

THE Shed

AUG./SEP. 2024
ISSUE 116
THE-SHED.NZ

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Herne Bay, Auckland 1147

CONTACT US

ADVERTISING ENQUIRIES

Matt Smith, 021 510 701

matt.smith@rustymedia.nz

OFFICE

09 200 4847

EDITORIAL TEAM

EDITOR

Greg Vincent, editor@the-shed.nz

SUBEDITOR

Karen Alexander

TECHNICAL EDITOR

Jude Woodside

PROOFREADER

Odelia Schaare

DESIGN

Mark Gibson

CONTRIBUTORS

Murray Grimwood, Jude Woodside,
Mark Seek, Ritchie Wilson, Nigel Young,
Chris Hegan, Coen Smit, Mark Bellringer,
Helen Frances, Mark Beckett, Bob Hulme,
Max Cussell, Solvej Mortimer

RUSTY
MEDIA.NZ

PUBLISHER

Greg Vincent, greg.vincent@rustymedia.nz

FINANCIAL CONTROLLER

Karen Grimmond,

karen.grimmond@rustymedia.nz

ADVERTISING MANAGER

Matt Smith, 021 510 701

matt.smith@rustymedia.nz

PRINTING

Inkwise, 03 307 7930

DISTRIBUTION

Are Direct, 09 979 3018

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GET YOUR MOTOR RUNNING

Some readers may get the impression when they read this edition of *The Shed* that we have a cunning plan for themed issues. They may think, *Oh, this is The Shed's motoring issue for this year.*

Sorry to disappoint those readers, but we aren't as well organised as that. We are a small team, and there are no large editorial meetings with covers projected on a big screen and each department pushing for its content in the issue. That sounds like a '70s movie scene to me, not the magazine business in the 2020s.

The *Oxford English Dictionary* defines a magazine as: "A periodical publication containing articles by various writers; esp. one with stories, articles on general subjects, etc., and illustrated with pictures, or a similar publication prepared for a special-interest readership."

So I reckon we have that covered OK.

Sometimes we go searching for articles, and sometimes the articles come to us. Often, they are suggested by our talented team of writers and photographers – and quite often, in fact, by our readers.

However, this issue does, unintentionally, have a motoring feel to it.

Our main article is a sneak peek inside a motorbike restorer's shed in the back blocks of Taranaki; a wonderful insight into his operation. So many of our readers own and restore motorbikes that I am sure many will enjoy this read.

We also visit Ara in Christchurch, which runs a very popular panel-beating course for beginners – so popular, in fact, that one course attendee flies down from Auckland each weekend for the course. Now that's commitment.

One of our sheddie writers has just retired from full-time employment so has started his retirement project: restoring Japanese-manufactured mini trucks. He is loving every minute of this project, which he has been waiting for a few years to have the time to get cracking on.

So that's three articles on vehicles and vehicle-related topics – but I reassure you that we are not turning from a shed magazine into a garage magazine. This is all purely coincidental. 🛠️

Enjoy.

Greg Vincent

editor@the-shed.nz

PS. So nice to see that Max and his dad have now completed the shed build they commenced last year. A great result we reckon, and a shed of which they can both be very proud.



ON THE COVER

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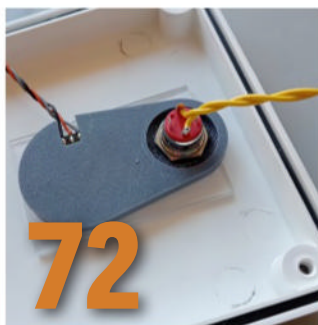
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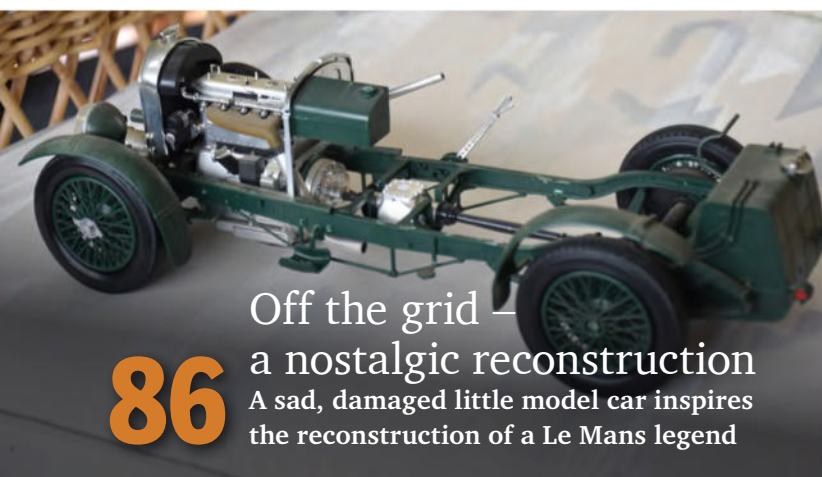
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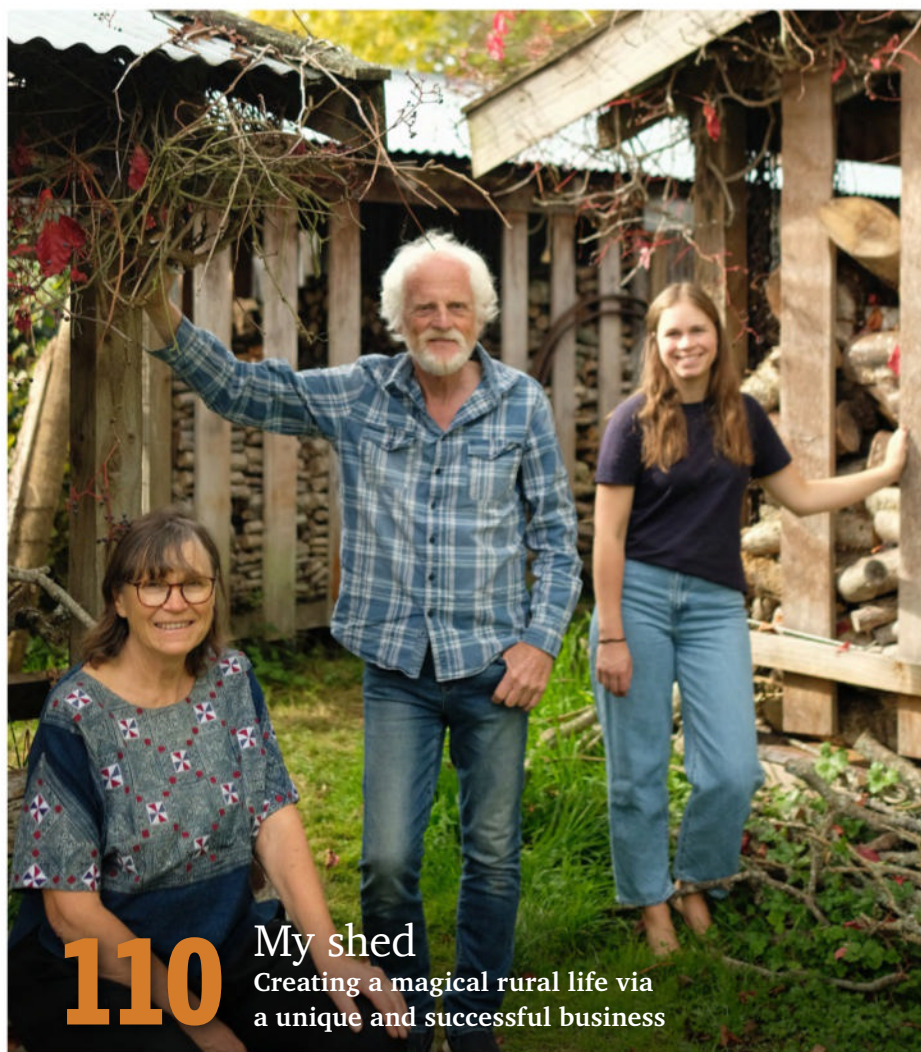
A sad, damaged little model car inspires the reconstruction of a Le Mans legend



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Max and his father have put the final touches to Max's shed



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My shed

Creating a magical rural life via a unique and successful business

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PASSION MEETS PURPOSE

When life deals you lemons, make lemonade: a business collapse led John to build a new, bigger business based on his passion for motorcycles

By Mark Bellringer

Photographs: Mark Bellringer



John sat down after his divorce some years back and thought, *What do I need for the rest of my life?*



I really want an old dairy factory – that's what John thought when contemplating the move from Katikati to Taranaki a few years ago.

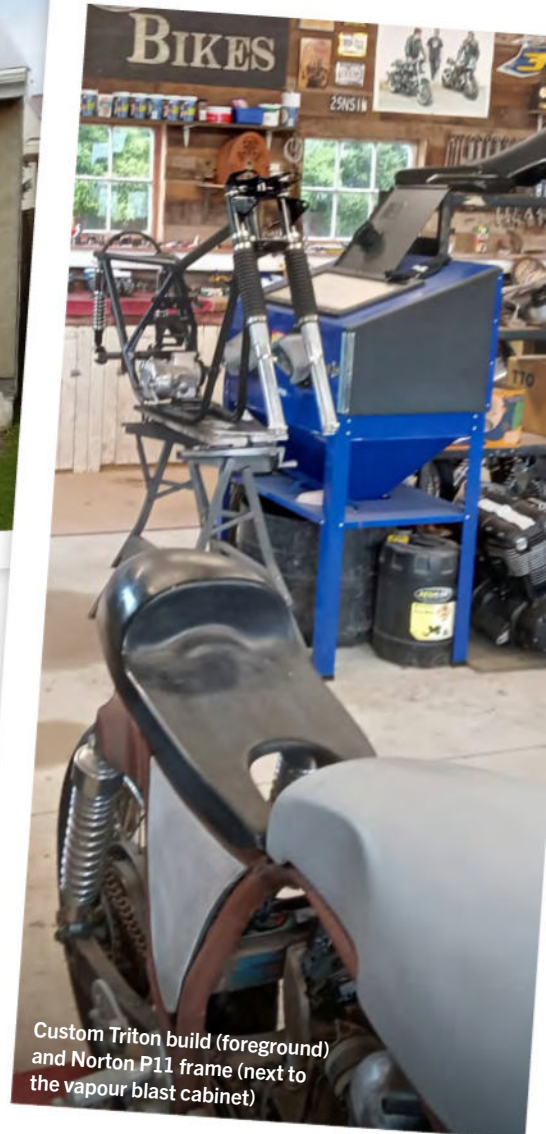
He sat down after his divorce and thought: *What do I need for the rest of my life?*

Well, I need a shed, a bed in the corner, and a place to stuff around with my motorbikes.

John's search took him all over the North Island; he was looking for something that was cheap enough. It didn't have to be flash, as he wanted

a few bob to help his kids to get on the property ladder as well as to be able to follow his passion for building and customising motorbikes – something that he had been doing for a long time.

An old garage in Pātea came into the picture, but, although it met all the criteria, it became too complicated to purchase. Then an acquaintance told him of a house that he had for sale in a small town a little further up the coast. In the end, that turned out to be the perfect location.



Custom Triton build (foreground) and Norton P11 frame (next to the vapour blast cabinet)

Three Norton 750 engines sit on the bench; one is for a client's bike, the middle one is for his P11 scrambler project, and the other is destined for the Norton with the yellow gas tank in the middle of the shed



John with his "1929 Triumph 500 that I've had since the '70s; it's complete and will eventually live again"



"John brought with him three containers filled with an extensive collection of motorcycles, motorcycle parts, tools, and 'shed stuff'"

Perfect spot

The small house had a small shed and enough land for an extension that would keep the look and feel of something that had been there forever.

John says, "It actually looked like my old grandad's shed, where I first learnt mechanical things."

The extension to the floor was poured before the move down from Katikati. John brought with him three containers filled with an extensive collection of motorcycles, motorcycle parts, tools, and "shed stuff". He gradually set about building his extension, replacing and building new trusses while looking after the old dilapidated wooden windows, as he wanted to "keep the look".

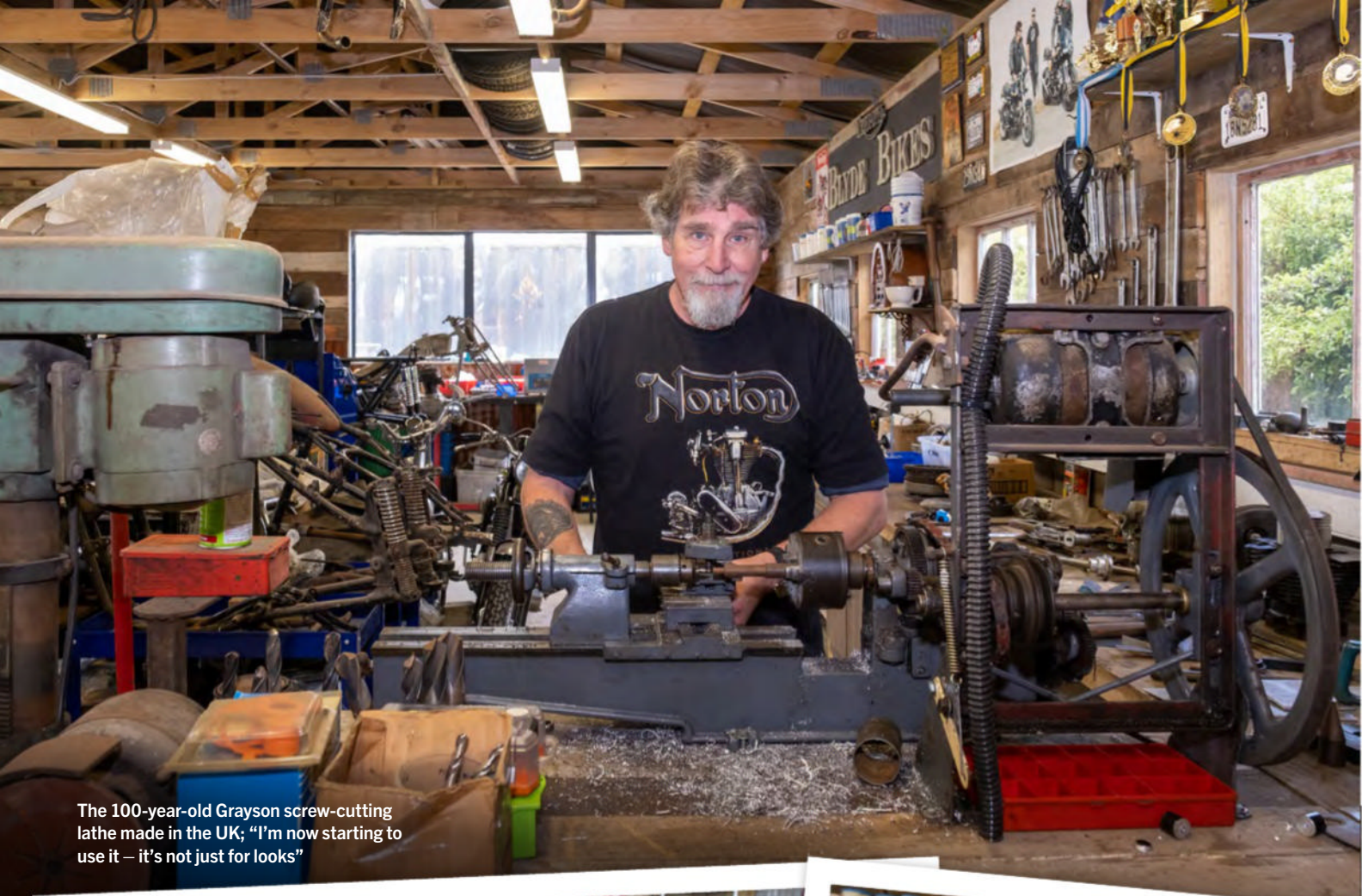
The environment in which he spends a great deal of his time nowadays is really important to John. Nothing looks new here – just a big old wooden shed full of treasures.

The perfect deal

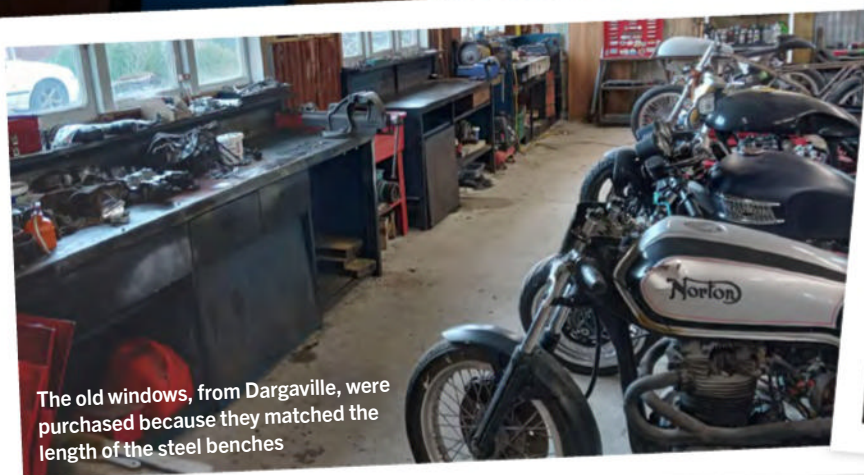
An old boy down the road who had some vintage cars introduced himself. He happened to be a retired chippy, and a deal was struck. He would fix up the old and fragile windows for John, and in return John would help him with an old Ariel Square Four that needed some attention.

In all, it took 12 months to rebuild and get the shed the way John wanted it: old wooden sarking on the walls, old wooden benches, and tools that would not have been out of place in his grandfather's shed.

One such piece of machinery is the 100-year-old Grayson screw-cutting lathe that was made in the UK. Originally a flat-belt drive, it has been brought into the 21st century with a vee-belt drive modification. John found it while fossicking on Facebook Marketplace. Although he purchased it



The 100-year-old Grayson screw-cutting lathe made in the UK; "I'm now starting to use it – it's not just for looks"



The old windows, from Dargaville, were purchased because they matched the length of the steel benches



Shelf of Norton parts for a client's rebuild

"It has the feel of everyone's grandad's shed – not just John's"

more as a curio that would blend in with the old-school look of the shed, he finds that he uses it quite often.

To look at it, you would think the shed had been here for the past 50 or more years. It has the feel of everyone's grandad's shed – not just John's.

A roundabout journey

John got into customising bikes in a roundabout way. A trained mechanic, he had run a garage and workshop in Katikati for years. He had a number of staff, including three apprentices. But when Psa (kiwifruit vine canker) hit the kiwifruit industry, his business died almost overnight.

He lost his staff, and ended up by himself in a big workshop selling spare parts, agricultural tractor and machinery parts, just to make ends meet.

John thought, *What am I going to do with this workshop?*

He says that he had always had motorbikes as a "disease", so he started importing bikes and Hinckley Triumph parts, and creating custom bikes for clients.

The bikes take off

Over 10 years, the new business eventually became bigger than his original car and agricultural machinery workshop.

He imported mostly Triumphs and

Ducatis because he knew them.

"I imported bikes from the States," he says, "did them up, and sold them."

Most of the damaged bikes that John brought in came with a salvage title, which most people in the US did not want. Insurance companies bought the bikes from the owners, and these would go up in large numbers for sale on the web.

"In years gone by, they were quite reasonably priced. After costs to import,

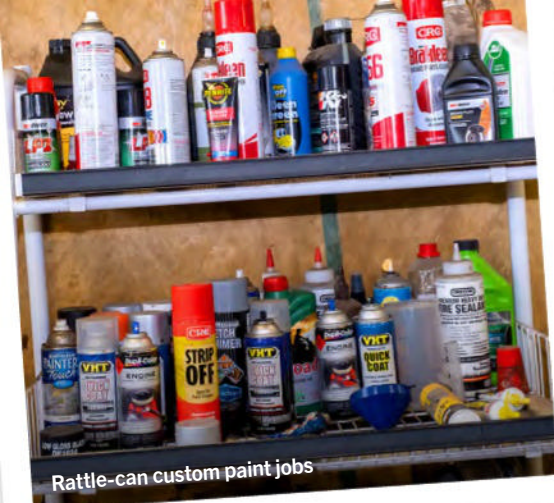
repair, have inspected and certified, I could turn a bit of a profit. I would go to bed having placed a bid on what I wanted to buy and in the morning I would either own the bike or not," John explains.

"The paperwork here was quite involved, and [the bikes] went through a strict process in order to be re-VIN'd. This was good, however, as at the end you could sell the bike hand on heart that it was a good machine." ►

"Over 10 years, the new business eventually became bigger than his original car and agricultural machinery workshop"

US-import Triumph 1700 — would make a great bagger racer

Large-capacity Rob North gas tank for the Daytona circuit



Rattle-can custom paint jobs



Norton engines for rebuild, and work already underway on two Ariel Square Four gearboxes

Retirement project

During that time, John accumulated bits and pieces, thinking that when he retired he would assemble them. He now has 20 or so bikes in the shed, some to do up to sell and others to recreate into something special for him to ride and enjoy.

One such project is a 650 Yamaha, which was acquired after a client's marriage busted up and he owed John a few bob. The brief had been to make it

look like a 961 Norton Commando, but now John thinks it might make a good flat track-style bike.

"They look quite nice as a flat tracker," he says, "probably a street tracker that will be road legal, a single seat, and two pipes up one side."

The registration is on hold as long as John doesn't depart too far from the original and keeps it mechanically the same; the cosmetic changes shouldn't be a problem.

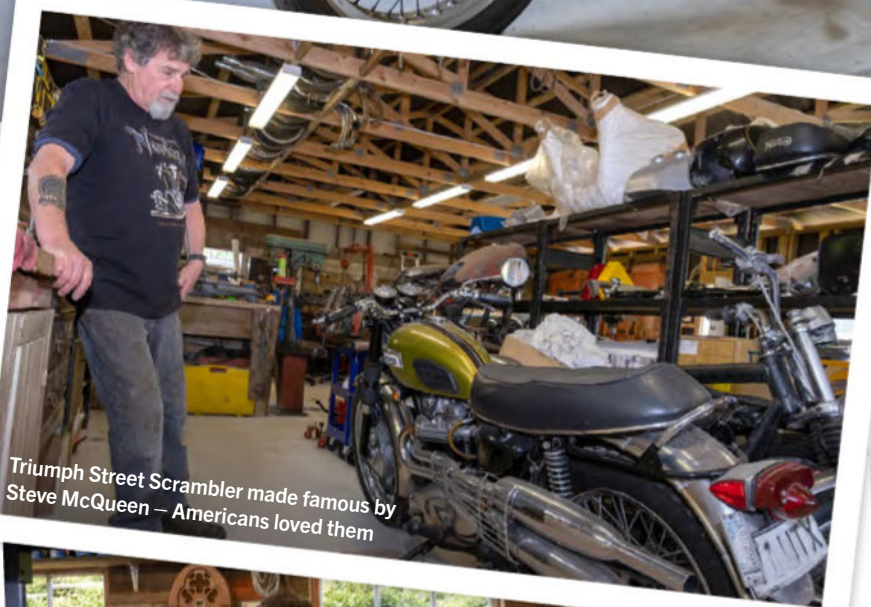
"Some to do up to sell and others to recreate into something special for him to ride and enjoy"

A rare Chater-Lea engine on the bench to be rebuilt





No. 195: Norton race bike with a hair dryer



Triumph Street Scrambler made famous by Steve McQueen – Americans loved them



Room with a view

Mostly classic

In addition to John's engine rebuilds, customising is his thing – mostly early stuff, although he has a Triumph Cruiser, a 1600 twin, which he imported damaged.

He sees a market now for bagger racing bikes, and says, "I can just see that bike with a batwing fairing, a supercharger on it, and pannier bags on the back." 'Baggers' probably emerged just after World War II. While we see saddlebags as a touring accessory, at that time, leather saddlebags were fitted to carry extra provisions and tools to fix the bikes on the battlefield.

A guy named Rob Buydos came up with the idea of a bagger racing series, and it has become quite big in the States. Maybe John's bike will be the start of a new road-racing series in New Zealand? ►



“Only 500
were made,
and John has
one of them”



What to sell?

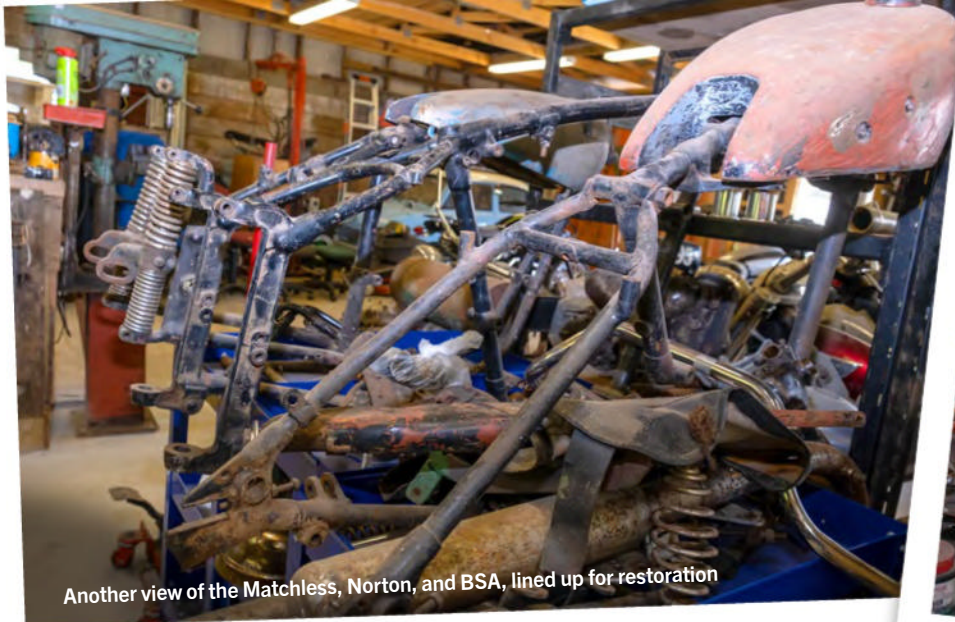
As to John's keepers, “There are probably half a dozen bikes here that I'll do up to sell; the rest are quite rare and collectable.”

He intends to ride the Norton P11 scrambler in the Burt Munro hill-climb and make a nuisance of himself in the Oreti Beach race.

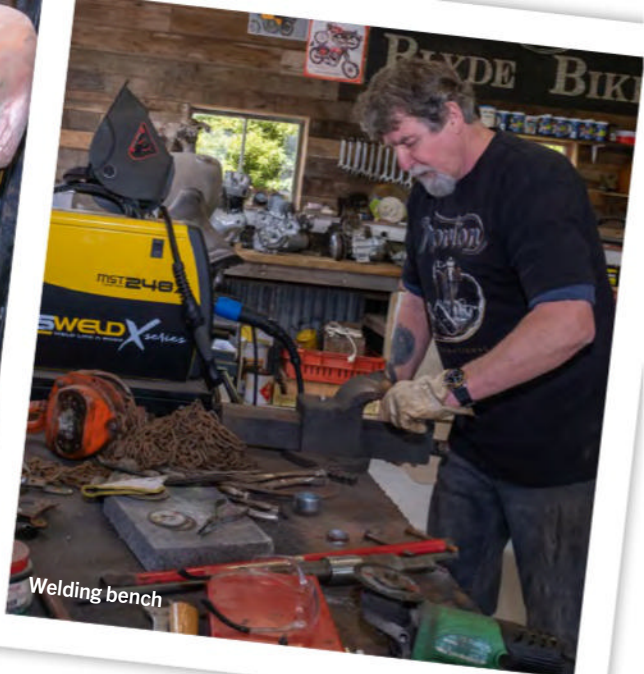
The Norton Atlas engine with a Matchless scrambler frame was raced as a desert scrambler in the mid '60s in the States. Only 500 were made, and John has one of them. Most of them died in the desert, but he has managed to collect parts over the years.

John likes the history and the background story to his bikes as much as the bike itself. He finds that understanding the history of the bikes helps him to find the rare bits and pieces and to match up parts from different manufacturers, as was done during times past. His Project 11 Norton “actually has ‘P11’ stamped onto the frames,” he says.

“Most were just parts, really.



Another view of the Matchless, Norton, and BSA, lined up for restoration



Welding bench

Norton had heaps of these frames, as well as Atlas engines, that they couldn't sell, as they vibrated too much, so they thought: *What are we going to do with all these bits ...? We'll build a scrambler ... these are rare and are really collectable now.*

"I got the frame out of Canada, the engine out of the States. Actually, I got the engine not realising it was a P11 – and that led to the Project 11 build that you see in progress," he says.

"I collected the gearbox from somewhere else, the wheels are unique,

and I was still on the hunt for an engine when I spied a 750 Norton Commando in Florida; it was really rusty. The story was that it was a one-owner 1500-mile engine. Even if that was bullshit, I got it here and, to my amazement, found it to be true – pistons and everything, mint, although it looked ugly."

John plans to rebuild the bike to its original state, when it will be very collectable. At the moment, he's not sure whether to sell it or keep it.

"I'd probably sell it only if I had to," he says. ►

"Actually, I got the engine not realising it was a P11 – and that led to the Project 11 build"



A modern version of the classic Triton taking shape, 2015 Thruxton engine in a custom copy of a Norton "Lowboy" Dommie racer frame



Three bikes being rebuilt: BSA Rocket 3 (foreground), 1970 Norton Commando Roadster (middle, with yellow tank), Yamaha XS650 (rear)

The Triumph Thunderbird Sport (middle) is John's daily rider: "I've done over 100,000 miles on her and never been pulled down"



"It's a very rare machine indeed. The handcrafted frame is made of aircraft tubing and is super light. As a friend of John's said, it is made of 'unobtainium'"

Working in threes

A 1928 Triumph 500 sits next to John's welder. He's owned it since the mid '70s – it's something that he plans on getting to soon; the dust has probably been on the seat for that long as well. Eventually, the bike will have a sidecar attached and will be made to ride the metal roads of back-country Taranaki.

John has a thing about working in threes.

"You can remember what you are doing," he says – and getting parts can be cheaper.

Three original frames lined up are in for some treatment soon.

"I think I will keep the patina rather than try to make them look pretty," he comments. "I'd have them mechanically going well and I might even do up the front end. I have a later BSA front end with a twin-leading-shoe front brake – the original brakes on these were just an excuse for brakes."

Bought from a friend of a friend, a recent purchase is a 1969 BSA Rocket 3 racer; it sits in the queue to be assembled. This bike, which has never been started, let alone raced (yet), is "worth moonbeams" says John.

It has a Rob North racing frame, 750 triple engine, Brembo brakes, and the forks are Italian Ceriani – the best around in 1969.

John has seen only one other that was assembled as a Triumph racer, so it's a very rare machine indeed. The handcrafted frame is made of aircraft tubing and is super light. As a friend of John's said, it is made of 'unobtainium'.

Rob North frame, BSA Rocket 3 race bike



Milk with your Castrol R?



Goggomobil micro-car (foreground) with its 400cc two-stroke engine out to be rebuilt



Armstrong Siddeley six-horsepower stationary diesel engine



Norton Commando parts for restoration bikes

Bits and pieces

Other engines, not just motorbike ones, can also be found in the shed.

An Armstrong Siddeley stationary engine was bought near Thames. It was probably used to drain the swamps way back in the day.

"I've never seen one before, or since," John says. "I'll probably get it to go eventually, but it's not high on the list of things to do."

A four-cylinder (with eight spark plugs) sits on the floor behind another bike. It's a rare French Vinot owned by a friend. ►



Detail of the Armstrong Siddeley diesel engine



Vintage French Vinot engine

“A friend of mine bought it from Wellington. He has a two-cylinder version of it in a French car called a ‘Gladiator’. It’s one of two in the world, and it’s here in Taranaki,” says John. “It’s amazing what comes out of the woodwork!”

Why does it have eight spark plugs in a four-cylinder engine?

“Apparently it was a luxury thing to do. Rolls-Royce had engines with two spark plugs per cylinder, and magneto and distributor. It made them more reliable – or more expensive. They

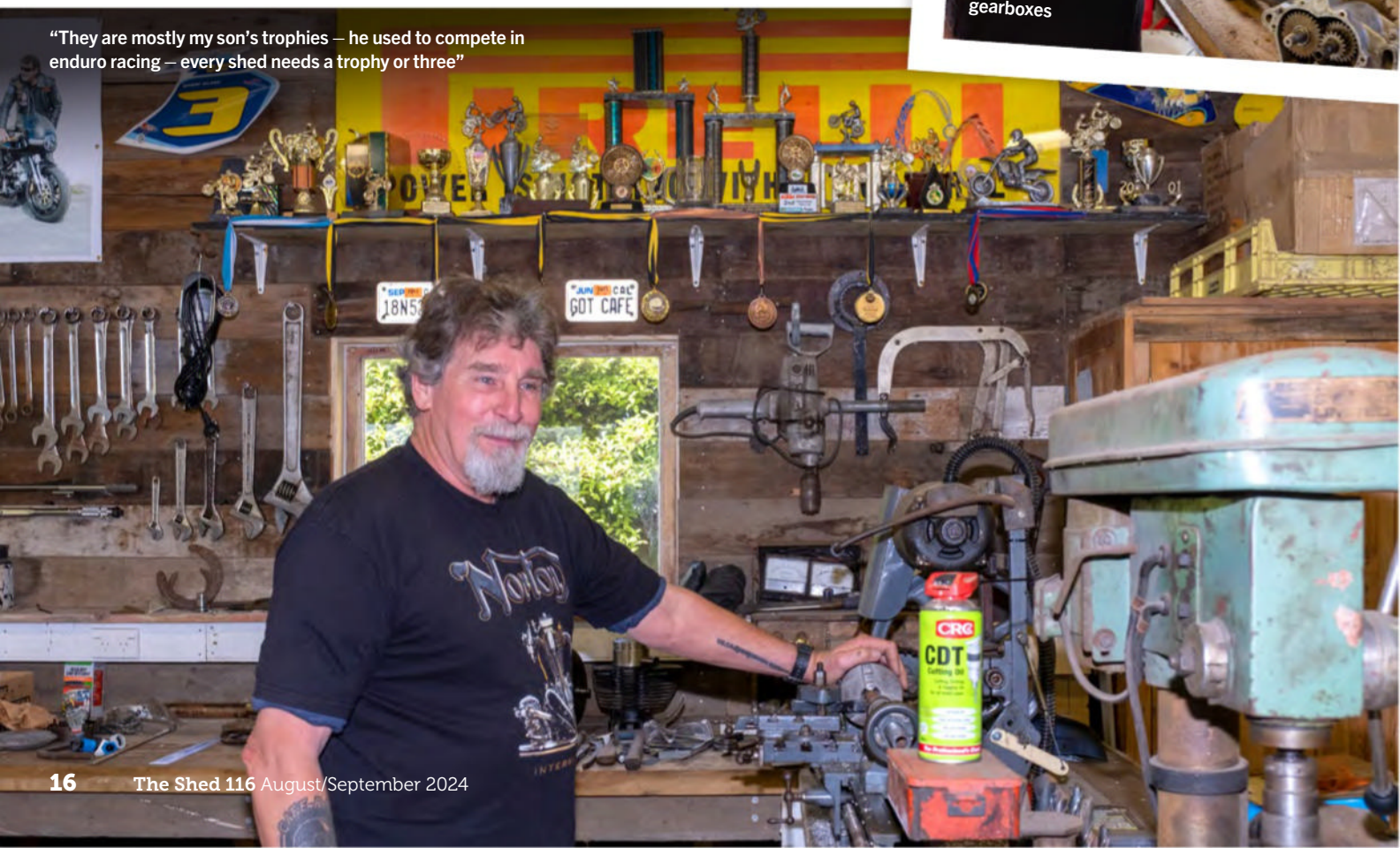
sparked together supposedly, but it was always a bit of bullshit because you could never get them to spark at the same time anyway. Probably a selling point.”

