

THE Shed

JUNE/JULY
2023

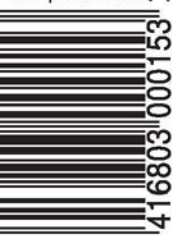
ISSUE 109
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WHERE WILL YOUR INTEREST TAKE YOU?

You know how it went. You started your working life in your teens, working 9–5 Monday to Friday in a job that ticked a few boxes – such as an income; if you were very lucky, it was a job that you really wanted and enjoyed.

Then that wonderful creation eventually arrived, called 'The Weekend', and it was your time to do what you really wanted and really enjoyed. I reckon that it's what you did in those weekend moments that actually dictated the person you ended up becoming today.

For me, it was not spending the weekend writing stories or reading newspapers but an obsession with entertainment and music. What I have ended up becoming is an entertainment supplier using words and photographs to achieve that.

A couple of our features this month are about sheddies whose interests and passions have provided them with a lot of pleasure during their leisure, and even a living. The ultimate achievement: turning your passions into a living – what could be better? Happy and fed 24/7.

Our cover story this issue is on West Aucklander Gary Norton. Gary has many roles that pay the bills and uses his various self-taught skills to restore trucks and classic cars in his own time. In a mammoth shed, he undertakes faithful restos of classic Fords and is undaunted by any project.

One such project is creating a mini version of a Kenworth truck that he always admired. By the sound of things, nothing fazes him. I reckon Gary will have messed with cars on his weekends as a young fella and the passion grew over the years.

Another feature this month is on a modeller from the other end of the country, Invercargill. Gary Peterson makes incredible unique models of cars, creating one-off replicas of the life-size hot rods or street machines that customers have built. What could be cooler than to have your drop-dead amazing hot rod in your garage and an exact miniature replica sitting on the mantelpiece in your living room? Very cool indeed.

Gary's passion started with the chance discovery of a box of models at his grandparents' house one school holidays; the spark was lit. He has turned this interest into his living – that ultimate combo – and his work is highly sought after and regarded throughout New Zealand.

So ya just never know whether what floats your boat when you are a young 'un will buy you a boat when you are a big boy or girl. It proves to me how important interests are and how much we should encourage the young to seek out and enjoy those weekends – they can turn into seven-day weekends if you are lucky. 🚗



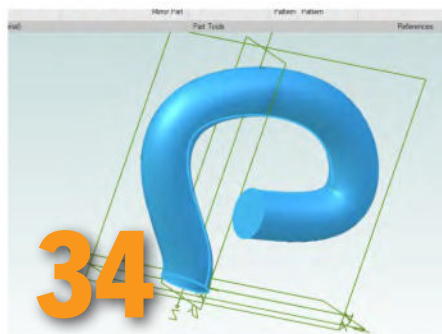
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DRIVE

One man's paradise: a shed crammed with vehicles in various stages of restoration, a bit of extra time on his hands, and rock classics soothing his soul

*By Jason Burgess
Photographs: Jason Burgess*



Gary inspects the Kenworth's newly installed 353 turbo Detroit Diesel engine



Gary between Fordson van and Zephyr Mk3

As shed sizes go, Gary Norton's is a megastore. It needs to be, because, despite the square footage, space is at a premium, crammed as it is with "a bit of everything" and no end of enterprises in various states of progress.

There is a saying about the more you have, the more you are occupied. Luckily, Gary and wife Raewyn are as industrious as they come. They run their rural property as close to organic as possible. Even when they both worked full time away from their land, they still managed to raise 22 different breeds of chickens, rear calves, fatten sheep, and breed goats.

Lately, they have been scaling back; they now tend only two kinds of chooks – Jersey Giants and English Dorkings – some ducks, a few sheep, and a cow or two. They still grow maize and oats for feed and have a superb vege patch built over five enormous raised beds and in glasshouses. Yet, according to Gary, "We have made some big changes." Fortunately, this means more time in his shed. "With what is going on in the world, I'm happy to come out to the shed, start work, and listen to some rock classics. Drive by The Cars is one of my favourites." ►

"I'm happy to come out to the shed, start work, and listen to some rock classics. Drive by The Cars is one of my favourites"



The bonnet up on the 1953 Fordson pickup



A box full of Kenworth accessories



A domestic scene in one of the shed's display areas



A 1912 Lister L stationary engine



An Andrews & Beaven chaff-cutter rebuilt by Gary

Gary's shed

Entering the shed is like stepping into a working museum. The Nortons used to have local school groups come through, until regulations made it too difficult. The exhibits are still in place, if a little dusty.

"It was a lot of fun. We used to teach the kids how the wall phone, the sewing machine, and spinning wheels worked; how milk is produced and grains milled. They could go through it all," Gary says.

As much as Gary is keen to exhibit his working collections of historic agricultural machinery again, his main focus for the moment is getting his fleet

of vintage vehicles back on the road.

Gary is not formally trained in the automotive trades but he has an enviable range of skills from his years spent in maintenance, truck driving, and as a handyman. He says he thrives on having multiple jobs on the go and does as much of the work as he can himself, because he likes to do it his way.

His vehicles are not rods or muscle cars; he prefers faithful restorations. He has a close connection to each of his motors and sometimes wonders if the spirits of their former owners are not overseeing and guiding the work.



The dash of the '52 Prefect



The Kenworth cab with original paintwork



“His main focus for the moment is getting his fleet of vintage vehicles back on the road”

The resto projects

At the front of the shed, in a series of pallet-walled bays, Gary is simultaneously restoring a 1965 Mk3 Zephyr, a 1952 Ford Prefect, and two 1953 Fordsons – one pickup and one single-seat van.

He also has a roadworthy 1939 Ford 10 and a World War II aircraft tug from Hobsonville airbase, which remains parked up until the other cars are ready to roll out.

“Originally, the Jitney ran an industrial

Model B motor,” he says, “but I used that for something else so I dropped a Model A motor into it – more or less the same engine. It has a three-ton Ford gearbox and a narrow Ford three-ton diff. It runs like a dream.”

Pride of place in the centre of the shed – just beyond the Ford 10, the mid-century rotary hoes, and various vehicle body parts – is Gary’s biggest project yet: a half-size, scale replica of a Kenworth W924 truck. ►



A grille from a vintage LTD rescued from the scrap heap



Under the hood of the Kenworth, the 353 turbo Detroit fitted and freshly painted



The Kenworth

Gary bought the truck 10 years ago as a “pile of parts” – a cab with no chassis or running gear and several buckets of water-damaged accessories.

