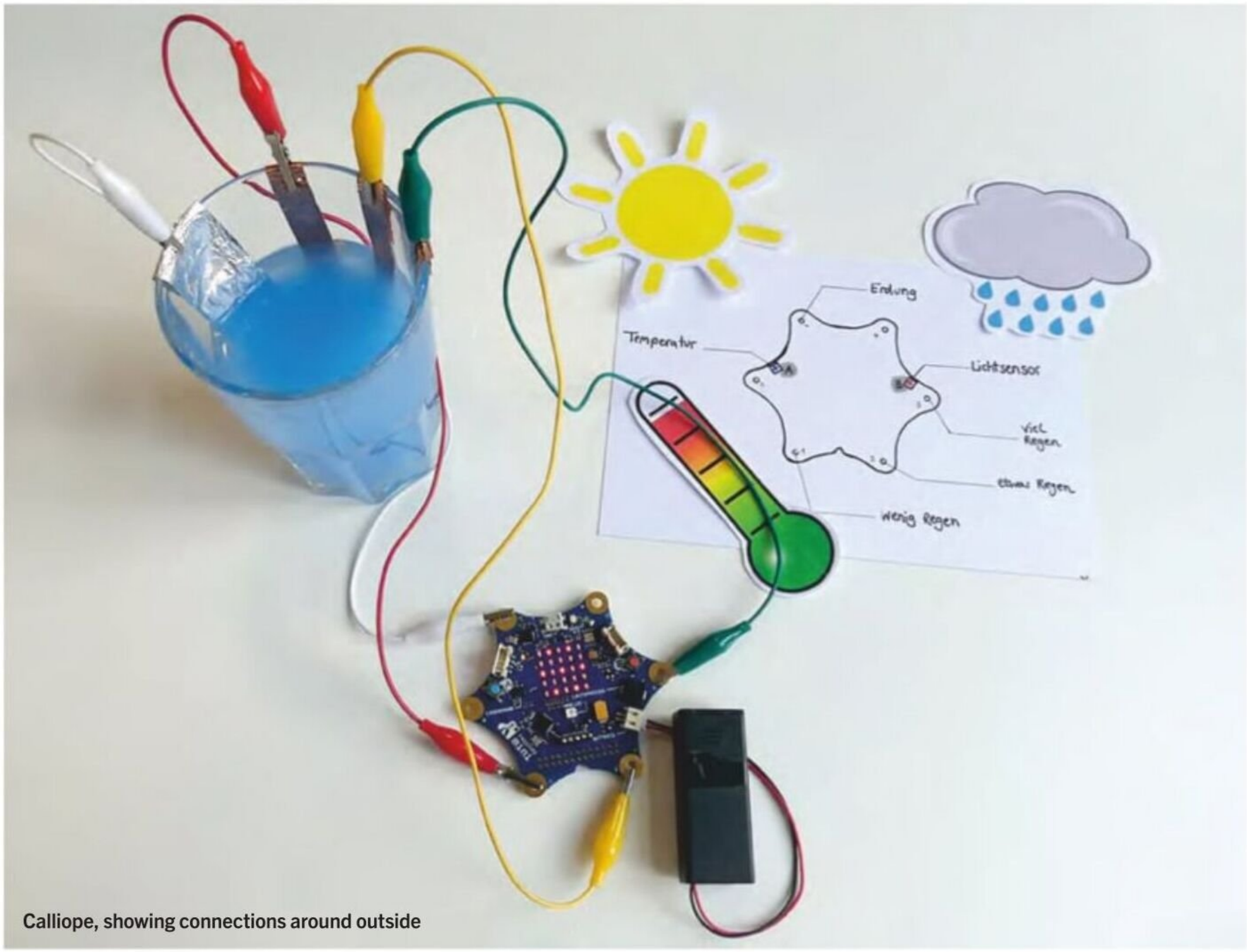


SINO:BIT

Chinese microcontroller enables computer learning in a number of languages

By Mark Beckett

Naomi Wu at Elecrow during development



Calliope, showing connections around outside

I have to admit that I was rather late to the party with this device, which was introduced in late 2017.

Readers may have heard of the BBC micro:bit (*The Shed* July–August 2018), which was developed to enable UK schoolchildren to learn coding. It was cloned by Calliope, with added features and on-board hardware. Then came the sino:bit.

The Elecrow website states: "The sino:bit was created by Naomi Wu, an open-source hardware evangelist and DIY enthusiast. It was executed and engineered by Elecrow Technology, a Shenzhen-based electronics company that offers contract manufacturing and engineering services to maker and hardware enthusiasts."

Naomi made the challenge more difficult for Elecrow by communicating only in English, as if she were a westerner collaborating with a Chinese manufacturer.

Of greater significance is that this is the first certified open-source hardware from China: https://certification.oshwa.org/cn000001.html

Language options

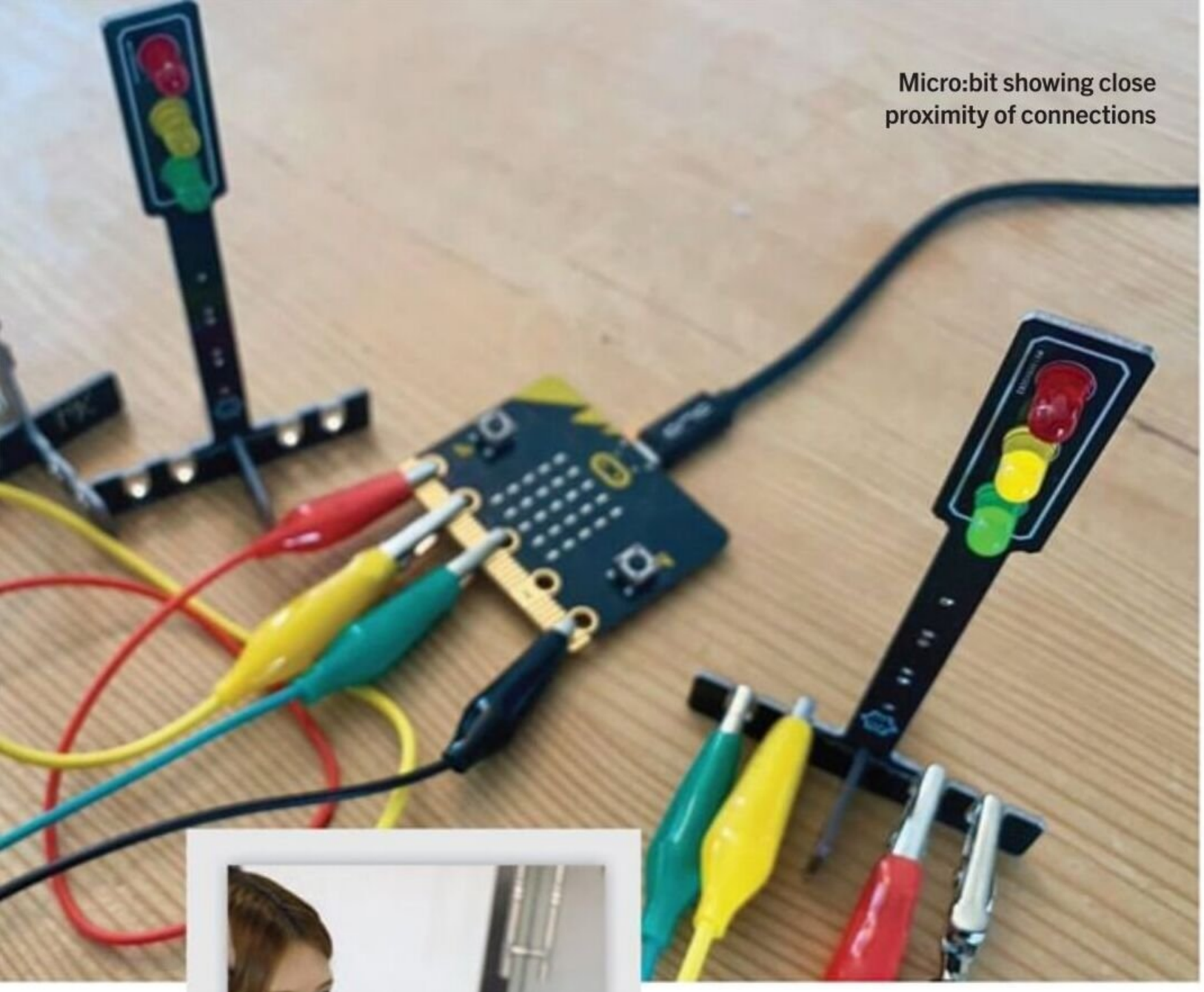
According to Elecrow, "The sino:bit is a single-board microcontroller designed for computer education in China. It is based on the Calliope mini with permission of the Calliope mini project. While several modifications are planned, the first was to upgrade the LED matrix from 5×5 to 12×12. This allows for support of Chinese, Japanese, Hindi, Arabic, and other non-Latin character based languages. Without this, the vast majority of the world's children cannot experience the thrill of that first 'Hello World' in their own language."

Similar to micro:bit

I purchased a couple of sino:bits from Elecrow. With shipping and the exchange rate included, they work out to be a similar price to the latest BBC micro:bit (which has extra features) from a local retailer.

The first thing that strikes you is the size. The sino:bit is more than twice the size of the micro:bit, which is not a bad thing when you're dealing with students. ▶

"Of greater significance is that this is the first certified open-source hardware from China"



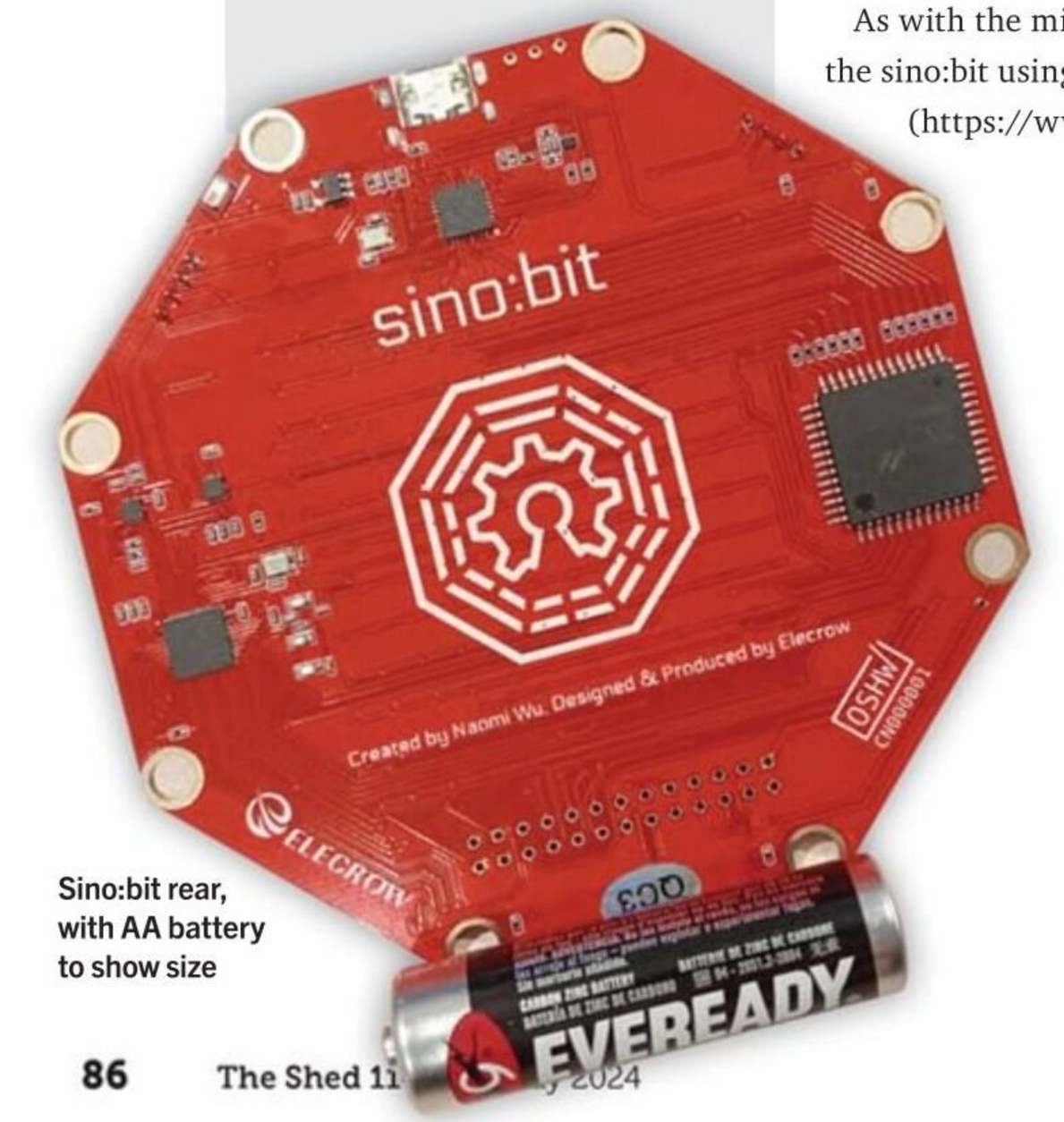
Micro:bit showing close proximity of connections

Resources

https://github.com/sinobitorg

https://github.com/tdicola/sinobit-micropython/releases

https://learn.adafruit.com/sino-bit-with-arduino/dastels-overview



Sino:bit rear, with AA battery to show size

> "The first thing that strikes you is the size"

The micro:bit has three connections that students connect to, using alligator clips. Both the Calliope and sino:bit increased the number and moved them to the perimeter to prevent shorting. This is important in a classroom situation, as a student may not understand why their device is not working, or how it was damaged simply by a slip of the connection.

To access more of the hardware features, the sino:bit has a standard 0.1 pitch connection. This eliminates the need for expensive add-on boards and gives greater control to the user.

Programming

As with the micro:bit, you can program the sino:bit using Microsoft MakeCode (https://www.microsoft.com/en-us/makecode), Arduino, or MicroPython (https://tdicola.github.io/sinobit-micropython/editor/editor.html). Many of the links and libraries seem to involve the work of Adafruit (Limor Fried), a big advocate of open source and the maker community.

Adding sino:bit into the Arduino IDE is a matter of following the well-documented guide at Adafruit: https://learn.adafruit.com/sino-bit-with-arduino/dastels-overview

Once it is installed, you can see all the examples and try a few yourself.

Custom images

If you wish to create and display custom images, there is a very useful html editor in the sino:bit source files. You simply click the squares and copy the result into your code.

I have no plans to use this microcontroller, and the purpose of the article is to bring it to the attention of readers and educators looking to include students who may not be native English speaking, or who need a larger display than the micro:bit offers.