The friend apparently bought it because he knew a guy in Australia who was doing one up and wanted the engine. After he had picked it up, he couldn’t remember the guy’s name and didn’t have his address or anything, so it will live here until he finds the guy who wants it.

If that guy reads *The Shed* magazine, this may just be his lucky day. 📧



The rare Chater-Lea motorcycle engine and a couple of Ariel Square Four gearboxes



“They are mostly my son’s trophies – he used to compete in enduro racing – every shed needs a trophy or three”



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Tram at the Junction

ART VIEWED THROUGH A TRAM WINDOW

A sheddie uses Matariki as a great excuse to travel on an historic Christchurch tram

By Ritchie Wilson

Photographs: Ritchie Wilson

The Pleiades star cluster is known as ‘Matariki’ in te reo. Its reappearance in southern skies marks the Māori new year. This event was important to Māori, as it marked midwinter – with the prospect of better weather coming and a new growing season – and so was cause for celebration. It has a similar significance to

the ancient European midwinter festival, which Christmas replaced.

Puaka is an associated star, so the celestial formation is best known as ‘Puaka-Matariki’. Christchurch City Council (CCC) marked Puaka-Matariki by staging the Tirama Mai light festival, which ran from 21 to 30 June and

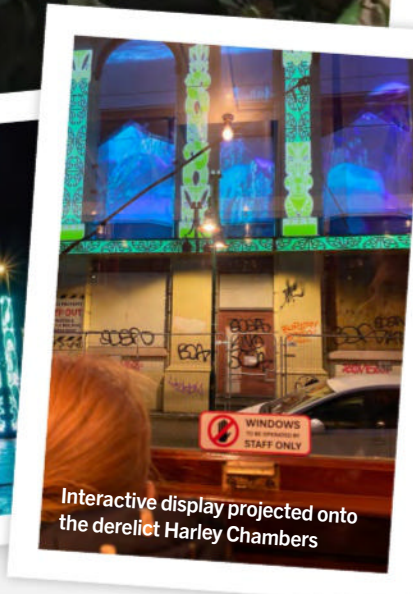
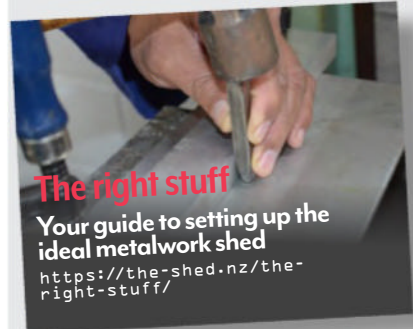
involved “artistic lighting and cultural displays” around the central city.

These could be seen on a nocturnal pedestrian “trail of illuminated artworks, projections, music soundscapes, and interactive installations”, but we Wilsons like steel wheels, so we viewed them from one of the city’s trams.

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:



Historic tram just adds to the enjoyment

We paid \$20 each to travel the 4.5km route, starting at John Brittan's Cathedral Junction, looping past the Arts Centre and the museum, and returning to the Junction via the New Regent Street pedestrian mall.

Along the way, the driver would stop the tram at the various light works and a guide would give some information about the display and the artist.

The tram was nearly full, mostly with families with young children.

The tram was a 102-year-old Christchurch Tramway Board tram built in 1922 and laid up in 1953. It was restored and put into service at Ferrymead Historic Park in 1970. It is powered by 600V direct current; the solid-state rectifiers that modify the current are located in the basement of the council offices. Hefty underground cables carry the electricity from the council building to the tramway's overhead wires.

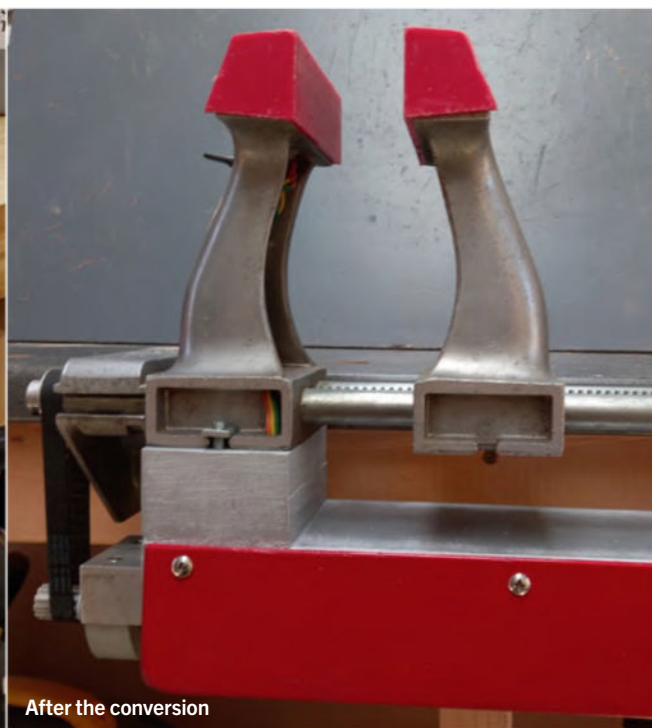
We happily finished the excursion, despite the cold and dark, at the ice cream shop in New Regent Street.



Warmly dressed passengers waiting for the tram to leave Cathedral Junction. Celebrated engineer John Brittan was working on the project at the time of his death



Before the conversion



After the conversion

MENZSHEDDER SHARES HIS INNOVATION

LETTER OF THE MONTH

Shed reader Richard Barwick shares his Zyliss bench vice mods

Try this handy, powered conversion of a Swiss Zyliss manual bench vice, operated (closed or open) by the easy flick of a toggle switch.

This original, portable, Zyliss bench vice was modified to operate using a redundant (2005) DeWalt DV 920, 7.2-volt cordless screwdriver that had been used daily in a workshop for around 10 years before the Ni-Cd battery finally gave up the ghost.

The Zyliss aluminium bench vice is still available in New Zealand as the Z-Vise – see homeshow.co.nz/gallery_zvise.html – and has a range of accessories available.

The DeWalt torque control feature has been retained (crush-injury risk minimisation). The handle and speed control module was removed from the driver and 2x12-volt relays were fitted for ‘open’ and ‘close’. An easy-to-use

(pinkie finger) toggle switch on the fixed vice arm is all that’s needed.

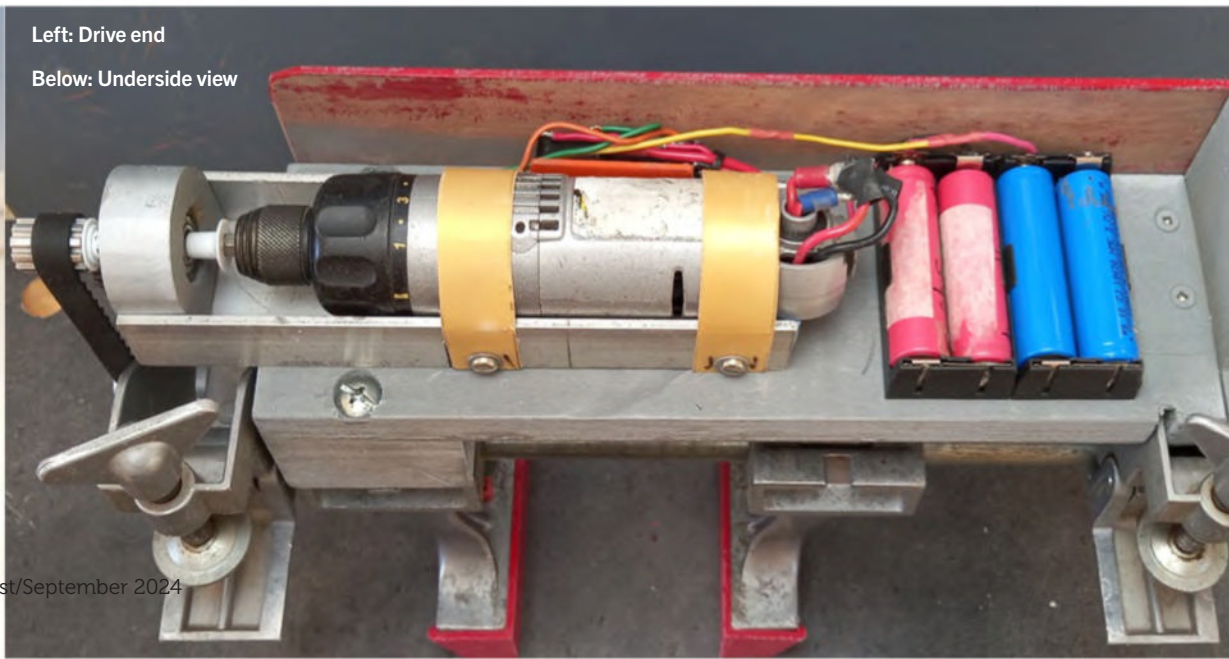
The relays double as low-voltage cut-out as they drop out at around seven volts. The four 18650, 3.7-volt cells are removed for charging in a separate system. The sprockets and toothed belt came from junked photocopiers.

Designed and built by Amberley Menzshedder **Richard Barwick**.



Left: Drive end

Below: Underside view



Odd Jobs

Hang out on your own DIY swing chair!



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

Swing chair to do list

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



Watch now!



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

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

MasterStroke
by Resene

WE HAVE A NEW FAN!

Wow! I'm so glad I found this magazine at Countdown today.

I'm a web developer (web3) by day but in my spare time I'm a musician and DIY guitar tech/builder. The cover caught my eye immediately! Walking past the magazines, I noticed a condenser mic on the cover and had to stop and take a closer look (that's not something you see at Countdown!). I'm so happy I did!

Thank you for the acoustic guitar article and plans. I recently received the wood for my project and have been searching for plans and step-by-step tutorials online. This edition will be incredibly helpful.

I hope to see some articles on four-track cassette recorders in

the future (cassettes are making a comeback). There's a guy in Wellington (I believe) who services old cassette multitrack tape recorders (Audiotech?). I'd love to read about that business and the demand for tape.

Sorry for rambling, but I'm excited and this magazine has truly nourished my passion. Thank you!

Johan

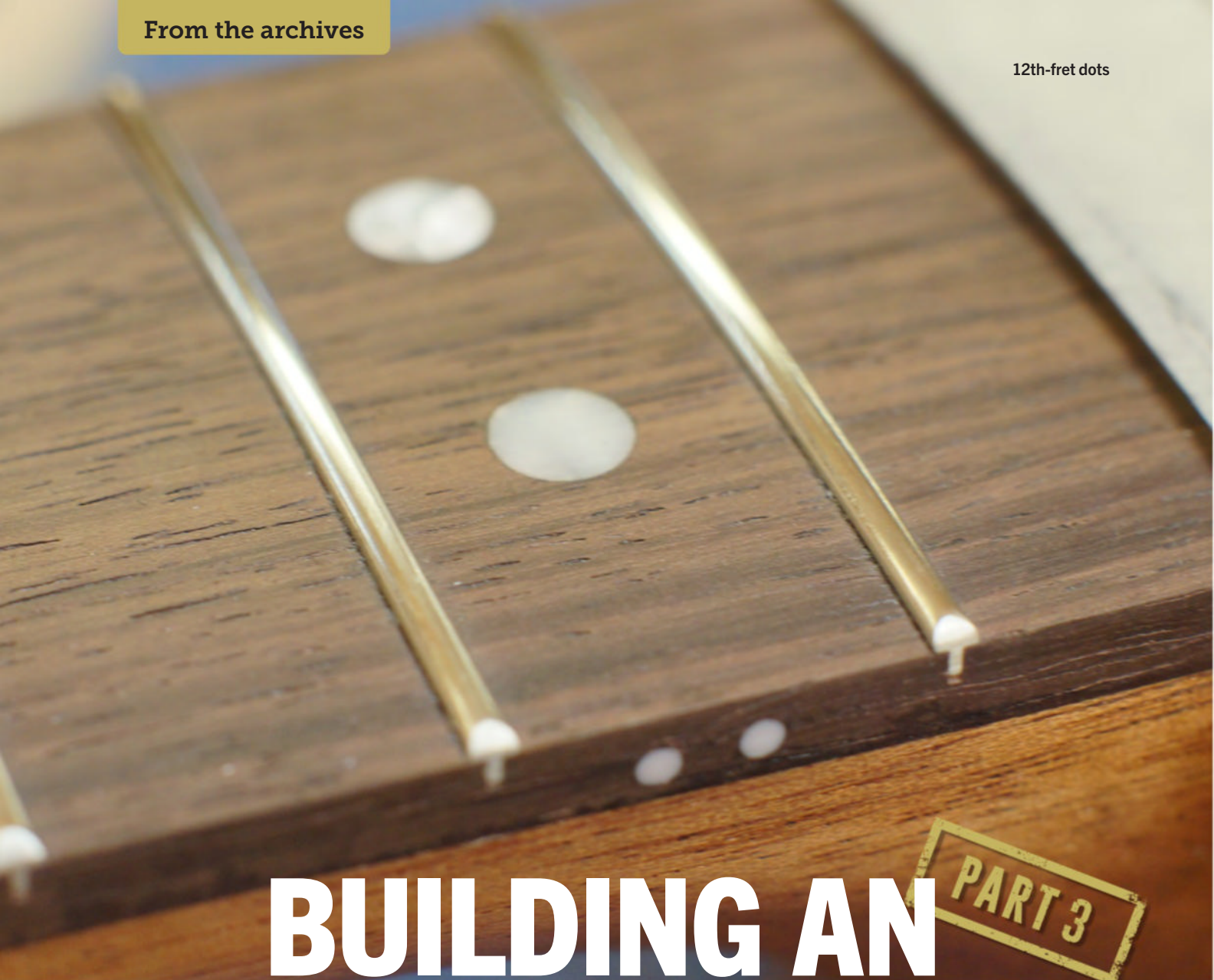
No – thank you, Johan. We really appreciate your enthusiasm for our magazine. There are quite a lot of us who enjoy it as much as you, and it's always terrific to have a new member join our gang. Welcome. Ed.

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





BUILDING AN ACOUSTIC GUITAR

Frets, fingerboard, and finishing

By Rob Bentley

Photographs: Rob Bentley and Giani Flego

Head shaping

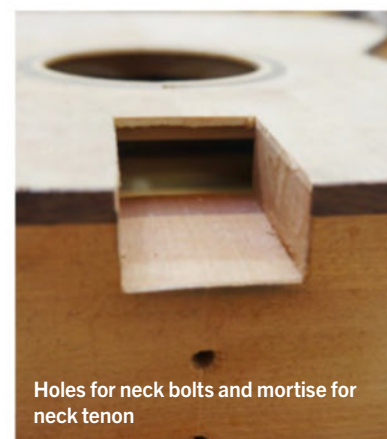
The head is thickened to suit the tuners being used.

Generally this will fall in the range of 12–14mm thick, so that the threads on the tuner posts will engage from both sides. Remove material from the back of the head using a vertical fence set-up on a bobbin sander. This also cleans up the back of the scarf joint on the neck.

Make a template out of thin card for the head shape, with its baseline at the back of the nut, and mark on it the

tuner positions. If the head shape is symmetrical, it is a good idea to make a half-template, which can be rotated about the centreline. Use the template on the back of the head to draw the shape, and bandsaw and plane/sand it to its final shape.

Use a bradawl to mark the centres of the tuner holes, and use a brad point bit of appropriate size for the tuners being used (normally 10mm). Use a drill press and support the other side of the head to avoid tear-out when the bit breaks through.



Holes for neck bolts and mortise for neck tenon



Mitre box, and fretsaw cutting frets

“The fingerboard is made from hardwood such as Indian rosewood, ebony, or maple”

The fingerboard blank is thickened to 6mm, with one reference side planed straight and one end squared off to this side. This will be the nut end, and all measurements will be made from here. Now, use a combination of plane and radiusing block with coarse sandpaper stuck to it with double-sided tape. Work along the length of the board until it is evenly radiused. The aim is to achieve a radius without creating any hollows along the length of the board.

Draw a centreline and mark the width of the fingerboard about the centreline at each end. Use a ruler and a marking knife to define the edges of the fingerboard.

While the fingerboard has a true, long edge parallel to the centreline and square to the zero-fret position, it is a good time to mark out where the fret slots are. Use double-sided tape to stick a steel ruler to the fingerboard so that one edge is on the centreline and the zero end of the ruler is aligned exactly with the zero-fret end of the fingerboard blank.

Refer to the plans for measurements of fret slots from the zero position. Use the end of a cabinet scraper against the side of the ruler to align the ruler measurement and fret position. Make a small and precise mark on the fingerboard centreline for each fret; use a marking knife against the end of the cabinet scraper. Once all frets are marked, remove the ruler and use a square against the planed side of the fingerboard to carry the marks all the way across the fingerboard with a marking knife. Use the fret slotting saw and jig to cut fret slots in these positions. Once this is done, plane away the excess fingerboard width to the lines marked earlier. ►



Slots all cut in fingerboard, with position dots glued and sanded

Fingerboard

The fingerboard is made from hardwood such as Indian rosewood, ebony, or maple.

On a steel string guitar, fingerboards normally have a slightly curved surface across the width – approximately 12-inch (304mm) radius – and are tapered in length from the nut to the sound-hole end. This can be altered to suit the player's preferences, but a good starting point is 44mm wide at the nut and 58mm wide at the 19th fret.

It is important that the slots cut for the frets are done accurately using a narrow-kerf fret slot saw. Pre-radiused and pre-slotted fingerboards can be bought from some luthiery supply companies.



Rosewood fingerboard and dots positioned and sanded

Dots

Position dots are inlaid into the fingerboard between the 2nd and 3rd, 4th/5th, 6th/7th, 8th/9th, 11th/12th, 14th/15th, 16th/17th, and 18th/19th frets.

It is usual to inlay a slightly different pattern in the 11th-/12th-fret position – often two dots rather than one. To accurately find the centre between the frets for the position dot, draw diagonals between the ends of the fret slots flanking

where the dot is going to go, then use a bradawl to make a start guide for a brad point drill bit and drill to a suitable depth for the inlay being used (usually about 1.5mm).

The dot can be dry-fitted and then fixed in place by running superglue around the edge. When the glue is dry, sand the dots flush to the fingerboard surface. Smaller position dots are also used in the edge of the fingerboard facing the player, and these are inlaid in a similar way.

Frets

Fret wire has a tang underneath that, force-fitted into the fret slots, holds the fret in. The fret wire should be curved to a slightly tighter radius than the fingerboard that it is going into.

First, clear the fret slots of dust (we use a craft knife blade). Place the fingerboard on a solid, heavy surface and align a piece of fret wire so that one end just sticks out over the edge of the fingerboard. Tap one end, then the other, into the fret slot using a nylon-faced hammer.

Finish hammering the fret down into the slot after sniping the wire off the roll. Hammer in the middle last; otherwise, the ends tend to pop up and are difficult to seat properly. Repeat until all frets are in, then use flush-cut nippers to trim off the excess length. File the fret ends flush with the fingerboard; they will be sanded with the sides of the fingerboard when the fingerboard is glued onto the neck.

Fingerboard glued on

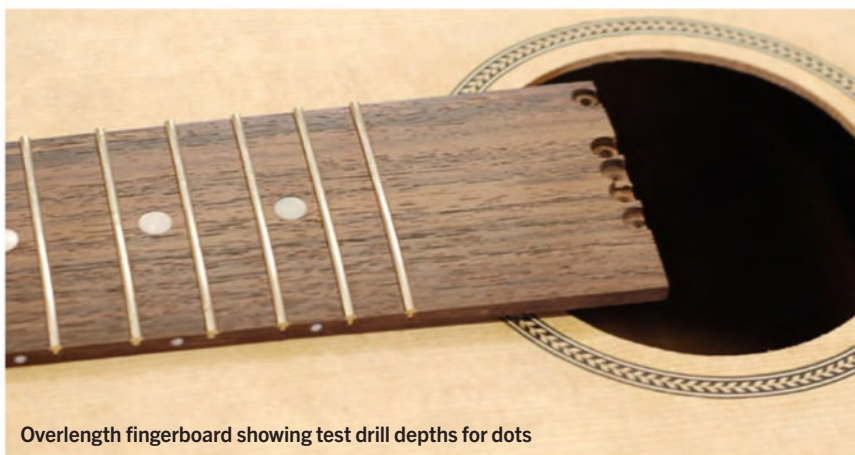
Use a long, thick (20-plus millimetres) clamping caul the same shape as the fingerboard, and that has been flattened along its length. This flat surface then needs to be made concave so that it bears down on the frets in the radiused fingerboard with even pressure.

Glue the fingerboard on. Use a 5mm wide spacer as a temporary nut to get the spacing correct. Once the glue has grabbed and the fingerboard is clamped on, remove this and clean glue squeeze-out from the nut slot.

Leave space between the clamping caul and the temporary nut so that a small clamp can be used to glue this top part of the fingerboard down



Hammering in frets



Overlength fingerboard showing test drill depths for dots



Fret filing

between the zero fret and the first fret. Ensure that the fingerboard is in the correct position relative to the lines marked earlier on the neck. Clean up glue squeeze-out around the neck tenon while it is wet.

Neck shaping

Necks can be shaped to suit the individual player. It can be helpful to have a favourite neck profile to copy from, but, if not, there are some general guidelines to arrive at a neck shape that feels comfortable to play.

Neck thickness is measured from the top surface of the fingerboard, not including fret thickness. At the first fret, it is usually 20–21mm, and at the 12th fret, it is 22–23mm. Mark these thicknesses on the side of the neck blank and cut or chisel a notch out to this depth to give a reference. Then, using rasps and/or spokeshaves, bring the neck down to an even taper between these two points.

Next, round the neck profile using spokeshaves, rasps, cabinet scraper, and sandpaper until it is the correct profile all the way along. Check that any shaping that is done is even all the way along the neck – that is, no dips or bumps – and that the profile and taper are blended nicely into the heel and the head.

Finish off by fairing the edges of the neck back to the sides of the fingerboard and sand all over down to 400-grit.

Heel cap

Normally, a wooden cap is glued on to the end of the heel, and this is usually of the same timber as the back and sides. Bolt the neck on to the guitar body and decide on the height of the heel cap. It could be flush with the back or stepped

“The reason for this is to give extra scale length compensation for the thicker bass strings; otherwise, they will tend to sound sharp when fretted higher up the fingerboard”

down so that the heel finishes in line with the bottom of the binding and the cap is above that.

Once you decide, mark the heel and trim it to height. Note that it is more visually pleasing to trim the heel so that the glueing surface for the cap is at the same angle as the back curve, rather than square. Place the neck back on the guitar, mark around the top of the heel on to the cap piece, and trim the cap slightly oversize. It is important to make the cap join tightly to the body, so take time to shape this join accurately.

Loosen off the neck bolts and slide a piece of plastic wrap between the heel and the body. This will prevent you from glueing the cap piece to the body. Apply glue to the cap piece and glue it onto the heel, making sure to push it tightly against the body to avoid any gaps. Once it is dry, trim back the cap and sand to fair it into the heel, then re-bolt the neck to the body.

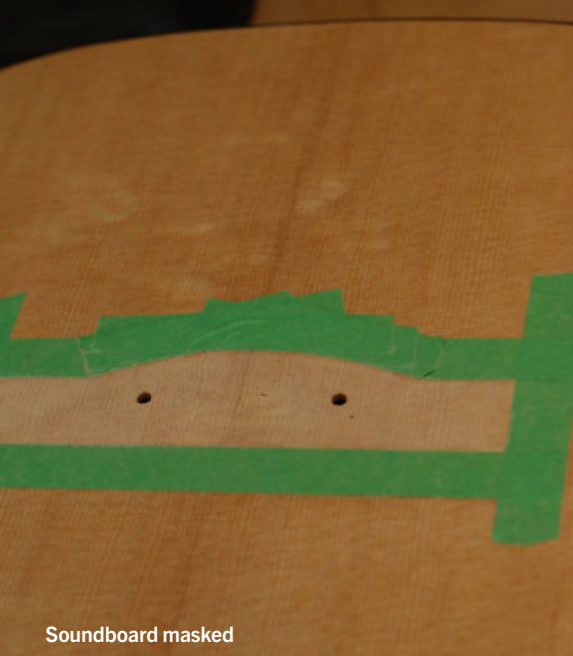
Bridge

It is usual to make the bridge from the same timber as the fingerboard. Dimension a piece of hardwood to 150mm long by 40mm wide, and thickness it to 9mm. You need to rout a slot 3.2mm wide in the bridge to accommodate the bone saddle. The slot – 6mm deep and 70mm long – is centred on the bridge but angled slightly closer to the front edge of the bridge on the treble side (5mm from slot edge to bridge front) than on the bass side (8mm). The reason for this is to give extra scale length compensation for the thicker bass strings; otherwise, they will tend to sound sharp when fretted higher up the fingerboard. Rout the slot using a straight-edge guide that also holds the bridge down while routing.

The bridge is marked for drilling holes to hold the bridge pins. These are spaced equally; spacing depends on the neck width on the plans, as these will determine how far apart the strings sit from each other and the overall span of the strings.

The centres of the bridge pin holes are 22mm back from the front edge of the bridge. They are marked with a bradawl and drilled with a 4.5mm brad point bit. These will be opened out later with a tapered reamer once the bridge is glued on to the guitar.

The overall shape of the bridge is cut out with a bandsaw and shaped on a bobbin sander. The wings, or outer ends of the bridge, are tapered down to approximately 3mm high. The flat underside of the bridge has to be shaped to the same dome as the soundboard. Either use a cabinet scraper or lay sandpaper face upwards on the soundboard and move the bridge over it to sand off the high spots. ►



Soundboard masked



Hot hide glue application



Placing bridge in correct position

“The bridge is glued on using hot hide glue, chosen because of its good bond strength, lack of creep, excellent acoustic properties, and reversibility”

Glueing the bridge

There are several points to consider in ensuring that the bridge is glued onto the soundboard in the correct place.

- The neck should be accurate to the centreline of the body. If not, this has to be adjusted; otherwise, the strings will run off the edge of the neck on one side.
- The bridge has to sit the right distance from the nut, determined by the scale length (distance between the nut and the saddle) used for the guitar. A small amount of extra distance (approximately 2mm) is usually incorporated into this measurement to avoid the strings playing sharp when they are fretted.
- The bridge should sit square to the centreline of the body.

Once the correct bridge position has been found, use some low-tack masking tape to define where it should sit and drill (4.5mm) through the two outer

bridge pin holes all the way through the soundboard and bridge plate underneath.

Two bolts through these holes will help to hold and clamp the bridge to the guitar while you are glueing. Use an additional clamping caul the length of the bridge, and place packing pieces on each end to bear down on the ends of the bridge while maintaining sufficient height in the middle to clear the bolt heads when the bridge is clamped.

The bridge is glued on using hot hide glue, chosen because of its good bond strength, lack of creep, excellent acoustic properties, and reversibility. We warm the area where the bridge is to go and the underside of the bridge under an infrared lamp.

The hot hide glue is brushed generously onto both surfaces and the bridge is then bolted into position. A long sound-hole clamp is used on the caul to bring pressure onto the wings



Bridge clamping



Bone saddle fitted



Slots marked in bone nut

“The slots in the nut are started with a razor saw then opened up to the correct width with small files”

of the guitar. Excess glue is cleaned up using a cloth dampened with hot water.

Leave it for 24 hours to dry thoroughly then remove the clamp and bolts and drill the rest of the bridge pin holes. The bridge pins are tapered and a reamer with a corresponding taper is used to open out the holes until the pins sit evenly.

String slots

The nut and the saddle are both made from bone. They are thickened to width, then trimmed to length using a stationary belt sander. At this stage they will both be over height.

The nut is shaped to match the radius of the fingerboard but should be about 2.5mm higher than the surface of the fingerboard at the zero fret. Cut into the surface of the nut to hold the strings, which are spaced so that the two outer strings sit inboard of the fingerboard edge by 3mm. The others are then spaced to give equal distances between the strings.

Note that, because the strings get thicker from treble to bass, if they are spaced so that the centres are equidistant, the bass string spacing becomes closer than the trebles.

The slots in the nut are started with

a razor saw then opened up to the correct width with small files. The depth of each slot should allow the string to have 0.3–0.5mm clearance over the first fret when the string is pressed down at the third fret.

The saddle is also shaped so that the top surface corresponds to the radius of the fingerboard. More compensation is added to certain strings by filing ramps into the top surface of the saddle. The thinnest E-string goes over the saddle towards the front edge; the next string (B) goes over the top of the saddle towards the back edge; then the next four strings go over the top edge



Nut being set up for strings.
Special nut slotting file used



Stringing from bridge



Bone saddle angled for correct intonation



Nut string slots filed deeper

progressively, from the front to the back of the saddle.

Fasten the tuners into the head of the guitar and string up the guitar. Check the string height at the 12th fret by measuring from the top of the fret to the underside of the string. It should be 1.5mm for the thinnest E and 2mm for the bottom E. To achieve this, the saddle may have to be removed from the bridge and material removed from the bottom of it until the strings are the correct height.

The guitar is now playable but the frets need dressing to ensure that there are no high ones to cause buzzing. Use a steel ruler along the frets to determine which frets are high and mark them with a permanent marker.

Use a diamond stone that you know is flat to grind down the high frets by running the diamond stone along the top of the frets. Maintain the radius of the fretboard. Once all the high spots have been ground down, mask off between the frets and use 600-grit wet and dry paper, followed by 1000-grit, then 000 steel wool to polish the grinding marks away. Oil the fingerboard with Lem Oil or a similar fingerboard conditioning oil.

Finishing

There are some points to consider when finishing a guitar, which should be treated differently from a piece of furniture. The finish on the soundboard should be thin and light in weight to avoid dampening down the responsiveness of the guitar, while the finish on the neck should be hard-wearing and non-tacky to the touch.

The many possible finishing options for a guitar are beyond the scope of this article. However, relatively simple finishes that can be applied by hand in the home workshop are French polish, Tru-Oil (gunstock oil), or brushed-on or wipe-on varnish finishes. Sprayed-on finishes such as nitrocellulose lacquer can also be used. 📦



Fast panel fixing

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JOB DONE WHAT NEXT?

PART 3

Max and his father have put the final touches to Max's shed, paving the way for some exciting new projects

By Geoff Cussell

Photographs: Geoff Cussell

For those who haven't read our previous articles, here's a bit of background on the shed-building project my dad and I started in September 2022.

First, let me introduce myself. I'm Max, an adult with Down syndrome. I like to keep busy using my building skills, so, with Dad as my teacher, I have designed a planter box. Every box is prefabricated by Dad as a kit for me to assemble. Two

years ago, we moved house and our new place had no shed for our projects and my planter box work. The garage is strictly for storing my sister's stuff, not to mention Mum and Dad's car. As project people, we needed to solve the problem. Dad got some quotes to have a shed built to his specs, but they were all way over our budget, so, with a lot of help, encouragement, and heckling from me, Dad and I:

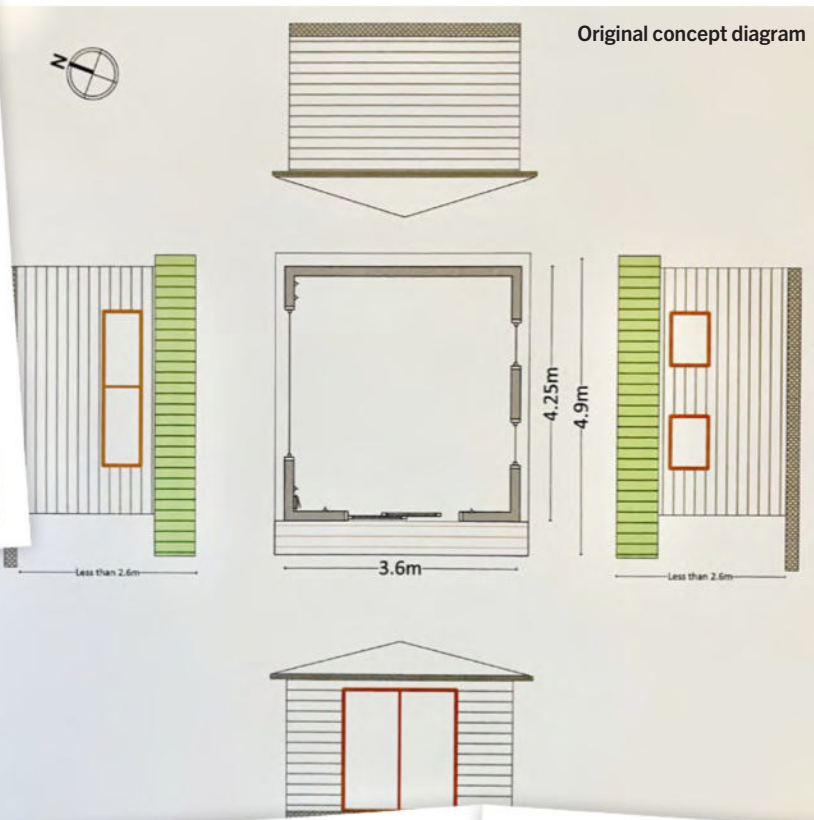
“Dad got some quotes to have a shed built to his specs but they were all way over our budget”

Can we start building planter boxes now, Dad?

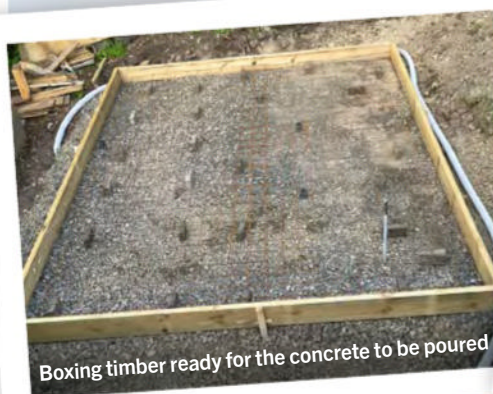




My buddy and mentor, Paul at Bunnings Botany – we couldn't have done it without his support and wisdom



- designed the shed
- levelled the area on the section
- built the boxing for the concrete pad
- had the concrete pad poured
- ground the pad to bring out the aggregate texture
- sealed the pad
- dug a drainage trench around the pad and laid coil and scoria through it with some fall to ensure water drains away from all sides
- purchased an aluminium ranchslider and windows from a demolition yard that would fit the basic design
- revised the scale elevations and frame designs to include the actual joinery dimensions (see concept diagram)
- had the roof beams engineered, fabricated, and delivered
- sourced the framing, insulation, ceiling panels, cladding, and roofing materials
- built the frames in the garage (sorry about the dusty stuff, sis)
- stained the beams
- painted the ceiling panels
- cut the insulation sheets
- erected the frames by bolting them onto the concrete pad – the frames needed to be separated from the concrete with a strip of damp course
- installed the roof beams
- got an electrician to install the basic wiring
- started installing the roof
- welcomed in the New Year here in Howick. ►



Boxing timber ready for the concrete to be poured



Boxing timber recycled as 132 planter box legs



Timber ceiling panels on the beams then purlins, spacers, insulation, building paper, and Colorsteel roofing

“The last article was even titled ‘Nearly There’. Ha! What did he know?!”