He remembers the truck from the '80s, when it was driven by the late Grant Osmond of Riverhead Towing: “I used to see it with a low-loader trailer towing cars for scrap, pulling a

digger, and transporting race cars for DB Breweries. It was sex on wheels.”

He reckons the W924 is the best-looking Kenworth produced. As a teenager, he had a poster of one on his wall, which is what inspired him.

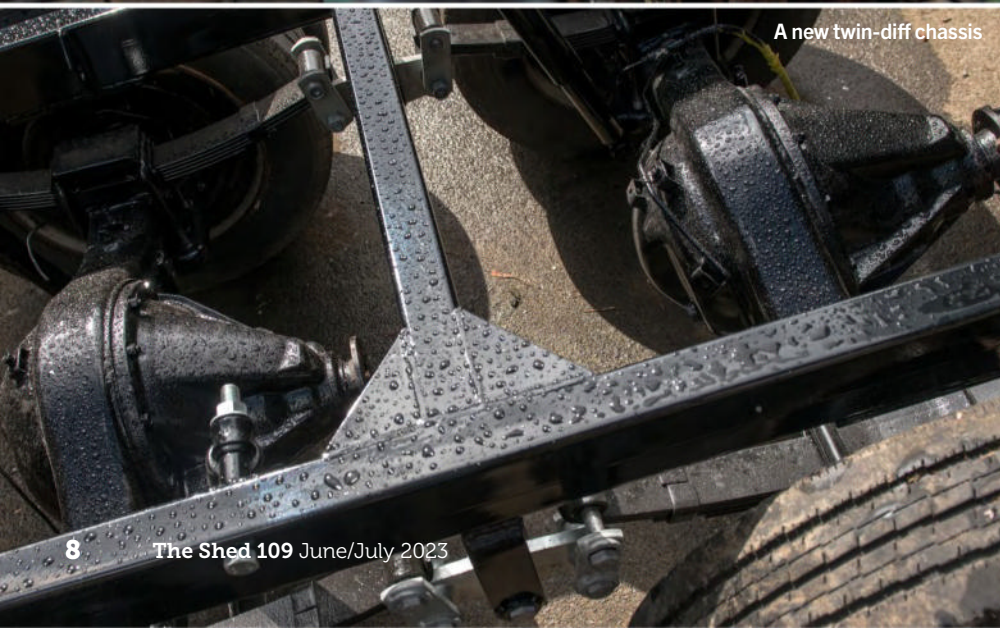
“When I saw this beautiful old girl on the road, I thought, *I have to have you one day!*” he says.

The Kenworth is Gary's first scratch-built endeavour. When all you have is a cab to work with, everything becomes an exercise in trial and error.

“It's massive – like a big jigsaw puzzle. That's what I like; I try to make sure everything is 100 per cent. It's a lot of fun but it does piss you off when you buy things that don't fit!” Gary says. ►



The original Kenworth dash



A new twin-diff chassis

“I used to see it with a low-loader trailer towing cars for scrap, pulling a digger, and transporting race cars for DB Breweries. It was sex on wheels”



An original photo album from the Kenworth's heyday

Orewa North is the place to be this Sunday

It's family fun at Orewa North Primary School on Sunday, November 6. Be in to win one of four hourly prize draws including dinner for two at the Creole Cafe, and a weekend away for two at a Quality Inn. Plus loads of great quick fire raffles.

Be early for fantastic bargains in the traditional stalls of white elephant, books, cakes and crafts.

Savour the atmosphere of the numerous market stalls on the green. Be prepared to bid for some great bargains in the auction and have a go on the Karaoke.

This year the chamber of horrors, organised by Centrestage Theatre, is back with a vengeance, along with heaps of exciting side shows, rides, such as the mini Kenworth, moon buggy, go-

karts and the Joy Box, plus heaps of interesting art activities for the children, and fascinating demonstrations.

Relax in the sun and enjoy some of the delicious food on offer including lamb on a spit, sandwiches, nachos, new seasons straw-berries and bangers.

All this and more - 9.30am, Sunday November 6. See you there.



Orewa North pupils try out the mini Kenworth which is one of the rides available at the Gala this Sunday.



Positioning the bonnet on the Kenworth

“I have notebook after notebook of things I have measured”

The rear of the Kenworth on the new chassis awaiting a fresh set of tyres

The engine whisperer

At first, Gary found a Mitsubishi L200 chassis that fitted the cab perfectly – that is, until he discovered that all the front-wheel settings for a faithful Kenworth replica were wrong.

Gary says that his brother Kevin is something of an ‘engine whisperer’ and helps a lot: “I have a bit of dyslexia, and when Kev comes in to lend a hand, he rechecks all my measurements; otherwise it could be a major muck-up. I have notebook after notebook of things I have measured. I got under a lot of trucks. The weird thing was, when somebody offered me a Toyota Dyna for parts, I found that the front fitted perfectly. So now I’m using Dyna diffs, driveshaft, and gearbox.”

In his yard, Gary has two Dynas, which he uses as a reference library and a source for manufactured parts. This should ease the stress come certification time.

At the time of writing, Gary had recently mounted a 353 turbo Detroit Diesel engine and was in the process of making the bellhousing to go from that to the five-speed gearbox, imperial to metric, which comes with its own series of headaches. His next job was to be fitting a Cardan shaft handbrake, because the Toyota Dyna diffs have only a foot brake. ►

The visor of the Kenworth from a box of accessories that Gary bought with the cab