Sino:bit front

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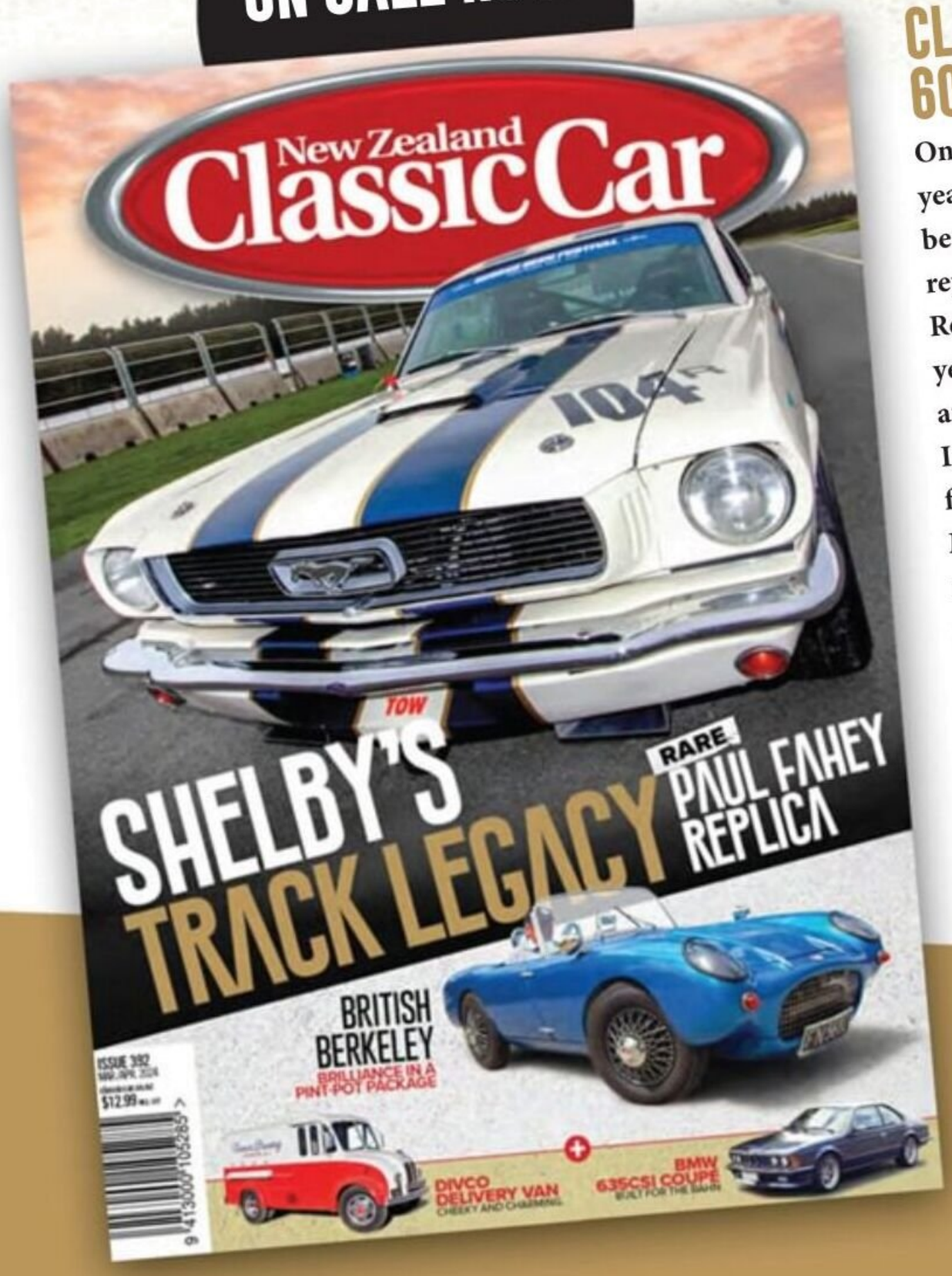

CLASSIC CAR MAGAZINE CELEBRATES 60 YEARS OF THE FORD MUSTANG

One of the greatest of classic cars, the Mustang, hits the 60-year milestone this year so we party and showcase one of the best-presented Shelby Mustangs in New Zealand: a Paul Fahey replica, driven by long-time classic racer Rodger Cunninghame. Rodger is also celebrating a huge milestone this year – 50 years of competitive racing – so these two make a perfect anniversary combo.

In 2019, Rodger took his new Mustang #104R (replica) to Taupo for the Dennis Marwood meeting, and was persuaded to go onto Manfeild for the Alfa May Madness meeting; 104 was the original race number when Paul Fahey raced his Mustang – his actual car is now resident in the Bowden car museum in Australia.

Also featured in this issue are some Berkeley micro cars, a Zakspeed anthology, a '56 Ford Fairlane wagon, a Frazer Nash, a BMW 635CSi, a Dennis Marwood tribute, a Gladys Goodall profile, and so, so much more.

For a fully illustrated content rundown of what's in this issue, head to our website: classiccar.co.nz

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Chris Gordon keeps busy – Part 2

Chris Gordon and his engines

A USE FOR LEFTOVER FORGED CRANKS

For most of us, building or restoring a motorcycle would be a mammoth undertaking. Not so Chris Gordon – he decided to build three

By Ritchie Wilson
Photographs: Ritchie Wilson

The story of Chris Gordon making a seatless tricycle from components inexpensively sourced from Christchurch's EcoShop was related in part 1 of "Chris Gordon keeps busy" – *The Shed*, issue 113.

A consequence of buying several second-hand children's bicycles was that Chris ended up with a number of forged cranks. Originally, these cranks would have transmitted the push on the bike's pedals to the chain and then to the back wheel. The chain is driven by the chain wheel, a sprocket with a diameter of a bit less than 200mm, which has a hexagonal-shaped central opening that fits neatly onto a hexagonal housing on the crank. This makes a strong attachment between the crank and the chain wheel.

Chris naturally thought, "This is a neat arrangement; I wonder what else it could be used for." With his extensive background in motorcycles, he didn't take long to come up with the answer. ▶

Exposed valve gear is typical of early engines. The brass tube on top of the head directs drips of oil to the rockers and the timing chain. In a late development, Chris has decided to enclose some of the chain's run in wooden-lined tubes

The three engines; the engine stands were made from aluminium and steel tube from Chris Gordon's scrap bin

A trio of motorcycles

For many years, Chris has had the idea of making a trio of early racing motorcycles, two having twin-cylinder engines; the other, a single cylinder.

After 18 months of work, he has just completed the engines and is seriously thinking about his next move.

The engine components come from four general sources: swap meets (spark plugs, carburettors, ignition cases); local foundries (crankcases, crankshaft discs, valve gear supports, heads); mainland China (valves, rockers, oil reservoirs, sight glasses); and automotive parts suppliers (pistons and cylinders, carburettor and ignition components).

The engines are all OHC, with the valve gear exposed – as was usual in the early days of motorcycle racing. The rockers, which push the valves downwards against the valve spring, and the chain, which turns the camshaft, are oiled from a tube Chris made, which runs horizontally across the top of the engine's head. The small brass oil reservoir, which is braised to one end of the tube, was sourced, like many of the components used in the project, from AliExpress.

> "Sourced from vintage car swap meets"

Rocker, valves, and plugs

The rockers (from Lifan) and the valves (copies of Honda CF250 scooter valves) also came from AliExpress. Each cylinder has two spark plugs, as the only positions available for a spark plug were off to the sides of the four-valve cylinder head, which may have been less than optimal for efficient burning of the fuel/air mixture had there only been one plug. Chris's solution was to have two spark plugs, one on each side of the head. The plugs are ancient items – Champion C5s – designed to be disassembled for cleaning. They were sourced from vintage car swap meets, and have been machined to allow a small modern plug (also from China) to be hidden inside.

The 92mm-diameter pistons and matching cylinders come from the first air-cooled Volkswagen Beetle, designed by Ferdinand Porsche, and were purchased new.

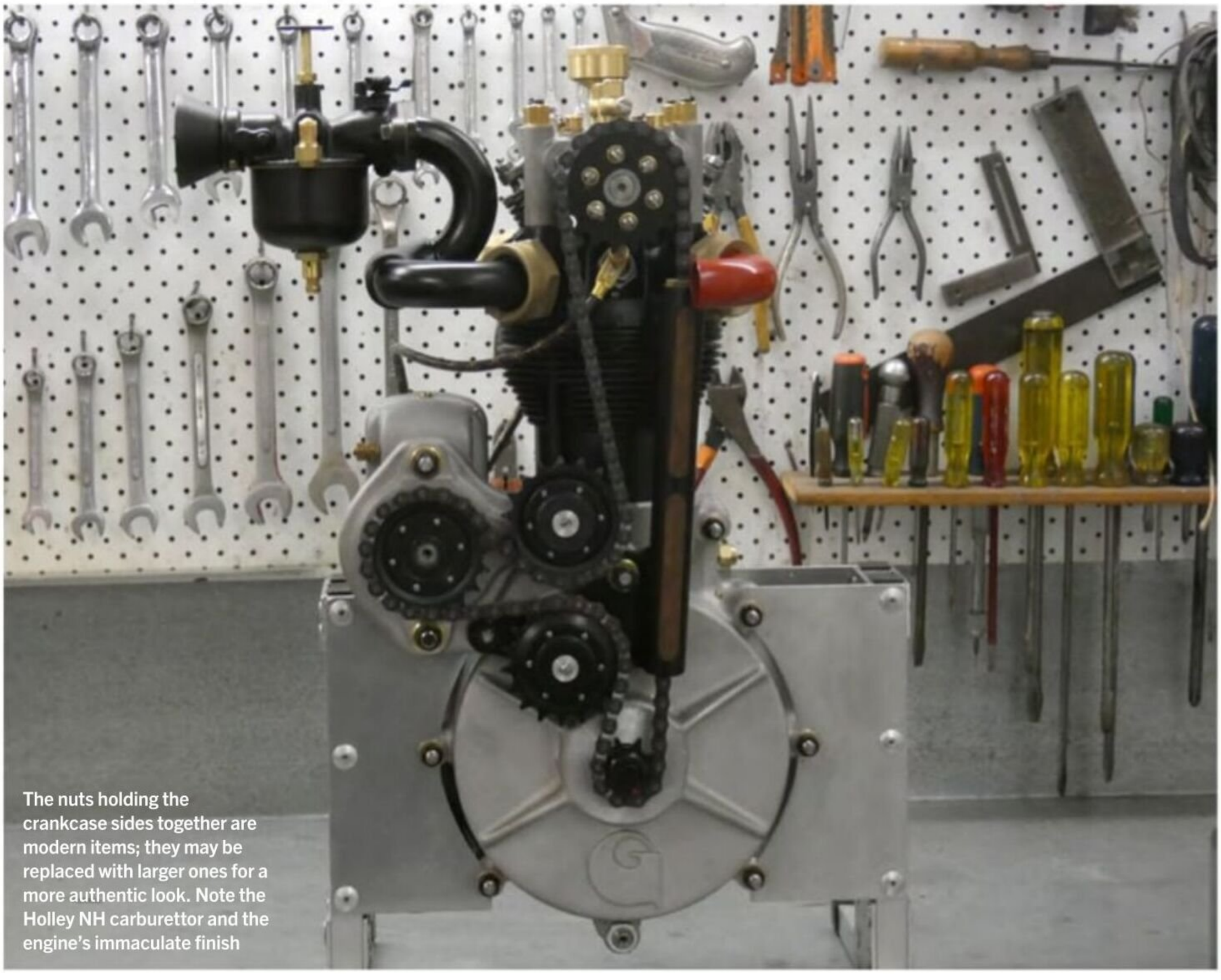
One of the V-twin engines; the central sprocket is from a child's bicycle

The single-cylinder engine; a Fairbanks-Morse magneto case is next to the engine

Tube bending

Chris made the inlet manifold and exhaust pipes using tube bent by an Auckland company. This was a challenging job because the tube was 1⅛th-inch in diameter and had to be bent to tight radii.

Large forces are involved in this type of operation. Chris has made a powerful tube bender that could do the job, and had mandrels (which sit inside the tube as it is bent to stop it from collapsing) that fitted the tube, but with a New Zealand company that had recently developed the capacity to do the job, he paid to have it done. The other part of the inlet manifold is a common T-junction plumbing fitting, which was machined on Chris's large milling machine to fit the tubes, which were then brazed into place. ▶



The nuts holding the crankcase sides together are modern items; they may be replaced with larger ones for a more authentic look. Note the Holley NH carburettor and the engine's immaculate finish

The pattern for one of the crankshaft's discs; Chris Gordon's symbol – a G-shaped arrow – is cast into the discs and the crankcase

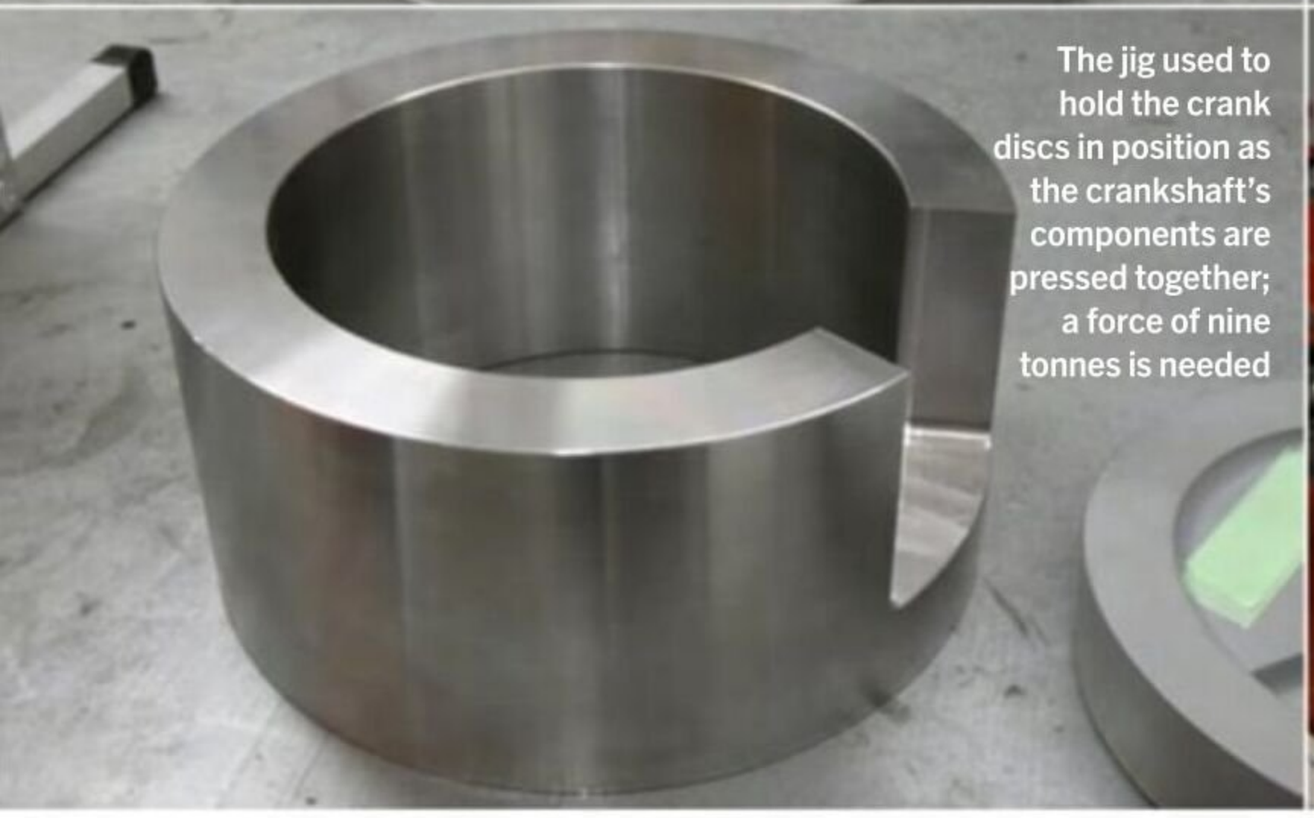
A pattern for the crankshaft disc and its shaft

A crankshaft disc pattern with a crank pin; the discolouration of the pin is a result of heat treatment

Wooden patterns made by Chris Gordon for the aluminium crankcases

The jig used to keep the crank's shaft square to the crank disc as it is pressed into position

A crankcase showing two brass crankcase breathers and two sight glasses, which show the oil level



The jig used to hold the crank discs in position as the crankshaft's components are pressed together; a force of nine tonnes is needed

Chris Gordon's stylised G cast into one of the crankcase's sides

"For the three latest engines, Chris has made the patterns for the crankcase in wood, using his milling machine"

Patterns in wood

Chris has previously built a single-cylinder engine for his replica board-track racer (*The Shed*, issue 77, March-April 2018). It used the crankcase, crankshaft, and connecting rod from a JAP (JA Prestwich Industries Ltd) engine, probably from the 1920s or '30s.