Dad spent a lot of time on this ladder



What have we been doing?

That’s what we did up to our last update, which was in the pre-Christmas edition of *The Shed*.

At that point, we had the frame up and the roof complete on the south side. Dad thought that the rest would be a doddle. The last article was even titled ‘Nearly There’. Ha! What did he know?!

So, what have we been doing since December?

Well, life really. I have been doing the things that fill my days: Special Olympics swimming; building and selling planter boxes; art classes; my work at Ecostore; and days at Eastgate and Recreate, organisations that provide respite services (BTW, these organisations need and thoroughly deserve all the support they can get!). Meanwhile, Dad’s been working hard at his day job.

Through all this, there’s been an

incomplete shed sitting on the lawn, staring at us, asking, “When are you going to finish me?”

Fear not, shed! We’re on it. In fact, we’ve been busy ...

Roofing

The north side had to be done, and that involved Dad going up and down ladders to get all the fixings aligned and installed. The roofing steps were first, laying the pre-painted ceiling panels over the beams. The purlins were then attached and the polystyrene insulation laid between the purlins and on top of the ceiling ply. Next came the building paper, and, finally, we lifted the Colorsteel roofing into place – the holes were pre-drilled, so they had to line up with the purlins. Luckily, Dad had this sorted. Over 200 fasteners were then tightened in place.





Dad and some mates installing the ranchslider – nice fit!



Punching nails in the ranchslider frame surround

“The profile matches the weatherboards on the main house”

Wrapping

We wrapped and stapled the entire frame with building paper. This provided another layer of water protection and insulation.

Cladding

We had the Colorsteel Bevelback cladding delivered at the same time as the roofing iron. After some pre-drilling, it was ready to be lifted, levelled, and screwed into place. The profile matches the weatherboards on the main house, so metal cladding was an efficient and attractive choice. It's so good that New Zealand has the Glenbrook steel mill producing these amazing building materials.

Metalcraft Roofing in East Tāmaki supplied the roofing, cladding, guttering, and all the flashings, according to Dad's specifications.

Insulation

With the cladding on, we slotted the precut polystyrene into the framing – the only hassle was having to carve out spaces for the metal bracing tensioners.

Enhancements

A good friend suggested that we leave the triangular spaces on the east wall framing as quirky windows to let in additional light. Good idea!

Dad cut some Perspex, framed it, and sealed it into both spaces.

Gibbing

This took much longer than expected and made a big mess.

We used the noise-reducing and heavy-duty spec board. Each sheet had to be glued and screwed into place with minimal gaps. The gib had to be cut to fit over the bolt-heads, which keep key parts of the wall and roof structure in place.

Some of the framing needed to be planed to get it vertical before the gib could be attached. The dust was hard to get out of the concrete floor, but, with some scrubbing, it was soon back to how it looked after the original grinding and sealing. ►



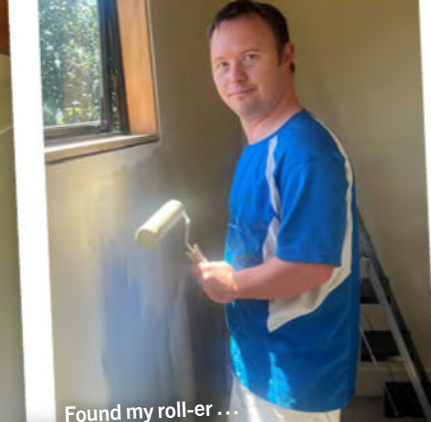
Screws for the windows surrounds



After a hard day's work ... my favourite beer at Minos Howick – oh yeah!



Washing the gib
dust off the floor



Found my roll-er ...



More finishing touches – painting nail heads

“As this is the icing on the cake, we decided to get it done professionally”

Gib-stopping

As this is the icing on the cake, we decided to get it done professionally. The gib-stopper was in and out within a week and the walls were ready for painting.

Painting the interior

A bit beige, but, hey, it's a shed – and once Dad had committed to the lime-wash ceiling, there wasn't really anywhere else we could go for a colour match. It matches the sawdust, anyway ...

Window framing

We framed these to match the house's external joinery.

Internally, the joins between the windows and the gib were masked with mitred and painted framing timber – finishing touches that make a big difference.

Spending time at the hardware store

We've needed lots of tools and materials, and Paul at Bunnings Botany, an ex-builder, has been amazing with his support and advice throughout our project.

Getting the electrics installed

Two LED strip lights down the main beam, a breaker board, and five power points do the trick. This work couldn't be completed until the gib-stopping was done. Dad decided to put the power points at the normal low level you see in a house rather than at bench height. This means that the shed could also make a tidy sleepout, studio, or office – a good selling point if we decide to move one day.

Guttering

The brackets had to be attached so that the gutter had a fall of around five degrees. We then cut the two lengths of guttering to size, cut a hole at one end for the downpipe, and sealed them at both ends. Dad then lifted and clicked them into the brackets. Finally, the downpipe components were assembled and attached. We'll connect it all to the storm-water soon.

Tooling up

At last, the stainless-steel cabinets are filled with hand tools, and the mitre saw, table-saw, drill press, grinder, vacuum, Workmates, and vice are in their new home.



Finishing touches

Recycling

Dad spent a couple of hours on the mitre saw and table-saw turning the long planks that we used for the concrete boxing into 132 planter box legs – that's the legs all done for 33 kits that I'll soon be able to assemble – you guessed it: in the shed!

I have a shed

Looking back to where we were before last Christmas, Dad says the 80:20 rule applies to a building project like ours.

Working, just the two of us, 20 per cent of the time got what looked like 80 per cent of the structure done, but 80 per cent of the time was spent on the last 20 per cent of the project,

to complete all the final details just described.

Dad and I admire people who build machines to travel in and go on adventures. These machines can be vehicles such as cars, boats, even aircraft. Sheds, in a way, are just like them: adventure vehicles.

While, of course, we won't travel anywhere different geographically, in our shed, we will go on journeys that will be creative; innovative; restorative; and a great way to meet people, learn, and share ideas – just as much fun as a road trip. Building our vehicle has been the first adventure, and what fun it has been. We're tooled up and ready for the next ones. Where to next, Dad? 🏡

“That's the legs all done for 33 kits that I'll soon be able to assemble”

More of these on the way!



Job done!



It seems that sometimes a bad workman can blame his tools

By Mark Beckett

Photographs: Mark Beckett

There is an old saying that a poor workman always blames his tools. In the CNC world, that excuse may well be relevant, because, unless you have good tools, the machine is unable to perform at its best.

You can have a totally rigid machine, the best spindle, smooth movement on all axes, but, if the tool you've fitted in the spindle is blunt, then at best the result will be less than ideal and at worst it will cause bigger issues and may damage the stock.

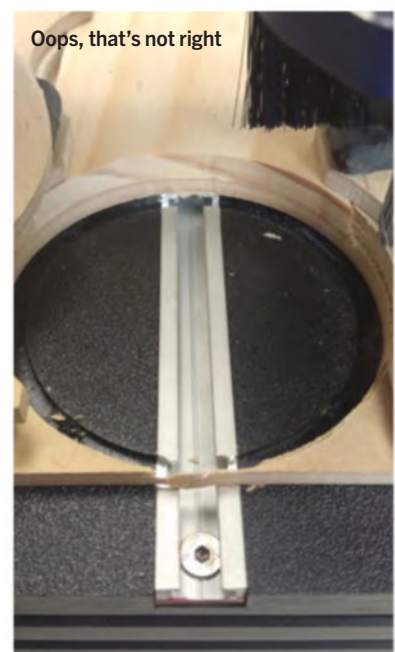
Size reality

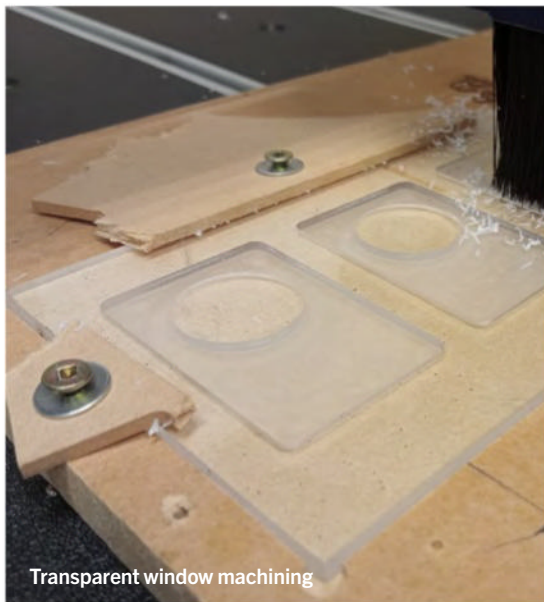
Aside from sharpness, there is the issue of size. If the tool bit is advertised as 6mm, then the tool path is calculated for 6mm diameter, and obviously it leaves or removes material based on the 6mm

diameter. However, if that 'really great value' item you purchased from overseas is actually 5.9mm, then there will be a 0.05mm error ($6\text{mm} - 5.9\text{mm} / 2$).

If you're simply roughing out a shape, then it may be nothing. However, if the parts are interference fit, then you may be in trouble.

Take, for instance, the project in which I had to machine a piece of Perspex as a window in a waterproof enclosure. I had to machine both the circle and the hole in the front cover. Based on the mentioned example, the hole would have been 25.9 instead of 26mm. The Perspex window would have been 26.1mm instead of 26mm, which would have meant there was a 0.2mm error and the two would never go together.

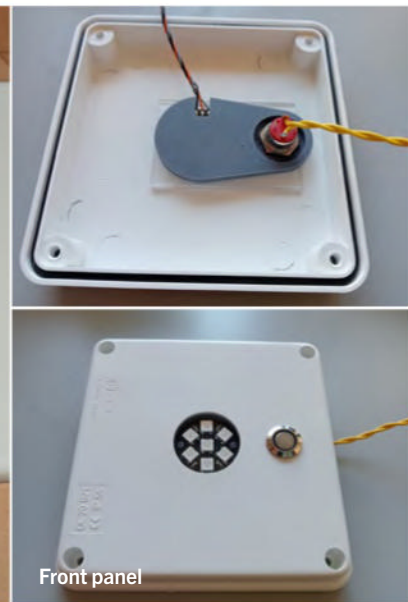




Transparent window machining



Window and hole that had to fit together



Front panel

“If the parts are interference fit, then you may be in trouble”

My recommendation

I have been using, and can recommend, ChipX tool bits. They are designed for the quarter-inch (6.35mm) spindle that my router uses and, apart from the really exotic bits, there is a full range, including a downcut, which leaves a nicer finish on Customwood.

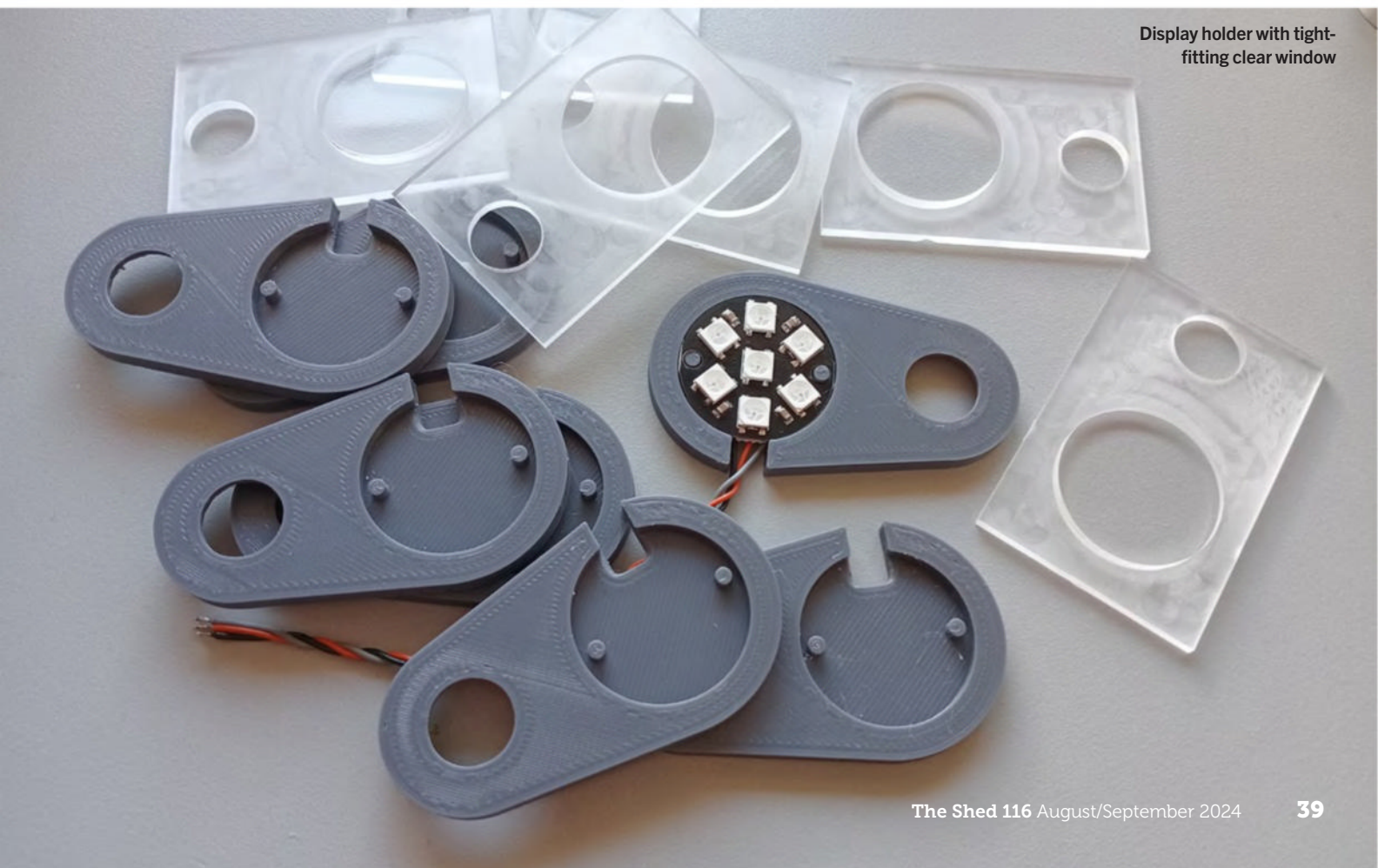
I tend to be conservative with my travel speed and, while the saying is ‘Make chips not dust’, you need to ensure that the stock is held rigidly to handle the speed.

The downside of reduced travel speed is additional heat on the tool bit as the

cutting edge is rubbing the surface. So far it works for me; the ChipX tool bits aren’t showing any signs of heat (well, maybe one that was an ‘ID10T’ error) and, as far as I can tell, they still have their cutting edge.

They cut aluminium and, if you accidentally get the Z-axis wrong, it will happily munch through the bed and fixing rails, and live to fight another day.

You can purchase these tool bits online at chipx.co.nz/. They are also stocked locally by Zealandia Systems in Christchurch. 📍



Display holder with tight-fitting clear window

ENGINEERED TO LAST

Particle board and MDF: inexpensive and a popular choice for storage cupboards – but what happens when they come face to face with moisture?

By Bob Hulme

Photographs: Bob Hulme

This is a story about those cheap-as-chips white melamine storage cupboards that are available from both of the large-format hardware suppliers in New Zealand.

There is no doubt that they are an economical way to create space for all those things that will come in handy one day. My garage is full of them – white cupboards and handy things! However, water is the arch enemy of the particle

board that these cabinets are made from, and that is exactly what found its way into my garage. The cupboards nearest the garage opening lapped up this water as if they lived in the desert and it had just rained for the first time in five years.

No problem, I thought. They don't appear to be falling down, and I'm not too worried about how they look – after all, it's just the garage.

“They don't appear to be falling down, and I'm not too worried about how they look – after all, it's just the garage”

Bottom edge of the board shows the open structure



Aluminium angle pieces screwed onto the side edge, and the offcut on the kick plate

It becomes a problem

Fast forward 12 months and the leaky sectional garage door is being replaced (no point in rushing these things). The installers insist that the cupboard closest to the door opening must be moved to give them room to work. As soon as I have it empty of a million handy things, the beefy installers pivot it around and walk it outside. Sadly, the lower edges do not survive the relocation.

This is not really a surprise to me, so I remind myself of the wise saying, 'The bitterness of poor quality lingers long after the sweetness of low price has gone'.

Yet I still want to minimise my cost in replacing the, now dead, cabinet, and it would be nice if a new one matched the others that have survived. Reviving it is an option, but at less than \$100 for a new one, that is what I choose.

After thinking more about the poor longevity that can easily become a problem with such cabinets, I put together a plan. The aim is to combat the poor strength of the lower edges as well as to prevent water absorption.

The plan

Putting some sort of waterproof material under the bottom edges would

"The bitterness of poor quality lingers long after the sweetness of low price has gone"

lift the particle board above floor level and away from water – killing two birds with one stone. Further thought convinces me that water might use a capillary action to find its way into the particle board.

Therefore, I decide to seal the raw edges with a sealer/undercoat type of paint, making sure that it is well worked into the wood. For the strengthener and lifting material, I opt for some angled aluminium (30x30x2mm) that will be screwed into the side of the cabinet.

The execution

The new cabinet comes as a kit.

While everything goes together well, and all the screw holes line up as they should, it is disappointing that the dowels are very loose in their pre-drilled holes. That's when I decide to use glue on all the joints so that the cabinet will be inherently stronger.

Once it is all screwed, nailed, and glued together, it is time to seal the bottom edges with some sealer/undercoat paint. This isn't a time to be shy. I plaster it on and give it a good brushing to make sure it gets well into every exposed fibre of the particle board. The board that my kit is made from seems to have been made with quite chunky bits of wood, meaning that chunky gaps between them are visible at the cut edges – easy to see why porosity is an issue. ►



Bottom edge crumbling due to water damage and being moved

“I have to psyche myself up for the task, but now that it is done, I feel really good about it”

Fitting the aluminium strips

After the paint is dry, I check carefully to see if the coverage is 100 per cent. It is not. The paint has soaked in quite a lot in a few spots, so on goes some more paint. When that is dry, I screw the strips of aluminium angle through into the sides of the cabinet.

The aluminium pieces were available from the same big hardware retailer and, with a nice white coating on them, very handy. A 1m length gives me just enough for a strip each side running the full depth (in this case, 400mm) and

the offcut becomes the front kick plate. Of course, the screws I use are stainless steel. Job done. The cupboard is easy to manoeuvre into place.

The toughest part of the job is culling some of the ‘come in handy one day’ items so that, when the cabinet is repopulated, there will be some space for new items that will promise to be of value one day! I have to psyche myself up for the task, but now that it is done, I feel really good about it (meaning that I have not yet missed anything that I have thrown away).

Water damage evident around the bottom edges





Plastering on the paint



Paint shown along the bottom edge and a little way up the vertical back edge

“After thinking more about the poor longevity that can easily become a problem with such cabinets, I put together a plan”

Particle board standard

I became curious about the grade of particle board – and, indeed, whether there are grades at all. Maybe these cabinets are made of poor-grade board to keep the price low. It would not be surprising if that was the case.

Looking at the retailer’s online description of the white cabinets, I saw that the particle board specification is described as ‘E1’. Turns out the E1 grade has to do with gaseous emissions from the binder resin used to hold all those wood particles together so that they look more like a board than the output from

your electric planer piled up on the floor.

The binders contain formaldehyde, which can be harmful to people. The ratings E0, E1, and E2 describe the emissions permitted under each classification. See the table on the next page for details. These specifications were established in Germany in 1980 and are adopted into the New Zealand Standard AS/NZS 1859.1.2004. The standard applies to MDF board and plywood as well as particle board. These items fall under the category often referred to as ‘engineered timber panels’ or ‘reconstituted wood panels’. ►

MDF versus particle board

The difference between these two board types is best described as their density. MDF is made using wood that has been broken down into fibres that are then mixed with a binder (urea formaldehyde) before being heated and pressed into panels.

The same process is used for making particle board but the wood is chunkier – that is, not broken right down into fibres.

Therefore, particle board is less dense due to air gaps remaining in the wood chips and gaps where they do not fit exactly together. The density of MDF is typically up to 850kg/m³ whereas particle board is up to 700kg/m³.

“The difference between these two board types is best described as their density”

There are variations of engineered boards that use a central core of particle board with layers of MDF material incorporated on the outside. This works well where a thick panel is needed for structural and insulation reasons, yet a good finish on the exposed sides and lighter weight are also important.

Another type of particle board is OSB (oriented strand board), which is made with flakes or large chips of wood. The board is made in the same way as common particle board but the chips are glued in layers, with their strands at 90-degree angles to one another.

Because of its coarseness, OSB is best suited for use as full panels for structural walls, for example, rather than applications where more intricate shaping is required. MDF is best where shaped corners or relief patterns are to be machined into the face in items such as kitchen cabinet doors.

Moisture-resistant versions of particle board and MDF are available; they have paraffin wax incorporated into their surface. However, it should be stressed

that this resistance is only intended to deal with occasional spillage. Both types of board are intended for interior use only. 🏠



New cabinet on the right, all finished

Emission classification

Class	Formaldehyde emission level
E0	<0.5mg/litre
E1	<1.0mg/litre
E2 (banned in some countries)	<2.0mg/litre

AUCKLAND

Harley-Davidson

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MITRE 10: 1974–2024

THE FIRST 50 YEARS

Dedication to staff well-being, commitment to the local community, and support for community projects are key elements of Mitre 10's philosophy

By Nigel Young

Photographs: Supplied

In the previous article, we looked at the origins of Mitre 10, a New Zealand cooperative with its roots in both a Melbourne tavern in 1959 and the depths of 19th-century Aotearoa New Zealand.

We tracked it through the social, political, and technological turmoil of its 50 years as it expanded in both what

products and services it could offer and the locations where it would be found. The initial eight stores have become 84, with the 42 Hammer Hardware stores in some of the smaller regions and a fully functioning online store adding to the mix. As far as innovation and resilience go – particularly in such a highly

competitive and ever-evolving market – Mitre 10 has set the standard, not only in terms of its customer and community activities but also in conjunction with its business and corporate peers. In this article, we will look at the extent and the significance of that involvement and its impact on the turbulent world of retail.

While better known these days as a hardware/DIY retailer, Mitre 10 is a credible building supplier merchant with trade accounting for around 40 per cent of its business





CEO Andrea Scown is the first woman to lead the cooperative and the first internal appointment to the role

“Mitre 10 is a cooperative relationship in which each store is owned independently”

Co-op versus franchise

Perhaps it's also important to distinguish between a cooperative and a franchise. That Mitre 10 is a franchise would be an easy assumption to make, albeit wrong. A 'franchise', according to investopedia.com, is defined as "a type of license that grants a franchisee access to a franchisor's proprietary business knowledge, processes, and trademarks, thus allowing the franchisee to sell a product or service under the franchisor's business name. In exchange for acquiring a franchise, the franchisee usually pays the franchisor an initial start-up fee and annual licensing fees."

To put that another way: it's a licensing arrangement rather than an ownership relationship.

Mitre 10 is a cooperative relationship in which each store is owned independently. The collective nature of the arrangement brings with it economies of scale that would not otherwise be available, particularly for the smaller stores. It also brings protection against an attempted corporate takeover by an outside party, as, in that sense, there's nothing to take over. The interested party would have to

approach each owner and buy each store individually, and that simply isn't going to happen.

Business practices

Cooperative Business NZ

Mitre 10 is a member of two professional bodies: Cooperative Business NZ and Retail NZ. In 2017, Cooperative Business NZ named former Mitre 10 CEO Neil Cowie Leader of the Year, while former CFO Matthew Washington has been on the board since 2021.

Mitre 10's cooperative model encourages diversity. CEO Andrea Scown states, "While we are more strongly retail, this does primarily depend on the store, with some stores being 50/50 and others more retail dominant. However, if you rolled the business all into one, it would land around 60/40 retail to trade."

"Stores deliver different impressions, depending on where they are and what their local customers need. Some stores are very big in trade, and have their own frame and truss plants, while all Mitre 10 MEGA stores have a trade drive-through and a certain

range of timber supplies and building products. They all have a core range, and supplement this with local ranging that appeals to their specific customer preferences."

This "supplement ... with local ranging" is where much of the diversity is to be found, as Mitre 10 has a policy of supporting local businesses – in terms of supply and service – wherever possible, again underscoring its commitment to local communities and economies.

The impact of this can be seen in the way it managed during the Covid lockdowns. It is not therefore surprising that Scown was asked to speak at the Cooperative Business NZ Leaders Forum Grounded, Resilient, and Ready in May 2024.

Retail NZ

Mitre 10's chief marketing officer, Jules Lloyd-Jones, is vice-president of Retail NZ, the other professional body to which Mitre 10 belongs. One programme run by Retail NZ is 'ieRetail' – referred to as 'Retail DNA' – which it describes as: "An up-close online training series that focuses on the fundamentals of retail finance, profitability, and related performance metrics." 'Diversity' is another programme, intended to combat racial discrimination in the workplace.

Commitment

Mitre 10 has been a contributor to both of those programmes, demonstrating its commitment not just to its own teams but to the broader retail industry at large.

Its dedication to its team members – all 8000 of them throughout the country – was demonstrated during the Covid lockdowns, particularly the extended ones in Auckland, with Mitre 10's



Left: Helping Hands projects bring communities together. This one was a kitchen and tack-room reno for Timaru Riding for the Disabled

“The local Mitre 10 is often seen as an extension of the community”

chief people officer, Celena Harry, commenting on a work-life balance in a webinar for Retail NZ in 2022.

Harry talks about having brave conversations – ‘cup of tea’ moments – with a team member who may be distracted due to personal circumstances having an impact on their work performance. This can be a way of broaching a difficult topic in a non-threatening manner. Harry suggests that someone who needs support may not necessarily benefit from time out – for many, their workplace is their safe place, and support there may be far more beneficial.

Head of external communications Lisa Wilson explains, “Mitre 10 NZ has a structured well-being programme, including workshops to help leadership teams understand, manage, and promote well-being in the workplace. It holds an online speaker series available to all team members, featuring experts across a range of topics: motivational/inspirational, financial well-being, improving mental health, understanding menopause, and more.

“Stores also run their own local initiatives that reflect the needs of their team – for example, well-being

days off work, benefits at local health and well-being providers, and medical insurance cover.

“Well-being relies on having a sense of safety, which has become more challenging in recent years with increasing rates of violent and aggressive behaviour in retail stores. Retail crime is a key focus for Retail NZ, and Mitre 10 has worked closely with [it] on public campaigns and advocacy to raise it as a priority with government.

“Health and safety is Mitre 10’s highest priority, and it invests heavily to keep team members and customers safe. These [initiatives] include expertly facilitated workshops, scenario-based training, e-learning modules, and other tactics to help our teams keep themselves and customers safe.”

Sustainability practices

In a 2021 interview with former Cooperative Business NZ CEO Roz Henry, Mitre 10’s chief legal and property officer and executive sponsor for sustainability Grant Fraser commented that one strength of the cooperative model is in the communities that sustain it, as the local Mitre 10 is often seen as an extension of the community.

Cooperative Business NZ

In its report of the state of the New Zealand cooperative economy in 2021, Cooperative Business NZ stated that New Zealand is one of the most cooperative economies in the world.

The report continued that New Zealand’s top-30 cooperatives contribute 13 per cent of New Zealand’s gross domestic product (GDP) by revenue and employ 41,000 people.

In her Year in Review 2023/2024, CEO Saya Wahrlich stated that the percentage of GDP had increased to 18, reinforcing the growth aspect of the cooperative model. She went on to mention that the International Cooperative Alliance (ICA) has an estimated one billion members and three million co-op businesses worldwide.

She continued, “The 2023 World Co-op Monitor released in January by the ICA recognised five of New Zealand’s co-ops as being in the top 300 globally including; Fonterra, Zespri, Foodstuffs North Island, Foodstuffs South Island and Silver Fern Farms.”

Cooperative Business NZ operates under the Rochdale Principles, established in England in 1844 as a set of cooperative ideals and adopted by the ICA in 1937. The significance of cooperatives can be seen by the United Nations’ decision to declare 2025 as the International Year of Cooperatives (having also done so in 2012), thus recognising “the essential role cooperatives play in promoting sustainable development globally ... Cooperatives, known for their unique ability to balance economic success with social and environmental responsibility, are seen as key players in achieving the Sustainable Development Goals (SDGs).”

Cooperative Business NZ is currently working with Massey University to incorporate cooperative business models into its curriculum, with the result that Massey is now offering a postgraduate course in cooperative governance and management.

In a time that is seeing businesses pulling back from smaller communities, Mitre 10 remains proudly local, with local interests at the forefront.

Buy-in by all team members throughout the network is achieved by the Sustainability Champions programme, which looks to recognise local sustainability opportunities as much as implement Mitre 10's own initiatives.

In 2019, Mitre 10 formalised a sustainability programme that included an overarching policy and charter, with a four-pillar approach to its sustainability obligations. The following year, it introduced a sustainable packaging policy, requiring suppliers to use only the packaging that was absolutely necessary; that packaging must be refillable, home compostable, and/or fully recyclable in New Zealand. These changes must be achieved by 2025.

Awareness of waste

This isn't just about Mitre 10's own sustainability practices; it extends to helping suppliers and customers adopt the practices as a shift to living under a new awareness of waste and packaging management. The sustainability report, *Building for Better*, is published on Mitre 10's website.

Mitre 10's internal operations and practices have reduced waste by 39 per cent, while the recycling programmes for plastic garden pots, polystyrene packaging, light bulbs, and batteries



Multi-stream recycling units to help customers deal with packaging and end-of-life products like lightbulbs and batteries responsibly are being trialled in three stores

– none of which is accepted in council recycling – have resulted in the recycling of 25.1 tonnes of garden pots, 13,114m³ of polystyrene, 5.3 tonnes of light bulbs, and 3.9 tonnes of batteries in just 12 months.

“25.1 tonnes of garden pots, 13,114m³ of polystyrene, 5.3 tonnes of light bulbs, and 3.9 tonnes of batteries”

The polystyrene recycling is run in partnership with insulation manufacturer Expol, which repurposes it into new products. The programme operates in 30 stores, and last year alone recycled more than 13,000m² of material.

Construction and demolition waste is also a significant issue, creating about 50 per cent of all the waste produced in Aotearoa New Zealand. Mitre 10 is involved in industry partnerships looking to address the issue, including the introduction of reusable timber pack covers, which replace single-use plastic wrapping for weather protection; reusable cable ties; and low-carbon building materials such as cement. An example is Mitre 10 Glenfield, which has partnered with Naylor Love and Unitec in a trial to reduce packaging requirements right from the beginning.

Ethical practices

The cooperative works with hundreds of supply partners, local and international. These partnerships are subject to its Ethical and Responsible Sourcing Policy, which includes requirements around providing safe working conditions, respectful treatment of workers, sustainable sourcing, and acting fairly and ethically.

The policy is based on the labour standards established by the International Labour Organization, principles to protect and respect human rights set out by the United Nations,



The Pot Recycle programme is the first of its kind in New Zealand, a fully circular solution that operates in partnership with supplier Zealandia Horticulture



The extensive selection and quality brands of power tools at Mitre 10 MEGA stores are a real drawcard for both retail and trade customers

and the United Nations Sustainable Development Goals (SDG) and aims to promote sustainable practices.

This raises the issue of local versus imported products and materials. While high-profile international brand-name products will always be required, local will always be a priority. Scown states: “Mitre 10 New Zealand imports less than people think ... I think any business is open to a sustainable supply chain today. It makes sense to source locally, because the freight costs would certainly be lower, so if it was sustainable and reliable, all businesses will be open to that.”

A good example of this is timber, for which Mitre 10 requires a sustainability and ethical provenance, in line with a formal policy around legal and responsible sourcing and forest management; the recognition of third-party certifications for imported timber or wood finished goods; and zero tolerance for illegally harvested, sawn, or traded timber.

Retail and online differences

Mitre 10’s website was launched in 1998, and, in 2015, a full online store was set up, offering both click and collect and home delivery.

What made this a particularly astute move was the decision to deliver from the locally selected store as opposed to a central warehouse and distribution centre. This meant that the online shop was supporting rather than competing with the local store. There was a huge increase in online shopping during the Covid lockdowns, which gradually declined as the restrictions were lifted. While online shopping is still popular, the preference is for the

personal shopping experience, with its opportunity to browse, get advice, or just buy a coffee at a Columbus café, when one is available.

Brand awareness and trust

In the Corporation Reputation Index 2023, released by marketing data and analytics company Kantar Insights New Zealand, consumers rated Mitre 10 second only to Air New Zealand, up from third place the previous year, commenting, “Mitre 10, the home improvement retailer, has emerged as a formidable contender to Air New Zealand’s top spot.”

Mitre 10 secured second place in Trust (111) and Responsibility (107), garnering accolades for its honesty, ethics, and commitment to treating employees well.

Scown attributed the exceptional

ranking to the mahi of Mitre 10’s 8000-strong team across the country: “As a Kiwi cooperative, we’ve been doing business and earning trust in every corner of New Zealand for nearly 50 years, and some of our stores have been serving their local communities for many generations more. We’re absolutely committed to operating ethically and responsibly, and to the well-being of our people and communities. As a result, our team members go above and beyond, delivering great experiences for our customers.”

Reader’s Digest, now 102 years old, has listed Mitre 10 as second in its 2024 Trusted Brands Awards, with only Whittaker’s ahead.

Contribution to the New Zealand economy

In 2010, Mitre 10 acquired full ownership of its brand names, its final severance from its Australian namesake. This resulted from the sale of the controlling share of Mitre 10 (Aust) to Metcash – which has since gone on to acquire full ownership.

Then-chairman of Mitre 10 New Zealand Martin Dippie commented, “We’re very pleased to now have full ownership of the Mitre 10 brands for New Zealand. This will ensure Mitre 10 New Zealand remains in control of its

“Zero tolerance for illegally harvested, sawn, or traded timber”



Mitre 10 worked with Naylor Love, Unitec, and the Auckland Council to trial reusable timber pack covers, reducing single-use plastic timber wrap on sites



own destiny now and in the future.”

Mitre 10 New Zealand is a privately owned company and files financial statements with the Companies Office, but member businesses are not included, due to their being independently owned and operated. Having said that, some group numbers are published in Mitre 10’s sustainability report.

Lisa Wilson says, “As a network, Mitre 10 invested over \$4M in supporting Kiwi communities in the financial year to 30 June 2023, and over 1300 groups used our store BBQs for fundraising. We work with over 500 New Zealand-based suppliers, and we support tens of thousands of trade customers, mostly small to medium residential builders and sub-trades, all over the country.”