NZ's favourite lubricants

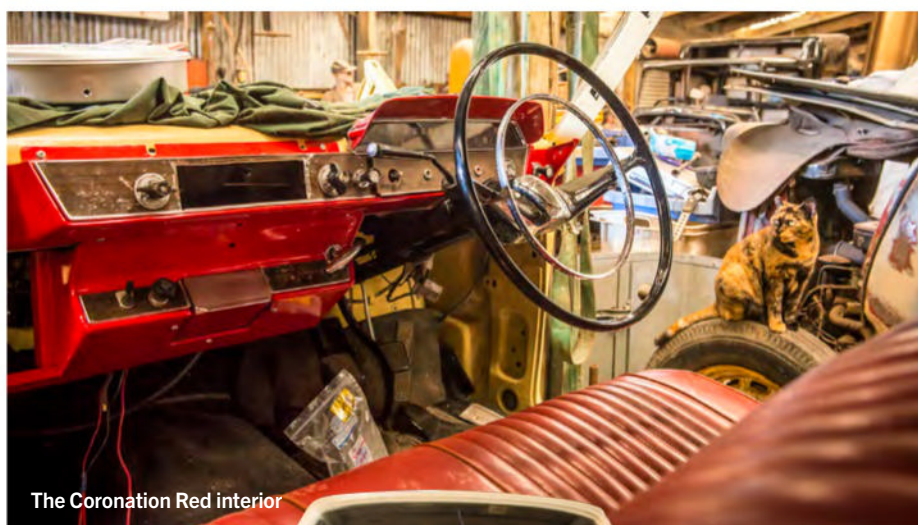


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The Coronation Red interior



The Mk3's classic grille

Not fun

Gary says the steering was “a mission from hell” because he had to drop it four inches. When the truck was first built, that might have been achieved through a simple welding job, but not now. Gary is on to his second steering set-up and is now using a Toyota Hilux box and power-steering pump.

Another key consideration is weight. To get a WOF, he has to keep the build under 3500kg. When every seat belt weighs 80kg, decisions about whether to include passenger belts on the back seats become a quandary – particularly when a roll cage also needs to be installed to the cab to mount the seat belts on. Another roll-cage bar has to be fitted inside the dash. Every step of the way has to be documented, drawn up, and photographed, then, once the vehicle is passed locally, the paperwork needs to be sent to Wellington for final certification. A lot of effort, but Gary reckons that, when it is finished, it will be pure “truck porn!”

Mid-life crisis

Gary's credo is, "You can't rush it; otherwise you won't enjoy it."

That said, there is one project that he has managed to race through: his Harvest Gold-coloured Mk3 Zephyr. He calls it his "mid-life crisis". His first car was a Mk3, and he has bought and sold a few of them, but this one is a keeper. He found it at a swap meet a year and a half ago.

"Everything was original; it looked terrible, but it was all surface rust," he says.

The first job was stripping it down, "to the last nut and bolt", and sandblasting inside and out.

As well as giving it a fresh paint job, Gary has fitted new brake and fuel lines, new tyres, and even upgraded the wheel

nuts. He is insistent that everything safety related is up to spec. However, because it is not an 'as new' project, he is a little less fussy about the finish. He concedes that there is "a bit of pitting in the paintwork" and that the chrome work, the aged but original Coronation Red dash, and the wood-grain veneer will just get a polish.

He is now on the final leg of the restoration. When it is complete, he hopes to show the Mk3 to the guy he bought it off.

"He had inherited it from a relative who had started to do it up but died suddenly. It had been sitting in a container up north for over 17 years," Gary explains.

He acknowledges the Auckland Consul Zephyr Zodiac Club and a bloke called Clyde in Waiuku for their guidance. A mechanic friend also visits to ensure everything meets compliance standards. ►

Freshly sandblasted and newly painted bodywork, complete with original pitting



The first job was stripping it down, "to the last nut and bolt", and sandblasting inside and out





Dash, engine (top right), interior (right), and hood (below) emblem of the '39 big block Ford 10, 'Green Beast'



Ford fan

The '39 big block Ford 10 is Gary's 'Green Beast'. He bought it, warranted and registered, from the estate of car collector Chris Kite.

"Chris was a lovely dude," says Gary. "I think he may have been related to Henry Ford, because he had a shed full of Fords and really loved his Ford 10s."

Chris was fastidious with all his restorations and had renewed all the suspension, the wiring loom, and carpets on the 10 before he passed away.

Gary's blue '52 Prefect also came from the Kite estate. It was the first car that Chris had owned.

"Later in life, he tracked it down, bought it back, and stripped it. Chris had purchased new parts and had given it the most amazing panel beating and paint job; the chassis is even painted the same colour," Gary says.

A guiding hand

Gary says that he is building it back to Chris's standard. He recently found a replacement motor at the Ford 8 & 10 Club Day.

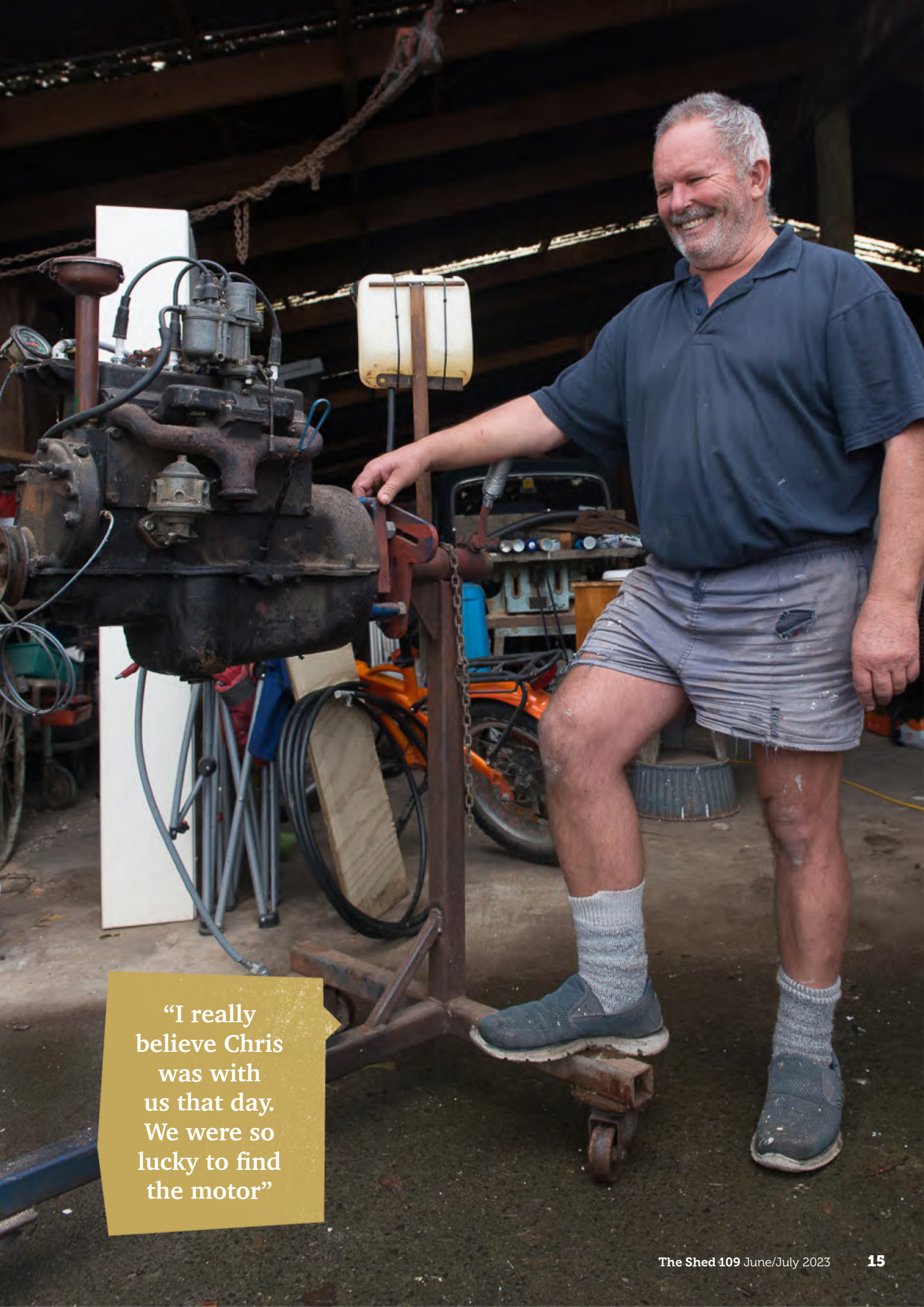
"I really believe Chris was with us that day," says Gary. "We were so lucky to find the motor. It was covered up, under a bench, and it came with a brand-new clutch, which was unexpected."