For the three latest engines, Chris has made the patterns for the crankcase in wood, using his milling machine, and had them cast in LM25 aluminium alloy by the Mecca Group foundry in Woolston. The aluminium castings were then heat treated to make them harder; the hardened and tempered cast aluminium machines better. The crankshaft, in typical motorcycle fashion, consists of two discs connected by a crankpin, which is a press fit in holes in the discs.

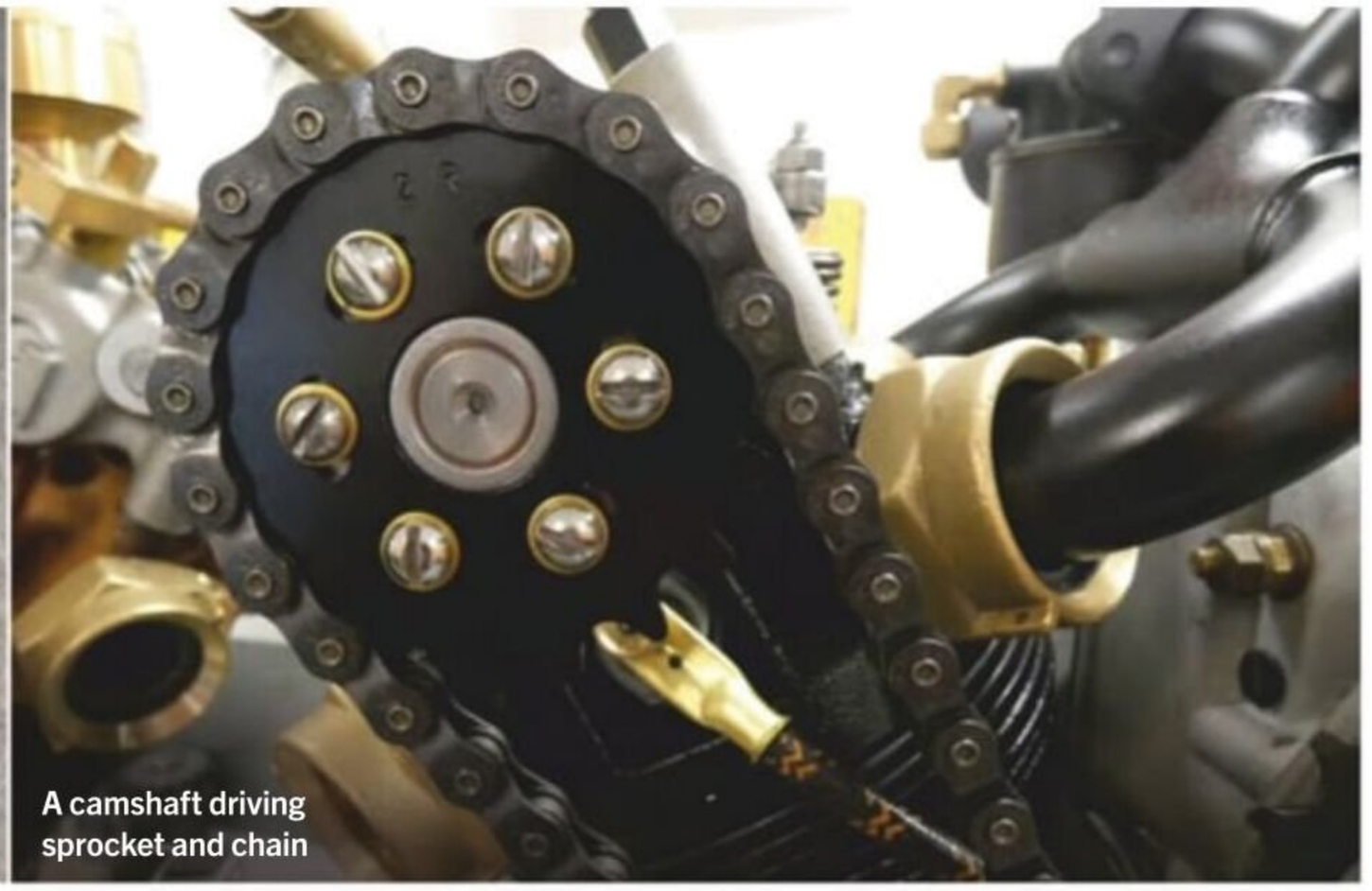
These were cast in steel by CanCast in Washdyke from Chris's patterns and then machined by him. A Christchurch engineering firm with much experience with built-up motorcycle crankshafts then pressed the components together.

Nine tonnes of force was required for the crankpin to be pushed into its housing. To ensure that it went in squarely, two heavy jigs were machined up by the company. One was a short section of very heavy walled steel pipe opened out so that the crank discs were a very snug fit, and the other was a hefty steel block with a hole just larger than the diameter of the hardened pin. ▶

Above: The wooden pattern for the head of the board-track racer's engine (left) and an unfinished cast iron head (right)

Left: Chris has previously built a single-cylinder engine for his replica board-track racer (*The Shed*, issue 77, March-April 2018)

A forged, one-piece crank from a child's bicycle – the object that started the whole project



A camshaft driving sprocket and chain

> "The advantage of the two cranks turning on the same journal is that the two cylinders can be in the same plane rather than staggered"

Alignment

Together, the two jigs ensure that the pin is kept square and the two discs in alignment, as the large hydraulic press exerted its force until the pin's shoulder grounded on the disc. The connecting rods are one-piece forgings, so have to be in position, complete with their big-end roller bearings, as the two crank discs are pushed together. The aligning fixture has a cutout milled in one side to allow the two crankshafts to poke out as the crank is pushed together.

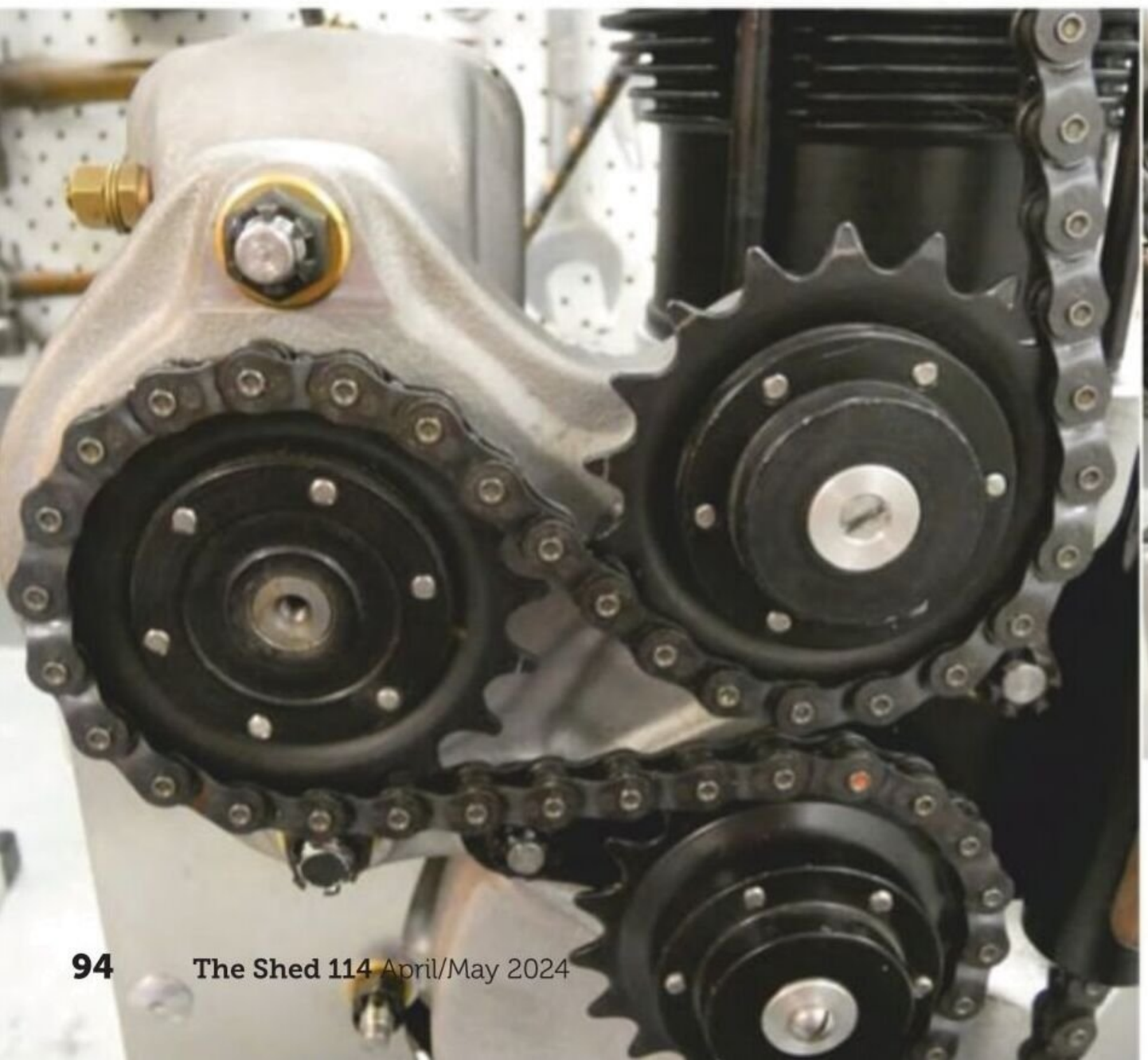
The crank turns in ball main bearings, which are located in housings in the crankcase. The crank turns in the main bearings, which are located in housings in the crankcase.

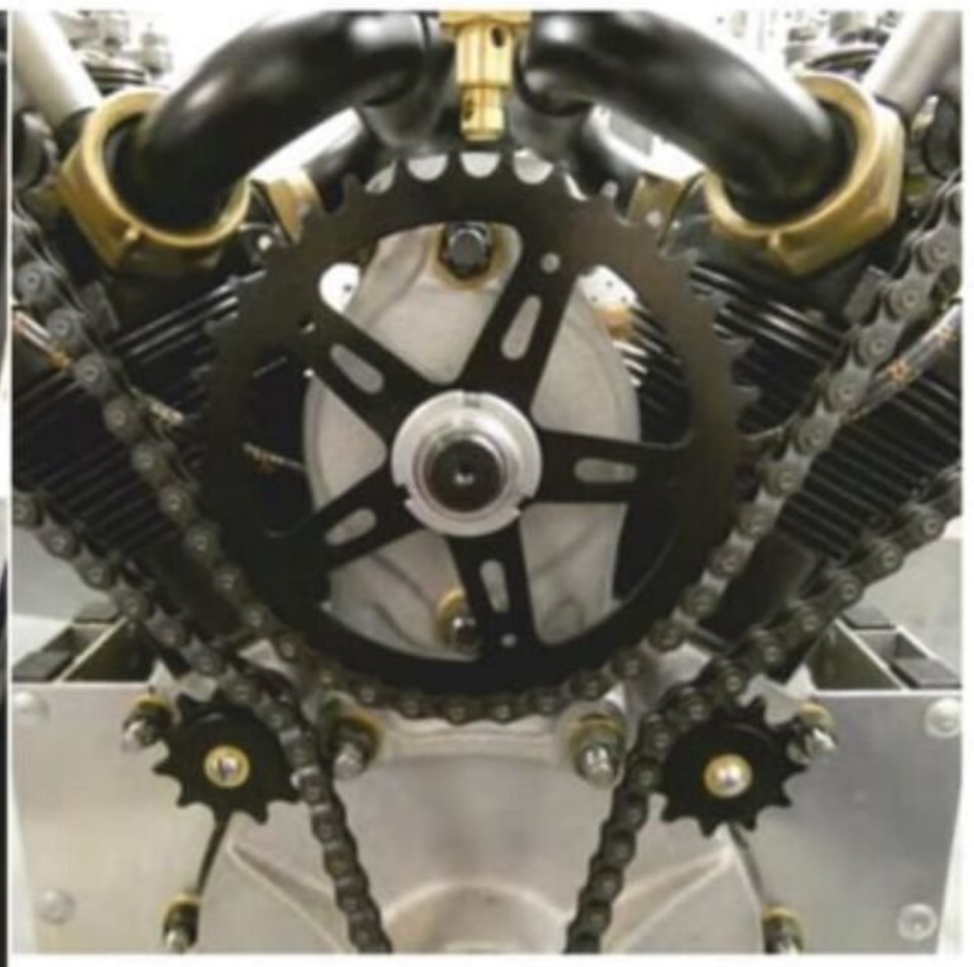
The connecting rods are Ultima 4130 chromoly H-beam after-market Harley-Davidson, and both connect to the single crankpin. One rod's big end straddles the other, both having the same contact area with the pin. This means that three separate roller bearings are needed – two narrow and one wider. The advantage of the two cranks turning on the same journal is that the two cylinders can be in the same plane rather than staggered.

Electrical current

Back in the 1920s, this type of engine would have had a magneto to generate the spark at the spark plugs, thereby eliminating the need for a battery.

A magneto has a magnet that rotates inside neatly wound field windings producing a current in the windings by electromagnetic induction. This current is conducted through the primary windings of a coil which acts

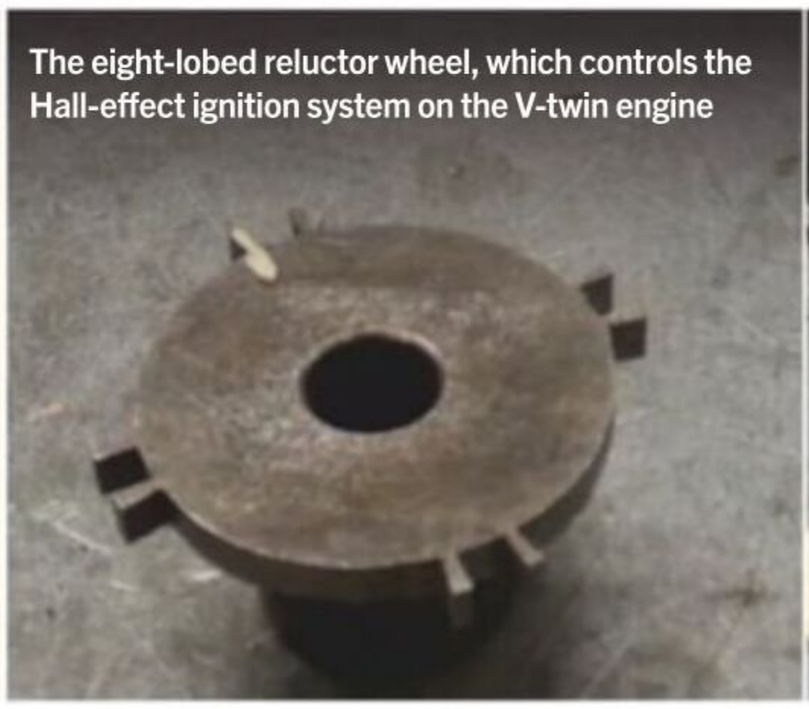


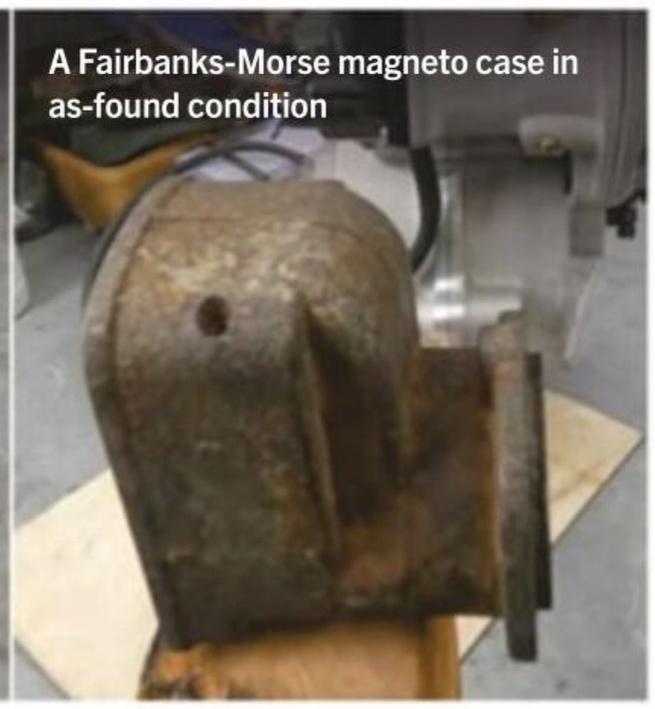


Left: Sprockets and chain on the single-cylinder engine; the castellated nut, at top left, is an old-stock item sourced at a vintage car swap meet

The brass oil reservoirs on each of the heads lubricate the rocker gear and the chain; the Fairbanks-Morse magneto case's new cap is from the Brillman Company


A magneto case in original condition; Chris Gordon has collected a box full of the devices


The eight-lobed reluctor wheel, which controls the Hall-effect ignition system on the V-twin engine


A Fairbanks-Morse magneto case in as-found condition

as a transformer, converting a small primary voltage into a much larger voltage. At precise points in the engine's rotation a cam opens a set of points that acts as a switch, cutting the current to the coil.