Community contribution and sponsorship

For the 10th anniversary of Mitre 10 MEGA Nelson, its CEO, Brandon Beveridge, suggested what became known as the ‘10+10+10 plan’, in which 10 community projects were offered 10 volunteers for 10 hours. The programme was so successful that 10 projects soon became many more, and the name was eventually changed to ‘Helping Hands’.

The programme was soon picked up by other branches, and, by 2020, it was formalised as part of Mitre 10’s ongoing contribution to its respective communities. One such initiative is its Project Playgrounds, which aims to establish meaningful play spaces across Aotearoa and encourage more physical activity and creative play among Kiwi kids. In 2021 alone, 550 schools applied for these – almost half the number of primary schools in the country. Kiwi

kids at 13 primary schools so far are playing on Mitre 10 Project Playgrounds.

Other projects include Trees That Count, in which more than 37,500 native trees were planted by 52 different planting groups; the sponsorship of champion rally driver Hayden Paddon, whose team developed a Hyundai Kona as the world’s first electric rally car; and a 30-year partnership with the Neurological Foundation, for

“In 2005, Mitre 10 teamed up with DOC to support the Takahē Recovery Programme”

research into disorders of the brain and nervous system, in which it organised educational activities such as in-house My Amazing Brain workshops.

Teaming up with DOC

In 2005, Mitre 10 teamed up with the Department of Conservation (DOC) to support the Takahē Recovery Programme, initially contributing \$50K a year to assist the Burwood captive rearing unit.

The donation was increased to \$70K in 2008 and expanded to include such diverse recipients as the Fiordland Tramping and Outdoor Recreation Club, which checked traps in the Takahē Special Area in the Murchison Mountains, and the Takahē Rescue National Kids Art Competition, in which schools held short story writing competitions. Mitre 10 has also worked with Treaty partner Ngāi Tahu and national partner Fulton Hogan in the maintenance of the takahē sanctuaries.

Other programmes include sponsorship of the Community of the Year Ngā Pou Whirinaki o te Tau Award in the Kiwibank New Zealander of the Year Awards and the Graeme Dingle Foundation’s community teams, which plant trees, paint refurbished projects, build walkways, and fence community gardens and kai pantries, all around the concept of giving back to their respective communities. ►

The work of the Takahē Recovery Programme



DIY training

In 2012, Mitre 10 launched its Easy As guides and advice programme, and along with that came the larger-than-life Stan Scott.

A carpenter with 18 years' experience in the trade, Stan – who has also contributed to *The Shed* as a writer, and featured in our 100th edition – championed the need to learn how to use tools properly before beginning a project. This meant not only respecting the tool and learning about its care and maintenance, but also using it for the right purpose in the right manner. Stan addresses polytech students, and operates in conjunction with Te Pūkenga – New Zealand Institute of Skills and Technology. Sound practice is always at the forefront of his videos, as he keeps up to date with industry standards and methods.

Stan has also been involved in many of the Helping Hands projects, particularly in relation to primary school playgrounds and bigger building projects such as the community room at the recently opened Southland

Charity Hospital. He has an interest in classic cars too. At this point, I take my *The Shed* hat off and replace it with the hat of its stable-mate *New Zealand Classic Car*, as he tells me about his 1928 Model T Ford, which he found in a barn 35 years ago.

“I’m glad that I heard that radio announcement all those years ago, as, 50 years on, Mitre 10 is as iconic as Phar Lap, Split Enz, and the haka”

Mitre 10 Trade sponsors champion Kiwi rally driver Hayden Paddon and co-driver John Kennard, seen here at the 2023 International Rally of Whangarei (photo: Tayler Burke)



Conclusion

In part one, I concluded with comments around Mitre 10's cornerstone as our leading contributor to DIY and community support. This article reveals the seriousness with which it takes its corporate responsibilities. That is reflected in its involvement with professional bodies, industry partnerships and training programmes, and sustainability – not only around building practices and responsible waste recycling and disposal but also in terms of what makes us special as Kiwis going forward in 21st-century Aotearoa New Zealand.

The sponsorship of Hayden Paddon and his Hyundai Kona electric rally car, the community category in Kiwibank's New Zealander of the Year Awards, the focus on the next generation of both customers and store owners, and its role in the bigger areas of cooperative business are examples that establish Mitre 10 as an integral part of our culture. I'm glad that I heard that radio announcement all those years ago, as, 50 years on, Mitre 10 is as iconic as Phar Lap, Split Enz, and the haka. It has covered a lot of ground – both metaphorically and practically – during that time, and I look forward to seeing at least some of its involvement in the next 50 as it continues its nationally based yet locally focused contribution to the social and economic well-being of our unique, inspirational, and innovative culture. 🏠

Easy As and Helping Hands legend Stan Scott



MITRE 10

**Here's to 50 years
of pretty awesome
customers.**



50 YEARS

WITH YOU ALL THE WAY

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CODING FOR BEGINNERS

LEARNING THE LINGO, WHERE TO START, AND WHAT TO BUY

Keen to dip your toes into the mysterious world of coding but bamboozled by the volume of information on the internet? This series is for you

By Mark Beckett

Photographs: Mark Beckett

Back in Issue No. 44, August/September 2012, *The Shed* magazine began a series of articles on Arduino, with an introduction to coding.

Feedback since then suggests that these articles were very useful, and introduced readers to a whole new field. Those back issues are no longer

available; however, the articles have been added to *The Shed* website: <https://the-shed.nz/2018-5-2-arduino-101-getting-started/>.

This new series of articles is intended to enhance that series and cover some other aspects that hopefully will be useful to readers and anyone wanting to dip their toes into the subject.

“This new series of articles is intended to enhance that series”

Analogue brick sensor



“I end up
getting confused
and frustrated
– so you’re not
alone”

Why bother when the internet is there? That is a reasonable and valid question. The simple answer is that there is too much information. While some examples are well written and well explained, a large number aren’t – or, worse, cause confusion and frustration.

If it’s any help: when I’m being lazy and seeking a shortcut from the internet, instead of sitting down and writing the code, I end up getting confused and frustrated – so you’re not alone.

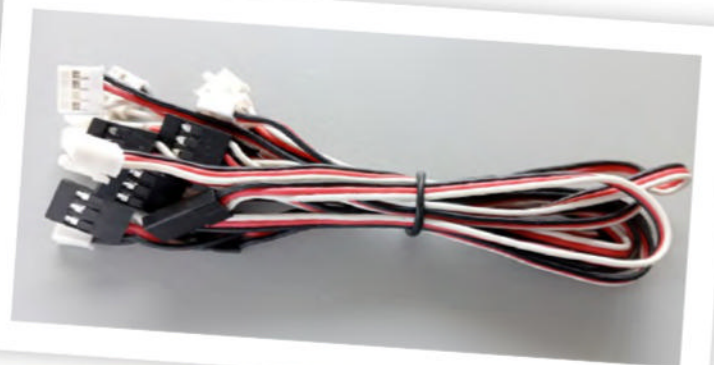
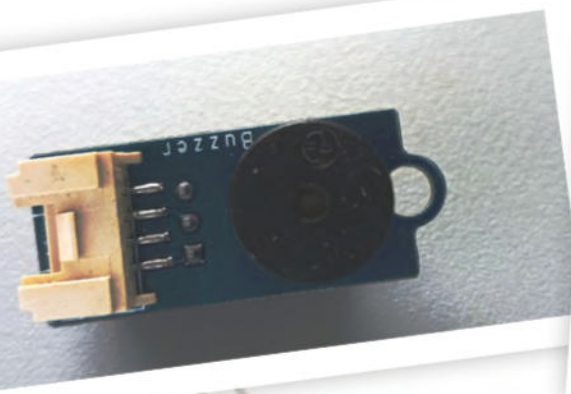
Recap

Back in 2005, Arduino was developed by Massimo Banzi, David Cuartielles,

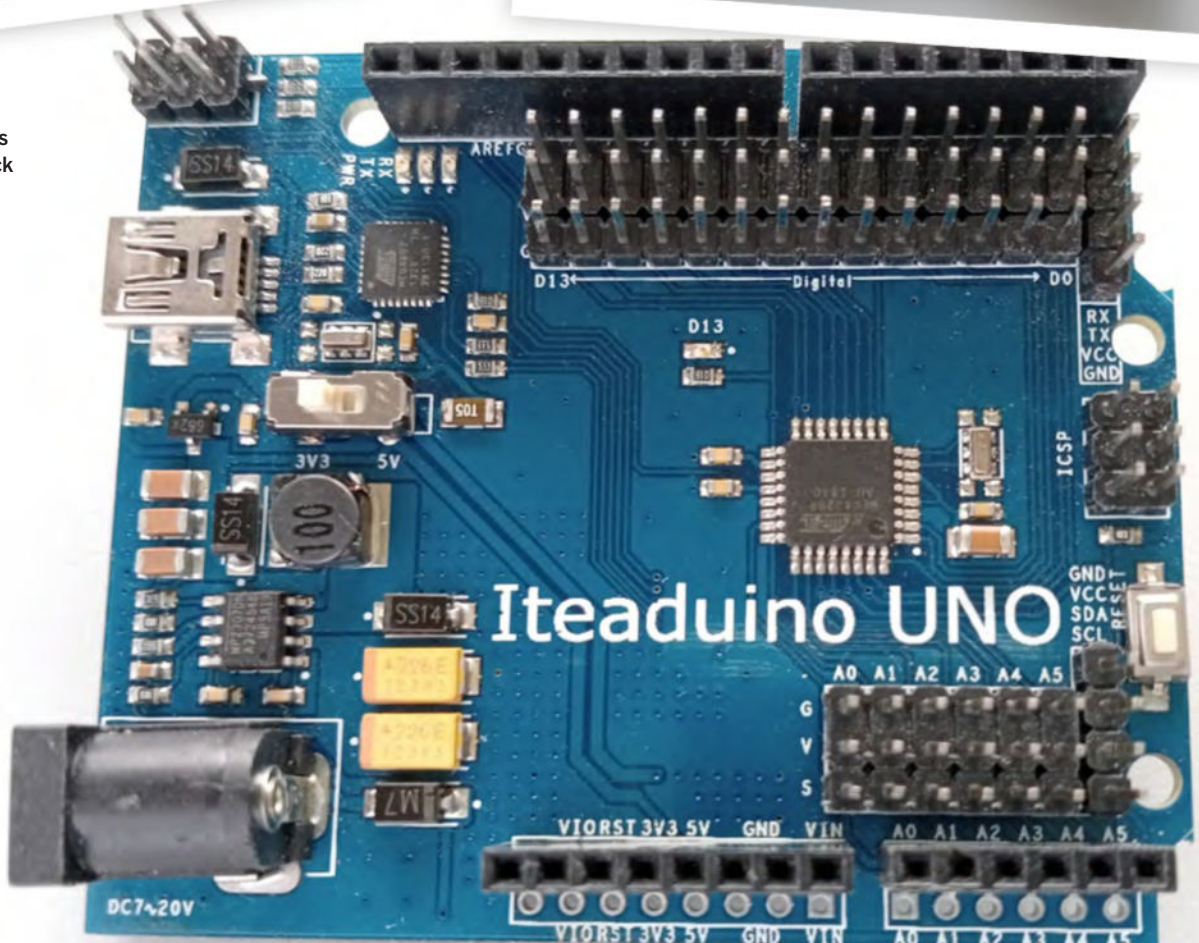
Tom Igoe, and Gianluca Martino to aid with coding. They wanted a device that was simple, easy to connect to various things (such as relays, motors, and sensors), and easy to program. It also needed to be inexpensive, as students and artists aren’t known for having lots of spare cash.

They selected the AVR family of 8-bit microcontroller (MCU or μC) devices from Atmel and designed a self-contained circuit board with easy-to-use connections, wrote boot-loader firmware for the MCU, and packaged it all into a simple integrated development environment (IDE) that used programs called ‘sketches’. The result was the Arduino. ►

Below: Buzzer brick sensor (left) and leads (right) for connecting between brick sensor and UNO



Arduino UNO
with extra pins
used with brick
sensors



“Arduinos can be used for simple input and output control through to automated control systems”

Arduino arrives in 2007

The first official Arduino boards were the Diecimila and LilyPad in 2007, followed by the Duemilanove, Mini, and Nano in 2008, and the UNO in 2010.

While the UNO-style hardware is still applicable, there are many more devices available – all thanks to open-source licensing. The Arduino IDE has been expanded to allow programming of many other boards: ATtiny85, ESP8266, and ESP32 are a few.

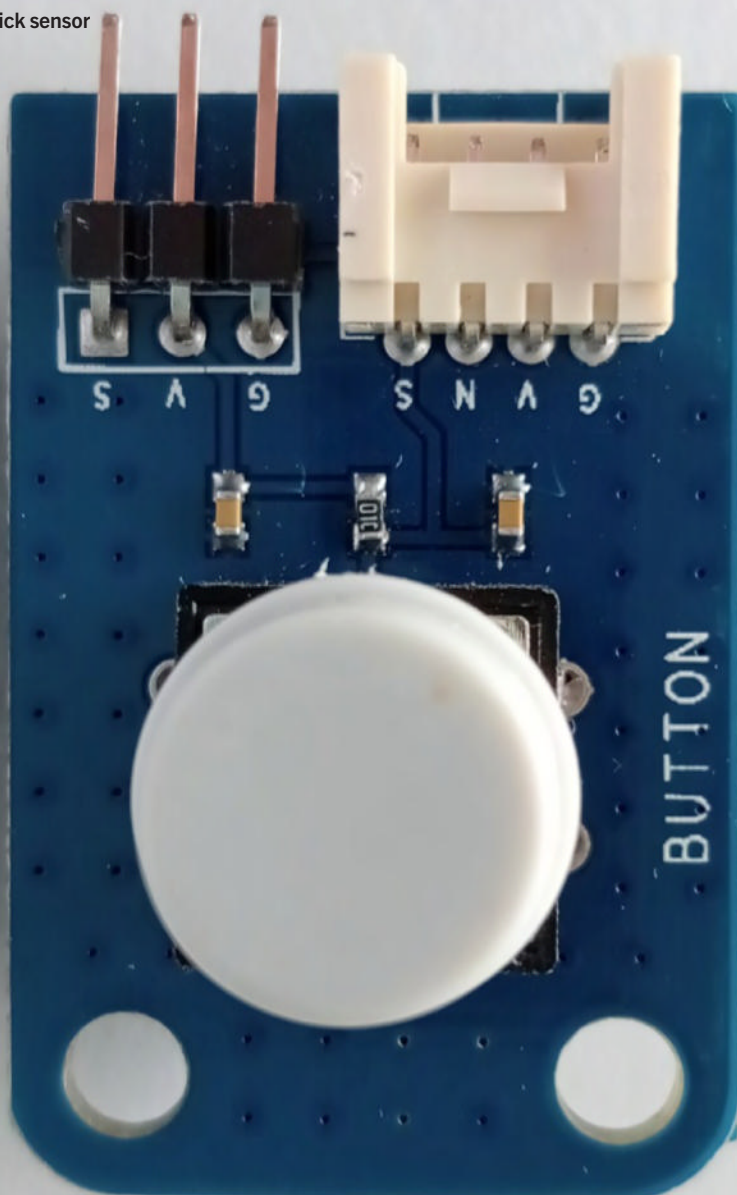
The libraries have expanded to talk with a large range of hardware, including emulating devices that communicate with Alexa or other virtual assistants.

Arduinos can be used for simple input and output control through to automated control systems. These are referred to as ‘machine to machine’ (M2M), with a simple example being one or more temperature sensors communicating via an Arduino (or ESPxx device) to control a heating or cooling device. Once set/programmed, the process doesn’t require human intervention. This is different from the average thermostat switch on the wall connected directly with a heating or cooling system.

Open source

One of the important features that make Arduino popular is open source of the hardware and software. This means that

Button brick sensor



Inputs

A quick note here about inputs, push-buttons, and detecting a high or low when the button is pressed.

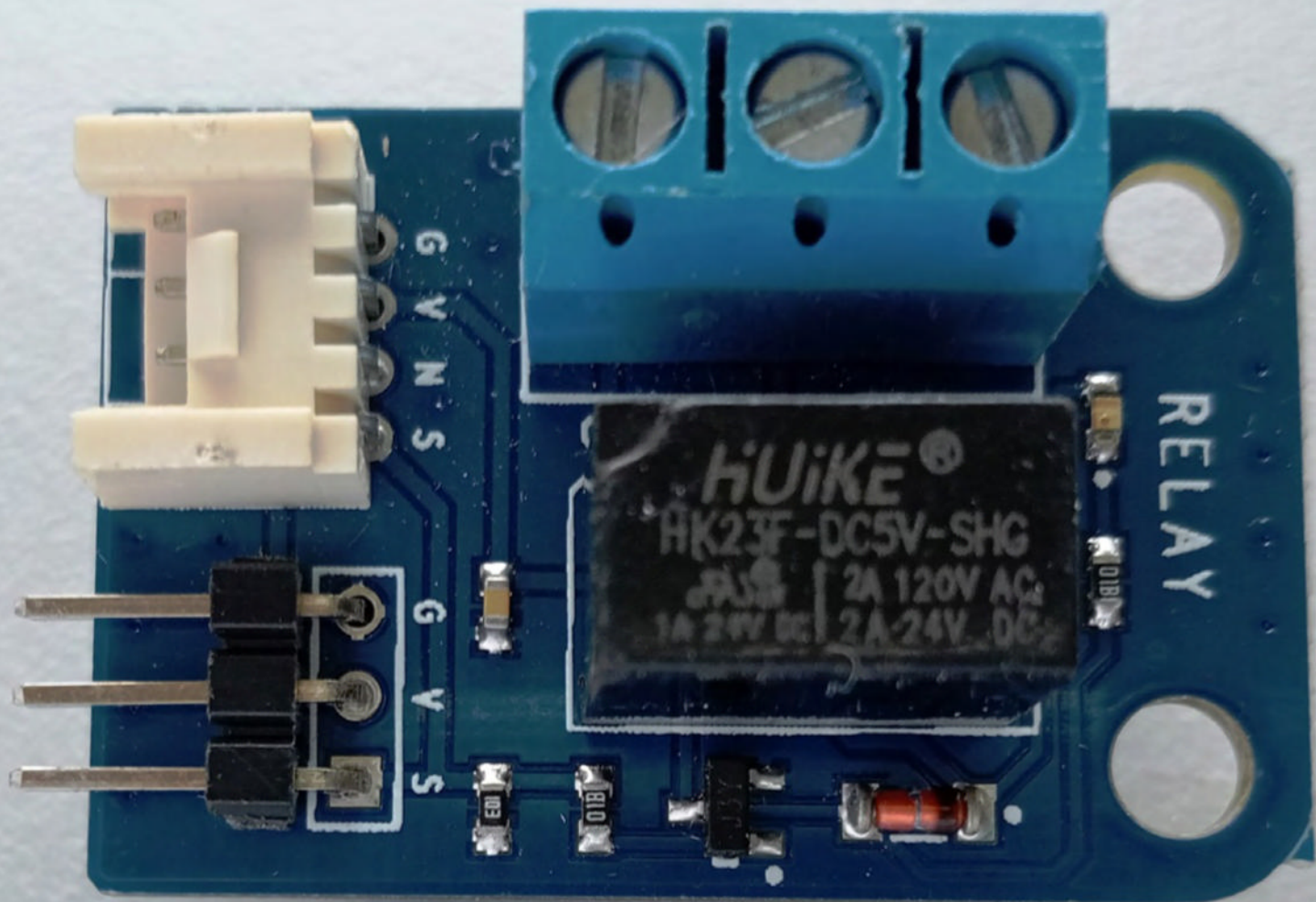
Many circuit examples feed 5V to one terminal on the push-button and then connect the other terminal to the input pin. The alternative is to connect one terminal to ground and the other terminal to the input pin.

Arduino does not have an internal pull-down resistor, so the input can float when the button is not pressed. To combat this, you need to add a resistor to ground.

The alternative method uses the internal pull-up resistor and saves adding components and floating inputs.

I prefer the switch-to-ground configuration. This method is the same if you interface to many other devices that have an ‘open collector’, and also means that you can never accidentally short out the 5V line.

When you use the switch to ground, you need to be mindful that the ‘On’ state is when the input is low, so be aware of this in the code examples. (There will be a comment.)



Relay (5V) brick sensor

the user community can contribute and provide additional features (libraries). Usefulness, popularity, and relevance continue well beyond the life of the company that produced the item.

Some governments have recognised the benefits in using open source, particularly when the software provider insists that it won't support the current version, which means the operating system needs updating and usually the hardware does as well.

The rationale for open source is that documentation can still be viewed in 20, 30, 40, or 50 years, while still being in an electronic form.

Releasing the hardware design as open source means that hardware manufacturers can duplicate the design with an enhancement. This has led to some very interesting and useful variations, all integrating with pre-existing add-on boards (shields) and using common libraries.

Arduino 102 series

The intention of the Arduino 102 series is to introduce features that can be used in your code. If you're just starting out, best read the original articles on our *The Shed* website – simply search 'Arduino 101'.

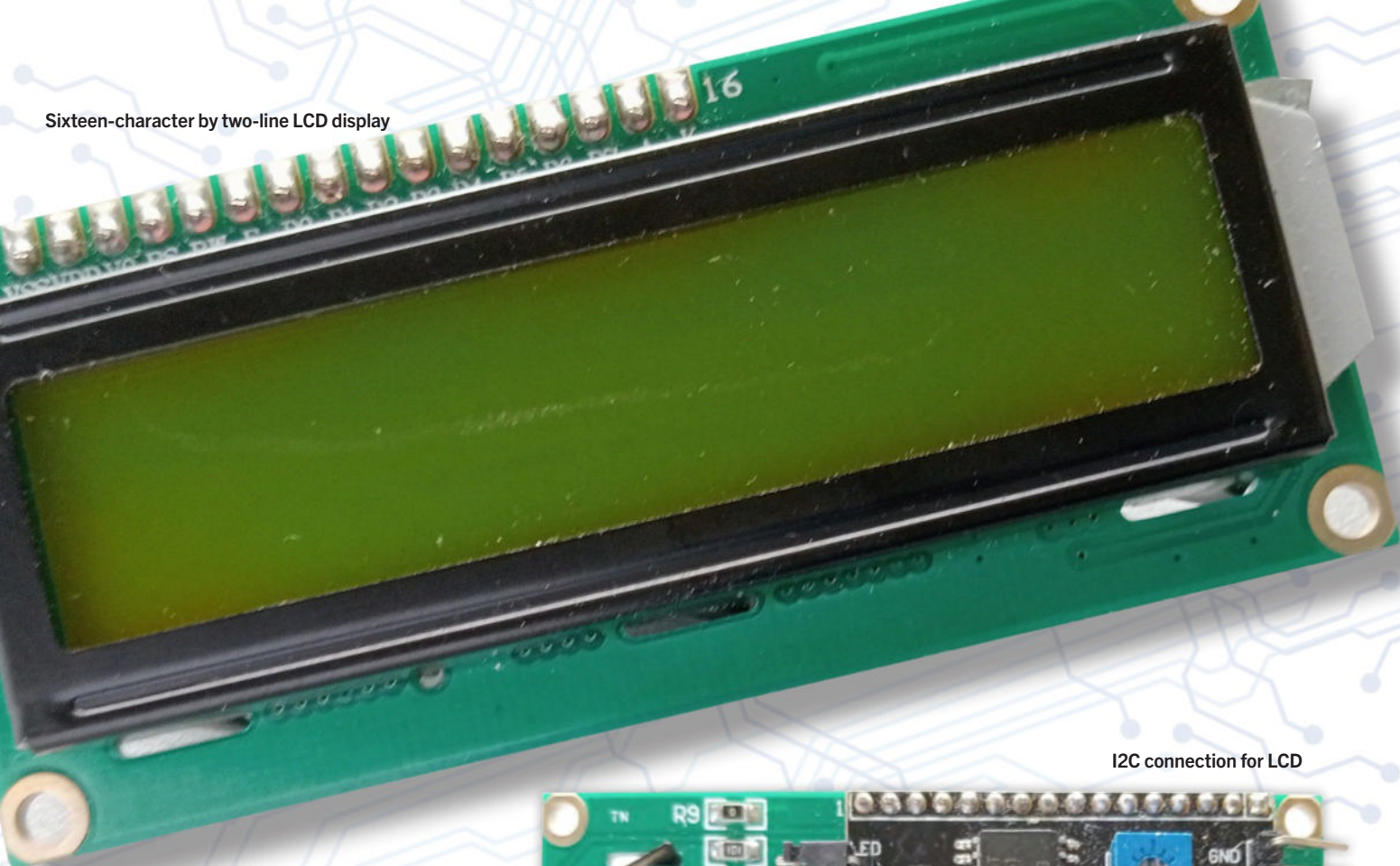
The aim of each article in this series is to explain the process: what we're trying to achieve and how it can be used in multiple different ways in your own code.

We will talk about it, compare it to real-world examples, and provide the code (to save typing mistakes and reduce magazine space).

Unlike many examples on the internet (and even the IDE), I'll be using a set of common variables and names, meaning that you can cut and paste between sketches. There will be lots of comments so that the reader/user can follow what each bit is doing (or meant to do). In case you're wondering, the comments are not compiled so take up no space in the running code. ►

“We will talk about it, compare it to real-world examples, and provide the code”

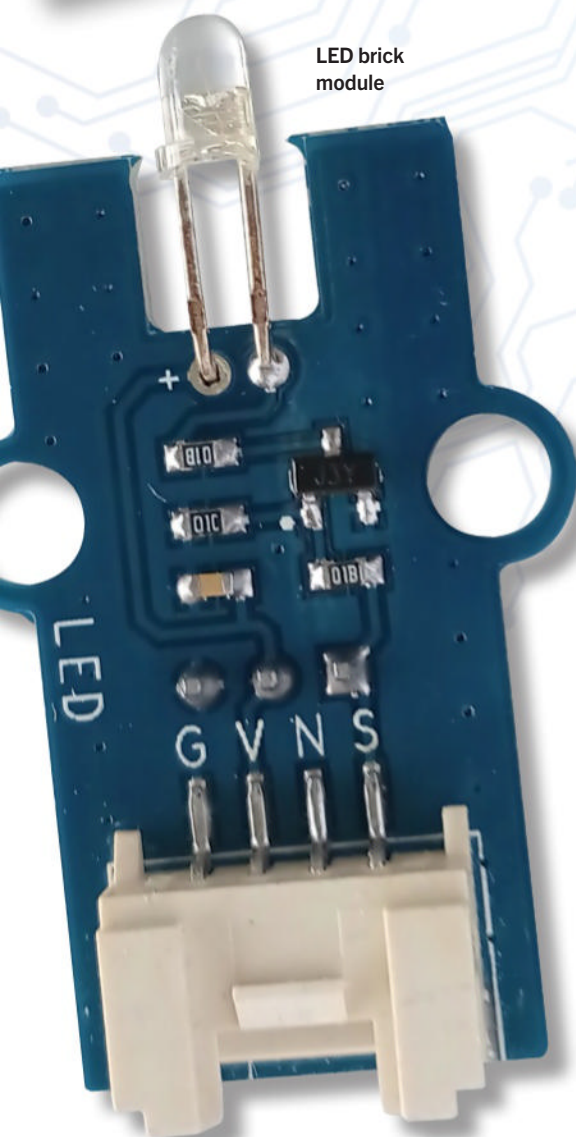
Sixteen-character by two-line LCD display



I2C connection for LCD



LED brick module



Topics to be covered

Time: We will discuss using the `millis()` feature and how useful time can be in your code. We'll use it to provide debounce and other uses for a switch.

Inputs: It's possible to detect and respond to multiple inputs, but the code is important. How you process the result can affect what happens when one switch/input changes first.

Outputs: An output is just an output – but is it? Some have other features; pulse width modulation to reduce the output is just one option.

Displays: We will discuss the options to provide an indication to the user. LED, Neopixel, and LCD are a few, but the key is not to overwhelm or confuse the end user.

I2C: What is it and how do we use it? This is something that has its roots in history but is still in use today.

Error code: Having software that can handle an error is important, but indicating the error is even better. If you read a manual, you'll see that every modern appliance has error codes that can be useful.

Analogue: I'll show how you can use analogue for a number of buttons using only two wires. The pitfalls and issues of using it need to be understood to ensure that the data are valid.

Arrays: These can be scary but incredibly useful. A calendar is one example of an array, but we'll talk about more useful examples and how easy they are to use.

Libraries: We'll cover the use and the pitfalls/traps of using these. Libraries provide many of the inner workings when communicating with sensors and other peripherals, but can consume large amounts of code space.

Starter kits

What about starter kits? Where do you get them, what type do you get, and what is a good buy? Personally, I prefer the 'brick'-style modules that have a three- or four-pin connection and plug into the board. The original source that I use (Itead Studio) no longer makes them, but there are some alternatives.

Most sensor kits have a large number of sensors, but the reality is that you don't need them. My suggestion is an Arduino UNO, two LEDs, two push-buttons, a 5V relay, an analogue sensor, a buzzer, and an I2C LCD. This will cover 90 per cent of all your programming needs, and you can pick up other bits if/when you need them.

My current favourite source is Elecrow (www.elecrow.com/crowtail.html); a quick check showed it is \$55 delivered. Trade Me also has some, so have a look around.

Some kits still offer a breadboard and components. I started out with breadboards, whereby you add the component and wires to it and back to the board. However, it became a pain and led to confusion when a wire fell out. It's not easy to learn both electronics and programming, so, for development, I use the 'brick'-style sensors and only when I really have to will I drag out the breadboard.

Sit back, learn, enjoy, and watch this space as this new series runs. 

“What about starter kits? Where do you get them, what type do you get, and what is a good buy?”

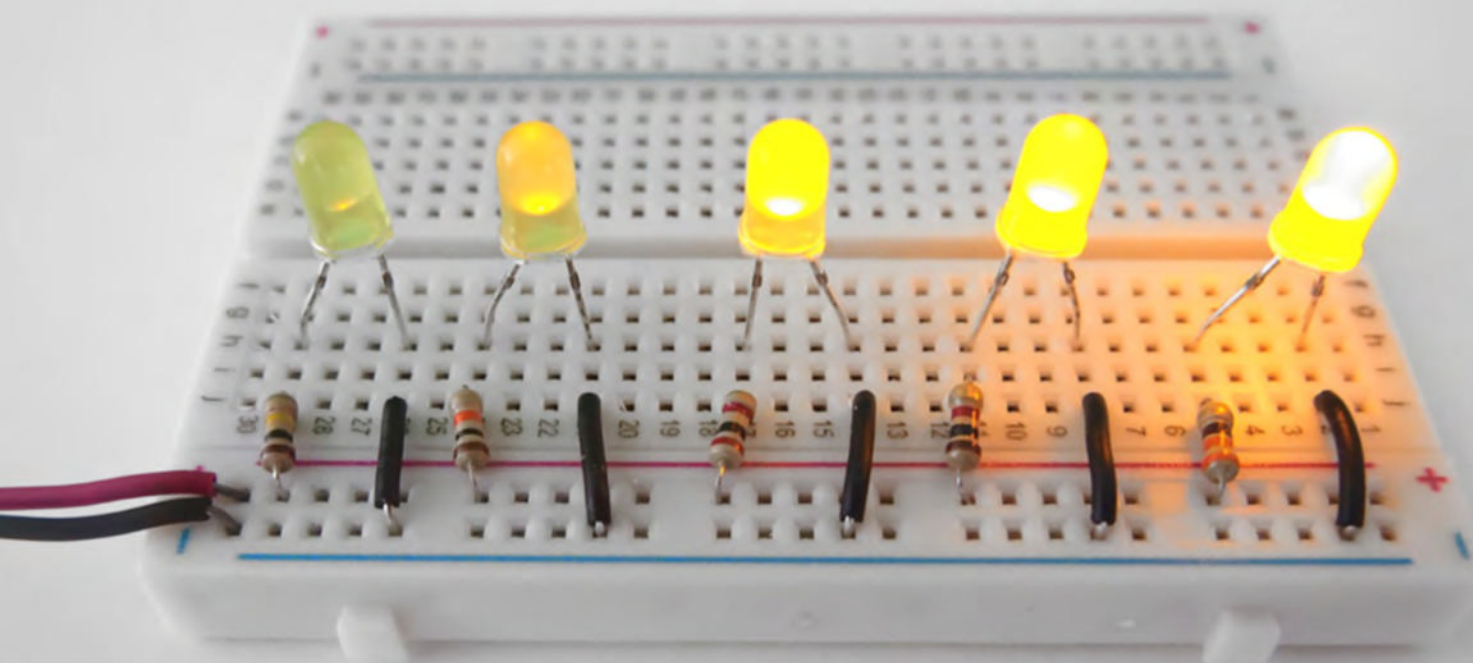
LEDs

There are many examples out there that connect an LED directly to an output pin without a resistor. This is a big no-no, as it relies on the internal circuitry to limit the current and causes both excessive current to be drawn and extra heat in the MCU. Always use a 470Ω resistor to limit the current through the LED.

($I = V/R$ 5V output – 1.25 LED = $3.75V/470 = 0.0079A$) or 8mA.

Here's a good demonstration of LED brightness with different value series resistors:
www.gsnetwork.com/led-resistor-values-for-current-limiting-resistor/

100K 10K 2K 1K 330



Course tutor Craig Erickson
welcomes entry-level course
members to the Ara

ARA'S DIY MOTOR BODY RESTORATION CLASS

Just to the east of Christchurch's core is a facility where enthusiasts frequently spend many years learning and perfecting their craft, giving the lie to the claim that the last car to be restored in New Zealand has already been restored

By Ritchie Wilson

Photographs: Ritchie Wilson



Long-time course attendee Peter has a passion for small cars

“Some pupils drive up from Oamaru and Timaru; another pupil flies down from Auckland for the afternoon sessions”

For more than 20 years, panel-beating teacher Craig Erickson has run a Saturday class at Ara Institute of Canterbury (formerly a polytechnic) for folk wanting to learn how to repair classic car bodies.

The not-inexpensive course is split into three 16-week modules of 60 hours each: entry-level panel beating, steel panel fabrication (both run on Saturday mornings), and aluminium panel fabrication (run on Saturday afternoons).

In practice, the third module has the students working on their own projects and can be repeated indefinitely, until either the project is completed or the student gets too old to swing a hammer.