The valves needed some work, but brother Kev applied his magic touch, and Gary says that every time they started her up, the oil pressure improved, and now she runs smoothly.

Other than an impending oil change and a sump dent to repair, the rest is cosmetic. The engine will be repainted in its original black; the guards will also need a lick.

"It's going to be beautiful," he says. "I prefer cars with lights on top of the guards, but this is Chris's car, and I'd like to keep him happy. I always have a conversation with him when I'm working on the Prefect; same as I do with Grant when I'm working on the Kenworth." ►





“I really believe Chris was with us that day. We were so lucky to find the motor”

Gary's "cuddly to drive, slow as buggery" Fordson pickup



A working truck

A spectre of motoring history that still thrills Gary is his Fordson pickup, which he has owned for 30 years.

"I love trucks," he says, "and I love the look of this one; it is so basic. The lights are on top of the guards, which turns me on, but it is a working truck – cheap and nasty – and it still goes really well."

Until the recent renewal of the rear brakes, the truck was maintenance-free. For the moment, Gary is parking it up to fix some play in the kingpins – a simple winter job.

A while back, he did have to drop a new Ford 10 motor in it after discovering that he had used the wrong engine oil: "If the oil has additives, it chews away the white-metal bearings. Luckily, I had another motor on hand."

Gary had a woofers signwriter hand paint the Heritage Farm logo on the driver's door, while he repainted all the interior. He is replacing the bucket seats with an original bench-style seat; these were originally made from the packing cases in which each truck was delivered.

He reckons this is his forever vehicle. "She is cuddly to drive, slow as buggery – top speed 35 miles per hour – and she wanders a bit, but I've driven traction engines and they are worse than this."



The Fordson badge

It's art, mate

The Fordson van is a recent purchase. Gary paid \$1K, and some people tell him just to leave it as a bit of shed art, but he is undaunted.

"I like everything to go, and this is a complete van," he says.

He started on the rust removal, which he says was all easy – but then he found the Zephyr, which has distracted him ever since. He says he will get back to the van's panels in summer, when he can park it outside under his gazebo.

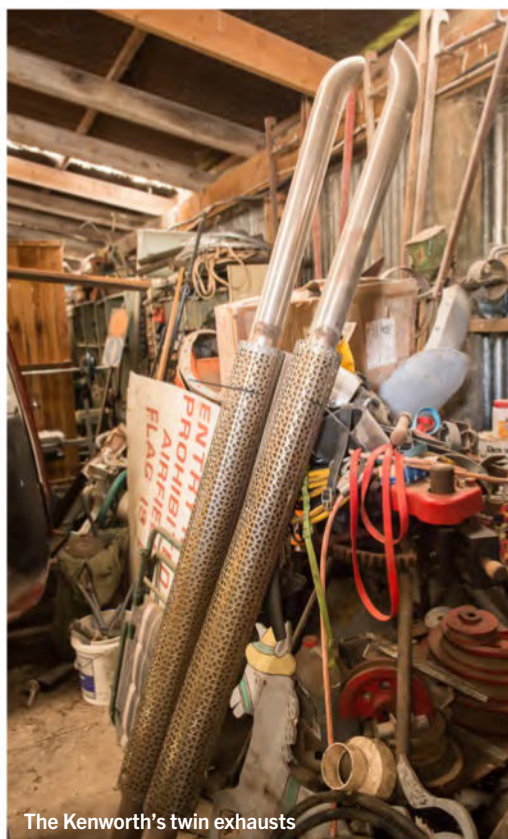
As each vehicle in his fleet becomes roadworthy, Gary wants it driven and shown at rallies and club days. As with the rest of his collection, he often hires these ►

"I love trucks, and I love the look of this one; it is so basic"



The partially stripped '53 Fordson van

vehicles out to film crews. As much as he loves seeing his cars out on the road. However, these days, he prefers the restoration to the driving. He constantly has an eye out for new vehicular projects and is also formulating a plan for showing all the agricultural machines at the Kumeu show. He is still on the hunt for an early threshing machine, saying, "I could build one, but I would rather restore one."



The Kenworth's twin exhausts



Gary's latest project: a 1972 Ford D-series truck

In the meantime, as well as tending the farm, he is trialling designs for a home business: making composting toilets and caskets – because, as he says, "Shit happens, then shit happens!"