The magnetic field produced by the current in the coil's primary windings collapses as a result, which causes – again by induction – a current to be produced in the coil's secondary windings. Because the number of turns (windings) in the secondary windings is a couple of orders of magnitude greater than the number in the primary windings, the voltage of the new current is large enough to cause an electrical arc to jump across the spark plug's air gap, igniting the petrol/air mixture. A magneto for a multi-cylinder engine needs to produce sparks more frequently and must have a distributor to direct the current to the appropriate spark plug. ▶

"A magneto for a multi-cylinder engine needs to produce sparks more frequently"

> “The twin-cylinder engine’s rotor has eight lobes, arranged in four pairs, so each rotation of the rotor produces eight sparks”

Keeping the lights on

The ignition systems on Chris’s motors look like pre-WWII magnetos; indeed the case and distributor cap come from old industrial motors’ magnetos, which Chris has bought at swap meets over the years. He has a box of them.

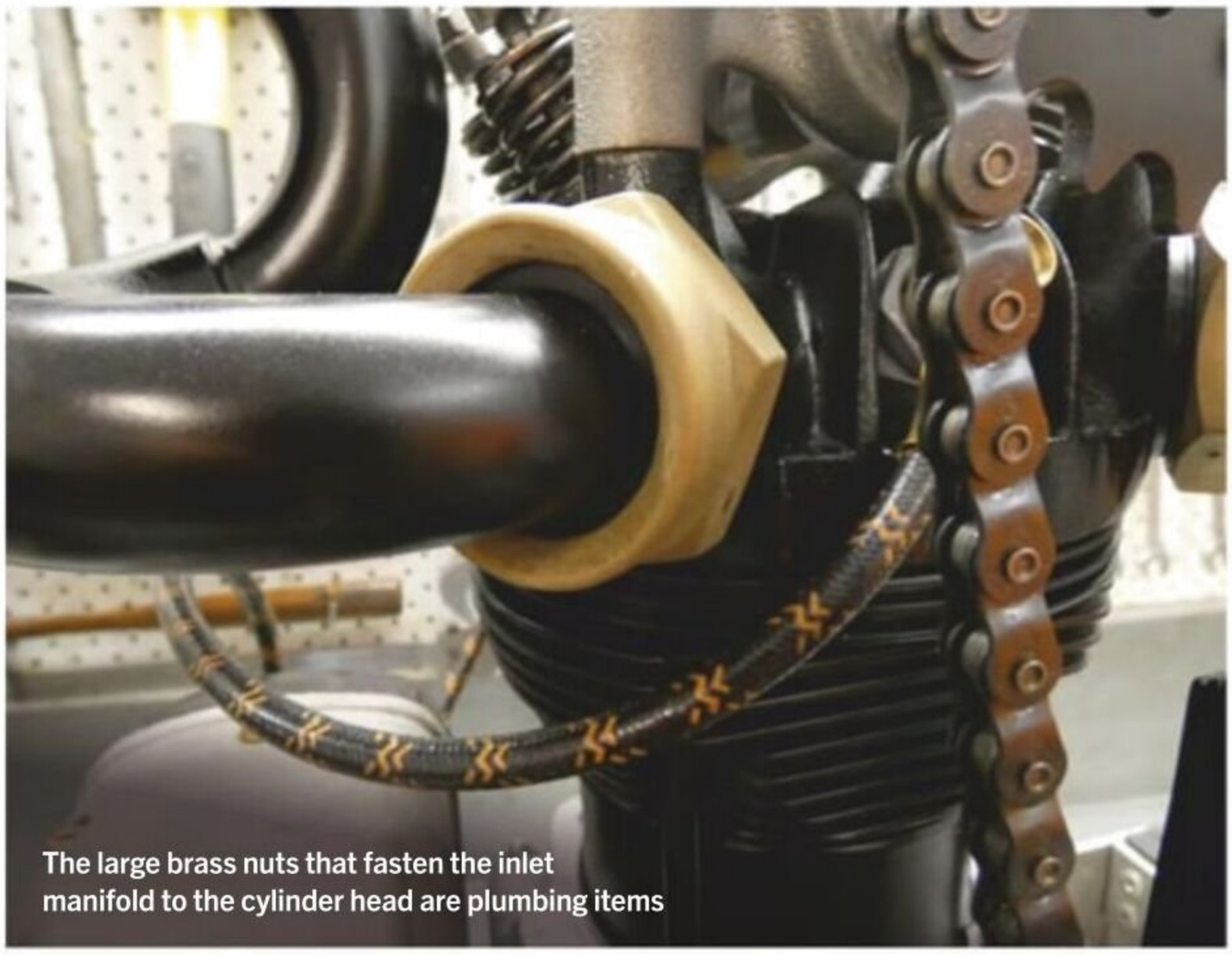
The ones he buys are made by the Fairbanks-Morse Company (founded in 1823 – 200 years ago) for its range of IC engines. The company, famous for producing diesel engines for the US Navy’s submarines, 130 or so years ago was a leading maker of the windmills that produced electricity for the isolated homes of vast numbers of American farmers.

The problem with the wind as an energy source is that it doesn’t always blow, even in windy parts of the world. Fairbanks-Morse began to produce petrol engines that could turn the farmer’s electrical generator, keeping the lights on when the air was still. These engines had magnetos made by the company that were highly regarded and often fitted to other makes of engine as an upgrade. They were still being made until the middle of last century. The number that Chris has seen over the years suggests that they were fitted to engines that were common in New Zealand; perhaps locally made stationary engines used them, such as Mason and Porter or Anderson.

Pluses and minuses

Magnetos have the advantage that they don’t require a battery, because they generate their own electricity, but they also have the disadvantage that the spark they produce at low revolutions is relatively weak, making starting harder. Chris has replaced the internals of the Fairbanks-Morse magnetos with a modern Hall effect electronic ignition system coupled with an ignition module from a Yamaha XV250 ‘cruiser’ (a V-twin with the same 60-degree V-angle as Chris’s twin-cylinder engines). This will be discreetly located on the frames of the bikes, along with a small battery. The heart of the system is a rotor that turns at one-quarter engine speed.

Below: The Hall-effect ignition system fits neatly between the two cylinders on the V-twin engine



The large brass nuts that fasten the inlet manifold to the cylinder head are plumbing items

On the single-cylinder engine, this rotor has four iron lobes, each of which triggers a spark at the engine's spark plug. The twin-cylinder engine's rotor has eight lobes, arranged in four pairs, so each rotation of the rotor produces eight sparks. The rotor, a transistor-controlled (TC) module, the coil, and the distributor are crammed into the magneto case. Chris sourced new Fairbanks-Morse distributor caps and suitable braided spark plug wire from the Brillman Company in the US.

Clever thinking

The shaft that turns the rotor is from the one-piece forged crank of a child's bicycle, which Chris straightened. The crank has a hexagonal projection, which fitted a hexagonal opening in the bicycle's chain-wheel, held securely in place by a threaded ring. It was this neat connection between the chain-wheel and the shaft that got Chris thinking about how to make the three engines in the first place. When he noticed that the modern arrangement was so superior to the old method – where the bicycle's two pedals were attached to the bottom bracket's axle by over-stressed cotter pins – he thought to himself, "What can I use this for?" The answer, perhaps not obvious, was to use it in an ignition system for V-twin and single-cylinder motorcycle engines. The sprocket and shaft are turned by the chain, which also drives the camshafts. ▶

A modern spark plug flanked by two antique examples; Chris hides the modern plug inside an old one

Hall-effect electronic ignition

In 1879, a young American physicist, Edwin Hall, discovered the effect that carries his name. The Hall effect generates a small voltage in a thin conductor (or semiconductor) that is in a magnetic field perpendicular to an electric current flowing through the conductor. The voltage generated is at right angles to both the original current and the field.

This discovery was important, not only because the Hall effect is used in a wide variety of modern electronic devices, but also because it was evidence that the things making up an electric current passing through metals had a negative – rather than a positive – electrical charge. This was nearly 20 years before the discovery of the (negatively charged) electron, which today is accepted as being the charge carrier of electrical currents passing through metal conductors.

The electron was discovered in 1897 by Sir Joseph Thomson while he was experimenting with cathode ray tubes (CRTs). Cathode rays – a stream of electrons in a vacuum – are now called beta radiation. The non-flat-screen TVs of last century used CRTs.

Hall voltage

The theory is that as the electrons of an electric current flow through a piece of metal, which is held between the poles of a magnet, the electrons are deflected by a force, called the Lorentz force, which is at right angles to both the current and the magnetic field between the magnet's poles. The consequence is that electrons accumulate along one side of the metal, giving it a negative charge compared to the opposite side. If the two sides are connected to a voltmeter, a voltage – called the Hall voltage – will be detected. This voltage is constant as long as the current and the magnetic field are unchanged.

The magnetic field is reduced if a ferro-magnetic object, such as a piece of iron or steel, moves closely past the magnet, causing the Hall voltage to reduce. This change in the Hall voltage is used in electronic ignition systems to trigger a high-voltage current to a spark plug. The piece of steel that affects the magnetic field is on a rotor, sometimes called a reluctor wheel, which turns with the engine. The overall result is that fat sparks are reliably generated at the appropriate time in the engine's cycle.

Hall-effect ignition has the advantage over the old points and capacitor ignition systems that preceded it in that it doesn't suffer from wear or contamination and, in theory at least, should operate faultlessly for the life of the engine.

The Holley NH carburettor was original equipment on Henry Ford's Model T

A refurbished Holley NH carburettor

Reprinted manual for the carbs

"Reconditioning kits are available relatively cheaply"

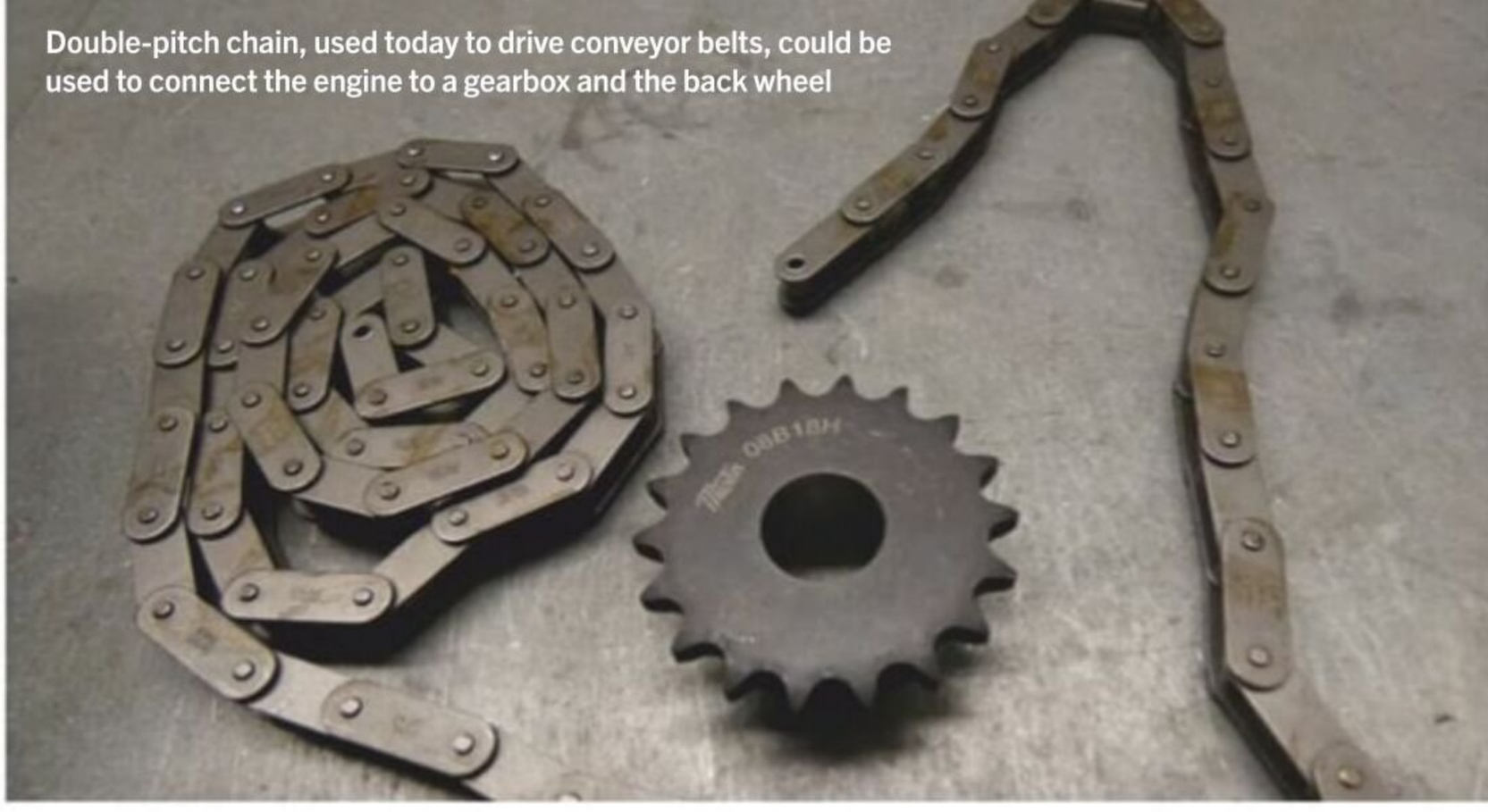
Carburation

The carburettors used on all the engines are Holley NHs, as were originally fitted to Model T Fords. Chris has a box of these (13 in fact) that he has bought at swap meets. Apart from being fairly common and period correct, they are made of cast iron, so haven't deteriorated as aluminium carburettors tend to do after a few decades. Because of the very large number of Model Ts still on the road, comprehensive reconditioning kits are available relatively cheaply from American suppliers such as Lang's Old Car Parts.