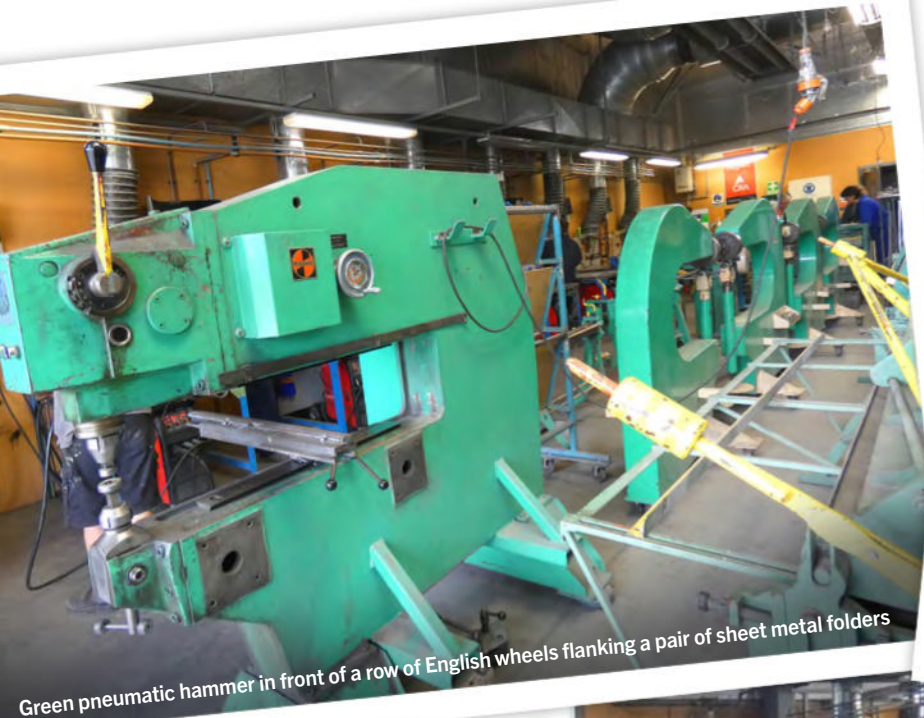
The classes attract men and women

with a range of ages, occupations, and some considerable variety of place of residence – some pupils drive up from Oamaru and Timaru; another pupil flies down from Auckland for the afternoon sessions.

Solid training

Craig served his time as an apprentice panel beater at Christchurch’s Midland Panel Works. This was a large operation, with almost 100 staff. It was an excellent place to learn the trade because, as well as the Midland Coachlines’ bus fleet, they worked on Hertz rental cars and on customising camper vans. The work was varied and had to be carried out to a high standard.

After completing his apprenticeship,



Green pneumatic hammer in front of a row of English wheels flanking a pair of sheet metal folders



Welding stations with their fume-removal pipes



Chris working on the front wheel well of a Datsun Sunny. He owns four, but wouldn't say no to another one

Craig went to work for David Crow Cars, preparing cars for sale. David, a well-known driver in saloon car races around New Zealand, had a collection of Rootes Group cars – Sunbeam Alpines, Tigers, Singer Gazelles – which Craig also worked on.

Varied career

In 1984, Craig was hired by the polytech as a part-time tutor. The following year, he became full time. Then, in 1990, he was made redundant. Six months later, he was rehired to teach car restoration classes part time.

In 1992, he established his own car restoration business, Erickson Vehicle Restoration (EVR), eventually moving to a large rural shed in the north of the city.

At its height, EVR employed five staff and did work for locals as well as for customers from Australia and Japan. Craig continued to do work for David Crow and also worked on a lot of cars belonging to manufacturer and property owner Brian Black. Brian would sometimes bring a bare chassis and some old photographs to EVR and Craig would make the car's body from scratch, working from the photographs. The proportions of the bodies were estimated from the known wheel sizes.

Craig also accepted commissions to make car and tractor parts, such as brass radiators and headlamps. He is of the firm opinion that if a component has been made in the past then it can be made today.

“He is easy to believe when he says that he has a passion for car restoration”



Craig Erickson introducing entry-level students to the art of panel beating



Highly respected course tutor Craig Erickson

“One said that Craig was the best teacher he had ever had; another that the course had ‘changed my life’”

A challenging industry

The financial side of a restoration business is challenging; costs can be very variable, dependent on things such as the extent of hidden corrosion. Over the years, Craig suffered a few large bad debts. Retaining experienced and skilled staff was also a recurring problem, which he found wearying, so he gradually wound the business down. He finally stopped doing work for customers after the Christchurch earthquakes.

He continues to work on his own vehicles. His current project is a Singer Le Mans two-seater sports model from the 1930s. These are particularly interesting cars because their features of cut-away doors, slab petrol tank-mounted spare wheels, and large-diameter wire wheels set a fashion for

competition cars. The iconic MG TC is very similar in appearance, as are the Austin Seven ‘Grasshoppers’ that competed at Le Mans in 1935.

Cars awaiting Craig’s attention include Beans, Hudsons, a MkII Jaguar, and a Clément-Bayard. He is easy to believe when he says that he has a passion for car restoration.

The ‘Saturday Club’

I spent a couple of Saturdays at the class and spoke to many of the attendees. They had several things in common: they were all very pleasant and interesting to chat to, and they were often very complimentary about Craig Erickson. One said that Craig was the best teacher he had ever had; another that the course had “changed my life”. ►

Perfection is the aim





Jamie has a natural skill for TIG welding



Another happy course member

Some of the cast

Peter

Peter is a fireman and has been attending the Saturday afternoon class for, he thinks, 23 years – since before the polytech trade classes moved to the Sullivan Avenue campus.

He has just about finished restoring a Mini Moke, which required the replacement of multiple rusted-out panels. He has completed the separate paint course at Ara and has painted the Moke in a Resene special blue. He also has a Mini LE and a Fiat 600.

Peter's wife Andrea has a Citroën 2CV. He says that he likes small cars because he has a limited amount of room to store them. He has just bought an 850cc 1964 Hillman Imp – again, not a large car – which has a surprisingly small amount of rust for a car of its age. He has already made patch pieces for some of the worst spots.

The Imp is a collectable car because it has an engine copied from the

Coventry Climax unit, which has such an outstanding racing pedigree. He regards the DIY panel-beating course as good value; he appreciates the comprehensive equipment to which the restorers have access and, especially, being able to draw on Craig's advice and experience.

Jamie

Jamie is a young woman who is much admired by the other restorers because of her talent for TIG welding, which she mastered after little practice. Most people take time to become proficient in a manual skill – some never get beyond being barely competent – but some are gifted with such superior hand-eye coordination, concentration, and insight that they can produce excellent work with little experience.

'It's in the blood!' people will sometimes say, suggesting that the skill is inherited, that it runs in the family.

It's humbling to see.

"Jamie is a young woman who is much admired by the other restorers because of her talent for TIG welding"



Peter has fabricated a closely fitting replacement section for the 1964 Hillman Imp



Craig Erickson demonstrating a bending machine



Mike and son Jack with the repaired petrol-diesel tank from an IH WD-40 tractor



Zuck taking a break from working on the windscreen opening of a large Mercedes



Dr Bill sanding undercoat on the Singer's body

Zuck

Zuck used to work in an office but is now a builder, working on straw-bale houses and suchlike. He made a point of telling me how much he enjoys the classes, which he has been attending for eight years, and also what a great teacher Craig is.

Like most of the Saturday afternoon restorers, Zuck is accumulating panel-beating gear. He showed me the tiny pneumatic grinder and the small pneumatic belt sanders that he had brought along to use on the Mercedes-Benz station wagon that he is working on. He also bought an old MIG welder from the polytech when Ara replaced it with a more up-to-date unit.

Zuck has owned three Volkswagens, including a Golf GTI MkII.

Ian

Ian says that he is a panel-beating beginner. He is a retired commercial pilot and has definite ideas about living up to one's potential, especially in the acquisition of manual skills, in which panel beating is particularly rich. He owns a Citroën Traction Avant.

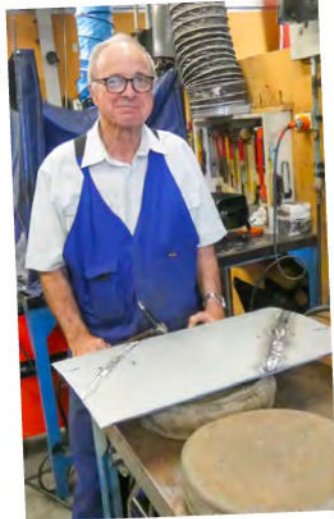
Ian thinks that the Ara course is a "gem which needs to shine".

Andy

Andy has a great admiration for Maserati cars. He is currently restoring a 1996 Ghibli GT, fabricating support panels for the car's bonnet, the originals having rusted away.

He works on jet airliners in his day job and has been attending the Ara classes since 2009. ►

"Like most of the Saturday afternoon restorers, Zuck is accumulating panel-beating gear"



Rich

Rich used to be a landscape gardener in Berlin and a builder in Australia before returning to New Zealand when his mother became ill. He now lives in Timaru and has been doing the Ara course for four years, driving the 100km north each Saturday.

Rich likes German cars, and owns a 1973 Porsche 911 RSR replica, a BMW, and a 914/6 GT Le Mans replica.

He says that he “can’t talk highly enough” about the course.

Hugh

Hugh is a pupil at a local high school and has just started the entry-level panel-beating course. His father is a graduate of the course.

Hugh owns a Triumph Herald (the type with the removable roof), which, he says, is in “OK condition”.

Chris

Chris has been doing the course for six years. He is working on a 1978 A14 Datsun Sunny, one of four he owns. His

is one of the round-headlight versions. He used to race a speedway car, which used Sunny components, and that gave him an appreciation of the marque.

There are very few of these cars left; they were produced for only four years, between 1978 and 1982. They are long gone from wrecking yards, and new parts have been unavailable for many years.

Chris admits that he would buy another Sunny if he saw one for sale.

Dr Bill

Dr Bill is a retired doctor who has owned sports cars in the past and is currently working on an aluminium-bodied 1951 Singer sports. The model is variously known as a ‘Singer AB’, a ‘1500 Roadster’, and an ‘SM Roadster’.

Nothing lasts forever, and even aluminium bodies are no exception, so Bill has had to do quite a lot of tricky welding to make good the patches of corrosion in the body’s aluminium alloy. He has reached the painting stage, and at present the body is clad in undercoat.

The IH diesel

Diesel engines are more efficient than petrol engines, largely because of their higher compression ratios. The other side of this particular coin is that diesels have to be more robustly constructed – so are heavier – and they are much harder to turn over while starting, especially by hand. Today, with large and fairly durable batteries, powerful starter motors, and glow plugs to warm the cylinders, this isn’t a major problem.

In the past, various other solutions were tried. One seen on IH’s TD and WD range of diesels was to start the motor on petrol before pushing a lever that switched the fuel from gas to diesel.

The thoughtful *Shed* reader will have spotted a couple of problems with this scheme. First, the compression ratio of a diesel is so high that there would be problematic pre-ignition (or ‘pinking’) when the engine was running on petrol, and, secondly, the spark plugs would suffer when exposed to diesel fuel.

Both these problems were addressed by having spaces cast in the engine’s head. When the motor was running on petrol, these would be opened, becoming part of each combustion chamber.

The extra volume lowered the compression ratio and, as they were in the spaces, the spark plugs were shut off from the diesel fuel because the spaces were isolated when the engine was running on diesel.

It isn’t surprising that this complicated set-up isn’t seen today, as it required a carburettor, an ignition system, and an extra fuel tank (for the petrol) – as well as the extra spaces and their valves – all of which modern diesels don’t need. The complex head-casting of the dual-fuel engine is also thought to be weaker and more prone to cracking.



Craig Erickson giving instructions to entry-level students



Craig and Mike consult the factory specifications for the Charger's body

Mike

Mike works in the transport industry and is restoring a Bedford TK truck, a Valiant Charger, and an International Harvester (IH) WD-40 tractor. The 'W' indicates that it is wheeled; the 'D' that it is diesel powered.

That isn't quite the whole story, because the WD-40 is a dual-fuel machine that runs on both petrol and diesel. Two different fuels means that it has two different fuel tanks – one for petrol, the other for diesel.

Unfortunately, the IH designers decided to house the smaller petrol tank inside the larger diesel one. A consequence of this is that, if the petrol tank corrodes – as they tend to do over the decades – repairing it requires the diesel tank to be opened up, a task that would give anyone pause.

Mike and his son Jack, who is also doing the course, took out one end of the diesel tank; removed, remade, and replaced the petrol tank; and reinstalled the diesel tank's end.

Seeing the finished tank, it is hard to imagine that it has been in pieces. The



Craig and a Saturday Club member discuss progress in removing a crease in the skin of a MkII Jaguar door

tank's original spot welds have been imitated with TIG welding.

For a long time, Mike has owned a Valiant Charger that, early in its life, sustained major damage to its front end. At the time, unrepairable panels were

replaced with new ones from the factory. Mike is now in the process of measuring up the body so that it can be adjusted to meet the original factory specifications, after which the body will be painted and the running gear installed. ►

So, where is car restoration going?

Someone recently said to me that, in their opinion, the last car to be restored in New Zealand had already been restored. Meaning that any cars currently under restoration would probably never be finished.

When I put this idea to Craig Erickson, he had no hesitation in rejecting it completely. He sees many people who are as committed to car restoration as he is and who are prepared to invest time and money in cars they like.

He also thinks that modern techniques and materials have greatly improved the standard of restored cars – he mentioned TIG welding, modern fillers, and two-pack paints. He said that, while modern paints are not suitable for the DIYer to use at home, they can reliably produce a superior finish “off the gun”.

The cars that folk choose to restore continue to evolve. Edwardian ‘Brass Age’ cars were what was being worked on 70 years ago, then came cars from the 1920s and 1930s, and then post-war classics – which many readers will remember as new cars. It all depends on what we are nostalgic for.

Very early cars are less usable today because of the speed and congestion on modern roads. It is increasingly common for old cars to be trailered to events rather than driven.

Another issue is the value of old cars. For example, when did you last see an affordable Porsche 911? Many Holdens and Ford Falcons have been great investments for their owners. One of Craig’s students told me that he still drives a Falcon Cobra, whose market value now is a long way north of \$100K.

Craig remembers a course graduate who, over many years, restored and sold MG sports cars as a retirement business. On the other hand, if you are not doing the work yourself, the cost of a restoration can easily exceed the value of the finished vehicle.



Valiant Charger has new panels in the front after a serious crash

Brett

Brett works on mergers and acquisitions in Auckland and owns a number of classic cars. He’s built a large shed to house them.

He has several Triumphs, including a Spitfire (a sports car with Triumph Herald running gear), GT6, TR6, and TR8. Brett travels down from Auckland most weekends for the restoration class because, he says, there is no equivalent course anywhere else in the country.

He would prefer that the course be held, full time, over a two-week period, rather than on successive weekends, as that would greatly reduce the time that he has to spend on planes.

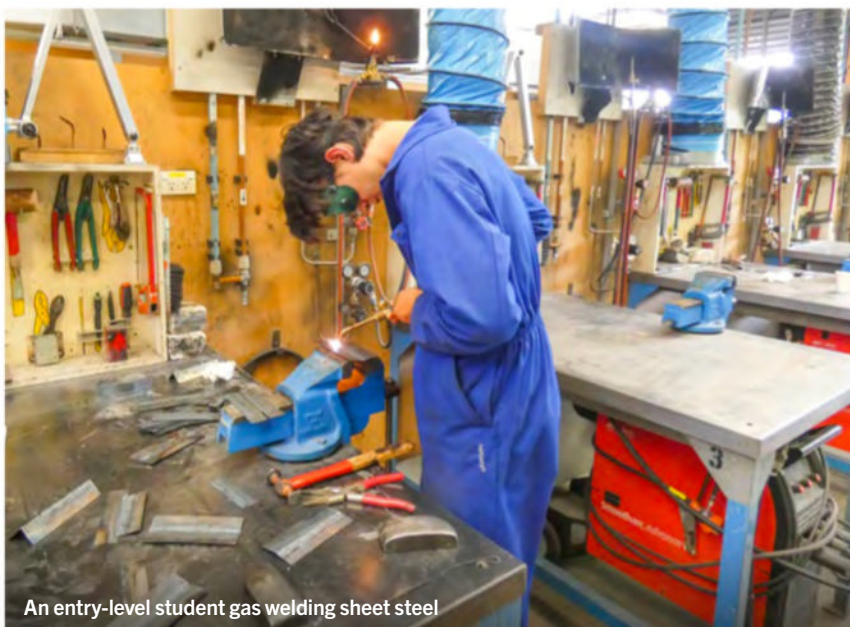
The management at Ara has taken that idea on board, and this year has scheduled two block courses, each of two 40-hour weeks. The first will be

a combination of the beginners and intermediate classes, while the second will have restorers working on their own cars.

There are a couple of major advantages to block courses: out-of-town restorers don’t have to travel to Christchurch so often, and the cars can be left at the Sullivan Avenue campus for the duration of the course rather than having to be trailered to Ara each Saturday, thereby allowing more time for working on them.

The first 80-hour block course is scheduled to run from 8 to 19 July 2024. The second will run from 30 September to 11 October 2024, and is for students who have completed the introductory courses. The cost for each of the block courses is \$2000.

More information is available at ara.ac.nz or phone 0800 242 476. 



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A TIMELY REMINDER

Motorcyclists are known for their willingness to raise money for worthy causes, and DGR is one that is close to home for many

By Mark Seek

markseek@rocketmail.com

Support for charities is in motorcyclists' DNA, and the Distinguished Gentleman's Ride (DGR) is widely known among the motorcycle fraternity. Participants ride with a poignant message: we need to do more for men's well-being and reduce the number of prostate cancer deaths with education, awareness, and research.

I have a personal reason to support this worthy cause: a recent diagnosis of prostate cancer, which left me feeling my world had turned upside down.

Riding for charity

On 19 May each year, riders in their thousands dress up in tweeds, collar and tie, the odd pair of aviator sunnies, and some quite impressive handlebar moustaches. The spectacle of these dapper gentlemen rolling past on their eclectic machines is breathtaking and humbling.

A chilly Sunday in Christchurch didn't deter these heroes, as the air filled with the melodic sound of Triumph triples, BSA twins, old 500 single AJS and Matchless bikes, Indians and rival HDs, and a smattering of Italian

"More than
116,000
riders in
104 countries
raised
US\$6 million"

A distinguished rider on a classy Triumph





Promotional material announcing this worthy cause

Lambrettas and sexy Vespas.

So how did all this come about?

The DGR chose Sydney to host the first ride. Mark Hawwa, the bloke behind the event, was inspired by a photo of Don Draper from *Mad Men* astride a classic bike. He decided that a themed ride would be a great way to combat the often-negative stereotypes of bikers, while connecting the global motorcycling community to raise funds for an important cause. A man of vision!

Since its inception in 2012, the DGR has attracted an increasing number of riders. In 2019, fundraising and attendance records were set: more than 116,000 riders in 104 countries raised US\$6 million.

Support network

A strong support network for those with prostate cancer is run by generous volunteers such as Chris Ward and his wife Dianne. Chris and Dianne decided to start a support group after Chris's prostate cancer diagnosis a few years ago. Two regular monthly meetings are held, one in Christchurch and the other in Selwyn. There is also a weekly fitness group, aptly named Prost-FIT.

I recently went along to a local prostate support group to get more information about this change in my health. The blokes who attend are a great bunch, and I felt sure I would benefit from listening to others in my situation. Chris had a phone conversation with me a few days beforehand; his kind words and willingness to come to see me at home lessened the anxiety that I was feeling.

Once considered a disease associated

with older blokes, prostate cancer also afflicts younger men, who also get testicular cancer. The message of the Prostate Cancer Foundation of New Zealand is to get regular blood tests from your GP, asking especially to have your PSA (prostate-specific antigen) level checked.

Chris explains that there is no specific government funding for research on prostate cancer in New Zealand, yet it is our most diagnosed cancer (apart from skin cancers) – so all the more reason to embrace DGR.

Second-biggest cancer killer

Every year, more than 4000 men in New Zealand are diagnosed with prostate cancer and more than 700 die – the second-highest cause of cancer death in men, behind lung cancer. For the whole population, it sits third – behind lung and bowel cancers. Māori men have a slightly lower incidence of prostate cancer but a higher death rate. The reasons for this may be a later diagnosis or the treatment choices offered to them. Overall, the number of men diagnosed is increasing, largely due to increased rates of testing, and the death rate is slowly dropping, largely due to better outcomes from early diagnosis and improved treatments.

Men are more likely to develop prostate cancer as they get older. It is more common in men who have a father or brother with prostate cancer, and in families that carry certain genes, such as the BRCA1 or BRCA2 genes.

So, guys, let's do our bit. As one slogan states so eloquently: "Get to know your balls." 🍌



Symptoms of prostate cancer

Prostate cancer can develop silently, without causing symptoms for some time. Symptoms may include the following – always see your doctor if you experience any of them.

- A frequent or sudden need to urinate, especially at night
- Difficulty urinating (trouble starting, or not being able to urinate when you feel the need)
- Discomfort when urinating
- Finding blood in urine or semen
- Pain in the lower back, upper thighs, or hips
- Bone pain
- Unexpected weight loss

Note: Many of these symptoms are common in men as they age, and are often caused by other prostate conditions such as an enlarged prostate.

More options are available if prostate cancer is detected before it causes symptoms, so an annual GP check is vital. Let's do our best to reduce this risk: get checked, and don't think it can't happen to you – nobody is immune to cancer.

THE PLANE-MAKERS

Kiwis have always been great DIYers – but what about building a plane in your shed, then having enough faith in your handiwork to risk your life flying it?

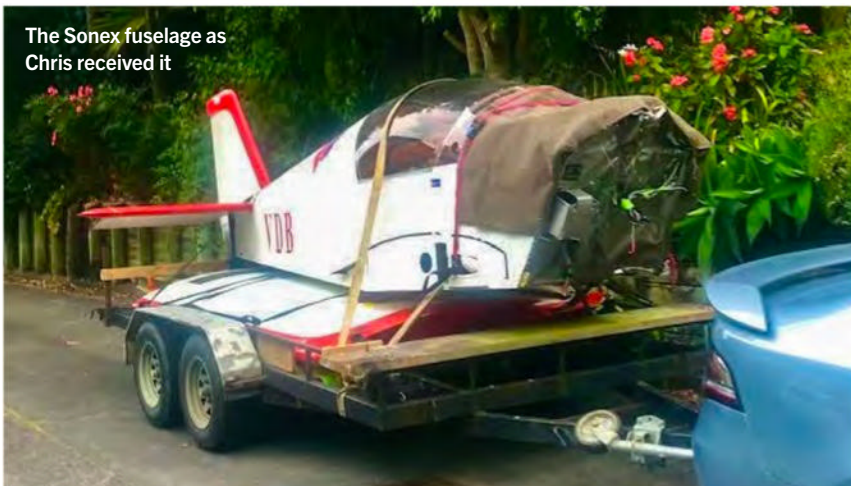
By Chris Hegan

Photographs: Chris Hegan, Chris Wade, David Wilkinson, and Gordon Lindsay



The crashed Sonex that Chris Wade is currently repairing

The Sonex fuselage as
Chris received it



“In almost every case the problem is not the plane, nor even the inexperience of the pilots, but bad decisions”

In the previous issue of *The Shed*, No. 115, I began my exploration of the world of home-built microlights, quickly discovering that my preconception of glorified kites with modified lawn mower engines was way out of date. Modern microlights may be the Dreamliner's baby brother, but they are all aeroplanes.

My next stop is to visit Chris Wade, in Cockle Bay, Auckland. I know he is working on a crashed microlight so I spend some time looking through the Civil Aviation Authority (CAA) record of fatal air crashes for the past decade and noticed a conspicuous increase in the number of microlights involved in fatal plane versus earth events.

At first glance, this raises the question of the safety of homemade aircraft, but the content of the reports reveals that in almost every case the problem is not the plane, nor even the inexperience of the pilots, but bad decisions – in one case, by a qualified flight instructor.

“People get a case of get-there-itis,” says Chris, “or they get into difficulty and instinctively try to turn back. But you can't do that. You're flying into the

wind and a sudden turn can put you in a stall; or you're facing the other way with the wind behind you and you lose your lift.”

The Sonex that Chris is repairing experienced a rare case of engine failure: “He lost his oil. There was a pool of oil on the ground where he started, which he wouldn't have seen. So, he gets in the air, the pressure drops, and the engine seizes.”

That pilot was lucky – he survived.

Upgraded engine

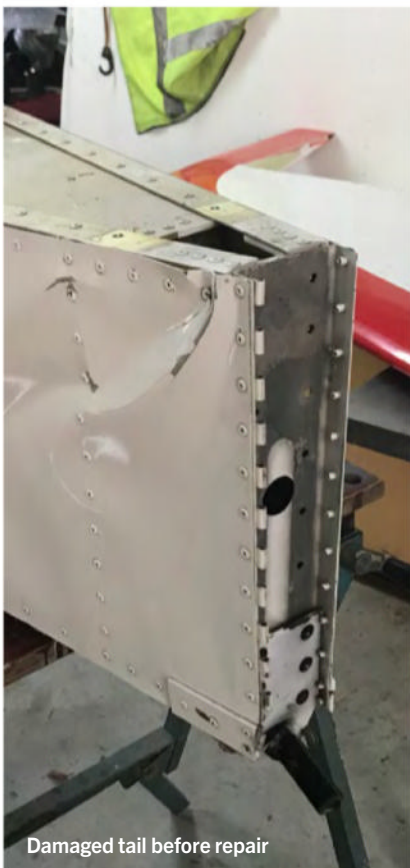
Chris has replaced the seized engine, an AeroVee, with a second-hand Rotax.

“That's a proper aircraft engine. The AeroVee is a modified VW car engine. I've built a couple of those,” he says.

From pictures, I see that the VW engine has two plus two horizontally opposed cylinders, just like the Rotax and many other aircraft engines.

Chris is working from the plans that the plane was built from. The plans always stay with the plane, and if he parts with this one, the plans will go with it. However, the standard Sonex is not designed to use a Rotax, so the plans were of no use in mounting the engine. Chris shows me a picture of the ingenious method that he used to design the engine mount, which, in this class of plane, is a network of steel tubes.

“Sonex in America offer a Rotax in one of their planes, and I got a picture of the mounted engine from one of their ads,” he says. “I wrote to them to ask for the design but they refused. But I know what thickness tubes they used and the photo gave me a pretty good idea.” ►



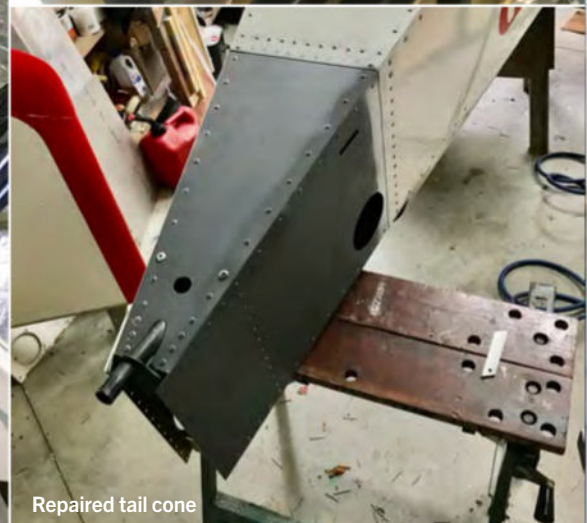
Damaged tail before repair



Won't be long now – Chris in the nearly finished cockpit



Forward fuselage removed for rebuilding



Repaired tail cone



Damaged wing reskinned

Impressive solution

Chris measured the engine and created a network of strings from the firewall to where the propeller mount would go. It is an impressive solution but how, I ask, does he turn a network of strings into a plan?

“Slowly,” he answers.

He painstakingly measured the length and angles of each string and duplicated it in steel. He has also modified the engine cowling design, taking a mould from another aircraft.

“I made a mould from gib board and plaster but changed the way it opened. The original cowling was split vertically, and the two parts swung out sideways,” he explains. “I think you want to look at the top of an engine when you work on it, so I have cut this horizontally so the top

cowling flips up like a car bonnet.”

The Sonex is a plain, very traditional shape, almost boxy, but Chris points out its sturdiness. He shows me the surprisingly few parts of the plane damaged in the crash.

“This thing hit the ground, the pilot survived, and most of the plane is undamaged, as you can see. It’s mainly panel work. It’s remarkable – it’s a robust little plane.”

He has dismantled and reassembled one wing that appeared undamaged, but the rescuers walked on the wing to extract the pilot.

“It looked all right but you don’t want to run into trouble in the air and be thinking, ‘I should have checked that out.’”

Knowing when certification is necessary

A skill that Chris and all amateur aircraft builders have to acquire is the ability to know when the certification of a part as aircraft-grade is necessary and when it is not.

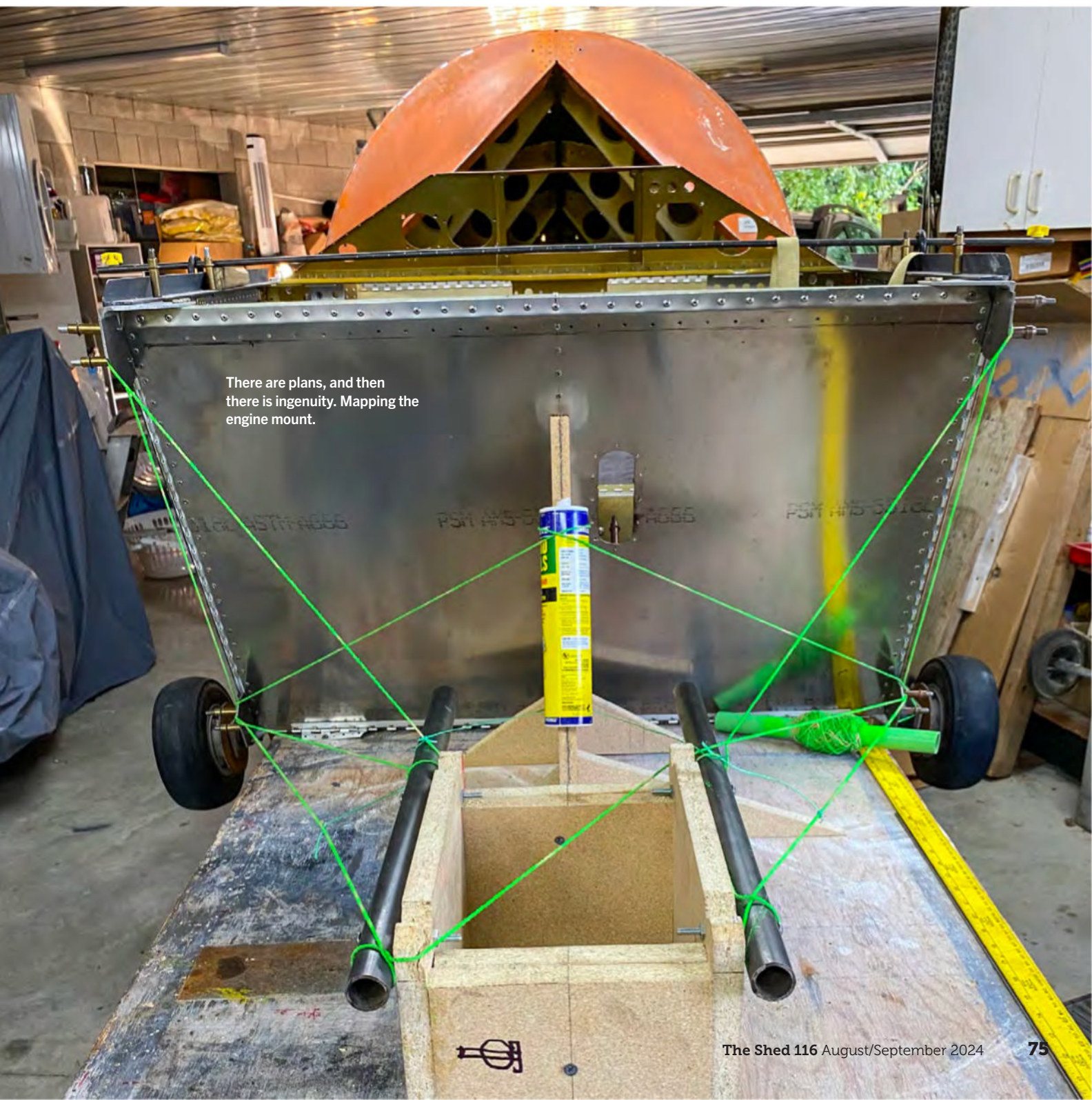
He explains how he acquires some parts from a trader that he refers to as a 'shark', who sells parts that come from the same production line as aircraft-rated ones but that have not been expensively certified. Then he shows me

a small bracket about four inches long. "How much do you think they wanted for this? \$100, and it's just a small piece of pressed metal."

He picks up a large, galvanised lock haft. "I got a slightly bigger one of these and cut, drilled, and tapped it. Saved myself \$100."

He shows me two identical pieces of kit, one stamped for aircraft use and the other not. Then, to cap it off, he shows me a photo of a boxed part from a company called 'Andair', with an

"He shows me two identical pieces of kit, one stamped for aircraft use and the other not"



There are plans, and then there is ingenuity. Mapping the engine mount.

accompanying warning not to use it in an aircraft. Although Andair is clearly using the warning to ward off possible litigation, it still looks risky. Is it?

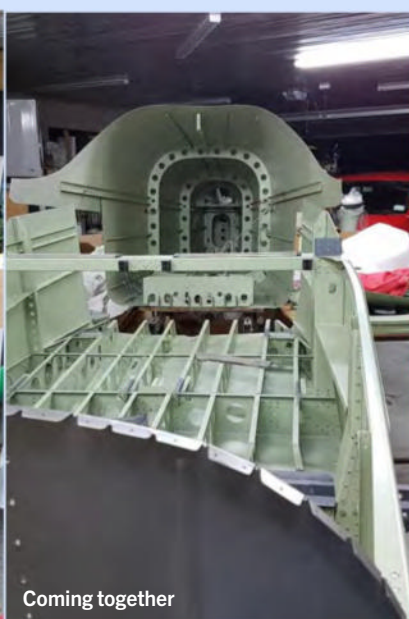
“No. Usually you’re just doing something that has been done many times before in aircraft that have gone on to fly safely for years. Mechanical failure is extremely rare. You just have to know what you’re doing.”

After hearing about all the aircraft engines and planes Chris has built or worked on, I wonder when he has time for flying.

“I made my first solo flight at 70. I built that plane and then learned to fly it. I have only about 40 hours of flying; I’m more of a builder than a flyer,” he says.



A plane on a trailer – Chris Wade’s Vans RV14 kitset arrives



Coming together



Joysticks in place

Integrated engine mount and undercarriage

The other way to make your plane is with a kitset. Chris took me through his pictures of the Vans RV14 kitset that he put together for a mate who did not have the time. The job started with the arrival of three large boxes (above left)



DR-107 airframe welded and painted



Early stages of the DR-107 airframe

“What David does with the plane in the air is a tribute to the accuracy of his maths”

An aerobatic microlight

After David Wilkinson has finished showing me around his Coot amphibian restoration (see sidebar) in his huge shed in Ararimu, I ask him about his DR-107 aerobatic microlight.

The plane is in its hangar at Ardmore but the plans are still here on the bench. They are not even close to an instruction manual – just a set of technical drawings annotated with David’s trigonometry calculations.

“The RV8 I built from a kit, which

came with a construction manual. Start on page 1; put this bit there and drill a hole there and you end up with an aeroplane. For the DR-107, all I had was these drawings.

“The plans for the Coot were even worse. They’re just old blueprints. I had to get my maths out. I was working out all the angles on the page; if you don’t get it right it won’t fly straight.”