Gotta have it

However, before any of that happened, along came another couple of projects. The first is a 1953 Prefect that, Gary

explains, "I was initially going to scrap for parts, but there's no rust in it. It had been stored in a shipping container with a dehumidifier for five years, so it's in great condition. That won't take long to get back on the road."

The other is a 1972 Ford D-series, which had been stored in a shed for 30 years. Gary had to have it because, "It's what I got my HT in." 📁





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BELGIAN POWER TOOL RACING

Who wouldn't love to see this event fly in New Zealand?!

By Enrico Miglino



In late April, the city of Ghent, Belgium, hosted the annual Ghent Maker Fair (makerfairegent.be/nieuws), an exhibition dedicated to all the crazy inventions of makers in Belgium.

On the fair's opening night of 30 April, the Belgian Power Tool Drag Racing Championship entertained the visitors in a one-off event. Popular in many countries around the world, this is a spectacular race of electric 'vehicles' powered by 220V AC and built with one or two power tools such as drills, chainsaws, and any other kind of electric-powered hand tool. The only rule is that it must be a tool that can be used by hand.

In the next issue of *The Shed*, Issue No. 110, I will give more detail on the challenge. If it sounds like your kind of fun, there is the option to participate in the 2024 event.

Tool pilots

These photos give readers an insight into what incredible beasts have been created by the makers, usually the pilots. Even though the power tools are required to

be connected to an AC plug – about 20m long – the challenge is spectacular; along the straight race path, these incredible vehicles reach very high speeds of 40kph or more.





The only rule is that it must be a tool that can be used by hand

Special mention

A special mention goes to the vehicle shown in the photo above. It did not win the race but was awarded a participation prize. It was fully designed and made by a team of six youngsters aged between 10 and 13 years, who

were supported by The Creative Stem (<https://decreativestem.be/>), under the guidance of Lennard Ameys. The image shows the third prototype built by the children that worked as expected.

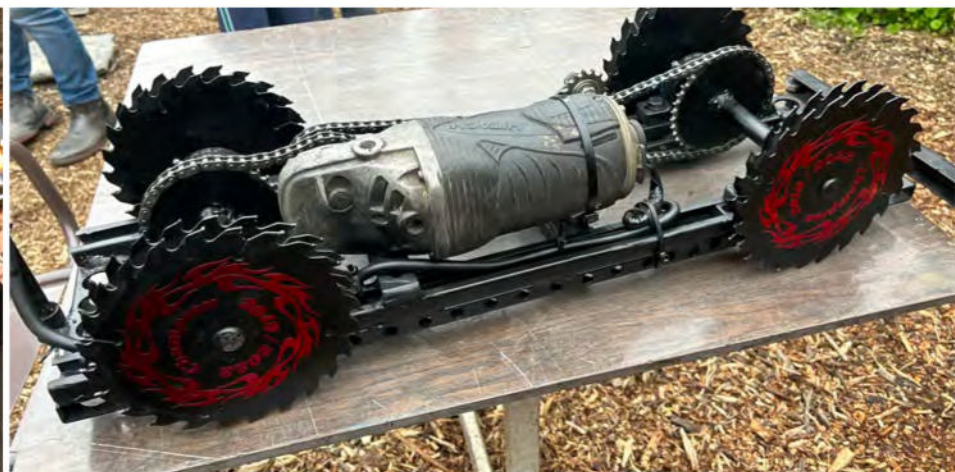
Of course, the creation process followed a requisite project methodology:

investigation, brainstorming, making, testing, and redesigning. The children learned how to use open-source tools – CAD software, laser cutting, vectorial design – then applied their knowledge to make the working project you see here. 📄

See our website – the-shed.nz – for some videos of this event.

Links

makerfairegent.be/nieuws
<https://decreativestem.be/>



LETTER OF THE MONTH

SIMPLE AND CHEAP APPEALS TO ME

Hi guys,

On page 42 of the article Kiwi Ingenuity in *The Shed* Issue No. 107, there was an interesting photo that I think would be worth expanding on with a separate How I Did It article: the Honda motor hidden in the stern!

A simple and cheap motor interests me, and I would love to see a lot more detail on the whole set-up. Thanks for an awesome mag.

Regards,

Dave Robbie

Thanks for getting in touch, Robbie; that seems like a great idea for a follow-up article. We will approach the boat builder, Neville Watkinson, and hopefully you'll see an article on that engine install in the coming months. Ed.



WILL FAME EVER COME?

Hi Greg,

Hope you and yours are well.

After being on the front cover of Issue No. 96, my hope of fame, fortune, and public recognition never eventuated. Even a T-shirt with the cover printed on it didn't help.

Then one day, as I walked through a used building supply shop in Whanganui, the young lady staff member came up to me and said how much she enjoyed the article; how she admired the things I made and was in awe of my skill. I effervesced for days.

Six months later, my glass-blowing partner, Fran, confessed it was a put-up

job to massage my ego. A couple of years later fame, fortune, etc. still elude me, albeit I have sold a lot more art glass, mostly in Ōtaki.

Regards,

David Etchells

Hi David,

Nice to hear from you.

Now, it's not a question of will fame ever come but when. Good things take time, so stay patient and stay alert for recognition from your fellow Whanganui-uns; it surely cannot be that far away – now any day, I reckon.

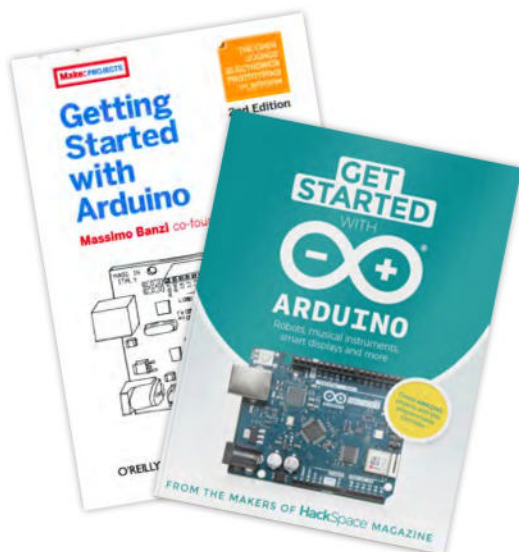
Good to hear glass sales are going well for you. Ed.

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 should be emailed to editor@the-shed.nz, or posted to Editor, The Shed, PO Box 46,020, Herne Bay, Auckland 1147.