The overhead camshaft's sprockets are driven by a bicycle half-link chain. The sprockets were laser cut by Christchurch company Autobend.

The comprehensive reconditioning kit available for the Holley NH carburettor from Lang's Old Car Parts

The inlet manifold is made from tightly bent, large-diameter tube – only one NZ company (besides Chris Gordon) can bend this tube to these radii



Double-pitch chain, used today to drive conveyor belts, could be used to connect the engine to a gearbox and the back wheel

Nuts and studs

There are some metric threads in the engines, but the vast majority are UNC – which, in America in the early years of last century, would have been called SAE (Society of Automotive Engineers).

The engines are held together by studs and nuts. The brass nuts are 5/16-inch UNC automotive manifold nuts, and look the part. Chris thinks that the steel UNC nuts he has used elsewhere on the engines may be replaced with nuts that fit the studs but have larger external dimensions, to resemble more closely the size of nuts used on motorcycles of the WWI era. He may have to make these nuts himself.

The reason the nuts and bolts used to have relatively larger hexagonal heads is because in the past weaker material was used to make these fasteners. As stronger steels came into use, the size of fasteners could be reduced and, particularly, the size of the hexagonal head could be smaller. Consequently, larger nuts look more authentic. The large brass nuts that hold the inlet manifolds and the exhausts onto the cylinders are plumbing components, possibly locally made. The brass oil glasses, oil reservoirs, oil caps, and crankcase breathers all come from China.

What will the engines be used for?

Chris is keen on motorcycles. He has built a V8-engined racing bike and a replica 1920s single-cylinder board-track racer. He also used to campaign a successful 125cc MotoGP bike on which rider Dennis Charlett won the 1998–1999 NZ Championship. It is probable that at least one of the V-twin engines will end up in a replica old-time racing bike frame. ▶

> **“Consequently, larger nuts look more authentic”**

The drip-feed (also called total loss) oiling system for the engine’s chain made by Chris; the brass oil caps are from China

1912 Bédélia BD-2 Cyclecar

Cyclecars

In some European countries, in the early years of last century, motorcars were taxed annually, with smaller capacity engines attracting a lower tax. This encouraged hundreds of manufacturers, from about 1910, to build two-seater cars powered by small air-cooled single-cylinder or V-twin engines, often sourced from motorcycles. Final drive was usually by belt or chain, and the bodywork was rudimentary.

They were called cyclecars because they were an amalgam of motorcycle and car engineering. There was a boom in the manufacturing of cyclecars after WWI, but the introduction of low-priced vehicles from large companies such as Peugeot (the Quadrilette) and Austin (the Austin Seven and its continental replicas) eventually killed most of them off. Exceptions were Morgan in England, which is still making cars, and Amilcar in France, which lasted until the occupation of France by the Wehrmacht.

Some of the lightweight cyclecars had quite powerful engines, so could produce performances that were, for the time, respectable. In 1920, a Cyclecar GP was held at Le Mans. In England, between the two world wars, cyclecars were the basis for many amateur-built 'specials', which competed in famous hill climbs such as Shelsley Walsh and Prescott, among other venues.

The most successful Shelsley special was Basil Davenport's Spider. Based on a GN cyclecar, it had a wooden chassis, V-twin engine, and chain drive to a solid back axle. Davenport achieved the fastest time at Shelsley, against all comers – including the racing departments of large manufacturers – no fewer than seven times.

"In England, between the two world wars, cyclecars were the basis for many amateur-built 'specials', which competed in famous hill climbs"

The suggestion that a WWI-era cyclecar, like the famous GN, would be a use for one of the engines has been suggested by a couple of acquaintances, but Chris is unconvinced. Perhaps better than anyone else in this country, Chris is aware of the work required to make a rideable motorbike, such as his 500cc GP bike, or his replica board-tracker; it would be a major time commitment.

Another consideration is that Christchurch's vibrant post-earthquake motorcycle scene, which included well-attended beach races and regular but unpublicised suburban bike exhibitions, appears to be contracting back to one of its sources: Johnny Moore's Smash Palace inner-city bar, with its Thursday-night bike nights.

The possible venues to show off a V-twin racer in the future may be limited.

One of the engines may be packaged into a period wooden crate, just as if it had been discovered after being long forgotten in the back of an old bike shop, or hidden under debris in the proverbial barn.

The engines' finish

Chris Gordon takes great pains with the finish of the things he makes. Two of the three engines are being cleaned and painted so that they look new; as if they were fresh from the factory. The second V-twin will have the appearance of an engine that has had little care since it was built 100 years ago. Chris thinks that producing an aged patina on the 'old' engine is more difficult than making it look new as, except for the carburettor and magneto case, the engines are new.

In issue 115 of *The Shed*, June/July 2024, you can read part 3 of 'Chris Gordon keeps busy' – Gordon goes electric!

1919 AV Cyclecar manufactured by Ward and Avey

AUCKLAND
Harley-Davidson

x' Electra Glide

SPORTSTER S

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DOESN'T MATTER WHAT ERA YOU'RE RIDING

WE'VE GOT YOU COVERED

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TIME IS ON MY SIDE

Time: the precious gift that we so often forget to value

By Mark Seek
markseek@rocketmail.com

The Stones last contribution to vinyl?

The Rolling Stones released the single Time is on my Side in 1964, and to be quite honest, I can't think of anything more prophetic for the current trio with their combined age of somewhere near 240 years. It would appear that time has been something these old chaps have managed to slow with their appetite for life.

Hackney Diamonds is their latest album release, and it could quite possibly be the last of some 31 studio albums created by these elder statesmen of rock 'n' roll. Promoted with much 'Stoneseque' fanfare, it is somewhat tinged with a bit of sadness for die-hard fans of Charlie Watts (RIP).

Downtime

What about the rest of us? I found myself watching a doco on *The New Yorker* YouTube channel – yes, I had some downtime between carving the Christmas turkey and New Year festivities – and felt it could provide me with material for my own side hustle: *The Shed* shrink 2024.

The documentary introduced several middle-aged Americans who found themselves digging for diamonds amongst the remains of a volcanic plateau (Crater of Diamonds, Arkansas). The park has been open to DIY diamond hunters since the early 1970s. Sadly, most go home empty handed to mundane lives.

I sat in my recliner watching these folk and thinking to myself: "Is this a good use of their time?" Obviously, I can't answer that, but I wonder if these modern-day miners with their buckets and spades had any other place to be.


Diamond seekers

Why?

The filmmaker, like me, was curious as to why they were there. Was it a vacation or a desperate attempt at getting out of a jam?

Most of us have been there (in a jam, that is) maybe more times than we care to remember. The journalist delved a bit deeper than the unsuspecting amateur miners probably realised. Once the camera was rolling, it became obvious that the common narrative was of pain and dysfunction along with health issues and … well, you get the picture. Maybe not desperate, but clearly looking for that big jackpot; a gift from the gods and perhaps an opportunity to change their predicament.

Personally, I have become increasingly aware of time and what constitutes good use of it. I often find myself automatically distinguishing between what I need to do as opposed to what others expect me to do.

To hell with the hustle

I recently picked up a cool little paperback and read it cover to cover. The title says it all really: *To Hell with the Hustle* by Jefferson Bethke.

What did I get from the read? To be better about prioritising my time so that I had excess stored up and available should a situation arise that required me to participate. How many times have we been asked to step into a place where we can make a difference but are unable to commit because our schedule can't be altered or changed? In 2024, I want to be available to assist a neighbour, friend, or work colleague; essentially, to accumulate time that can be productive. Here's that word again: self-care – but what does that mean?

One of the quotes from the book is: "Hurry is violence on the soul". Simply put my definition for self-care means making time for yourself; connecting with those things you somehow thought were irrelevant and not considered worth the time and effort – yet often when we disconnect with those aspects of our lives, we find we are less likely to be optimistic, unprepared for a crisis, and often lacking the skills to be pragmatic.

Things to consider

The side panel lists several aspects of resilience to consider; perhaps we can view each one as if it were a diamond to be found in our own life situations.

Wherever you find yourselves as 2024 progresses, I wish you and your families all the very best and hope that you will continue to read my articles and that they will have some relevance for you either now or sometime in the future.

Maybe this year can be an opportunity for us all to manage our time effectively, to look for new ways to contribute to our community, to teach some skills to those who show an interest in our hobbies, to invite others along to club events, especially those eager but who have limited resources.

Let us all look for diamonds in these experiences, enriching us all.

Six aspects of resilience, for your benefit

- Vision: Vision is about your sense of purpose, goals, and personal vision for yourself;
- Composure: The ability to maintain your composure in all situations;
- Reasoning: Be resourceful; see opportunity in change;
- Tenacity: Creativity, and innovative problem solving;
- Collaboration: We are social beings, so support and be supported;
- Health: Enjoy quality sleep, regular exercise, and healthy nutrition.

Cool little paperback

TINNITUS

The sound that no one else can hear

By Ritchie Wilson

One of the things guitar legend Eric Clapton and I have in common is tinnitus. Eric blames the years he spent in the band Cream, playing in front of the bass speakers of fellow band member Jack Bruce, who always had his amplifier turned up to 11.

One of the differences between Eric and myself is that the continual phantom ringing, which is a common form of tinnitus, doesn't bother him. However, it certainly bothers me and, I predict, it will bother you if you ever suffer from it.

Tinnitus is usually associated with hearing loss, and hearing loss is most commonly the result of exposure to loud noise. My slight hearing loss was probably caused by hammering on metal in the shed and going to rock concerts. I should have been much more careful about ear protection.

How the ear works

The ear has three parts: outer, middle, and inner.

The inner ear has a spiral, fluid-filled tube called the cochlea, which has tiny hair cells projecting into it. Sounds cause the hair cells to move; the movement sends electrical signals to the brain, which interprets them as sounds. Loud noises cause the hair cells to bend and stop moving. The brain interprets the lack of signals from the bent hair cells as a noise – the familiar ringing in the ear that the audience experienced after a Cream concert.

> "I should have been much more careful about ear protection"

“Tinnitus is an example of prevention being better than cure – because there doesn’t seem to be a cure”

Professor Grant Searchfield from the University of Auckland is actively searching treatments

Usually, the hair cells recover and, standing upright again, move in response to sounds. The ringing in the ears stops.

Repeated exposure to loud noise causes more and more of the hair cells to be irretrievably bent or broken, until the ringing can be permanent. This is tinnitus.

Not the same for all

Not everyone who has damaged hearing experiences tinnitus and not everyone who has tinnitus has damaged hearing, but the vast majority of tinnitus sufferers have hearing loss. So what can be done?

Professor Grant Searchfield is the Director of the University of Auckland’s Hearing and Tinnitus Clinic, and he is actively researching treatments.

I heard Grant tell how he heard rumours that the drug ecstasy reduced tinnitus and so he set out to investigate. He gained permission to give ecstasy to tinnitus sufferers. He then ran into a bit of a problem. He couldn’t find enough victims of tinnitus who were prepared to take the drug. He thinks it’s probably not very effective in most cases anyway, and it does have noticeable side effects.

Grant’s team has recently developed a successful phone-based therapy for tinnitus that uses white noise to control the imagined din.

A psychologist has told me that mindfulness training can be beneficial in coping with the incessant sound, which is inaudible to everyone but the sufferer. It won’t reduce the level of the sound but it will promote acceptance of the condition.

Not always there

Some sounds reduce tinnitus. For instance, I can’t hear it when I am driving in my car. Either the sound of the car’s movement (white noise?), or the concentration needed to navigate the local roads causes my brain to lose focus on the lack of information coming from my ears and to cease ‘hearing’ the phantom ringing.

Tinnitus is an example of prevention being better than cure – because there doesn’t seem to be a cure.

My advice is to wear ear protection much more often than is commonly done. Wear ear muffs when shooting, hammering, mowing the lawn, or being near to anything that is noisy – even slightly noisy. When things in the shed get noisy, stop what you are doing and put on the ear muffs.

Get extra muffs for visitors, and special ones for children. If your workplace is noisy, wear ear protection religiously; it’s all cumulative, and you may be nearer to suffering from tinnitus than you imagine.

When things in the shed get noisy, stop what you are doing and put on the ear muffs

My Version 3 (right) next to Version 2

POSSUM TRAP

Live and let live worked well until the nightly visitors began eating the strawberries

By Mark Beckett
Photographs: Mark Beckett

We live in a rural setting and have a large hedge that extends all the way to a dry river bed, which provides an excellent conduit for possums.

The local pest people had previously offered to set some traps as part of their TB-monitoring program, but as we had a cat and their only option was a leg-hold trap, we politely refused. We were aware there were possums about, but it wasn't until they started tasting the strawberries and making a mess with the rubbish drum that we decided to take action.

The battle begins

A neighbour had been using a drop-door trap, so I set about copying the principle.

Version 1 worked fine until the ravages of time took hold. Version 2 was made but, while it has been very successful, it's starting to flex and the past few possums have been desperate to get out, so it's time to make it stronger, and share the design.

Previously, we had been 'relocating' the trapped possums as I didn't have a firearms licence and I wasn't keen on grabbing something that was annoyed at being locked up overnight – that was, until I found out that it's illegal to live trap then relocate; see side panel.

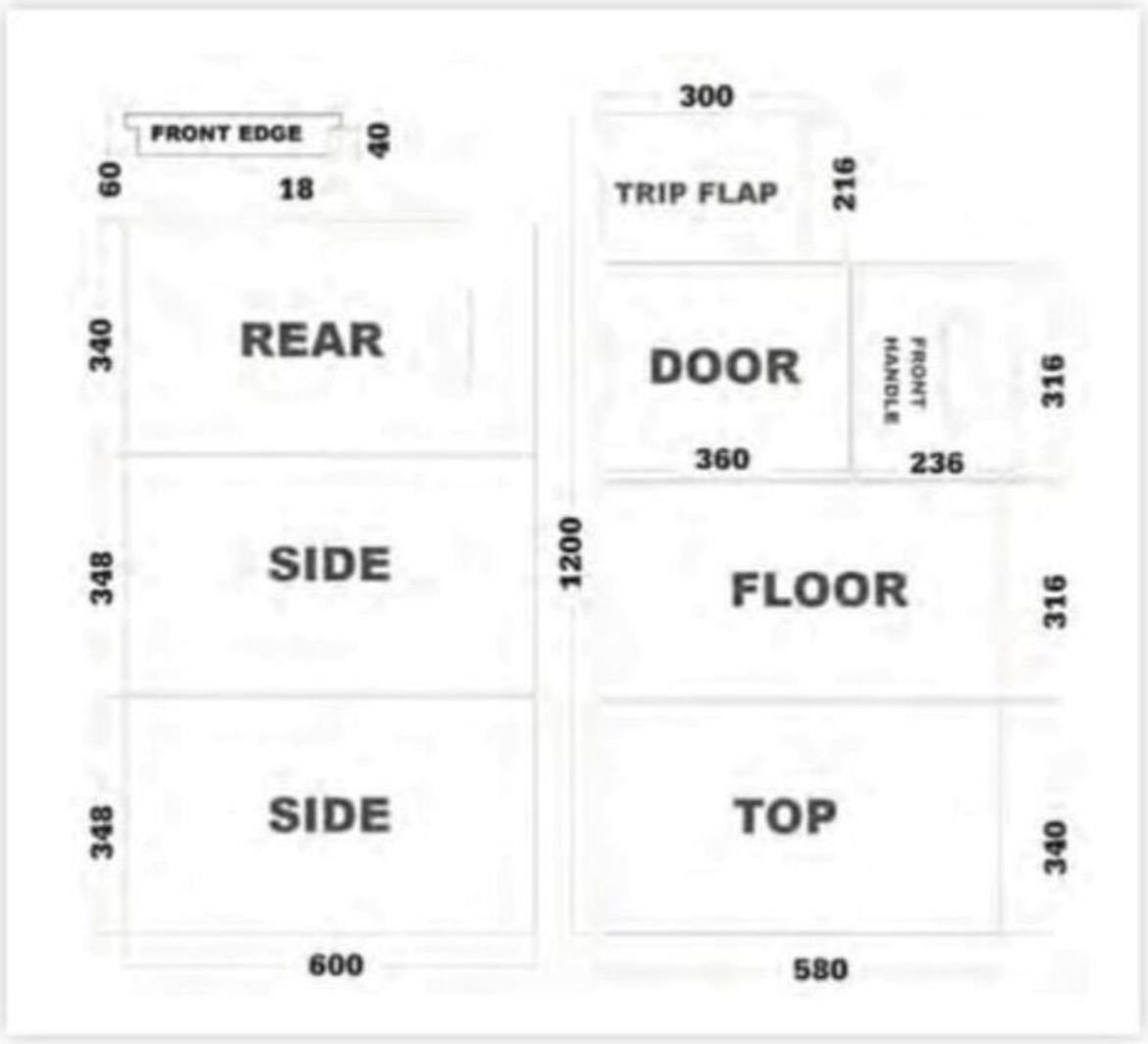
We stopped using the trap until a conversation with a colleague about using a high-powered air rifle to dispatch the animals provided a solution.