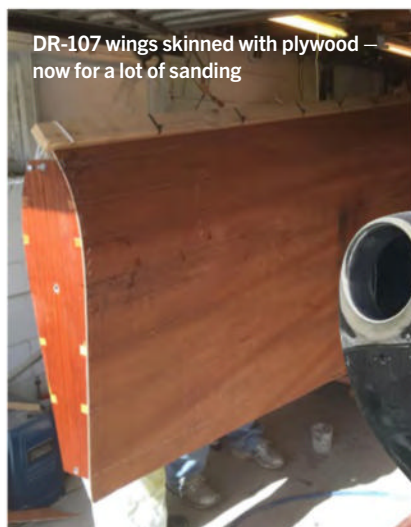
What David does with the plane in the air is a tribute to the accuracy of his maths. ►

DR-107: 80 per cent complete and ready for dismantling, finishing parts, and covering the fuselage with fabric. Photographed next to Wilkinson Sr’s Corby Starlet, which the DR-107 design is based on





Many, many hours of work — aerobatics call for strong wings



DR-107 wings skinned with plywood — now for a lot of sanding

“I reckon it took me 5000 hours — 20 hours a week for five years. I sanded the wing structures for eight months. I ended up sanding in the dark — you can feel a lot more than you can see.”

It doesn't seem to leave a lot of time for flying.

“I've found that too, but during the winter, when it's raining, you just bury yourself in the shed,” he says. “I've been in my shed at four in the morning. I built it when the kids were little and I was stuck at home a lot. It was fine — I had the baby monitor in the workshop. I had to build it twice. First, I put it together and ran the engine, made sure everything worked, then I pulled it all apart to paint and finish all the bits.”





David Wilkinson – man on the way to the sky

Born to fly

David grew up with a Corby Starlet that his father had made.

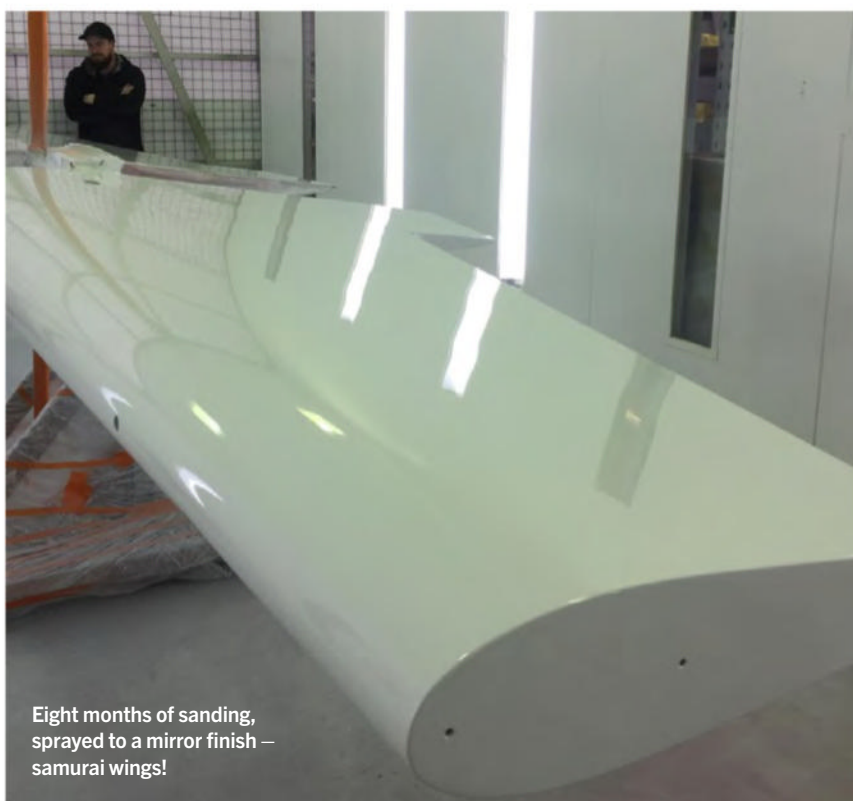
“I was born into it. I’ve done more than 2000 hours now. I’ve test-flown seven or eight aircraft on their first flight.

“An amateur-built experimental aircraft has to be flown for 40 hours before it can carry passengers, although not for hire or reward. For a Class 2 microlight, you have to do endurance testing – 10 or 15 hours,

depending on what the CAA decides.

“People moan about the CAA, but anyone who has a problem with them is not doing something properly. I’ve never had an issue with them. You get all the paperwork in line, you do everything correctly, they turn up, say yes, yes, yes, thank you very much, go flying. It’s not like the UK, where it’s a nightmare apparently. We’re lucky in New Zealand. They’re only trying to protect the third party, which is the public.”

“People moan about the CAA, but anyone who has a problem with them is not doing something properly”



Eight months of sanding, sprayed to a mirror finish – samurai wings!

Bringing it home

Suddenly, I hear the loud spluttering of an aircraft engine starting up – it is the ringtone on David’s phone. He shuts off the call to tell me about flying aerobatics in the DR-107. “It’s like a V8 race car or a Formula 1: after that, everything else feels underpowered.”

I express my astonishment at the things David did in the air at the Thames Wings and Wheels Show. He shakes his head.

“Actually, I tone it back with the air shows. Half the people aren’t watching anyway; they’re eating their hot dogs. I fly it above 800 feet, which isn’t as dramatic as 600, but that 200 feet might be the difference between going home that night and not. My only goal when I take it out of the hangar to do an air show is to put it back in the hangar that night. It doesn’t matter what happens in between. Cancelled because of bad weather, mechanical problems – doesn’t matter. If I put it back in the hangar – success.” ►

I'm loving this

Back in the air over the Hunua Ranges with the Hauraki Gulf ahead of us, I see why you would want to be in a real aeroplane – and, for all its lack of size, Gary Briggs' shed-built Sonex is a fully fledged aircraft.

We run into thermals over the hills and hop around a bit, but it is nothing compared with bouncing down the

staircase from the Southern Alps to Christchurch in a 737 on a day when the thermals are crossing swords with the Canterbury nor'wester. It feels solid, and perfectly safe.

I take the stick for a while; it is highly, intuitively responsive, and with no training, I have no difficulty in maintaining level flight. I discover that travelling the country via its

"I take the stick for a while; it is highly, intuitively responsive"



Taping and masking pinstripes for the big yellow-up



Big DR-107 moment – lowering the engine into position



Add a dash of colour – show me the sky!

highways has given me an entirely false impression of what it is like. Whitianga, Cooks Beach, Coromandel town – from the road they seem like sizeable towns, but from 5000 feet we see that they are just isolated settlements in an endless, hilly, green landscape. The restriction on flying over built-up areas leaves the microlight pilot the vast majority of the New Zealand sky to explore. ►

“From 5000 feet we see that they are just isolated settlements in an endless, hilly, green landscape”



History reborn: the amphibian cousin of the world's first flying car

David Wilkinson is restoring a piece of history in his Ararimu shed.

Back in the late 1940s, American engineer Moulton 'Molt' Taylor designed and built the Taylor Aerocar. It was one of the first truly practical flying cars, with wings that could be quickly removed and folded onto a trailer behind the vehicle.

He is less well-known for taking some of the Aerocar's design innovations and

applying them to the Taylor Coot, an amphibious light plane, and selling the plans to home builders. Similar to the Aerocar, folding wings configure the plane to be towed on a trailer.

Taylor's innovative thinking shows up in other parts of the design. The plane is pushed by a rear-facing propeller and there are no floats on the wings. The low-slung wings act as flotation support as well as compressing the air between the wing and the terrain to help with take-off.

Some 70 examples are known to have been built, one of them by Alastair McLachlan, an Air New Zealand engineer, who, in the '70s

and '80s, made the machine that David Wilkinson is restoring – one of three built in this country.

"A guy in Waiheke bought it off Alastair and did nothing with it, just let it sit outside in the weather for a year," David says. "Gavin Magee got it for its Lycoming engine for the Sopwith Camel he is building and had no use for the rest, so I stepped in and took it off his hands."

"The windscreen was all crazed, but it was superficial and we polished it clear. It's actually still in pretty good condition. It looks dirty, but that's because there's so much grease. There's no corrosion in it."

Dave Wilkinson does the maths



Hatchet



Taylor Coot





Anchor hatch



Bottleneck splash guard

No plans to upgrade

The technology has moved on generations since the Coot was designed, but David has no plans to improve anything. He shows me where Alastair used the sliced-off tops of plastic bottles to splash-protect sensitive bearings.

"I could 3D print that but I won't."

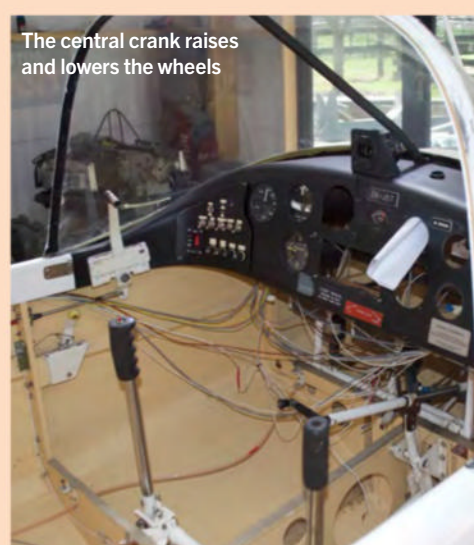
The tomahawk clipped to the back of the cabin was an obligatory feature at the time as an emergency exit aid. Another oddity is an anchor in the nose hatch.

"You need it," says David. "You don't have brakes on the water."

He will increase the power from a 150hp Lycoming to a 180hp of the same make, the extra power helping take-offs from the water.

He hands me a piece of wooden floorboard about half a centimetre thick; it surprises me by weighing far less than it should.

"Under the skin, it's all honeycombed; they're Boeing floorboards. The guys from Air New Zealand used to scavenge bits and pieces for their own projects. Putting the floor together is going to be a bit of a jigsaw puzzle, but I'm not far off getting the thing flying. Next winter, I'll tootle away making it look great."



The central crank raises and lowers the wheels



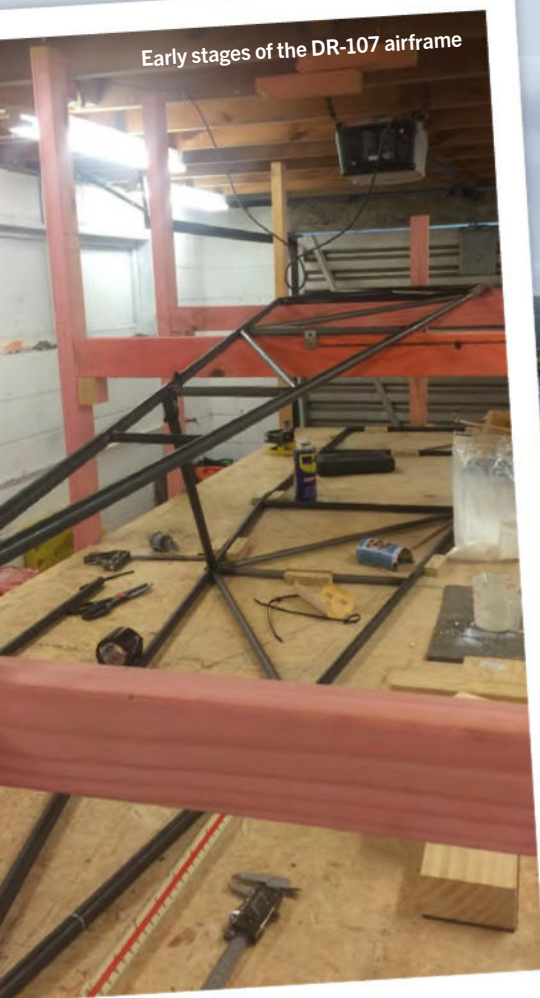
Throttle jig

Project number 2

The Coot is not the only piece of history that David has in his hangar. He also owns a Pitts Special aerobatic plane that took its builder 35 years to make – and he never flew it.

David found it in a hangar up north, where it had languished for 10 years. When he shows me several boxes of precisely cut and turned blocks of wood, I start to see why it took so long. Many parts were formed on one of those blocks, each of which would have required hours of measuring and cutting to prepare. They were then used as jigs to bend, stretch, turn, or fold aluminium sheeting to make the plane parts, an extraordinary feat considering some of the jigs had to be 1/20,000th of an inch smaller to allow for the thickness of the aluminium. ►

Early stages of the DR-107 airframe



Lands like a brick

The DR-107 is based on the Corby Starlet, a model David's father finished in 1982 and has now flown for 2400 hours – but with two major modifications: a much more powerful engine and a wing that is symmetrical in cross-section, curved on the top and bottom, which gives it lift when flying upside down. Ordinary wings have a

curved top and a flat bottom, giving them lift in level flight.

The DR-107 has to be pitched off the horizontal to stay in the air, either way up. Taking off, the pilot gets to flying speed, pulls the stick back, and waits for the tail to drop. Only then will it lift.

"If you level off again, it will drop flat to the ground. It lands like a brick. The

aeroplane will do 150 knots inverted; it will cruise just as fast either way up. I overtake my mates, go past them flying upside down. It will fly any way you put it."

This is also the reason that the little plane is not technically a microlight, although it falls well under the weight limit. A microlight has to fly at 45 knots without going into a stall. Try that in the DR-107 and it will give its impression of a brick. 🧱

David Wilkinson and his DR-107 aerobatic microlight





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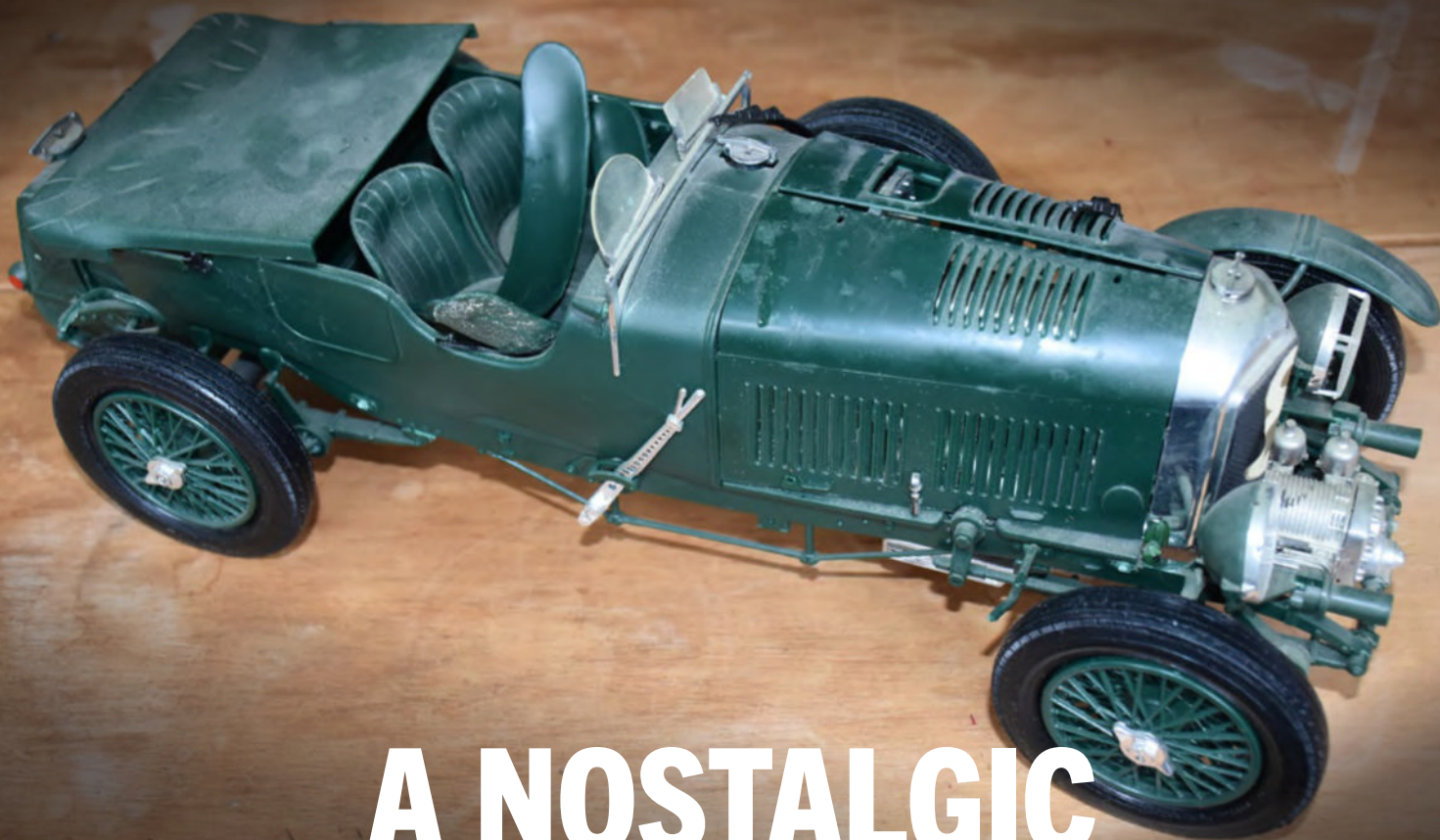
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A NOSTALGIC RECONSTRUCTION

A sad, damaged little model car inspires the reconstruction of one of the more dramatic winners of Le Mans

By Murray Grimwood

Photographs: Murray Grimwood

They were sitting in a box – damaged, forlorn, dreaming of a past pristine life, and waiting for a new home.

I wasn't interested in the Tamiya 1:350-scale *Yamato* (much though I'd envied school friends lucky enough to have one, once upon a when), but the Bentley pulled my eyes back for a second – and then a third – look. I didn't know who had manufactured the kit, or even its scale, but someone had dropped this one, damaging its right-hand side (see above). Mudguards broken off, headlight askew – it screamed a story I'd known since I was a nipper: the 1927 Le Mans Whitehouse Corner crash. I knew exactly what I wanted to do with it: recreate the survivor – Old Number 7.

Detective time

I love nothing more than researching stuff.

It didn't take long to find out that this model was an Airfix 1:12-scale representation of a 1930 4.5-litre Blower Bentley. First released around 1970, the kit is still being reissued and generally meets with approval; not bad for dies that are more than 50 years old. This was an early example from when the mouldings were still British Racing Green; that explained the tarnish on the chrome bits, and the sun-failed glue joints.

As I incrementally discovered, the 1930 'blown' 4.5 was a somewhat different animal from the three-litre, naturally aspirated, 1927 Le Mans

"I knew exactly what I wanted to do with it"



**“The saga of
18–19 June
1927 at Le Mans
would make a
fine movie”**

winner. The 4.5 has a squarer scuttle, squarer radiator cowl, bigger tank, windscreen lets, spare tyre on the opposite side, longer / more-louved bonnet, cycle mudguards, no running-boards, and that dirty great big blower – carving a slice out of the radiator core, calling for a beefed-up front cross-member ... but, despite all that, I settled on recreating, as near as possible, the evocative photograph of Old Number 7 circulating late in the 1927 race.



The legend

The saga of 18–19 June 1927 at Le Mans would make a fine movie. The Bentley Boys would be a standout group anywhere, anytime, but my pick of them has always been Davis and Benjafield – the two who nursed Old Number 7 home.

The Bentleys were expected to dominate a fairly empty field, and held first, second, and third with ease until dusk came on.

Callingham, in the leading 4.5-litre car, comes around the Whitehouse (Maison Blanc) Corner – long since bypassed for obvious safety reasons – to find a French Schneider sideways, blocking the road. Travelling at around 70mph, he chooses the ditch, his car coming to rest there. Along comes Duller in the second-place Bentley; he makes the same decision and canons into the first Bentley, overturning it in the process. Miraculously, no major injuries so far – although the French driver has a few broken bones. Along comes Sammy Davis. His car (known as ‘Old Number 7’ but carrying a ‘3’ this time around) is the same one he stuffed into the sand at the end of the Mulsanne Straight 23 hours into the previous year’s race, so he presumably has a few demons to exorcise. ►

The finished article, looking more like a three-litre. I tried to copy the photos on pages 88 and 91 of this article





“I half climbed, half fell out and immediately recognised that the mass in front of me was the 4.5-litre on its side athwart the road, while on top of it was Duller’s car ...”

Carnage ahead

He notices spectators are looking at the corner, not at him. He senses debris on the road, and eases off, but not enough. Carnage in the headlights, moments to react; he broadsides into the wreckage right-front-corner first.

In his own words: “With the rending crash of riven metal, we slid right into the mass and brought up all standing with a shock that threw me hard against the wheel. All the lights went out.

“Feeling weak at the knees, and now quite certain I had wrecked a team car unnecessarily, full of ideas about what I should have done, I half climbed, half fell out and immediately recognised that the mass in front of me was the 4.5-litre on its side athwart the road, while on top of it was Duller’s car ...”

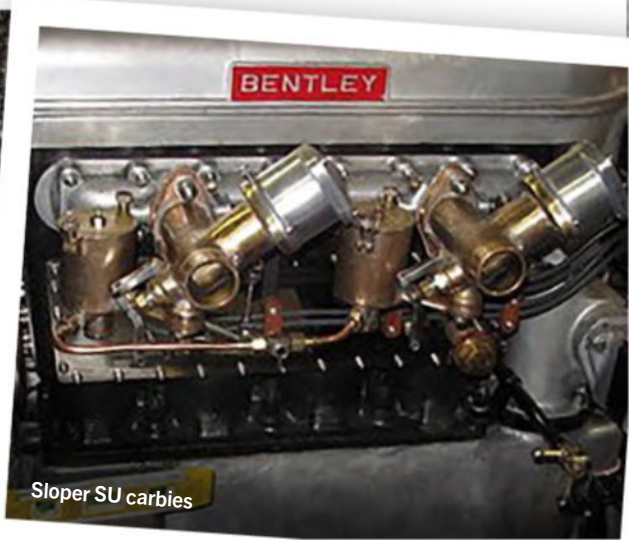
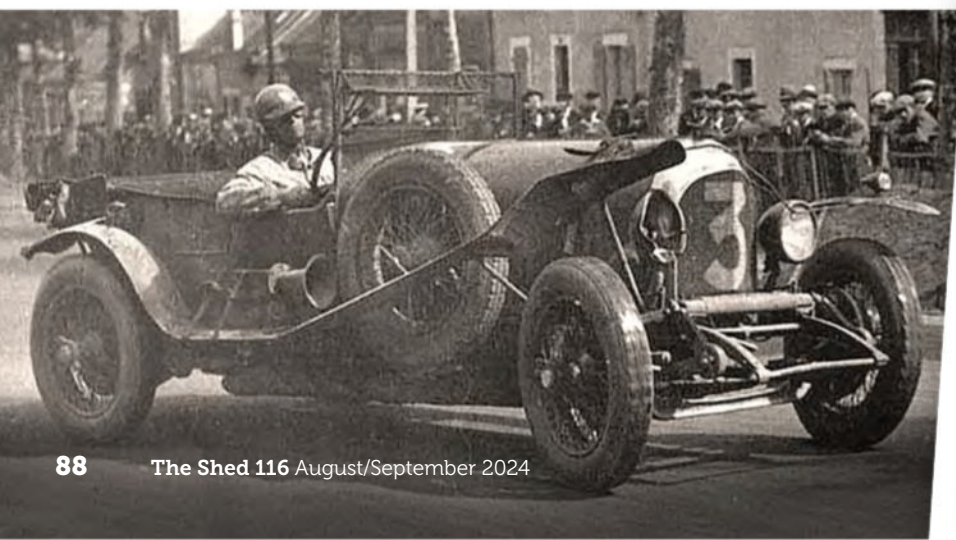
Learning that everyone is alive, Davis starts his car, extricates it, and heads – cautiously – for the pits.

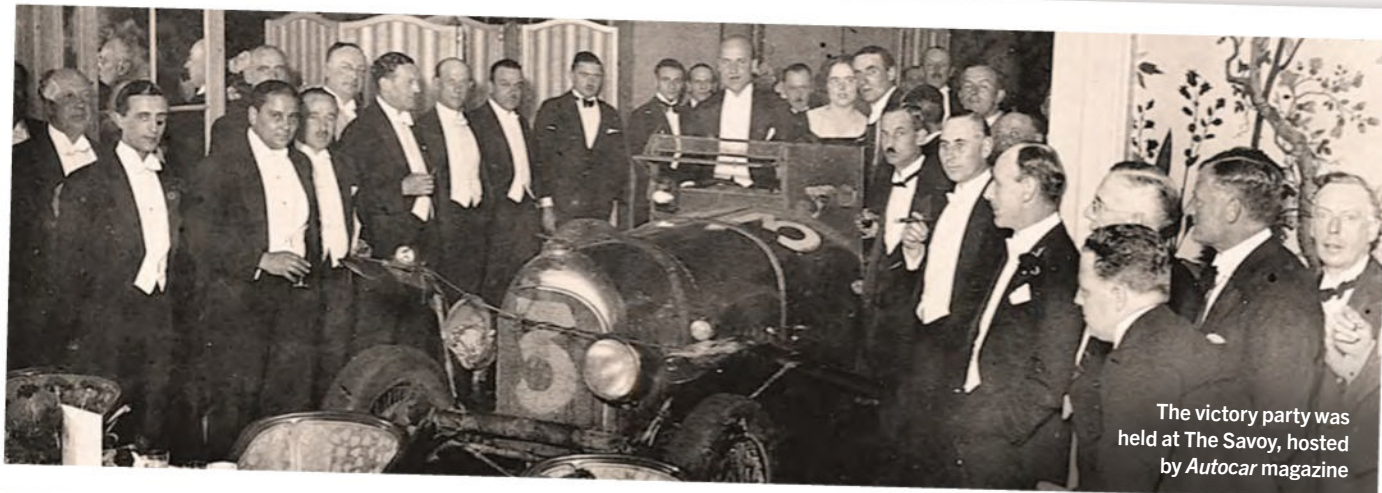
His words again: “I ... drove the machine backwards, with more catastrophic rending noises, out of

the wreckage, and had a hasty look around with a flashlight ... Things were obviously bad, yet there was a chance the car could run. I went slowly off ... Number 7 limping with a bent front wheel. Sick at heart, with something inside repeating, ‘You have done it again, you have done it again’, I pulled up in an avalanche of questions.”

The damage is: a bent chassis, a shifted axle, a buckled wheel, a flapping mudguard, a smashed headlight, a suspect drag-link ball joint – and rules that state only the driver can work on the car. Davis changes the wheel, points the left-hand headlight somewhat to the right, and re-bulbs the left-hand park light. He works feverishly with wire and strapping, lashing things (famously: a wire from mudguard to mudguard; less famously: the battery back on). An hour later, he whines away into the night – steering not self-centring; brakes coming on 1-2-3-4; left-hand headlight illuminating (?) a predominantly right-hand circuit.

The photo I tried to replicate: Davis bringing Old Number 7 home





The victory party was held at The Savoy, hosted by *Autocar* magazine

The chase is on

Some 214 miles later, at midnight, Doc Benjafield takes over a car in somewhat less than concours condition. He not only gets to grips with it; he takes up the chase of the three-litre Aries, six laps ahead.

The night includes heavy rain, and, at some point, he stops to attach a flashlight – a 1927 flashlight – to the scuttle. By two o'clock on Sunday afternoon – two hours from the finish – the Aries is only 3min 27s ahead. Half an hour later, its camshaft drive fails, stranding driver Chassagne out on the circuit. (Some accounts record distributor failure, but an un-driven camshaft is liable to result in that, you'd think.)

Fifteen minutes from the finish,

Doc Benjafield comes in and hands over to Davis to “bring her home” – so very British, that! They averaged 61.35mph, considerably slower than the 66.08mph achieved by the winning Lorraine-Dietrich the year before, but impressive enough given the stoppages and the damage.

The victory party was held at The Savoy, hosted by *Autocar* and featuring ‘Bentley’ cocktails, 1919 Clicquot and Courvoisier 1875.

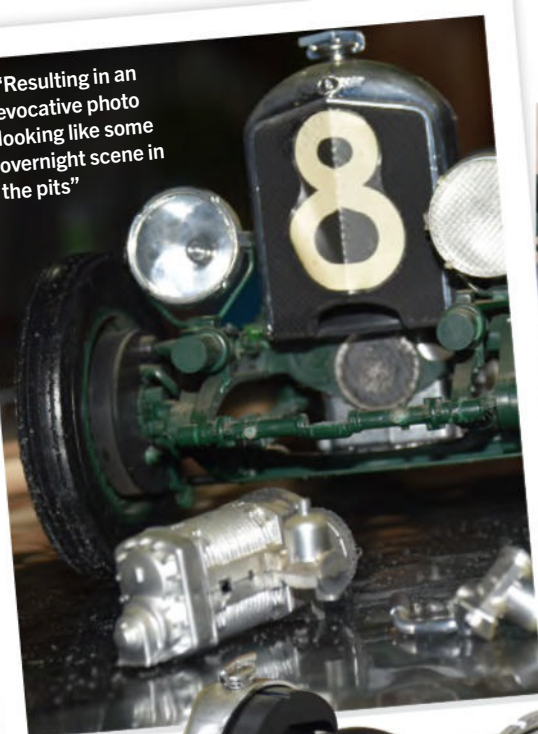
When Sir Edward Iliffe stood up to speak, he began, “I feel there is someone missing here this evening, who ought to be present.”

At that moment, an engine fired up and Old Number 7 drove into the room; the photograph speaks volumes. ►

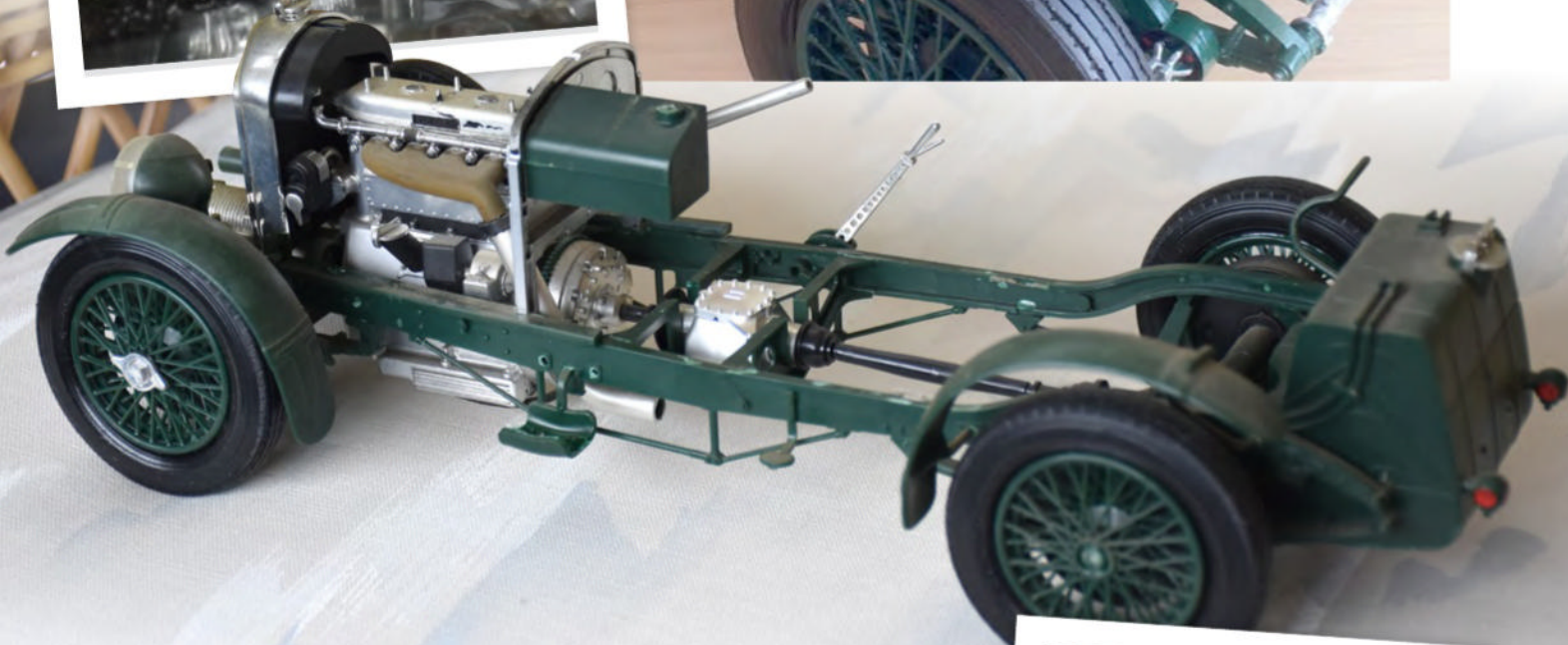
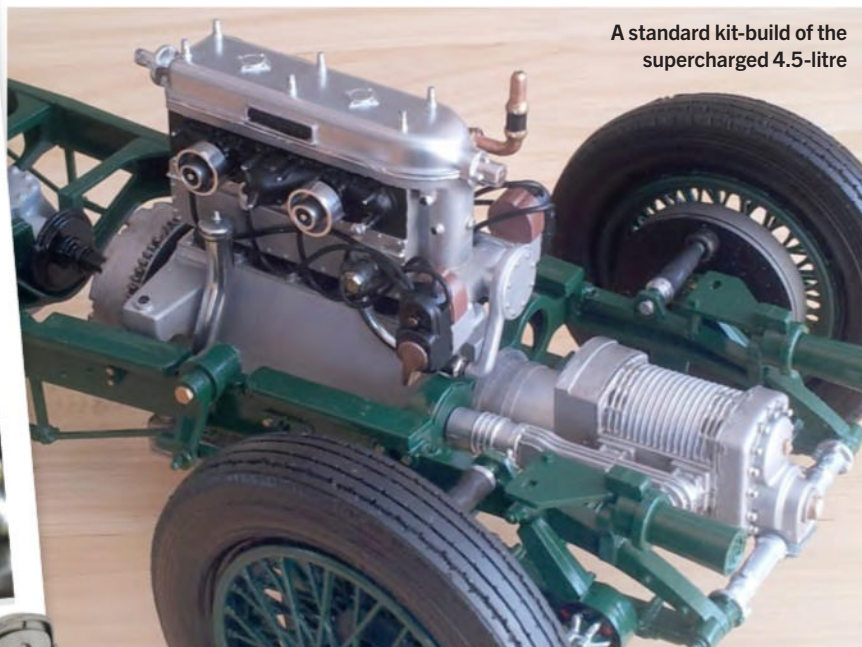
“The victory party was held at The Savoy, hosted by *Autocar* and featuring ‘Bentley’ cocktails, 1919 Clicquot and Courvoisier 1875”



"Resulting in an evocative photo looking like some overnight scene in the pits"



A standard kit-build of the supercharged 4.5-litre



Getting down to it – the tank is too tall, that bulkhead tank has to go, as do the cycle mudguards

Old Number 7's fate

Researching further, I came across an interview with an English farmer and his boys, who'd bought a job lot of Bentley bits in the 1960s. They had restored three, which they were racing.