CAN YOU HELP ME?

I may be asking the impossible, but are the Arduino Starter Kits, including the *Getting Started With Arduino* book as presented in 2012, still available?

I want to develop a model railway layout to run on a computer using Arduino and JMRI [Java Model Railroad Interface], and would like to add some programming skills to my brain before attacking the main task in anger; this seems to be an appropriate medium. I realise that Arduino 101 might have been superseded but I'm sure that the basics will still apply,

whether the kit is available in its initial form or even an updated item.

Many thanks,
Steve Rowat

Thanks for getting in touch, Steve; I will pass your email over to our Arduino guru, Mark Beckett. I'm sure he will be able to assist you in some way or other. Ed.

LOOKING FOR A COLLECTION

Dear Sir,

I love *The Shed* magazine and always look forward to the next issue. I have every issue from Feb.–Mar. 2010 onwards, except for Jun.–Jul. 2010, April 2017, and Jul.–Aug. 2021. I have nothing prior to Feb.–Mar. 2010.

I would like to have the full collection. If any of the readers out there are willing to supply my missing issues, I would be keen to hear from them.

If you can help, email me at jrsanders@xtra.co.nz

Thanks,
John Sanders

OUR THIN BLUE LINE

Hi Greg,

Thank you for another enlightening edition of *The Shed* (April–May 2023) – another thoroughly agreeable read.

I do, however, have one small gripe. Reference in The Passing of Hoon article to “the clowns in blue” is offensive and bigoted. I tried to read this in the context of the article but it still irritated me. My late father was a police officer and I currently have friends in the police and they were/are far from being “comic entertainers, fools, and grotesquely dressed”. They may make you laugh at times but they are neither buffoons nor stupid.

I would have hoped that your editorial eye and pen would have dealt to this.

The same “clowns in blue” are the very people we all go to when we need help or are there for us in many emergency situations.

Kind regards,
Peter Kingsbury

Thanks for your letter, Peter, and I couldn't agree more. I must fall on my sword here; that comment should never have been published in our magazine, and I am cross with myself for missing it. I cannot blame my fellow editing team as they would have presumed I was OK with it, so my apologies – a bad oversight on my part. I am of the same belief as you that the police have the very toughest of jobs and a role that I could never entertain as having the strength or courage for. They are there whenever we need them, and if idiots are behaving badly on our roads then I am grateful that there is someone there to call a halt to it. Ed.

THE SHED ONLINE

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

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

The Shed profiles a blacksmith's historic Banks Peninsula workshop

<https://the-shed.nz/fire-dance-a-blacksmith-is-a-master-of-the-ancient-art-of-heat-and-hammer/>



Build a wooden blanket box

<https://the-shed.nz/out-of-the-box/>



How to make gears for a vintage Orrery timepiece

<https://the-shed.nz/top-gears/>



Installing and setting up an efficient-running electric hot water cylinder

<https://the-shed.nz/hot-water-tune-up/>





Tracey and parts
for a stool

CRAFTING A LIFESTYLE

Smart decisions on money and machinery are vital in setting
up a commercial woodwork workshop

*By James Perry
Photographs: James Perry*

It's easy to have a dream for a new lifestyle; it's a little harder to marry it to reality and actually generate income while enjoying it and staying loyal to your original concept.

My wife and I had a dream of selling handcrafted furniture. After completing a full-time course at the

Centre for Fine Woodworking in Nelson and working for other fine craftsmen, we moved south from Nelson to Arrowtown and set up a woodworking venture.

People often ask us about how we made the crucial decisions in those early days – such as where to set up shop and how to allocate our limited

budget for machinery.

We could have worked out of a shed, barn, or even our home garage, but we opted for a relatively small 100m² shop in our local industrial area. This gave us a professional setting with adequate facilities and the convenience of being just a stone's throw from home.

Three-phase grunt

The commercial unit also gave us the advantage of three-phase power. In simple terms – ones that I understand – the main benefit of three-phase power is that it allows the use of larger sized motors and, compared with similar single-phase motors, three-phase power has more torque.

A single-phase motor rated for more than one horsepower (hp), or thereabouts, will tend to lack the grunt required for tasks such as ripping timber on the table saw. The disadvantage of three-phase power is the cost of installation. The componentry, such as

plugs and wiring, is far more expensive. In addition, the larger the motor, the more it likes to use electricity. This is all fairly obvious, but it needs to be considered when you are running on tight margins.

Machinery

When it came to buying machinery, there were numerous options, including the basic choice of buying new or second hand. We had to decide what machinery we needed to function without compromising quality and without breaking the bank.

The first priority was a table saw.

We could have worked out of a shed, barn, or even our home garage but we opted for a relatively small 100m² shop in our local industrial area

Good storage is essential for a tidy workshop



There are many less expensive saws out there, but if you opt for a cheaply made saw with a less powerful motor, you will almost always regret it – I am speaking from experience

We opted for a second-hand Wadkin with a sliding table. The table can be locked for quick ripping, and the fence can be taken off for accurate cross-cutting. The machine is about 20 years old, but the casting is so heavy and the machining so good that it took only a little time and care to set it up to cut true.

Bigger will need better

This wouldn't be the best option for everybody. If you are in a larger production-type company, there are far better machines; Altendorf, for example, is the bee's knees, but, when you consider its \$20K plus price tag, my \$1500 option wasn't too bad.

There are many less expensive saws out there, but if you opt for a cheaply made saw with a less powerful motor, you will almost always regret it – I am

speaking from experience.

The next piece of equipment was a bandsaw. This is one of the most versatile of machines and one of the most important to get right. We needed a model powerful enough for resawing and trimming yet subtle enough to cut tight curves and veneers with accuracy.

We looked into the larger second-hand machines but decided there were too many unknowns. You need to know the condition of the rubber on the wheels, the wheel alignment, and the condition of the upper and lower guides, as these are vital for accurate cutting. This is true of any machine you might buy without being able to inspect it physically. In the end, we bought a new 430mm (17-inch), 2hp Taiwanese brand, because we could check it and tune it with no hassles and it came with a guarantee, as does any new machine bought through a dealer.