Elite Pest Control's Dawn Hendrikse uses an air rifle to shoot the possums in Christchurch's Hagley Park.

The guide from Bionet specifies that a muzzle velocity of 120 MPS or 394 FPS is required (so some pistols will not be suitable). The air rifle I purchased would also double to shoot hares (that's another story), so check the specs before you buy.

My trap

The trap detailed here works well in keeping the possums out of sunlight, but is not so well suited to despatching them. I was fortunate to pick up a metal cage, so, by putting the two doors together, and with some poking and prodding, the reluctant animal enters the wire cage, where it is more accessible. You could use a sack or net – whatever works.



> "But it wasn't until they started tasting the strawberries and making a mess with the rubbish drum that we decided to take action"

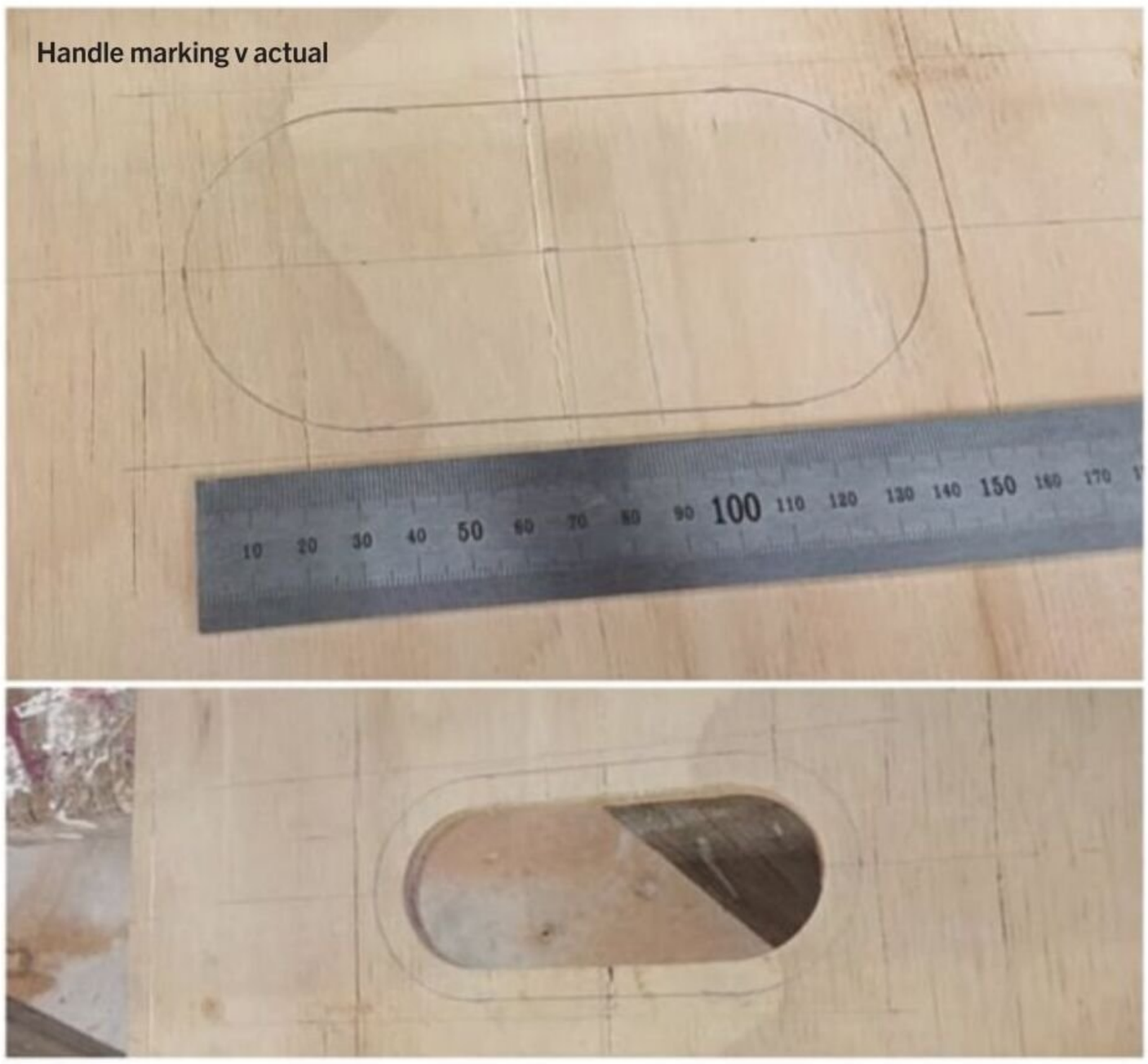
Design

The trap works when the animal enters to get the bait and stands on the trip flap; this pulls on the cord, releasing the door and trapping them inside. The size ensures that large animals are fully inside when the door drops.

Possums are very strong, and will attack the inside of the cage when trying to escape. The joints are glued and screwed, and the door drops below the floor to prevent lifting. The holes in the end wall only serve to help encourage it out, and can be eliminated in your version if you want to do the grab technique.

You may need to hose out the inside after some visitors, so choose materials that will last and not rust. I sealed the floor joint with glue after it was assembled.

Two handles have been included; the front one helps stop the box from twisting and helps stop the door from binding. ▶



Handle marking v actual

Materials

The materials cost less than $100 at a local retailer.

I chose treated materials that would better handle the moisture, but the size meant two sheets of 1200x600x12mm were needed. (If only they measured that – what is it with wood and sizing?)

The door needs to be robust. If you paint it, paint both sides to reduce warping.

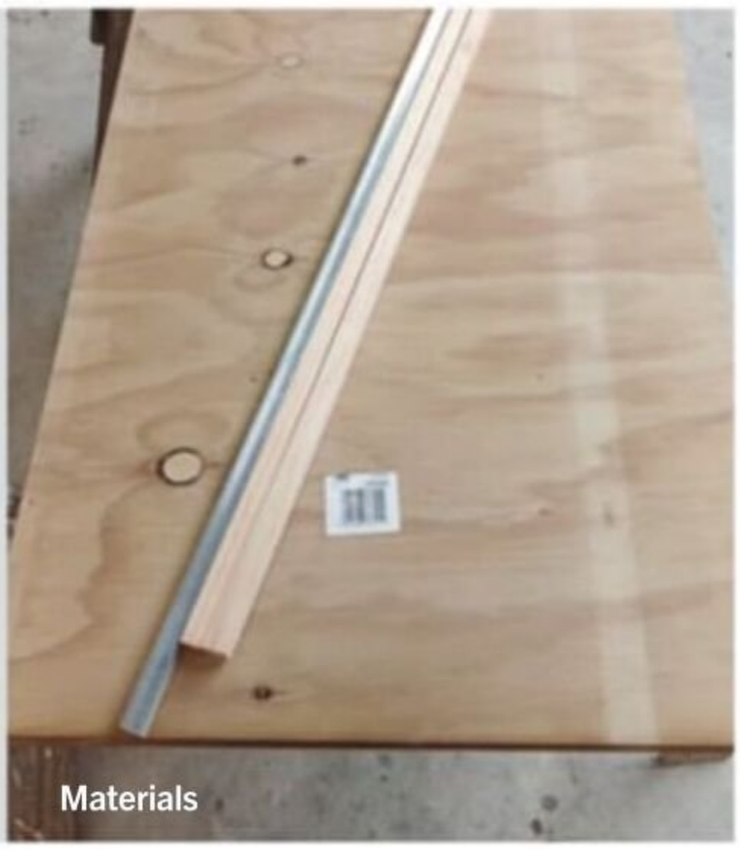
I used:

Two 1200x600x12mm sheets of treated plywood

Two 18mmx18mmx1.8m lengths of treated moulding timber

One 16mmx16mmx2m length of 1.5mm aluminium channel

Screws, glue, a short length of wire/fishing line and something for a hinge.


Materials

Clamp and glue

Hinge pivot left clamp to stop splitting right pivot and rounding of edge

Trip flap line hole

Construction

The drawing featured gives all the dimensions.

The floor, the top, and each side are screwed to an 18x18mm support piece rather than to the plywood edge. The floor has an extra strip of plywood on the front edge, which acts as a doorstep and helps to stop the possum from lifting the door.

I started with the sides, and attached the three 18x18mm supports with glue and screws.

In hindsight, it might have been easier to add the bottom strip to the floor rather than try to screw the floor to the side from inside the box. Leave a gap for the floor to go to the rear, or cut a notch.

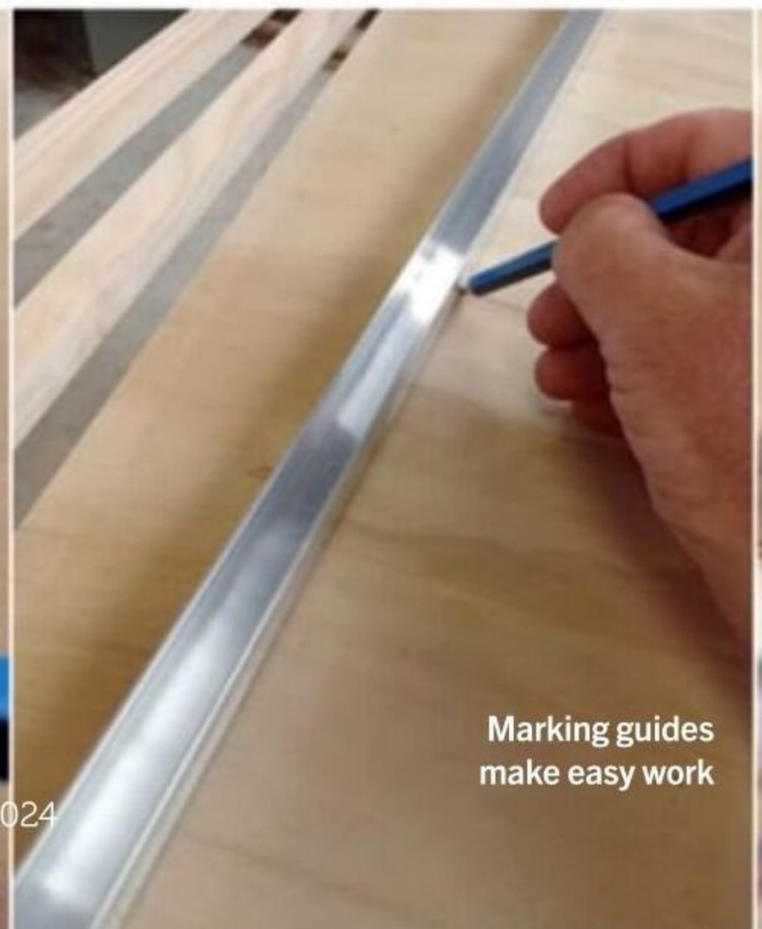
I found it easier to fit the trip flap to the floor before it was assembled. For this version, a couple of P clips and some screws made a good hinge that can be removed if necessary. I rounded off the bottom edge to allow a smooth rotation and drilled a hole for the line to be fitted.

The trip flap needs to be fitted far enough back to encourage the whole animal inside.

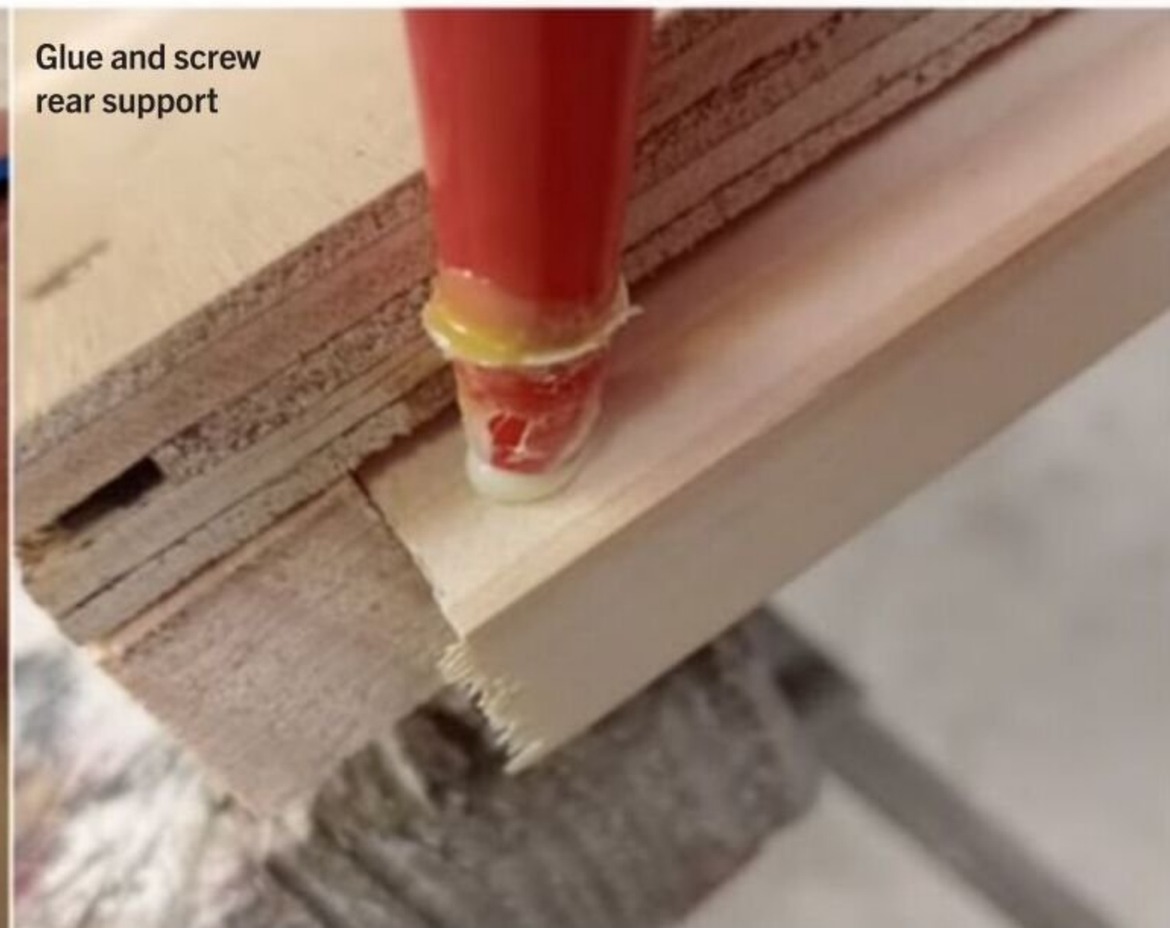
I added the sides to the floor, and used the rear to keep it square and rigid. Make sure the front edge is square so the door is smooth.