They recounted seeing Number 7's chassis but had declined to take it, reckoning that it was too far gone. That didn't tally with the race story or the post-race photos – so I delved on, finally coming across an interview with Davis several years later. (He'd taken up cycling.) He related that the car had been rebodied as a sedan and painted yellow – and opined that, in response to such a crime, it had driven itself into a lamp-post. That made sense; it took a second, bigger crash to kill a tough car. (Later, I came across corroborating evidence – see side panel.)

Deconstruction

The sad little model was barely hanging together, and I carefully deconstructed most of it; I'd stop, take something else off, then something else – indeed, I was still pulling parts off even after reconstruction had begun. Initially lacking a razor saw, I took to the supercharger with a hacksaw blade – resulting in an evocative photo looking like some overnight scene in the pits.

I did a lot of online research too. There are several good builds of this model on the 'net. Some are unbelievably detailed; one even has a working diff, gearbox, brakes, and crankshaft! However, nobody seems to have attempted my proposed conversion, nor could I find a model of the three-litre, in any scale.

How many folk have 'hacksawed a supercharger off' on their CV?



"They recounted seeing Number 7's chassis but had declined to take it, reckoning that it was too far gone"

Photographs and memories

While Old Number 7 has not survived; the Number 2 car has, albeit with a different chassis and motor – somewhat like the proverbial axe.

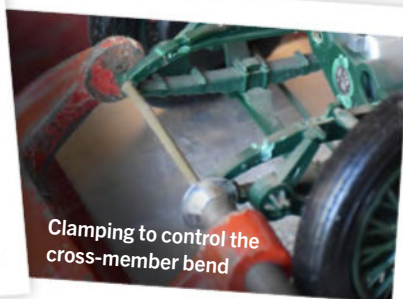
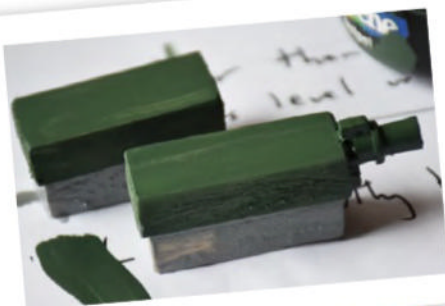
Photos that do exist from the time are grainy, sometimes scratched. Information is hard to come by, and the participants – who could have answered my questions – have all passed away. So, too, have a good number of intermediaries. Thus is history lost.

Some things were ascertainable; the wheelbase and track of the 4.5-litre and the three-litre were identical. Some things were not – did this car, as it ran,

have the railway wagon–style under-chassis supports? I've left them because they're so very Bentley, they look cool, and the three-litre is advertised with them – but I can't see them on the winning car.

Other things that were confusing were the rear light(s), the tank, the windscreen, the running-board mounts, and the toolboxes. Eventually, I figured that 'as close as' was my target, rather than 'perfect'. I wanted a model like my one of the globe-circling amphibious Jeep, 'Half-Safe' – not pristine but a conversation starter, the aim of which is to spread the stories, maintain the legends.

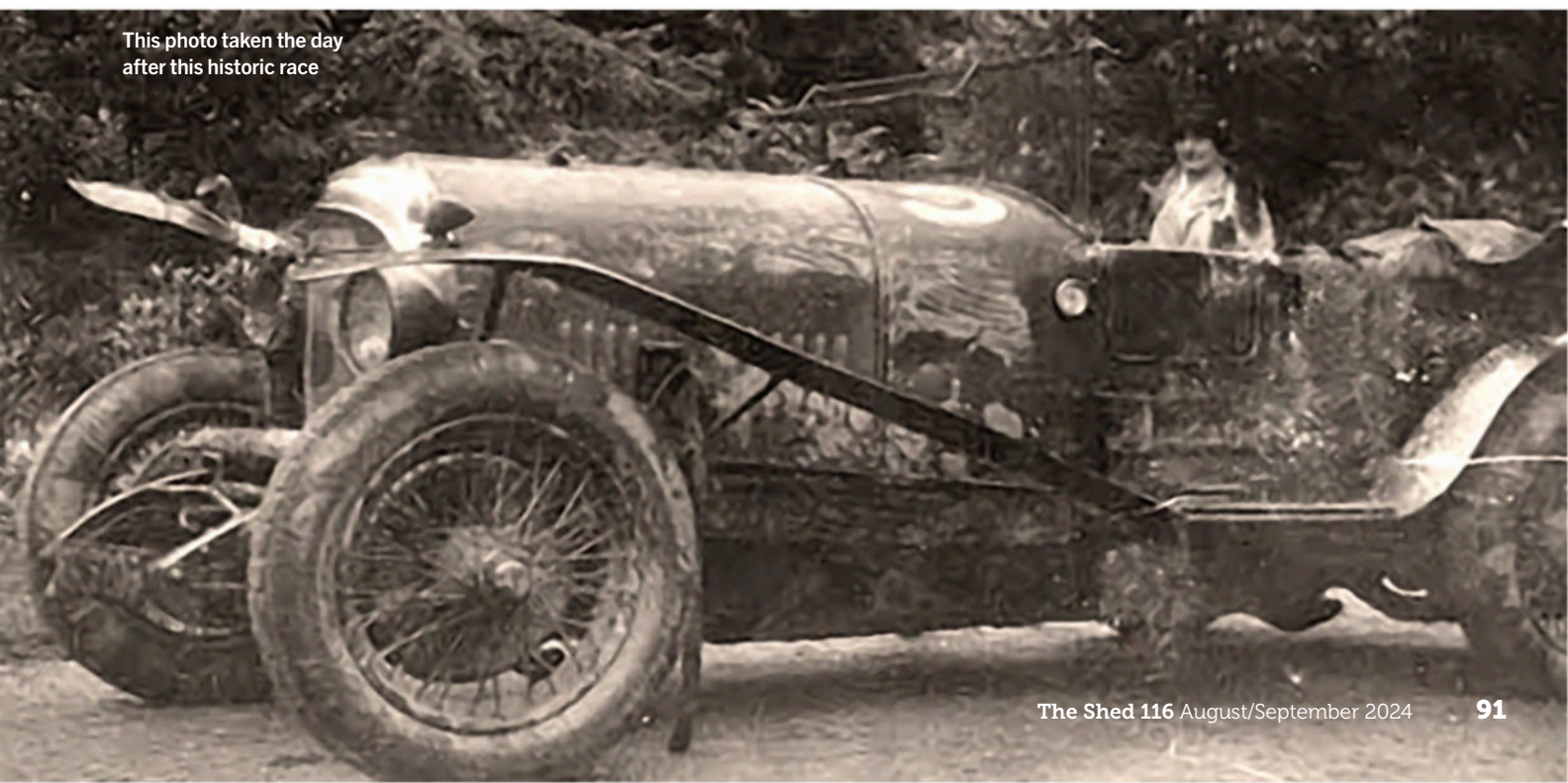
“Did this car have the railway wagon–style under-chassis supports? I've left them because they're so very Bentley, they look cool”

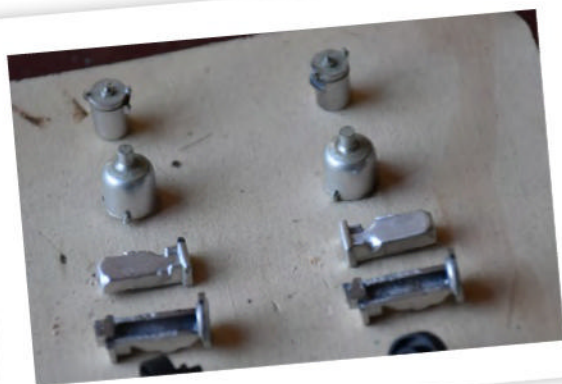


The 'as close as' plan

The rough plan went: drop the supercharger. Strip everything else as far as practicable. Make some carburettors (they were SUs and I've had a fair bit to do with those in real life, but not with ones mounted on a 45-degree slope). Bend the right-hand dumb-iron; bend the front cross-member; shift the front spring backwards. Reshape the scuttle and radiator – and probably replace the bonnet. Make new mudguards, running-boards, and windscreen. Chop the tank down. Copy the other race damage: fenders, headlight, lash-ups. Paint it (the model had been assembled mostly unpainted). ►

This photo taken the day after this historic race





The front shockie and cross-connection in brass, in the palm of my hand



Old No 7 at the pits, Le Mans 1926. In the race the car was driven by S.H. Davis and Dr. J.D. Benjafield. Thereafter the car was known as Old No 7. (BDC Archives)

Everything is legitimate in this game; clamps work but look ridiculous in scale terms; Spanish windlasses of copper wire and matchsticks work a treat. Tamiya putty does scale bog reasonably well, and instant glue at this scale is welding by any other name.

Problems arose with things I didn't anticipate. First, there is no such thing as 'British Racing Green' (I'd figured it would have a specific number); Tamiya does a shade I've called 'pea'. Secondly, chrome is a toughie to recreate; silver paint just looks like silver paint.

Don't touch that drivetrain

With the chassis nearly bare – I didn't dare remove the motor or gearbox, although the offside magneto chose to remove itself – the first moves were to shift the right front spring backwards and to kink the front cross-member upwards. In real life, the axle had moved backwards along the spring, but that joint was too well glued on the model to dare shifting it.

The thick cross-member pictured just in front of the radiator had me baffled – what was it? In the end, a mate and I decided that it was some sort of anti-roll

connection between the knee-action shockies. I made something out of brass tube, extended the upper shockie arms in brass, and await some expert telling us we were on the wrong track!

Finishing off

The SU carbies on the side of the supercharger were 'handed' (left/right) and side-draught. I chopped them to pieces and recreated slopers from photos; not perfect but they'll do. The scuttle I extended with printer's aluminium, smeared in modeller's putty. Mudguards/Running-boards were from the same aluminium, finished in a chipboard former. Thin plastic card came into play more than once; brass tube squashed in the vice became the windscreen frame.

As this goes to press, I have yet to create some racing numbers, and I may never bother devising a centre-line bonnet hinge, but I reckon that it captures the essence – and I have a sneaking suspicion that Sammy Davis would have approved. Anyway, when a grandchild asks why the damage, I'll have a story ready to tell – as long as I can remember what it is, that is. 📖

Specifications: 1930 4.5-litre Blower Bentley

Chassis number: LM1344

Engine number: LM1341

Registration: MK 5206

Delivery date: June 1926

Body type: Four-seater

Coachbuilder: Vanden Plas: body No. 1295

Car type: SP (four-seater Speed model)

First owner: Dr JD Benjafield

In his book *Bentley: The Vintage Years*, Michael Hay states: "Vanden Plas body no. 1295. 1926/7 Le Mans car. Body burnt out – rebodied as 2-seater. Wrapped around a telegraph pole (chassis had already cracked twice) and written off. Broken up – engine in ch. NR 503. Reg. No. now on ch. 997."

vintagebentleys.org/

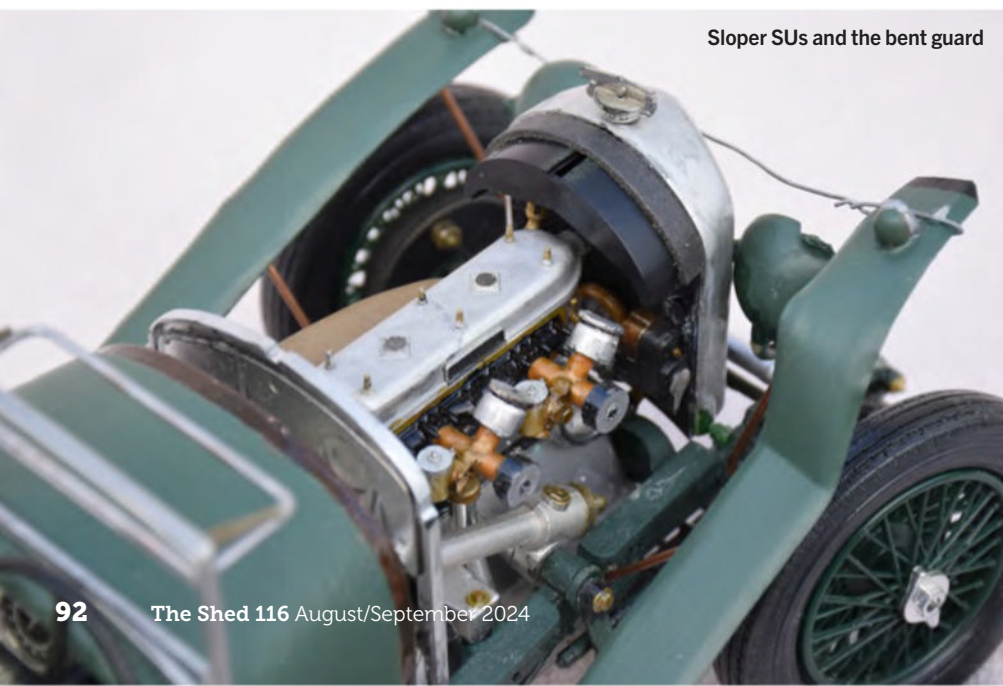
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vintagebentleys.org/articles/0024/page-2.htm

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Sloper SUs and the bent guard





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MY RETIREMENT PROJECT

An absorbing retirement project might possibly postpone the arrival of the Grim Reaper, but it brings its own stresses and challenges

By Coen Smit

Photographs: Coen Smit



Doing duty as a motorised wheelbarrow

Bringing them home





There comes a time in everyone's life when you should, or must, leave the world of work that you have lived with for so long.

My own experience in seeing others retire suggests that many, having lost the powerful force that has driven them to this stage in their life, suddenly feel at a loss. I can remember one man, who had been a banana grower, shuffling off this mortal coil within six months of giving up his profession. Another, a public servant, suffered the same fate within a year of retiring. For both of these men, their identities were intrinsically tied to their professional lives, and, with that having ceased, their life's purpose also evaporated.

On the other hand, I knew a retired cray fisherman who took up building small cray boats in north-western Tasmania after he quit fishing. As soon as he finished one, he laid the keel for the next one; it kept him going for years! He did it all on the cheap, scrounging parts where he could and calling in favours when necessary. The boats were not particularly beautiful, but it gave him purpose and a reason to get up in the morning. ►



Applying the anti rust

“A bonus is that they come in 4WD forward-control cab versions”

I’m following the fisherman

Having just retired myself, I am determined to follow the cray fisherman’s example.

Since I was a young boy, I have always liked some of the small cars made in Europe, such as the Fiat 500 and the Multipla (a 600cc minibus). Some years ago, I purchased a used Daihatsu Handivan to help in a small business my wife and I ran. Unfortunately, while it was doing erstwhile duty, we cooked the engine and could not really afford to rescue it, so we parted company. However, it had served us well and impressed me with its versatility.

Now, in my retirement, the asking

price for small Fiats is well out of my range, so I started looking at other options. One of these is *kei* mini trucks. A bonus is that they come in 4WD forward-control cab versions, making them more versatile in performing duties around our small acreage. As I like walking my dogs in the surrounding forests, one of these trucks would also be ideal for exploring the more difficult tracks. These little trucks are rare in our region, so, with a bit of stick-on advertising, one should make a good advertisement for our cattery business. (All these aspects are guaranteed to smooth its passage into our family with ‘the Chancellor of the Exchequer’!)

I considered restoring my favourite small Fiats but discovered they were well out of my price range

Fiat 500



Fiat Multipla van



That won't work

A couple of companies import these little trucks into Australia. The older models range in price from about A\$10K to A\$13K, again getting out of my price range. The cost of transporting one to Tasmania and registering it would add another A\$2K–A\$3K. Doable, but also more difficult to sell to the Chancellor!

The Japanese *kei* mini trucks are an interesting phenomenon of the Japanese auto industry. After World War II, *kei* (meaning 'lightweight') trucks were a logical step for Japanese manufacturers to recover from the devastation of the war. Inexpensive to build and run, they were ideal for companies like Daihatsu, Mitsubishi, Honda, Suzuki, Mazda, and Subaru to market to farmers, tradesmen, and delivery companies. Their small size is a bonus in Japan's crowded cities. These companies still manufacture *kei* mini trucks, as their usefulness has been proven in the intervening years.

In Japan, as a vehicle ages, associated

fees such as insurance and registration rise significantly, making it uneconomic to own older vehicles. This has meant that these older trucks are finding markets overseas. There are Japan-based firms that specialise in exporting used *kei* mini trucks. (If you are interested in obtaining your own little truck, a quick internet search will give you a host of sites to explore.)

A lucky break

I reluctantly resigned myself to not achieving this particular retirement project, primarily because of the overall cost.

Then, unexpectedly, my son found one for sale, located in Tasmania and complete with a parts van, at an asking price half of those on offer on the big island. I immediately contacted the owner, who sent a group of photos that gave me a realistic look at what we were in for.

I had previously purchased a book

“After World War II, *kei* (meaning ‘lightweight’) trucks were a logical step for Japanese manufacturers to recover from the devastation of the war”

Anti rust applied to windscreen area





“It’s all about the *kei* truck phenomenon in the US but it gives good general insights into what to look for when buying one”

The 1000cc engine and gearbox readied for refurbishment and transplantation in the near future

called *A Illustrated Guide to the Japanese Mini Truck: An Introduction To All Things Kei Truck* by Mark Roehrig. It’s all about the *kei* truck phenomenon in the US but it gives good general insights into what to look for when buying one.

With my prior daydreaming on the internet, I had some idea what to look for. For example, the older trucks only have a five-digit odometer so 80,000km could in reality be 180,000km, considering the age of the vehicle. A better guide to usage would be the wear and tear on the rubber pads on clutch,

brake, and accelerator pedals. A freshly painted chassis can mean repairs have been carried out, etc.

Scoring a bargain

In any event, my son and I decided to take the plunge and set off to Hobart the following morning with my car trailer in the hope of scoring a bargain. On arrival, we had trouble getting it to run until Nathan, the young owner, asked his dad to check the points. This done, we managed to get it running in a fashion.

Nathan said that it had done a genuine



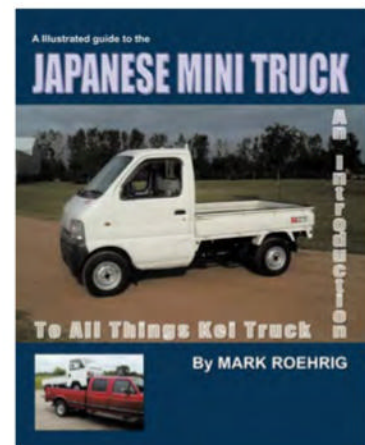
The original state of the rear end

81,000km and he had owned it for the past 15 years. When I looked at the rubber pads, they were still in good condition. The chassis had not been repainted. Everything worked as it should, and it soon became a foregone conclusion that this little truck and its parts van would be coming home with us.

Having dragged both the little truck and its parts van onto the trailer and back across the state, it became a matter of where to start. As you can imagine, there was a good deal of grime and

dirt to be removed, as well as a list of missing bits and pieces that needed to be sourced.

As soon as the little truck was cleaned, I went mad with a wire brush and a bottle of rust inhibitor to prevent further deterioration. Apart from some rust bubbles around the base of the windscreen and in one tray side, the majority of the rust spots were surface scratches caused by the inevitable small impacts that the vehicle has endured since it rolled off the assembly line. ►



Painting commenced on the rear end



Cleaning and tidying up the inside of the cab

Getting stuck in

I decided not to remove the windscreen, figuring that if I broke it in the process, a replacement would be hard to find. Instead, I used a chisel and small brush to gently lift the rubber surround and work the rust inhibitor under the edge. Time will tell if that has been good enough!

While this work was under way, I replaced the spark plugs, oil filter, oil, and water, assuming it had been some time since that had been done. A new battery plus a decent bracket to hold it in place were also called for. With these improvements, the little truck started readily and settled down to a constant idle within seconds.

Crawling around underneath it while changing the plugs, I noticed that the exhaust pipe beyond the muffler was missing, and that the muffler was solidly fixed to the exhaust manifold. I'm not sure whether this is standard on this vehicle, as most others I have dealt with have a flexible joint between the manifold and the muffler. I decided to leave it as is for the time being and only manufacture a replacement of the extension from the muffler to the back of the vehicle. If it gives any trouble, I will get a flexible joint put in ahead of the muffler later. ►



Repainting the front end. The wee truck will look so much smarter when painting is completed





New tail-lights and a clean-up of the rear end

“I guess it is unrealistic to expect replacement bits for older cars to be readily available, but you would think that manufacturers would standardise things”

Parts issues

Running the engine highlighted a problem with the alternator. The local automotive electrician tested it and recommended getting a replacement. While I was at it, I opted for a new regulator as well.

Accessing one of these brought to light an interesting aspect of my project. While some parts are readily available, such as the alternator (or so I thought!), points, and oil filter, others, such as the regulator (only 18 available in Australia at the time) are far scarcer. The rubber U-channel that covers the drop-down sides is almost impossible to replace. I needed a new 12-inch tyre (not stocked by anybody in Tasmania, apparently) and finally had to resort to eBay.

Particularly frustrating is the impossibility of finding bits like the little clips that hold the plastic grille in place. Trawling the internet for them brought up countless different clips, for every make of car, including Daihatsu – except, of course, the type I needed.

I guess it is unrealistic to expect replacement bits for older cars to be readily available, but you would think that manufacturers would standardise things such as these clips to a few types – even if only to take advantage of the economies of scale.

The alternator

Back to the alternator! The old one had no identifying marks on it as to its model or manufacturer. The auto electrician guessed that it was probably a Denso, and, when we looked through the Denso catalogue, a remarkably close match was found.

We measured the diameter, depth, and position of the mounting lug, etc.



Look at that stylish interior

“A feature very handy during war, when you could not waste time looking for a key while being shot at; however, not so good today!”

It all looked good, so we ordered one. Come the time to fit it, however, and things quickly went awry. No matter how I fiddled and twisted the new one, it kept fouling the intake manifold. I even resorted to building a bracket to lift the alternator up a bit, only for it then to foul the bodywork. In the end, we decided the only solution was to rebuild the old alternator. Time will tell whether it is up to the job! (The photo of the engine bay shows the old, refurbished alternator and an idea of the limitations we had to put up with.)



Fiddling with the alternator

Clever thinking

I wanted the little truck to be useful, and I was not desperate to restore it to original or to enter it in car shows. I have therefore compromised in certain areas, such as the tail-lights. The original screw jack and handle had parted company with the vehicle some time ago, so I sourced a Ford Falcon jack as a viable replacement. Unfortunately, it did not fit where the original was located, and, as you can imagine, space in this vehicle is at a premium, so I adapted an old Telstra equipment box that came with the parts van and bolted that to the tray upright. It holds the jack, wheel spanner, and a tool roll without compromising the tray area.

While I was at it, I installed a key switch that isolates the distributor – 1986 anti-theft technology was not great, so the extra key switch is an added deterrent. I had previously installed a similar switch on my 1943 Ford Jeep, which came equipped with only an ignition on/off switch – a feature very handy during war, when you could not waste time looking for a key while being shot at; however, not so good today!

Expert check

Before seeking to register the truck, I wanted to be sure that it was mechanically sound and safe. Rather than take the punt myself that the brakes were in good order, I decided to send the truck to a workshop that specialises in this area. The truck was fitted with disc brakes to the front wheels by the previous owner – salvaged from the parts car. Unfortunately, he had not bothered to fit the brake vacuum booster along with the disc brakes.

I contemplated removing the master cylinder/booster combination and fitting it to the truck but, looking at it, I realised that it was a plumber's nightmare to remove let alone refit; that was why he hadn't bothered. Fortunately, I came across a brand-new vacuum booster at a recent swap meet that could be situated and plumbed in remotely. I sent it along to the workshop mounted and ready to plumb in. ►



“Fortunately,
I came across
a brand-
new vacuum
booster at
a recent
swap meet”

Bearing anyone? Anyone ...?

In sorting the brakes, it became evident that the front bearings needed replacing. Amazingly, neither the company nor any of the bearing places or automotive parts chain stores could help me. They could tell me the kit stock number, but there are none in Australia and they aren't able to obtain any more. Given that these little trucks are still driving all around South-East Asia, it beggars belief that such basic spares aren't still being manufactured! I tried contacting Yokohama Motors in Japan, which advertises that it specialises in parts for *kei* trucks, but was unable to get a response or even an acknowledgment of my email.

Fortunately, while mooching around on the internet, I found Kei Truck Garage in Sydney, which specialises in parts for these little vehicles. I was even more pleasantly surprised when, after a bit of digging on his part, Anthony, the owner of the business, said that he could source an aftermarket version of the bearings and seals from Japan. All up, including freight, they did not cost me more than I would expect to pay for a set for my Holden.

It is a bit of a plug, I know, but any reader of *The Shed* looking for parts for these vehicles should seriously consider contacting Anthony at Kei Truck Garage. He was helpful and, better still, on the ball – more so than some of the importers of *kei* trucks that I contacted prior to him.

Road-test time

It would be nice to say that everything was smooth sailing from there; unfortunately, that was not to be the case.

On its first proper outing, the little truck suffered serious engine failure. An ominous ticking sound preceded a sudden reduction in power and smoke belching from the exhaust! This sort of problem is a bit beyond my expertise, so I trucked the truck to my mechanic. Stripping the two-cylinder engine down revealed that one piston had at some point swallowed something metallic, possibly the end of a spark plug, which had then proceeded to destroy the top of the piston and parts of the combustion chamber. Obviously, I would have to source more parts!

This time around, sadly, Anthony was unable to help me. However, Peter at

Auto Surplus in Melbourne (a company that specialises in supplying parts for older and unusual vehicles) came to the rescue with new pistons and bearings, but unfortunately no rings. Pistons without rings are about as useful as three men away!

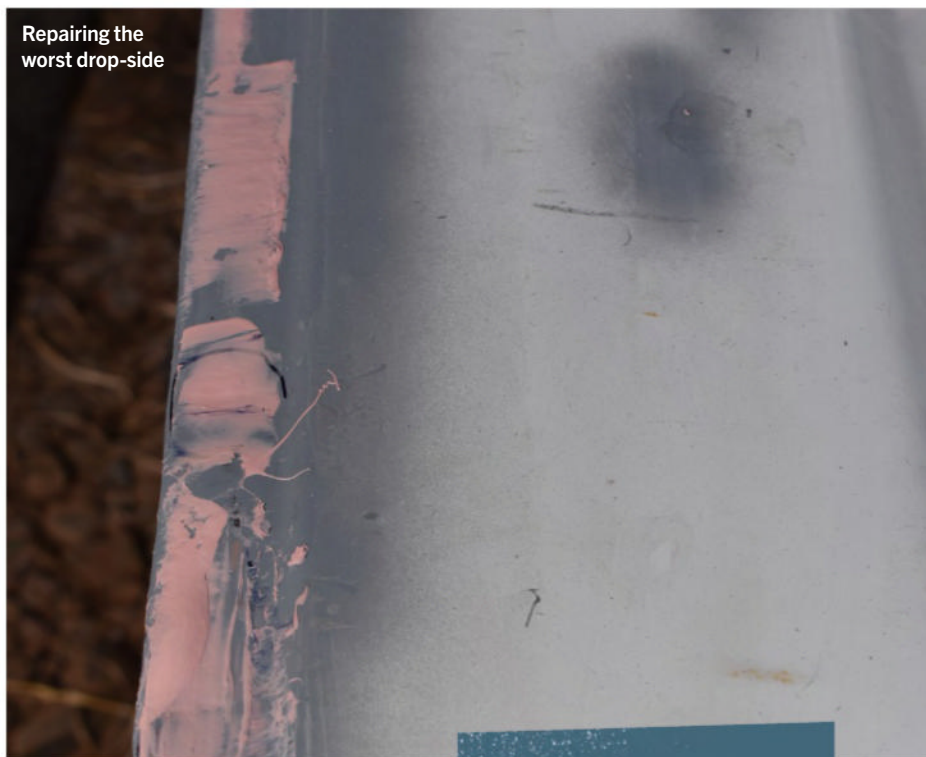
So, the hunt was on again! After much googling and gnashing of teeth, I found that JP Engineering in Adelaide had a set that should fit, at least in diameter. Unfortunately, they are a bit thicker than the grooves that carry them, so the new pistons have gone to a local engineering business whose proprietor used to race cars. He has undertaken to widen the grooves so that the rings will fit. Meanwhile, another local firm was tasked with rebuilding the head.

Lessons

What have I learned so far?

Well, unless you enjoy the self-flagellation that comes with restoring a rare model of what should be a fairly common old vehicle, it would be advisable to ensure that the vehicle is in fact a common version of the marque. Parts for the three-cylinder 1000cc versions are readily available, but the 547cc twin appears to be a whole other ball game.

Repairing the worst drop-side



“I should have taken time to consider using the 1000cc engine in the spare parts donor vehicle”

When the engine started giving me the grief I have described, I should have taken time to consider using the 1000cc engine in the spare parts donor vehicle instead of going down the route of repairing the smaller motor. It possibly would have been cheaper, despite the bureaucratic hassles that would have been involved in opting for the bigger engine. You live and learn! ►





An early outing for the little truck



It's a great off-road vehicle, that's for sure

“Since I was a young boy, I have always liked some of the small cars made in Europe, such as the Fiat 500 and the Multipla”

Ready for the road

After some more delays in reassembling the engine and finding better valves, the little beast was finally ready for the road. A bit jerky when cold, it soon settled down as it warmed up only to die on any long hills, forcing me back to first at idle speed – not a particularly nice feeling when you have a fully laden B-double log truck looming up behind you!

I decided that the mechanical fuel pump was starving the engine in those conditions, as the truck was perfectly happy on level going. I installed an aftermarket electric fuel

pump, rearranged a stack of hoses, and connected the electric unit via a relay to the power input line on the distributor. Success!

It is still not a fire breather in the hills but at least it keeps trying! The most difficult aspect of the job involved extracting the obsolete mechanical unit from its ridiculously confined space.

As you can imagine, the fuel pump saga involved numerous trips under the vehicle as I installed the new unit, wired it in, and removed the old. It taught me a second thing about taking on retirement projects: bear in mind that you are no longer as agile as you once were; knees, back, and elbows protest much more often at my age. Luckily, there was reasonable ground clearance, but unfortunately, I was working on a gravel surface. I had forgotten how much more I value my creature comforts these days!

0–60 performance?

Performance has looked up a bit since I fitted the electric fuel pump, but the truck is still no powerhouse. I guess I should not expect much when even my zero-turn mower has an engine that is 200cc larger than that of the little truck.

The wee truck is great in rough terrain, and has surprising ability even with standard road tyres. When speed is not an issue, I cannot fault it. However, to get to these areas, I have to do some highway kilometres and tackle a number of hills. I have therefore decided that phase two of the project will have to be the extraction of the three-cylinder 1000cc unit from the donor van, resurrecting that as much as needed, and installing it into the little truck.

As phase two is just beginning, I will wrap up My Retirement Project until I have more to report, and coax my old limbs into unnatural configurations for a while longer. 📁



My wee truck showing off its practicality

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THIS HUGE AUSSIE MUSCLE CAR MAKES THE GROUND SHAKE

Faced with the possibility of scrapping his cherished 1973 Ford Falcon XA 351 GT hardtop, David Chase took the plunge, delivering it into skilled hands at Matamata Panelworks. It's now a stunning classic and the 2023 Ellerslie Classic Car Show Intermarque Concours d'Elegance Masters Class winner.

Rarely do these Ford Falcon 351 GT hardtops last long in their original state; they are usually modified or raced, or rust results in them being scrapped. They are already a rare sight on New Zealand roads, and survivors turning up at car shows are well restored, with their values skyrocketing past the NZ\$220K mark. This is especially the case with David's car, as it's all matching numbers.

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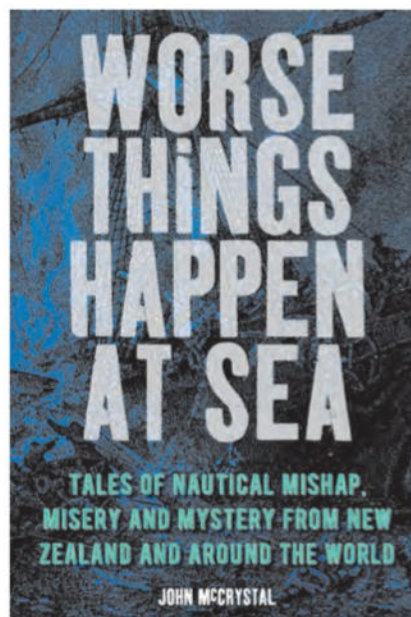
By John McCrystal

Review by Ritchie Wilson

The first English novel was *Robinson Crusoe* by Daniel Defoe, published in 1719. It was based on the real-life experiences of Alexander Selkirk, who was marooned for four years in the Juan Fernández Islands, off the coast of Chile.

Famous French writer Jules Verne based his best book, *The Mysterious Island* (1874), on François Raynal's *Wrecked on a Reef*, which was originally issued under the title *Les Naufragés* (1869) – which translates to 'The Castaways'. Raynal's book is an account of being stranded on Auckland Island when the ship *Grafton* broke its anchor chain and was driven onto a rocky shore during a tremendous gale.

Raynal was second in command, and his recollections, based on a journal he kept while a castaway, would have appealed to Verne because Raynal was a "god of DIY", who refused to succumb to the incapacitating despair that many disaster survivors experience. He made cement from roasted seashells and



sand, made leather by tanning sea lion hides using bark from the rātā tree, and cobbled serviceable shoes from the leather. He made a forge and then, using iron salvaged from the wreck of the *Grafton*, made nails and tools, including

a saw. He used the tools to modify the small ship's boat so that it could survive a five-day voyage to Stewart Island, saving all five crew members.

New Zealand marine historian Joan Druett's excellent *Island of the Lost* (2007) relates the story of the *Grafton* and of the *Invercauld*, which both came to grief on Auckland Island in 1864. Neither group was aware of the other's presence on the island. Only three of the 19 survivors who managed to get ashore when the *Invercauld* sank were still alive a year later when a passing ship rescued them.

A danger to navigation

In the age of sail, the Auckland Islands were a great danger to navigation for two main reasons.

First, a ship making the journey from Australia to Britain via Cape Horn by the 'great circle route' would head south to pick up the incessant westerly winds that circle the globe, almost completely unimpeded, around latitude 50 degrees south, this course bringing them dangerously close to the Auckland Islands, which lie 350km south of Stewart Island, or to other subantarctic islands such as the well-named Snares.

Secondly, celestial navigation, which was a sailing ship navigator's only method of determining the ship's position, required relatively clear skies, and they are notoriously infrequent in this part of the world. An unlucky captain could encounter cloud or thick fog, which might persist for many days. He would become increasingly uncertain of his position, knowing that he was possibly sailing directly towards the almost uniquely forbidding cliffs of Auckland Island. Quite a few ships are known to have been destroyed at the base of these almost vertical cliffs, some 300m high, which form the 50-kilometre-long western coast of the island. Probably, there are others of which we have no record.

Our maritime disasters

Prolific Wellington author John McCrystal's *Worse Things Happen at Sea* tells the story of 24 maritime disasters, four in the Auckland Islands: the *Rifleman*

(1833); the *Grafton* and the *Invercauld* (both 1864); and, most famously, the *General Grant* (1866).