The Wadkin saw and thicknesser/buzzer, also a thickness sander, and a Vicmarc lathe





Our router and our combination clamp / utility rack. Most of our equipment is on wheels, for easy access

Our biggest mistake

The next addition was our biggest mistake. We have a wonderful friend in the North Island, a retired joiner, who offered us his Wadkin thicknesser/buzzer. It was a mistake for two reasons. First, we knew little about the cost of transporting such a heavy machine across the two islands. Secondly – as I am sure many of you have found out – combination machines might save space, but it can be quite time-consuming to change between different operations.

Although the machine we bought is older in years than the ages of my wife and I put together, it is incredibly well built and, once set up, is accurate. However, it has one design flaw: it was made before the days of dust extraction, back when joiners in long white coats happily breathed in carcinogenic wood dust. ►



Cross-cutting on the Wadkin saw

The most important message, however, is to take care of your tools

For the buzzer, we were able to overcome this by designing a box to place under the knife roller and connect up to the extraction unit.

Two machines would be better than one

For the thicknesser, however, there is no simple solution. If I were to do it again, I would purchase a separate thicknesser and buzzer. There are enough times when I want to hop back and forth from one machine to the other to warrant the extra space and cost of two machines.

As for extraction, we found the best scenario was to connect a 2hp unit just for the bandsaw and a 3hp unit for the saw and the thicknesser/buzzer, with shut-off gates. This has kept the ducting short to get the best suction.

We also have two routers: an 1800W machine set into a shop-made table and a lighter unit for hand-held jobs. This saves on set-up time for each job.

James and Tracey with a stool in Nelson, finished in Arrowtown



We have a huge number of hand-held tools. These give us the most pleasure and keep us in tune with why we took up furniture making.

The most important message, however, is to take care of your tools. Whether you are working with hand

tools or machinery, your tools must be well set up and sharp if they are going to produce good-quality work. If you take time to truly tune each tool you need to use, it will help you to get better, more accurate results and you will truly enjoy the work. 📄



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Water in, leaves out

Autumn in New Zealand is a beautiful time, but all those golden and scarlet leaves can be a real pain when it comes to your spouting and downpipes functioning efficiently. That's where the Marley Curve® leaf diverter comes in — combining sleek, sophisticated design with innovative filtering technology, its unique screen draws rainwater in while preventing leaves and other debris from entering your water tank or storm-water system. Marley Curve diverters are available in six colours to match the Marley Stratus Design Series®, and will integrate easily into the Marley RP80® downpipe system. Even better, the Marley Curve diverters carry the same 15-year guarantee for peace of mind. Marley Curve is available in store for around \$114.95; check out marley.co.nz for more information.



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Convert-a-Ball

This bolt-on Convert-a-Ball pintle hitch and ball mount combo is ideal for heavy-duty towing, retaining the ability to tow with a standard coupling. It includes three interchangeable, stainless-steel hitch balls with towing capacities from 3500lb to 10,000 lb, and a pintle sleeve adapter (GTW 25,000 lb). The polyurethane interior acts as a shock absorber. The double-engagement, rust-resistant locking system converts quickly from pintle to standard ball mount — no tools needed. Convert-a-Ball is made in America.

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See easyaccess.co.nz/products/foldaway-scaffold for more info.

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The Marley Twist's RRP is \$79.95; check out marley.co.nz for more information.



ALIBRE 101

What your mother didn't teach you about sweeping

By Bob Hulme
Photographs: Bob Hulme

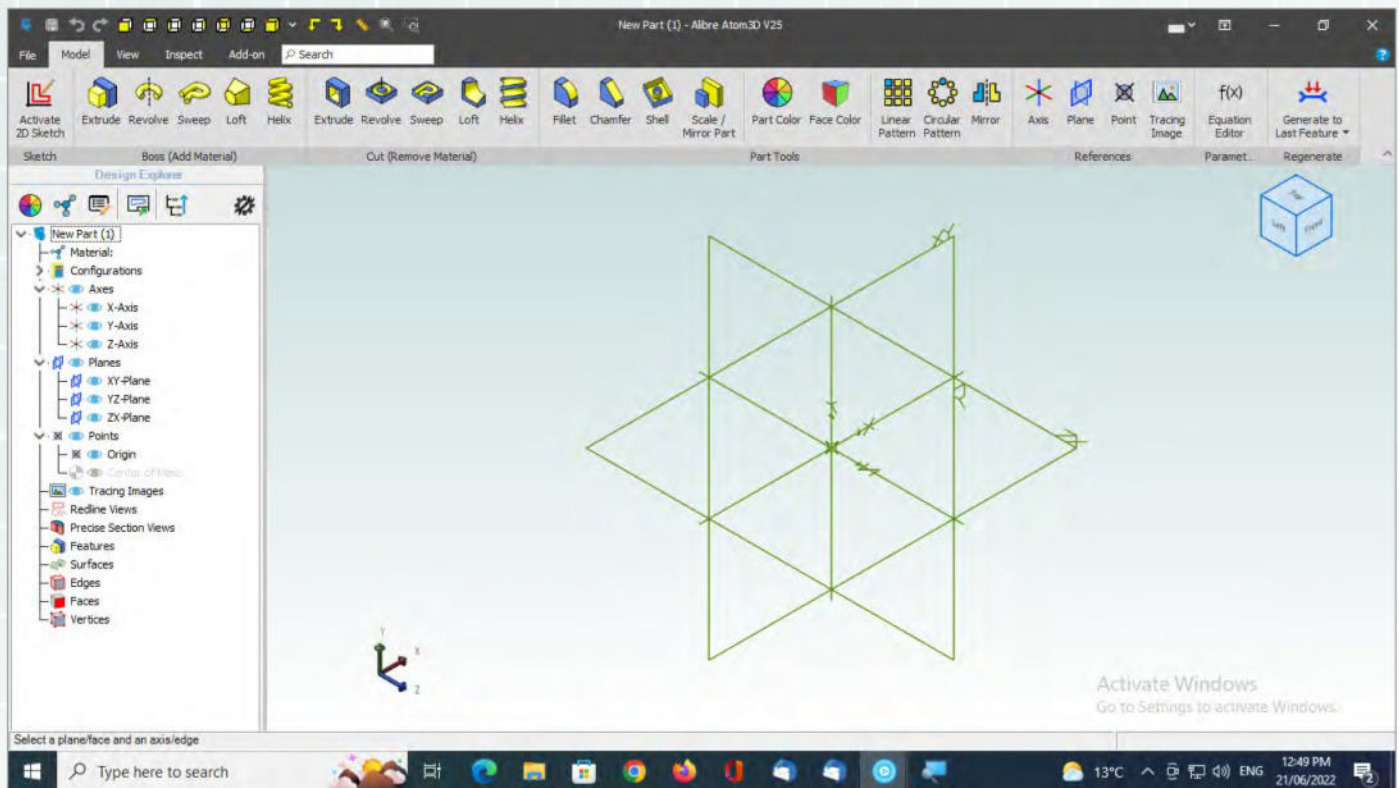


Fig. 1. The three planes clearly visible

In part five of this series, we learnt about lofting. Sweeping is kind of like lofting, but it offers the ability to go around corners – in fact, just about any path you would like to stretch a shape out along.