I then glued and screwed the rear, ensuring it was square before the glue dried.

> “The trip flap needs to be fitted far enough back to encourage the whole animal inside”



Marking guides make easy work



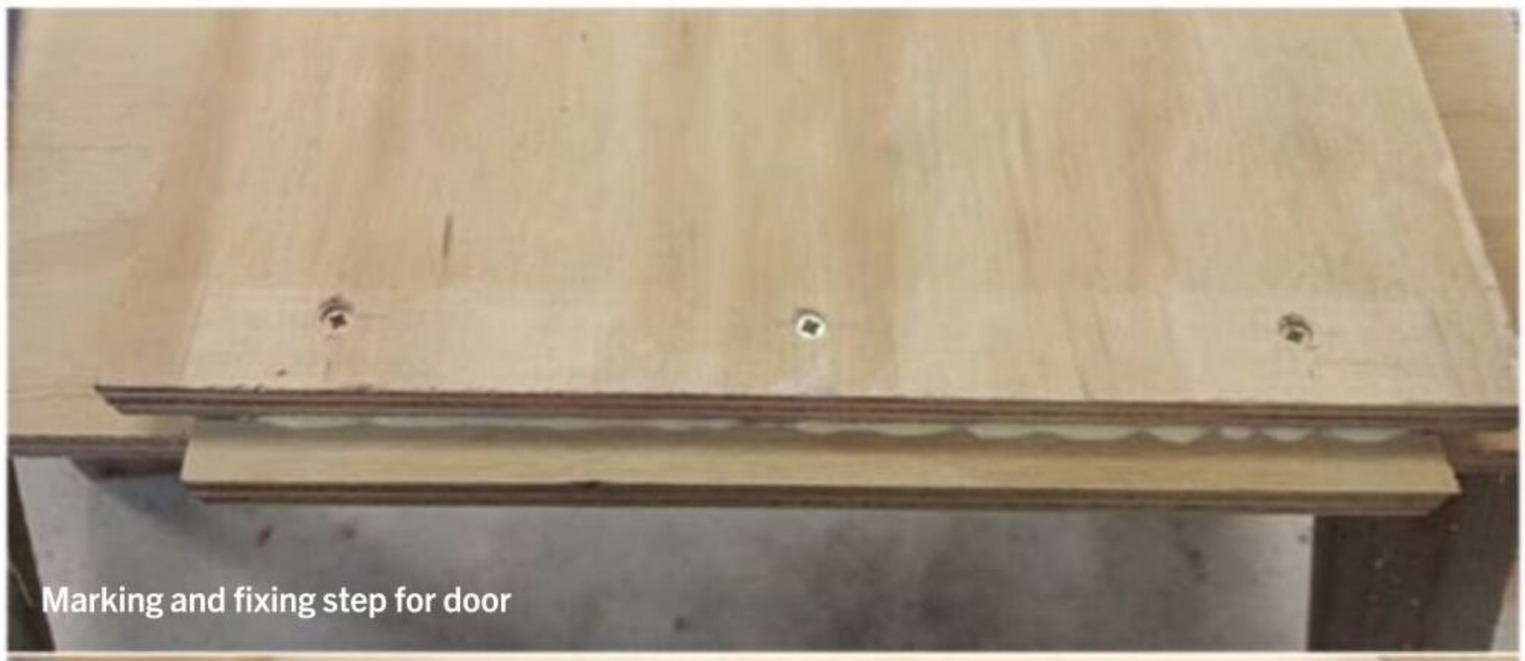
Glue and screw rear support

Channels, door, flap

The channels need to be cut and drilled for the fixing screws. Countersink the holes to ensure the door is not caught on the heads. For the upper holes, I drilled the screw hole through both sides of the channel, then drilled a larger hole through the front and used that to countersink the rear.

If the door is binding, you may want to remove a small amount. I sanded the edges to smooth it and rubbed a candle along the edges to help stop it sticking.

The pin holding up the door is a length of wire, bent to form a loop at one end and with a straight section approx 40mm long. Drill a hole below the handle and then lift the door so it is just above the top and mark it. Drill a hole the same size. ▶



Marking and fixing step for door

Why use a manual hacksaw?

Left: Inside showing glued edges

Right: awkward screwing angle

Door held by pin

Pin for holding door

Raise the trip flap to approx 45 degrees and measure from the trip wire hole to the rear. Drill a small hole in the top at this distance for the trip wire to pass through. I used fishing nylon for the trip wire, passing a length through the hole and securing it to the trip flap.

Lift the door and slide the pin in. Lift the trip flap to approx 45 degrees and secure the trip wire to the pin.

It should pull easily; if necessary, apply something to lubricate it and the line as it passes through the top.

Bait

There are many recipes out there for possum bait. I have used a quarter of an apple screwed onto the trip flap, but lately have taken to cinnamon lure and simply poured a small amount on the far edge. While this stops the rats, it has resulted in one hedgehog being held overnight.

Version 2 on left showing wear and tear while version 3 is ready for battle

Possum control

www.bionet.nz/assets/Uploads/A3-Landowners-Possum-Comtrol-Guide-2021.pdf

https://www.stuff.co.nz/environment/128296349/the-hunter-paid-to-shoot-possums-in-the-centre-of-a-new-zealand-city

> "There are many recipes out there for possum bait"

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It may have taken 40 years, but it was worth it. Bill Thomas with his masterful miniature house

SMALL IS BIG IN BILL THOMAS'S SHED

A creative spirit knows no boundaries

By Vicki Price

Photographs: Vicki Price

We walk into Bill Thomas's Waikanae Beach house through his shed. The trestle tables in the shed are filled with things Bill plans to show us but they have dust-sheets over them for now.

Inside his home, a tiny house awaits. The tiny-house project is a huge achievement that has taken Bill 40 years. He is justifiably proud of it and wants to show it to us first.

Bill had always wanted to build a miniature house and when he spotted this one while on holiday, he bought it. "We bought the kitset in America in 1983 and I've only just finished it," he explains. "Only the outside came with the kitset; I have had to make all the interior – the ceiling scotias, the staircases, and the large skirting boards, plus the redwood roof shingles. All the weatherboards are moulded, and they tongue and groove together, all out of ponderosa pine." ▶

The finished interior of the house, with both kit set Chippendale furniture and those that were handmade by Bill.

Bill holds a tiny replica he made of his own writing desk

Filled with Bill's creations

Bill presses a button, and the tiny house begins to rotate on a pedestal similar to a Lazy Susan. The interior is filled with Bill's creations, including a replica of his own writing desk. There are tiny paintings, washstands, furniture, even chandeliers.

When Bill's granddaughter visited, she was asked what was missing and replied, "A television."

Bill explained they didn't have televisions in those days, so she asked what they did have.

He replied, "A radiogram."

She said, "What's a radiogram, Poppa?" – so naturally Bill made one to show her. The arm for the record player is the pin from Bill's watch-strap and the disc is a cutting disc from a Dremel.

For the past 40 years, Bill has kept an eye out for tiny things with the potential to be used in the house.

The lightshades are cut from ice cream containers. Bill put the circle of plastic onto a large bolt head and put the heat gun onto it, causing it to get the wrinkled effect. The stairs were redone by Bill, with carpet laid on them and rods made from copper electrical wire. Candles in the candelabra and wall lights are disposable dental brush heads. One of the units is made from a piece of macrocarpa firewood. There are flour drawers in the kitchen and a piano sits in the lounge. The room at the top is called the naughty room by their granddaughter. All the doors and drawers in all the furniture open.

The weathervane was bought from America, but Bill made the clock. The little lady and man were in a French Christmas cake.

Disposable dental brush heads made realistic candles for the candelabra

The pin from Bill's watch strap made an effective arm for the radiogram's record player

Time to aim for perfection

"It's a challenge," says Bill, who has taken the time to construct each piece as if it was going to be used. "It's the first time in my working life where I haven't had to work to a time limit. If I didn't like it, I could chop it up and start again."

He adds, "The English TV programme, doing miniatures – the trouble was they had a time restraint, and they were doing a lot of hot glueing and it doesn't last."

Bill has made tiny planter boxes and plants, and the doormats are interlocking wood. The floorboards all have realistic nail dents, as if a tiny flooring craftsperson has been on their tiny knees hammering each board in place. The fireplace is made from miniature toy bricks Bill had as a child and had kept.

"They were little bricks and you used to mix up flour and water for the mortar [to stick them together]."

There is a bar of soap in the soap dish, and the toilet cistern has a pull-chain. The wall of the bathroom is covered with tiles.

"It's a piece of Perspex with lines scratched into it," explains Bill.

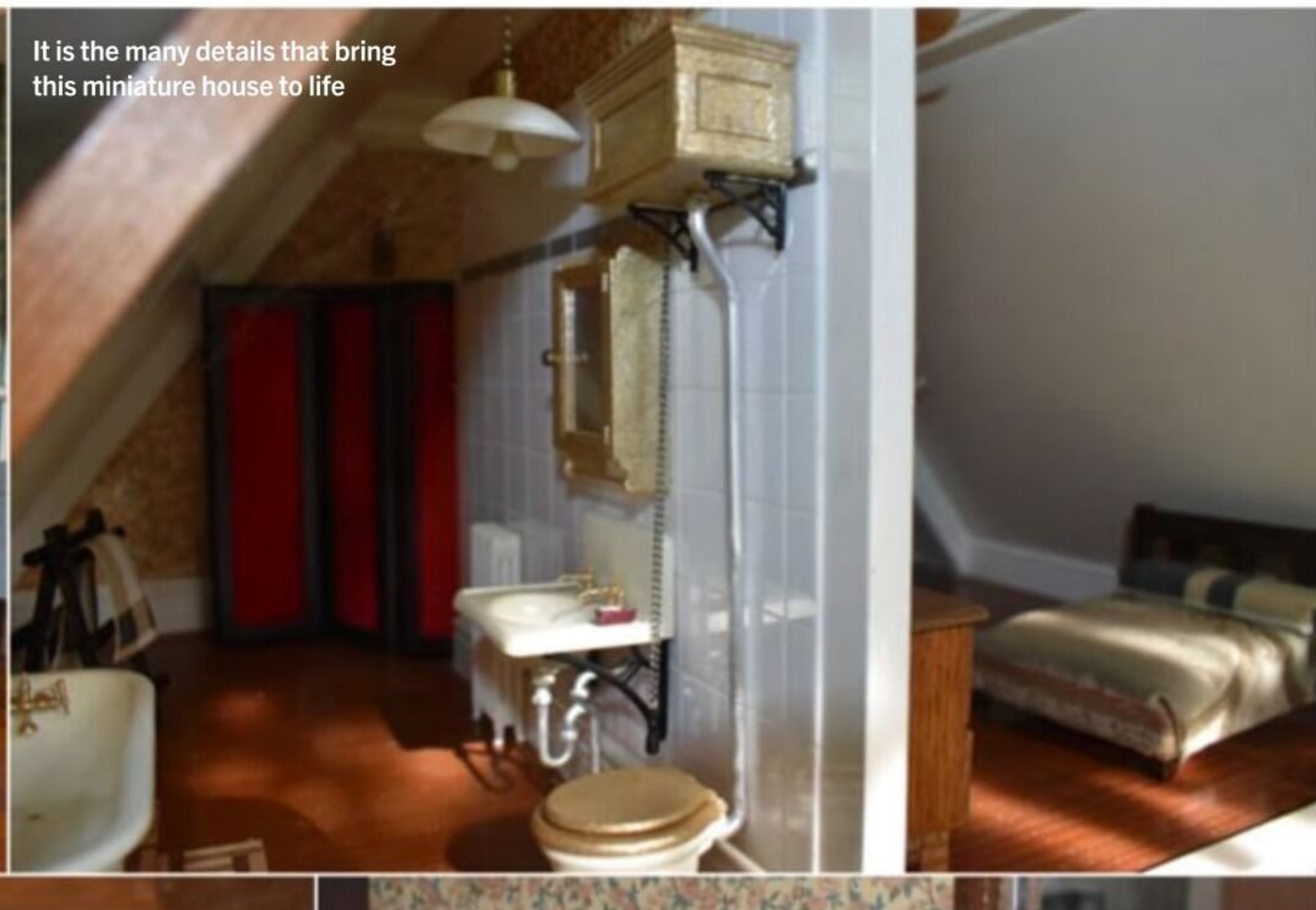
In the kitchen is a clock, made from an old watch, for which Bill made a wooden ring. Bill worked everything to a one-inch scale. Fitting the ceiling scotia and skirting boards was time consuming, especially working around all the corners and the stairs.

"It's not a doll's house; it's a miniature house," says Bill.

He is proud of his achievement — but would he like to live in it after all his efforts?

"No, not with the stairs and my artificial knees." ▶

A tiny deck where tiny people could sit and enjoy the view



It is the many details that bring this miniature house to life

“Bill worked in Wellington, initially at a carpentry apprenticeship then at a joinery factory, making timber windows, doors, and staircases”

The best thing ever

We go back out to the shed. Bill lifts a dust-sheet to reveal a vast collection of beautiful and complex wooden creations, a sample of other things he’s been making in his shed, mostly since he retired.

Before retirement, Bill worked in Wellington, initially at a carpentry apprenticeship then at a joinery factory, making timber windows, doors, and staircases.

“Then, for the last 40-odd years, I’ve been in the display manufacturing business,” he says.

The company was called Displayways and Displaycraft, and there Bill worked for the advertising industry, be it a shop or a new brand launching itself into the market.

“I was production manager for the last 30 years. I was coming up for retirement and they were revamping the place, so I took early retirement – six months early. It was the best thing that ever happened to me.”

Bill’s carpentry apprenticeship pre computers gave him design and crafting skills which have stood him in good stead for this project

A *Shed* magazine article inspired Bill to try his hand at segmented woodturning. He then produced many intricate and beautiful pieces in this form

> "He likes to spring little surprises on his neighbours from time to time – they might wake up to find a family of wooden pūkekos has moved in"

Makes dust to take into the house

Bill got organised. "I set up a little workshop here."

He says his shed is where he "makes dust to take into the house", but when you look outside the shed and around the cul-de-sac he lives in, there are signs of his work on fences, in gardens, and on the houses.

He likes to spring little surprises on his neighbours from time to time – they might wake up to find a family of wooden pūkekos has moved in, or a 'bloomered' gardener is bending over in the shrubbery. It is a friendly community, and even the children receive handmade wooden gifts from Bill, who loves to make things in order to give them away.

He's recently finished an apple shape, made out of a piece of wood he had lying around in his shed; other pieces have been turned into pāua shells. A 'clacker' of the type you might wield at a footy game makes loud clacks as it is turns in the air.

Rings, rings, and more rings

Bill is looking for new things to create all the time.

"I just finished one this morning, actually," he says. "Just whatever takes me, you know."

He was watching a programme on TV about a pioneering family in Alaska and was inspired by one of the lads who was getting married.