The book is based on the discussions McCrystal had with host Graeme Hill on Radio Live's Sunday night *Weekend Variety Wireless Show*. Each week for over a year, McCrystal would relate the known facts about a shipwreck to Hill; the book is a selection of these, often harrowing, narratives.

Some, like the *Mary Celeste* and the *Titanic*, will be familiar to most readers; others such as the *Costa Concordia* and the *Mikhail Lermontov* are memorable because of our incredulity that such improbable things could happen in the modern world.

Heroic acts

One theme of *Worse Things Happen at Sea* is the revelation of the true character of people caught up in an often slowly evolving life or death struggle. Mothers trying to save their young children could act heroically – an example being Ada Hannam trying to save her four youngsters after the sinking of the SS *Penguin* off the south coast of Wellington in 1909, or Shirley Hicks with her three, even younger, children after the foundering of the TEV *Wahine* in Wellington Harbour 59 years later. In contrast, survivors often described unforgivable behaviour.

Another theme is the reliability of the accounts of shipwreck survivors, particularly if they had to subsist in

bleakly inhospitable conditions, far from any law, for many months. Are the survivors' published stories completely accurate? Have dark deeds been edited out of the narrative?

The situation of smaller, weaker castaways – such as the ship's boys of the *Invercauld*, Liddle and Lancefield, or the unnamed woman who lived for 26 miserable months in a cave on subantarctic Macquarie Island with nine men after the wreck of the *Eagle* "around 1860", or Mary Ann Jewell, who survived the wreck of the *General Grant* – would be particularly worrisome.

"Raynal was a 'god of DIY', who refused to succumb to the incapacitating despair that many disaster survivors experience"

A cargo of gold

In the case of the *General Grant*, famous because of the large amount of gold from the Bendigo goldfields that it

was carrying, there is a possibility, no more, that the position of the wreck was deliberately falsified by the survivors so that they could salvage the bullion after getting back to civilization – that would explain why the wreck has never (as far as we know) been found.

Three of the survivors returned to the island with different salvage parties. The novel *Mrs Jewell and the Wreck of the General Grant* (2022), by Hawke's Bay writer Cristina Sanders, is based on the published stories of survivors and some of their letters.

John McCrystal has visited the Auckland Islands and dived on a wreck thought, at the time, to be the *General Grant*, but that he has identified to his satisfaction as being the *Rifleman*.

Absorbing and Upsetting

This book is an absorbing account of each of these 24 diverse disasters, some being quite upsetting to read about. His account of his daughter finding the remains of a woman's handbag, a relic of the *Wahine* disaster, among the rocks of a Wellington beach is particularly moving.

The numerous illustrations are first class; some are reproductions of woodcuts from François Raynal's account of the wreck of the *Grafton*, done by a well-known French artist of the day, and some are from contemporary newspapers. The photographs, several in colour, are well chosen; there is even one of Vladimir Putin. 📷



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Book type: Paperback/Softback
Number of pages: 176

Multiple woodsheds are needed to keep a church warm over winter. Wood-stacking techniques in a family are as contentious as how one should load a dishwasher



BUILDING A RURAL LIFE

Take one dream, two creative and innovative people, a path less travelled, a dash of business acumen, and voilà!

By Helen Frances

Photographs: Solvej Mortimer

When Thomas Mortimer moved to his wife's home village, Matiere, near Taumarunui, he realised a childhood dream – to have his own workshop. However, it didn't happen overnight.

Thomas, from Sweden, met Jenny Etherington in Fremantle, Australia, where he worked for a joiner and made wooden briefcases in his spare time. When he returned to Sweden, Jenny joined him and they made Sámi jewellery from reindeer skin and antlers, selling it on the streets.

"We made a living like that for five years," Thomas says, "going between Sweden and New Zealand. [Jenny] was faster than me, so she did the making and I did the talking."

When the couple's daughter, Solvej, was born, they settled back in Matiere. Solvej grew up in the village, then took off to study architecture. She returns regularly.

Before meeting Thomas, Jenny had bought a deconsecrated Catholic church,



one of three churches in Matiere, and the pair set about making it into a home. This was no mean feat, but they had plenty of time, living in the slower lane of rural village life. These skilled and

creative souls have converted the building into a warm; light-filled; and, in places, somewhat quirky dwelling.

Church house

The church interior was dark and cold, the windows small, so installing larger windows and insulating were a priority.

"In the old-fashioned wooden churches, the windows are high up, so that you don't look outside but look at the priest instead," Thomas explains. "In Sweden, of course, we like the light because winters are so dark."

Thomas installed various windows – a bay window sourced from a house renovation, some tall arched windows that he made, and another, which became a stunning feature for the mezzanine floor that he built.

He says, "I was going to lift up this skinny window and make some dormers but when it was just a big hole, I thought, *Oh gosh, look at this view; it's a shame to just have a skinny window.* So I made a big arched window." ►



A lead-filled lamp, carried home by backpack from an overseas adventure; internal window panes stacked to be added back in for winter

“I just added another frame, with the sphagnum moss in between, and in that way got a double-glazed window”

hole close to the ceiling that you could open or shut. Nowadays, they have pumps in each room that push out the condensation mechanically,” he says.

A more modern way of glazing that came in after World War II involved screwing the inner and outer window frames together, allowing them to be opened: “When you open the window, you open two frames that are connected to each other. Of course, to clean [them], you need to be able to separate those two frames. There’s a lot of special window hardware [in Sweden] that I never could find here. I bought some when I made the new windows – you have hinges and then you have special hardware to lock them together.”

Naturally, with more windows, the church building was even colder.

Says Thomas, “There was no insulation. We ate breakfast wearing fingerless gloves and beanies. Something needed to be done.

“We insulated the ceiling, the walls, and the floor. We used wool insulation where possible, because it’s more ecological and easier to work with.” ►

The Swedish way

Thomas double-glazed the windows in the Swedish way, with removable interior panes – a technique that he says goes back at least 150 years.

“You had a single-frame window and an extra frame with glass that you put on just for winter, but you couldn’t open the windows,” he explains.

The internal panes are glass. For some, Thomas added an exterior pane of Perspex or glass. The internal panes can be taken out in spring.

To manage the condensation, he placed a layer of sphagnum moss in between and at the bottom of the two frames.

“The sphagnum moss absorbed the moisture and, when it got hot, would release it. I just added another frame, with the sphagnum moss in between, and in that way got a double-glazed window,” Thomas says.

There is enough air circulation to remove condensation, as the church is not totally draft-free.

Thomas adds that in Sweden the heaters are placed under the windows so there is warm air flow in front of the window, and that removes the condensation.

“In the old days, you had just a little



A layer of sphagnum moss to manage condensation in double-glazed windows

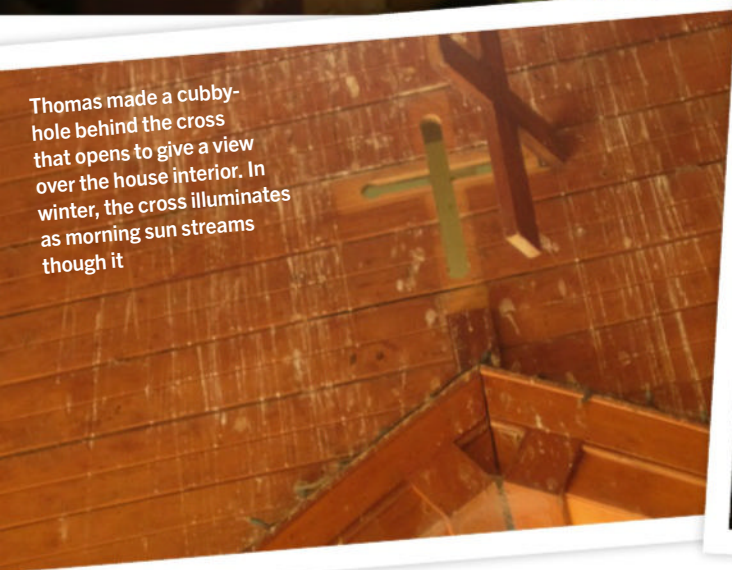


Naturally, with more windows, the church building can be quite cold





There are always at least six projects on the go



Thomas made a cubby-hole behind the cross that opens to give a view over the house interior. In winter, the cross illuminates as morning sun streams through it



Thomas, Jenny, and daughter Solvej

“The cross itself acts like a shutter, and Solvej could play peep-bo by swinging open the cross to look out into the church”

A quirky cross

The church/house used to be an adventure playground for Solvej. Thomas had fun making little nooks that she could climb into or where she could hide her personal treasures.

“I have made a lot of little hidey-holes for Solvej, behind drawers and under stairs – that sort of thing,” he says.

Although the church had been deconsecrated, one of the crosses at the top of the arch above the altar had proved too hard to reach. The roof over the vestry behind the altar was lower, so, in the tiny space behind the cross, Thomas made a cubby-hole and cut a hole in the form of a cross into the vestry wall. The cross itself acts like a shutter, and Solvej could play peep-bo by swinging open the cross to look out into the church.

The ceiling over the vestry, where the clerics changed their clothing, was high, so Thomas lowered the ceiling. In the lower part, he built the bathroom, and the upper part became a bedroom with a little entranceway through which a small person can crawl into the space above where the altar used to be.

“You can spy on the area below, where the congregation used to gather. It’s a little secret place,” Thomas explains.

Thomas’s first shed

When the local Methodist church came up for sale, Thomas bought it and converted it into his first shed. He put in a mezzanine floor as preparation for a future house conversion, and then set about making the wooden componentry for Solvej Swings (see side panel). Solvej

The Solvej Swings shop used to be a general store then a butcher's shop



also helped – as “child labour,” she quips – learning how to do the woodwork and assembly.

Thomas’s workshop in the church was up on a little knob quite far from where the sewing took place. He’d craft the wooden components of the swings there, and then take them to where Jenny sewed the seats on industrial sewing machines and attached the ropes. The sewing room is the bank manager’s house behind the former Bank of New South Wales. The bank itself, built in 1923, has been left untouched, complete with tellers’ booths.

Expansion

Sales increased and Thomas and Jenny’s operation started to expand, providing employment for locals.

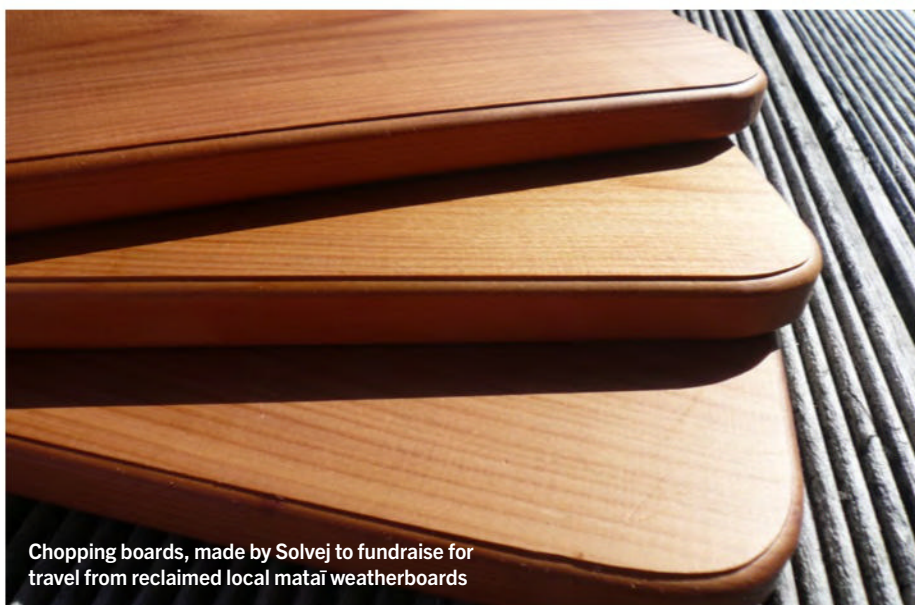
To house what had grown to be two mass-production processes of swing fabrication, they needed more space.

“We wanted to consolidate the business in one place so we could have two employees, one smoko room, and a toilet,” Thomas explains.

Jenny’s father owned the building next to the bank. It used to be the general store then a butcher’s shop, and had a solid concrete floor – ideal



Thomas’s well-equipped workshop



Chopping boards, made by Solvej to fundraise for travel from reclaimed local matai weatherboards

“There is a quaint, cottagey aspect to the factory, but behind the façade whirr the engines of modern mechanisation”

Below: Within the walls of the earth bank, a garden flourishes. Ponds and islands, created by excavating soil for the earth wall, are connected by bridges. The islands are used for veggie gardens, the moat both keeps the chickens out and creates a beneficial microclimate for growing. The duckweed-covered canals have fooled many a soaked dog – swimming skills are required on this property

for supporting large woodworking machinery and tools.

Thomas moved out of his church workshop, gave it to his daughter, and set up the woodwork side of the swing-making business in the butcher's shop.

“I had to open it up to make bigger spaces,” he tells us. “For instance, I had to raise the floor where the machines were [to install] dust-extraction ducting underneath.”

Gotta love machinery

There is a quaint, cottagey aspect to the factory, but behind the façade whirr the engines of modern mechanisation.

Large machines do the work of what used to be skilled crafting with hand tools – something that Thomas

still considers to be real craft work. However, he also loves machinery.

“An old dream I had was to have a Robland – a combination machine that has a table saw, a spindle moulder, a planer, and a thicknesser. It has three motors, but it's actually just one big machine. That, of course, is ideal if you are a one-man band, so that's what I invested in when I came out here,” he says.

“But that is not so practical if you have a factory. Then, you want to separate the machines so you don't have to change the machine depending on what you're doing.”

Now, Thomas uses the machine for planing and thicknessing and cutting as a table saw but not as a spindle moulder. Instead, two separate spindle moulders do a specific job in shaping timber for the swings.

Handcrafted

Thomas has a free-standing bandsaw and drill press, and a combination table saw and planer, also using them for personal woodworking projects.

“You think of a swing, and [look at] all these machines to produce something not very bulky, but there's still a lot involved in fashioning,” he says. “To me, a handcrafted product is when you use hand tools. I'm old-fashioned. In my mind, you don't use machines when it's handcrafted. Nowadays,





Thomas now has a small personal workshop among many other sheds where he stores recycled timber and firewood. At right, rims from old wagon wheels wait to be repurposed in a new project

if you hand-machine a product, it is considered handcrafted.”

All the woodwork and the oiling are done in the butcher’s shop; the sewing, assembling, and dispatching happen in the bank under Jenny’s management.

“To me, the cool thing about the swing enterprise,” Thomas comments, “is that we haven’t built a factory. We have used old buildings that have had some other previous use and turned them into a factory.”

That is very much part of this couple’s philosophy and practice: recycling what is already around them rather than buying new materials.

The personal project shed

Among all the building work, shed shifting, and repurposing, Thomas has found time to build a small woodwork shed for his personal projects. Daylight shines onto his workbench through a recycled Art Deco window.

Here, Thomas keeps his power tools and cherished handcraft tools, collections of hand planers, saws (his favourite is a Japanese pull saw), chisels, and a large array of other hand tools.

His first project was to build a multi-cubby-hole shelf using old planed pallets on which to keep his glass jars of nails, screws, and bits and bobs. Since then,

he has mainly used this shed for repair work. However, he did manage to make time to satisfy his love of whimsy by creating an ‘indoor chook house’ with wooden hinges and lock.

And another shed ...

Thomas needed storage to house his growing collection of timber, doors, windows, etc., so they built another shed, using the doors from the village fire station, and called it ‘The Fire Station’.

With so many sheds, Thomas is currently spending a lot of time building, renovating, and maintaining. A recent acquisition, a red 1960s goods train wagon, will need an interior fit-out. Jenny and Thomas got it from a local farmer, giving him a container in return. No easy swap, though; it required a large and a smaller digger to lift it onto the land between the butcher’s shop and the bank.

The new wagon gallery

Thomas and Jenny plan to turn the goods train wagon into an art gallery for local artists – all part of a longer term plan to revitalise the culture of the tiny village. This is happening, says Jenny, as other locals return to Matiere and the wider area. The village is only half an hour’s drive from Taumarunui, the base

In praise of recycled native timber

One of the first things Thomas did on arriving in Matiere was to rescue timber from derelict buildings on neighbouring farms.

“If you leave a wooden building for too long it dies,” he says. “So I would go and ask them, ‘If you’re not using this, can I use the timber?’”

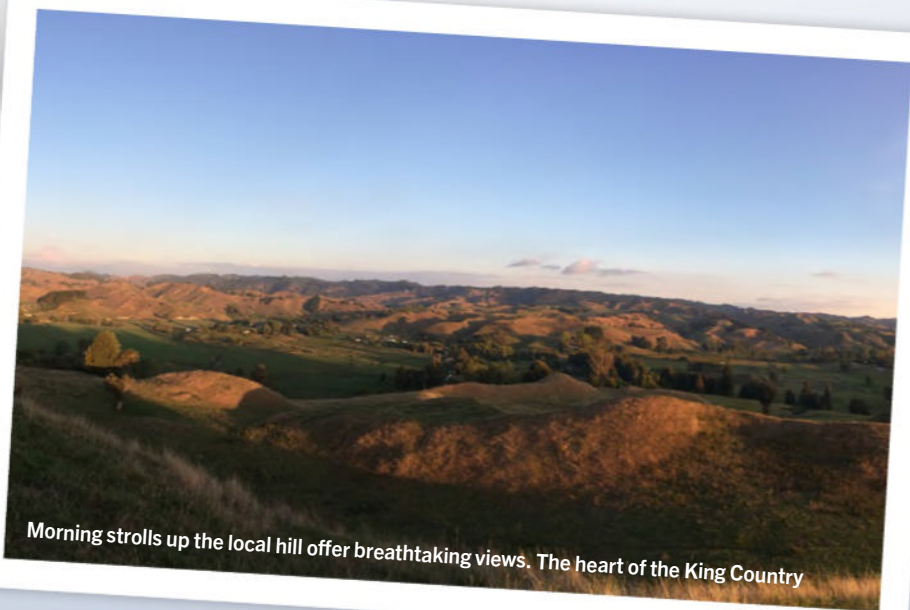
“It was all native, basically, because it was mainly old houses. Lots of mataī because often the floor is either mataī or tawa. The weatherboards are often mataī, and inside there is often a fair bit of rimu.”

The pale Scandinavian timbers tend to be quite bland, so it was exciting for Thomas to discover the rich, darker colours of many New Zealand native timbers. They have an exotic appeal to the Swedes.

New Zealand pine is another matter.

Thomas says Scandinavian-grown pines are a tougher tree, because they grow so much more slowly, and they make good furniture.

However, he adds, “They are messing with the pines there too. Originally, pines took 150 years to mature. Then they started to import pines from other regions in the world that had around 75 years of turnover. Of course, they are not as strong, solid, tight-grained, and so on. So now the timbers they have are 45 years old. But here it’s kind of 28 years, so that’s half again. The climate here is just too good. Everything grows so well, and fast.”



Morning strolls up the local hill offer breathtaking views. The heart of the King Country

for rail cart tours and other adventures along the scenic Forgotten World Highway.

Jenny is passionate about her village, both preserving what remains in a physical and cultural sense (she was the first woman to manage the Cosmopolitan Club) and encouraging newcomers and artists.

“We’re really lucky because we still actually have a village. I’ve seen so many villages where all that’s left is a skeleton,” she comments.

There are newcomers for who rural village life is more affordable and the lifestyle appealing. Solvej has seen this happening.

“Quite a lot of creative alternative

people are coming, and, more recently, there have been a lot more people who are interested in business and making things to sell,” she says.

Flood protection

Flooding is a major and regular occurrence on Thomas and Jenny’s property, due to the proximity of the Ōhura River.

Although Jenny had already had the church house lifted a metre off the ground, that proved not high enough. Thomas’s woodworking shed; Jenny’s pottery shed, which they are turning into visitor accommodation; and various other sheds also needed protection from flooding.

“We’re really lucky because we still actually have a village. I’ve seen so many villages where all that’s left is a skeleton”

It was the can-do attitude of the local contractors that made the impossible possible



Thomas says that, 30 years ago, tired of being inundated every time there was a downpour – the wash house and washing machine filling with silt on two consecutive days – they said, “Enough!” and hired a driver and digger to construct an earth wall around the buildings. With that and the addition of many more wheelbarrow loads of earth, they now have a dirt wall planted with a flourishing, well-established garden of trees, flaxes, and shrubs.

“When it floods, we are totally surrounded by water – outside the earth bank, it is all water, like a lake instead of a river just meandering past us,” he says. “Inside the bank we have all these houses that are protected from the water.”

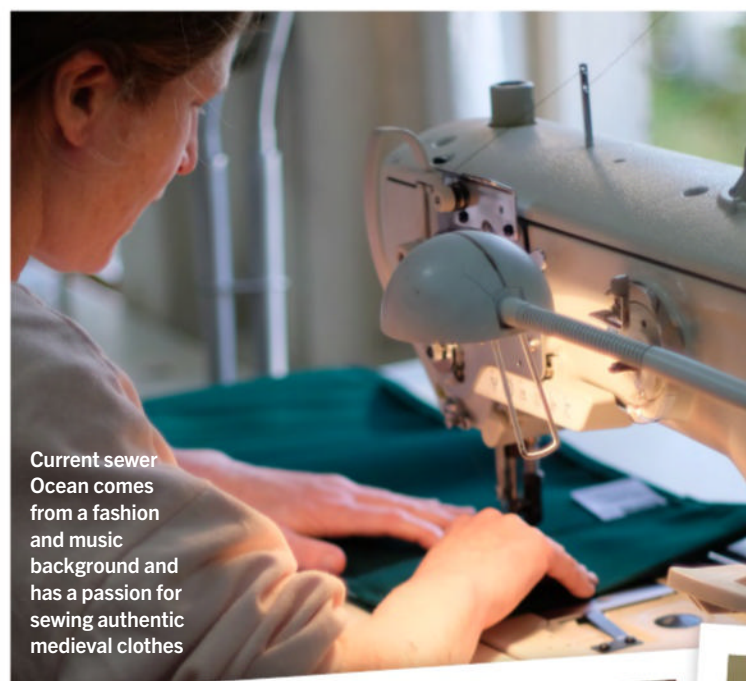
The inside area is at least 20m wide and 40m long, but the property is bigger than that. The orchard outside still gets flooded. To access the house, they have a drawbridge, powered by human muscle,



The church, already raised by Jenny, and the first shed, c. 1970s



A games lawn set-up for stilt soccer, kubbs, badminton, netball, and croquet. The earth bank planted with trees and shrubs protects the former church, now a house, which used to be surrounded by floodwaters



Current sewer Ocean comes from a fashion and music background and has a passion for sewing authentic medieval clothes

Diverse skills

A skilled cabinetmaker and craft teacher, Thomas began his career in Sweden teaching what we call ‘manual’ – wood-, leather-, plastic-, and metalwork. Jenny learned to sew from her mother, and Thomas is also handy with a machine, sewing his own clothes, including a tuxedo, in his 20s.

He says that he signed up to study economics at university but, lacking interest, was saved from that by military service: “They offered a three-day test to see what you were suited for, so I took it as it was three days off. I was hoping to get some direction of where to go. My dad was an engineer, and I had been advised to have a career as an engineer, but there was no way I was going to do the engineer thing, because Dad was working all the time and I hardly ever saw him. I was advised that I was suited to do anything as long as I put my mind to it. That wasn’t very helpful except for my self-esteem.”



Sámi jewellery made from reindeer skin, antler, and a tin-silver thread



to cross by foot from the bank.

"If we didn't have the moat, there would be 2m of water inside those buildings."

The tricky part, however, is when it rains continuously – the area inside also collects water. The family has a pipe with a flap on the outside that drains water from the inside, such as roof run-off, to the outside. It shuts automatically if the water rises outside the wall.

The earth for the wall came from what is now a cluster of ponds and islands inside the wall; these are interconnected by little bridges. The ponds can start to overflow during lengthy downpours, so then the family resorts to a pump. The church house remains high and dry; however, buildings that are flush with the ground, such as the pottery shed / guest house, may get a dose of silt.



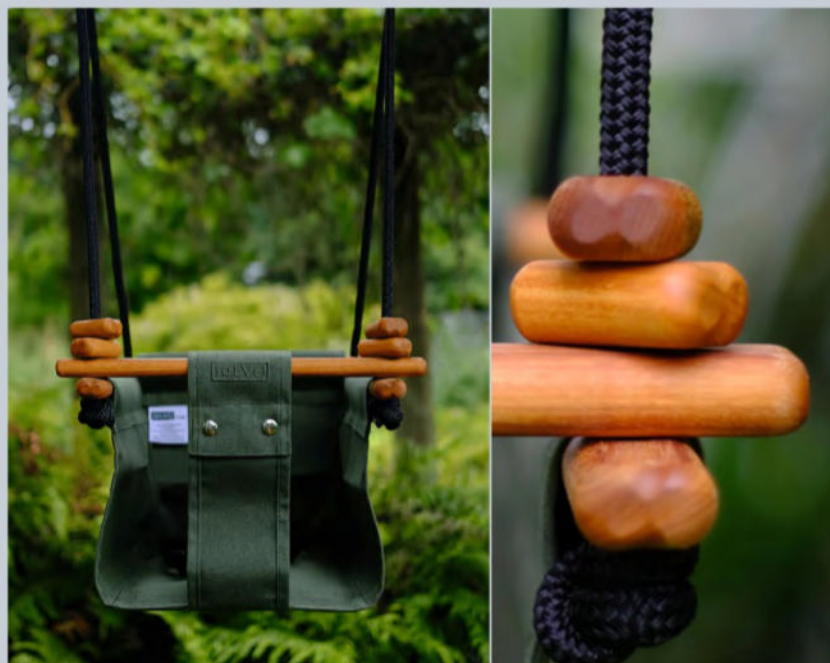
Any castle with some self-respect needs a drawbridge. It allows access between the games lawn and back lawn for projects and mowing, while also fulfilling a childhood fancy

Swings – beginnings

Solvej Swings, named after their daughter, was started by Jenny and Thomas more than 30 years ago when they saw how much Solvej loved swinging in a friend's plastic swing. They took an old deckchair apart to make her one.

"As a cabinetmaker and craft teacher, I didn't want my princess to have a plastic swing, so I made a swing from wood and canvas in the way that I remembered from my childhood," Thomas says.

Visitors kept asking if Thomas would make swings to sell, so he eventually thought he'd give it a go. Solvej Swings now designs and fabricates more than 3000 swings a year for babies and toddlers, selling them not only locally but overseas to the likes of Kim Kardashian.



Flooring

Thomas keeps all the offcuts from swing making. He is using them to make a floor like a removable jigsaw for the guest accommodation, so that when flood waters subside, the pieces can be gathered up and dried outside. The offcuts also make a jazzy wall.

Flooring in the workshop includes a novel reuse of the tubes around which the plastic used by farmers to wrap silage is wound. The tubes are made of cardboard or plastic. Thomas cut them off at the height he wanted and filled them with concrete.

"I put lots of them under the wooden floor that I stand the machines on," he says. "They are little pillars of concrete standing vertically. A 300x300mm square of ply sits on these pillars. Where I have a machine, the machine stands on one pillar, or four pillars, or whatever is needed. That way, I can lift the floor up and look after the ducting.

"The machines are actually connected to the concrete floor, which is good for the machines because it's solid, but concrete is not so nice to walk on. So, we are walking on a wooden floor but the machines are standing on the concrete floor through these little pillars." ►



Specially designed concrete-filled pillars to support heavy machinery in the workshop. The floor can be lifted to look after the ducting





Below: The little cubby-hole shelves Thomas made from old pallets. You can't have enough different screws when a loose one needs replacing



Dream realised

Two churches, a butcher's shop, a bank, a goods train wagon, and many sheds later, Thomas has more than realised his dream. He not only has a shed for his personal projects but he and Jenny have also built, and continue to run, an internationally successful business while enjoying being part of a small community and the slower pace of life that it offers.

See solvejswings.com for products and more. 📁

"Two churches, a butcher's shop, a bank, a goods train wagon, and many sheds later"



As an ode to the church their home once was, the doorbell is an old brass bell, rung with a rope

Bookcase

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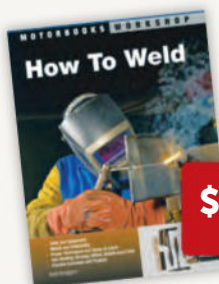
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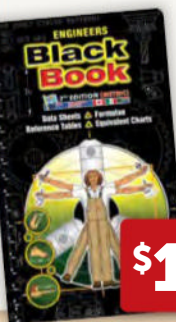
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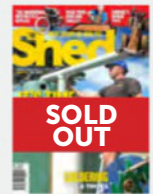
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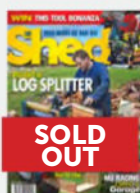
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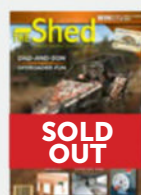
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A shed brings men together in one community space to share their skills, have a laugh, and work on personal projects or within a group for the shed or community.

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:

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THE RIGHT TO REPAIR

Earth provides enough to satisfy every man's need, but not every man's greed – Mahatma Gandhi

By Jude Woodside



A few years ago, I inherited my mother's old Kenwood Chef A701. I have never been much of a baker, but, with more time to spend in the kitchen, I have taken to whipping up the odd cake.

I remember when my mum bought the mixer in 1965. My mother was a baker, and the Kenwood saw some serious use over the years. Despite all that, it still runs well. It could use a strip-down and re-grease, but the remarkable thing is that you can still buy replacement parts for these machines. You can even get replacement parts for the earliest model, made in 1950!

That is not the case for more modern machines and for most modern electronic devices. It is often cheaper to buy a new device than to repair an old one. This leads to landfills full of consumer goods that could have had longer lives.

“You should be allowed to repair them if you wish”

Repairs are forbidden

In some cases, it is company policy not to allow repairs. John Deere used to forbid owners to repair their own tractors, claiming that they were only leasing the technology, analogous to the way Microsoft ‘leases’ you the right to use its software – you don’t own it. (Read the fine print.)

The John Deere situation was

resolved by pressure from farmers and legislators. Apple, too, has reversed its long-standing policy of not allowing owners to repair their own phones.

What this means is that vendors have to allow consumers access to the tools, manuals, and parts to fix their stuff.

Many modern electronic devices cannot be fixed because the electronics are encased in resin or epoxy, and many manufacturers will not provide the parts or tools required to fix them.

New legislation

There is currently a member’s bill before parliament: the Consumer Guarantees (Right to Repair) Amendment Bill. It seeks to amend the Consumer Guarantees Act to make it mandatory for manufacturers to make spare parts and information pertaining to the repair of their appliances available to consumers.

The bill basically restores the right for you to fix your own stuff. It will also make manufacturers up their game to make their appliances more reliable.

At present, the Consumer Guarantees Act allows manufacturers to opt out of repair as long as they have told you so at the time of purchase – that’s usually in the fine print too.

If the appliance fails before the warranty runs out, the manufacturer simply replaces the article and sends the faulty one to landfill. That can amount to hundreds of items.

The Repair Café organisation is pushing to have the bill passed, and you can help it do so. Check out its website: repairnetworkaotearoa.org.nz.

This is a bill that is in everyone’s interests, whether or not you are concerned about the waste stream. You still want your appliances to last for a reasonable length of time, and you should be allowed to repair them if you wish. 🛠️



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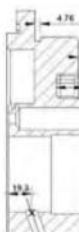
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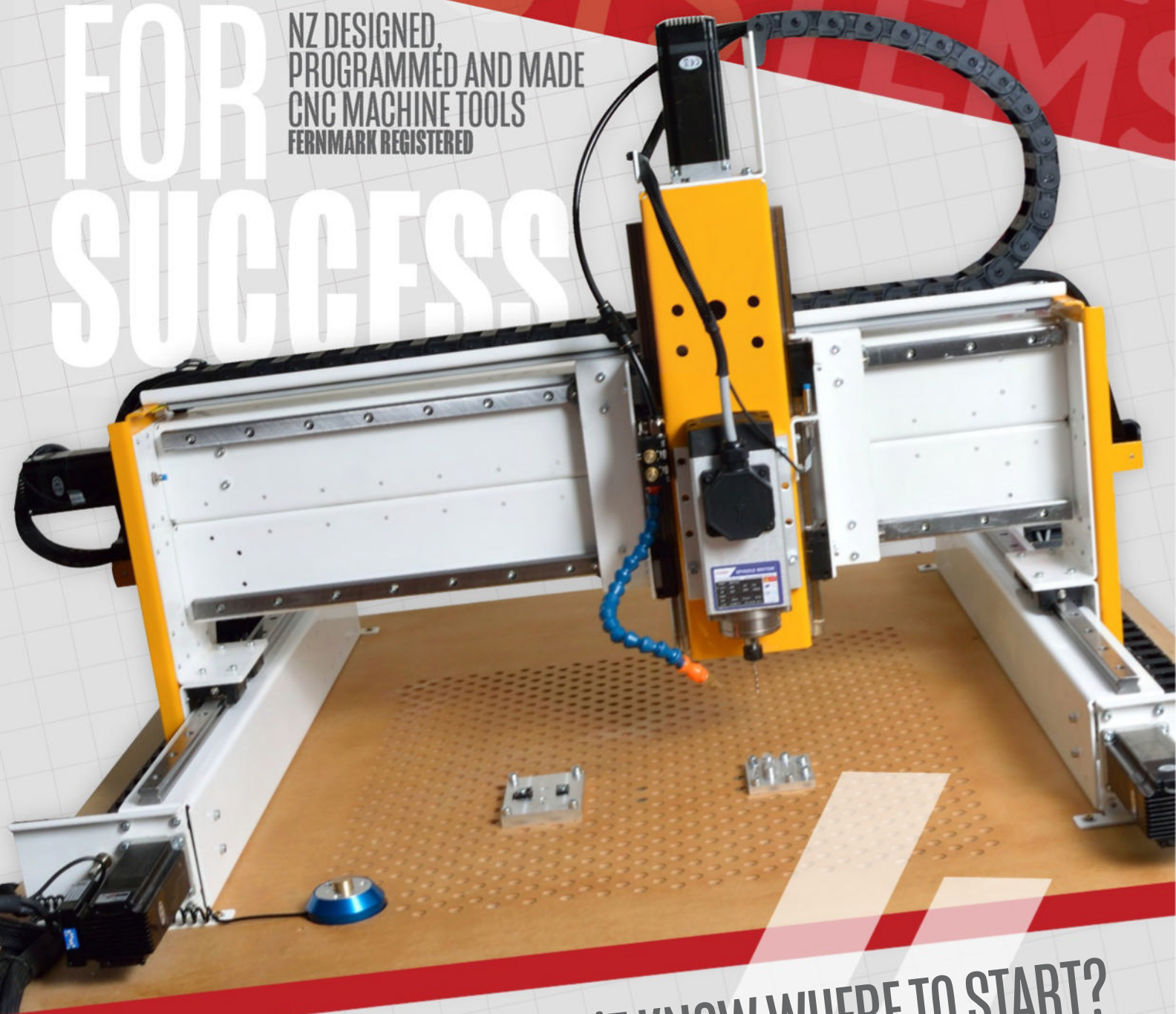
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