"He couldn't afford a wedding ring,

Some examples of Bill's freestyle designs in wood. The shell is particularly beautiful

The beginnings of a piece made using the segmented woodturning method

The ring within a ring, on the left, and three small to tiny wooden barrels with lids, below. The smallest is just 3mm x 4mm in size

The beauty of segmented woodturning is apparent in the finished product

"He'll put it on to scare them or lead them to think someone else is working in his shed"

so he made a wooden wedding ring. "I watched them doing it and I thought: yes! You know, from a hand plane you get those curls of timber?"

Bill shows me his creation. "It's laminated around a piece of tube. I glued one layer, then another layer, then another layer, and then hand sanded and hand finished it to get the shape. The circular inlays are made from knitting needles or toothpicks.

"I've had that in there since January, and it's lasting really well, but then I wanted a challenge: to make a ring within a ring. I had to make one ring, then make a ring inside the ring."

Inspired by an article on wood turning in issue 85 of *The Shed*, Bill works out the finished shape, the number of rings for depth or height, and the diameter of rings for the shape of the article.

"I usually work on 16 or 32 pieces per ring," he says. "For a 130mm diameter ring, with 16 pieces at 25.51mm wide, each needs an 11.25-degree angle cut on each side."

These are then glued together on a sheet of glass to form the ring. When the glue has dried, Bill sands the face that was on the glass until it is smooth, then glues it to the pre-made base block.

Lathes and saws don't take up much room in Bill's shed, but their output is massive

Bill likes to keep his neighbours on their toes – putting a wig on every now and then freaks them out!

"I true it up on the lathe, ready to accept the next ring, and start turning the finished shape. Accuracy in your calculations and saw cut angle is important. That's what I enjoy; it's a challenge. It's patience; it just takes time. Some of the items I have made have over 400 pieces in them."

This led to all sorts of cleverly designed bowls and containers, comprising multi-coloured timbers.

"This one is 177 pieces," Bill says, holding up a bowl. "There's 32 pieces on the top. It's glueing them that takes the patience."

"What sort of glue do you use?" I ask.

"Sticky glue," says Bill – adding that it's PVA.

Bill likes to see the lighter side of life – and wait: is that a pile of hair I spot beneath his workbench?

It's a wig. This, Bill explains, is to keep the neighbours on their toes. He'll put it on to scare them or lead them to think someone else is working in his shed.

Honeypots

"I made that one there," Bill points to a thimble-sized honeypot, "and my old boss, Peter, said, 'Come on, Tomo, I used to make something smaller,' so I made up the next one. His daughter, Simone, was there, and she said, 'Come on, Tomo, make something smaller,' so I did."

This tiniest of honeypots, just 3x4mm, also has a lid. Bill made it on the lathe with a chisel. Amazingly, for something so small, Bill didn't lose it onto the floor while making it.

"It wouldn't have worried me; I'd just have made another one," he says. ▶

Sticks for stirring or making miniature creations

The challenge of making something smaller is one of great satisfaction for Bill

A magic puzzle-box that makes coins disappear is a great favourite of children, many of whom have received one from Bill

> "Accuracy in your calculations and saw cut angle is important"

Something for the kids

Bill reaches for a wooden box, quite devoid of decoration. It's a puzzle box – something for the kids to watch in fascination as coins magically disappear from the top drawer into a secret opening in the bottom drawer. They have to work out how to open it. A panel on the side of the box pulls out to reveal the lost coin. Bill has made quite a few of these and given them away as Christmas presents. The small handles on the box are made from brass welding rod. Bill has a metal lathe, too, but hasn't used it for some time.

"These wooden spoons are quite popular, too. They're made out of tree branches; I just carve them out. We give these away a lot; people love them."

Bill uses a spoke-shave to carve the spoons from branches that have fallen or been removed from their garden. One of these branches was from a Portuguese laurel.

"These are popular with the kids," Bill says, showing us a wooden periscope, suitable for spying on mates.

Paint remnants from Bill's creations have been scraped off stirring sticks with a Stanley knife and layered and glued onto wood to create a marbled effect.

Broken tree branches on the property are turned into spoons by Bill, many of which he gives away

Tiny goblets, barrels and rings sit upon a miniature cabinet

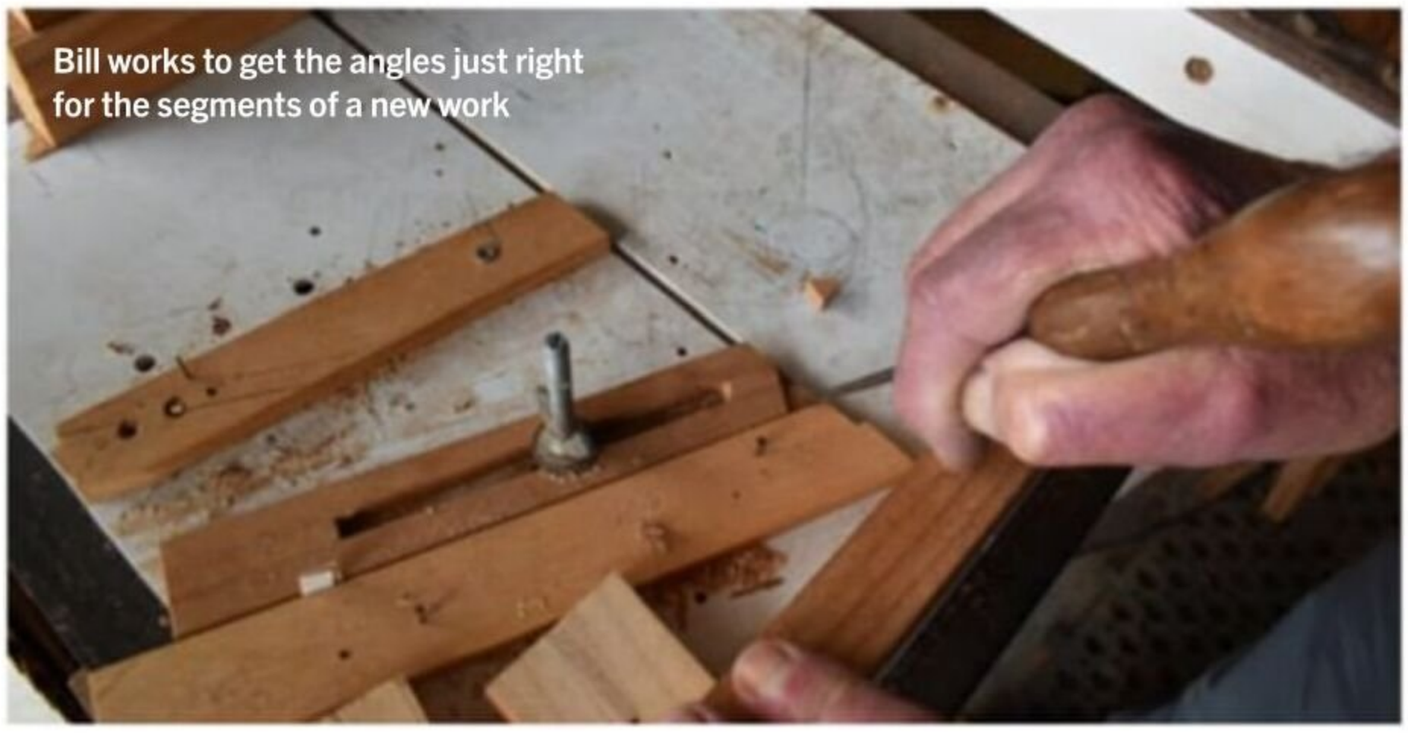
What pirate wouldn't want arrgh real treasure chest?

Large salad bowls are a lovely addition to the couple's table

Bill's shed is tidy and organised, which is helpful when you're working with tiny components

Along with the puzzle boxes and clackers, Bill has made a few dogs that wiggle along the ground on their leash, and these are arguably more popular with the children than anything else.

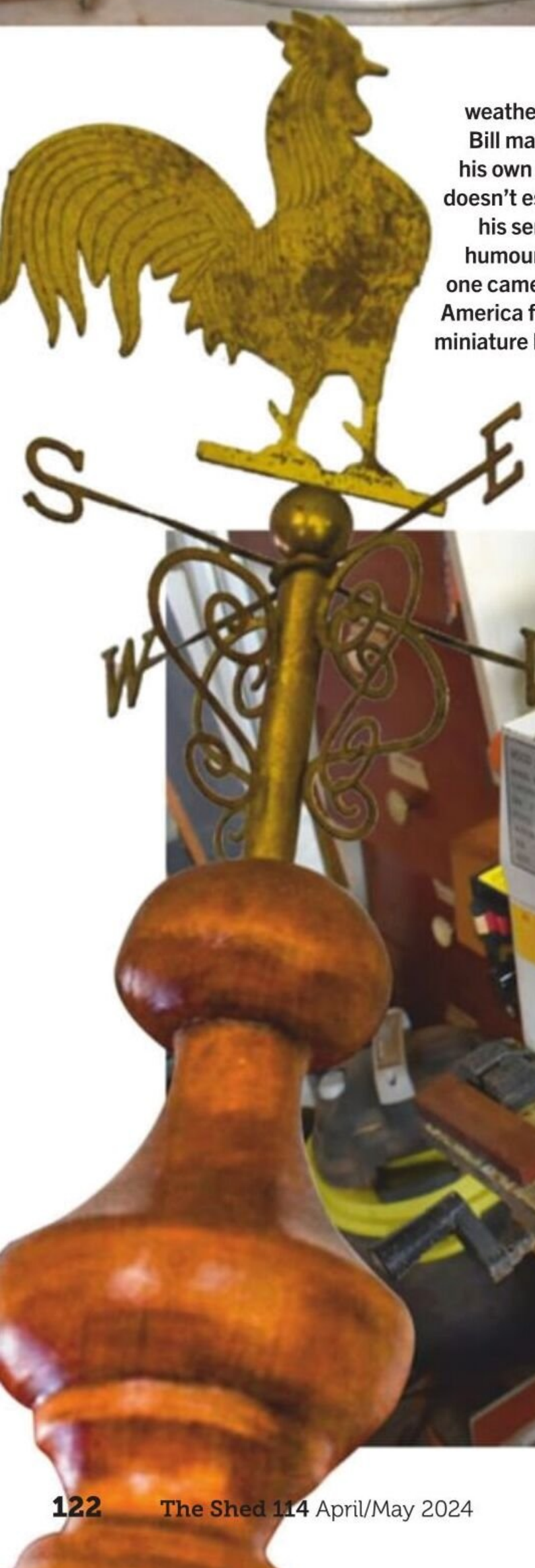
"I made 'Peg' the knocker for the little boy over the road – and the expression on his face! I gave a clacker I made to Reid [the boy over the road] and he loves it. He came over and told me, 'Not late at night or first thing in the morning.'" Clearly repeating instructions from his parents. ▶



Bill works to get the angles just right for the segments of a new work

Neighbour Keith gave these to Bill, in case he needed them

An example of the calculations required before a project is begun



The weathervane Bill made for his own home doesn't escape his sense of humour. This one came from America for the miniature house

Bullshit corner

Bill's neighbour and cobber, John, affixed a sign to Bill's fence: 'Bullshit Corner.' Then Keith down the back saw a can of sweets labelled 'Bullshit Blockers', which he bought for Bill.

"Very appropriate," says Bill.

Bill's tool line-up includes a scroll saw, metal lathe, sander, drill, bandsaw, and the lathe. A cabinet of little wooden drawers holds all sorts of bits and pieces that might come in handy.

Bill must have gone through some timber over the years.

"Yeah, well, I haven't bought any since we've been up here [to Waikanae]." Working on tiny items means very little goes to waste in Bill's shed. A weathervane he made brings a chuckle from him.

"Which way is the cock facing today?" he asks with a grin.

Bill's lathe with a block of wood ready for turning

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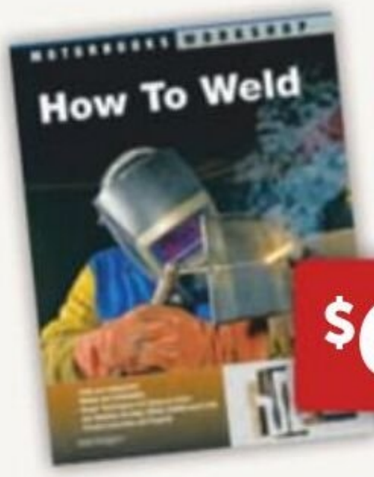

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MENZSHED® NEW ZEALAND

THE MEN'S SHED MOVEMENT IS ABOUT MAINTAINING MEN'S HEALTH AND WELL-BEING IN AN ENVIRONMENT CATERING FOR THEIR INTERESTS

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.

Sheds and their members decide the projects to undertake. However most sheds throughout New Zealand take on some community projects, examples include repairing toy library stock, building playgrounds for early learning centres, repairing old bikes for community distribution, building planter boxes for the main street of the local central business district, the list goes on.

The shed is a great place for blokes to learn new skills. We see builders teaching engineers some of their skills and vice versa.

Sheds have been operating in New Zealand since 2008. The last decade has seen the number of sheds across both urban and rural areas increase to 140.

We have a team of Regional Reps who attend to sheds and public inquiries:
Northland, Auckland - David Broadhead 021 324 762 regrep1@menzshed.nz
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OK, BOOMER!

We haven't been perfect … but things are, overall, better than when we started

By Jude Woodside

I'm a boomer. I was born in that exalted era between the end of World War II and 1964.

I was a rebel, a hippy, a rock music fan. I grew up during one of the longest sustained periods of peace and prosperity. That changed when the Americans brought us into the Vietnam war in 1965, and when they introduced monetarism in the 1970s.

The fight against Nazism was our parents' fight – a fight that took millions of lives. It was necessary. The Nazis planned to enslave most of Eastern Europe to work in their factories, mines, and farms. The idea appealed to the Japanese, too. They planned to do the same to us and anyone in between. Fascism was the Italian name for what had originally been called 'Corporatism', which gives an indication of who was in charge. It was predicated on the idea, to quote Orwell, that "Some animals are more equal than others".

> "Our parents' generation saved the world from tyranny; that's a hard act to follow"

Fading away

Every generation eventually fades away, and my generation is doing so now. We are often portrayed as a self-indulgent generation. To some extent, there is truth in that. We were always pushing the boundaries for new experiences, whether in music, personal fulfilment, or just for fun. We were the first generation that didn't really have to work quite as hard as our parents had. It was a heady, exciting time as we reached for new experiences and new sensations, and campaigned for our 'freedom', whatever that was.

What have boomers achieved?

I look back now on what my generation did for the world at large. Our parents' generation saved the world from tyranny; that's a hard act to follow.

We exposed racism, and campaigned for equal civil rights for all. The contraceptive pill helped to energise the feminist movement, and thus we took the first steps towards sexual equality (clearly got a way to go there!)

We questioned government, and business – something that was previously unthinkable – and normalised it. We campaigned for freedom of thought and religion. None of those campaigns are finalised, but my generation did start them and made them mainstream.

That promise

We didn't invent the smartphone or the internet, but, sadly, we did help to perpetuate the Cold War that went on to dominate our culture and our media. We haven't been perfect. The promise of those rose-coloured hippy days wasn't fulfilled; we never achieved the cooperative, equal society we hoped for, but things are, overall, better than when we started.

We at least have the freedom to protest (at the moment). The things we fought for and won are still important rights and worth fighting for. My fear is that they are now under attack by the same ideologies our parents risked their lives fighting. I hope our children don't end up having to reclaim them again.

05.05.24
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