To begin with, we will have a play about with sweeping, then we will apply the technique to improve the vee pulley example that we have used in the past couple of parts in this series.

Let us play

Fire up the Alibre Atom 3D program on your PC and click the Create New Part icon on the home page. You should now

see the workspace screen with the three planes represented (Fig. 1).

It is easy to change the aspect of the view by moving the mouse around while holding down both left- and right-hand buttons. It will be good to see all three of those planes – XY, YZ, and ZX. When performing a sweep, it is necessary to have a 'profile', which is the cross-sectional shape of the item you are creating, and a 'path', which is the line along which the profile stretches. These two elements must be on planes that are at right angles to each other. Yes, it is hard to explain in words alone, so let's just do it.

Keep it simple

To keep it simple, we will use a circular profile. Select the XY plane, and click the Activate 2D Sketch button at the left end of the tool ribbon.

Now, select the Circle tool from the Sketch Figures Tools section. Click on the origin point on the XY plane that is showing in the workspace. That establishes the centre of the circle. Then move the cursor out in any direction to form the circle. Size does not matter. Hit the Esc key to get out of the Circle tool then click on the Dimension tool. Click the circle and make it, say, 10mm diameter. Simple stuff, really, if you have

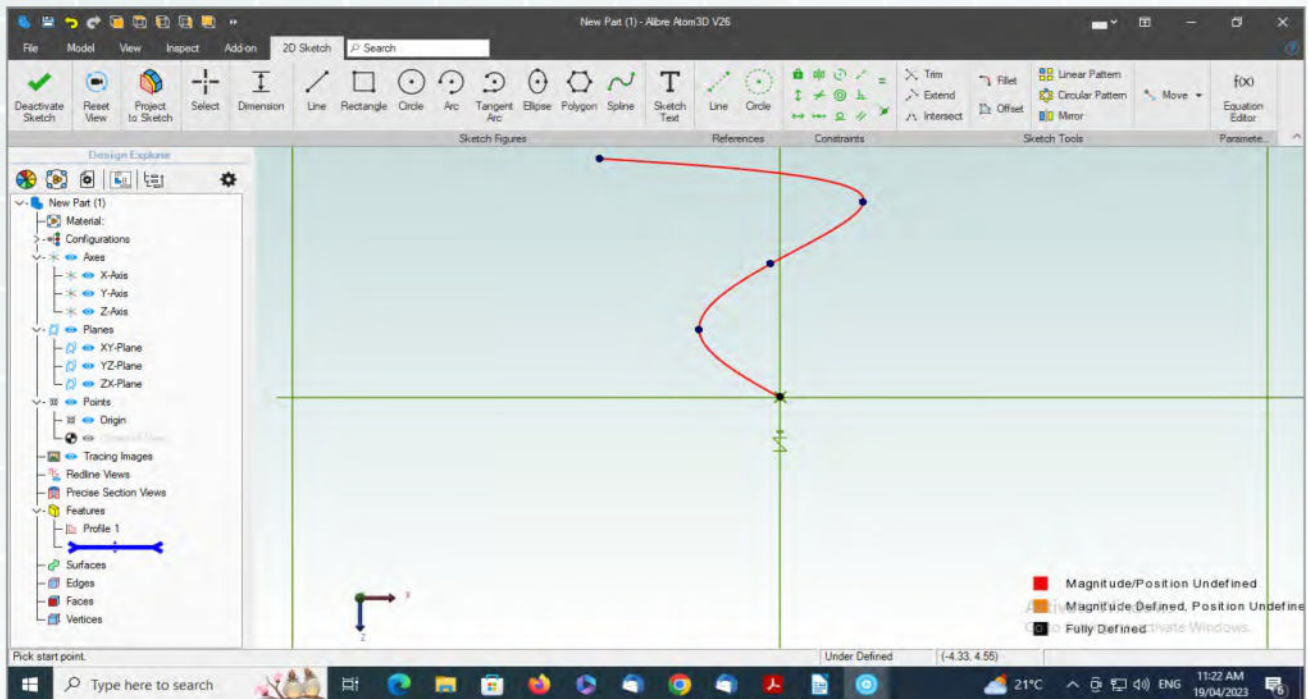


Fig. 2. Curvy line made with the Spline tool

been following this series. The sketch is now fully defined and you can hit the Deactivate Sketch button, which is where the Activate 2D Sketch button was.

Sensible names

If you like, you can rename the sketch from 'Sketch 1' to 'Profile 1' by simply right clicking on it. I find this useful when setting up the Sweep function.

Now for the sketch of the path. It is a good idea to zoom out the work area of the screen now, as it will have adjusted to suit the sketch we did of the 10mm circle.

Select the ZX plane and click the Activate 2D Sketch button. Select the Spline tool from the Sketch Figure Tools section. This will allow you to draw a free-hand line with curves. Click on the origin point to establish the start of the line. This is also the centre of the profile on the XY plane. Now move the cursor away from the origin point and you will see a straight line from the origin point following it out. Click again, move the cursor in a slightly different direction, click again, and you will see that a curve is now

shown where there was a straight line before, and all three points are joined by that curve. You can keep clicking points as you go and the Spline tool will connect them with a smooth curvy line (Fig. 2).

Click the Deactivate Sketch button. A dialogue box will appear (Fig. 3) telling you that the sketch is not fully defined, as we have not given any dimensions. Don't worry; it is not important for this exercise, so just click the Ignore button on that dialogue box. Rename 'Sketch 2' as 'Path 1'. ►

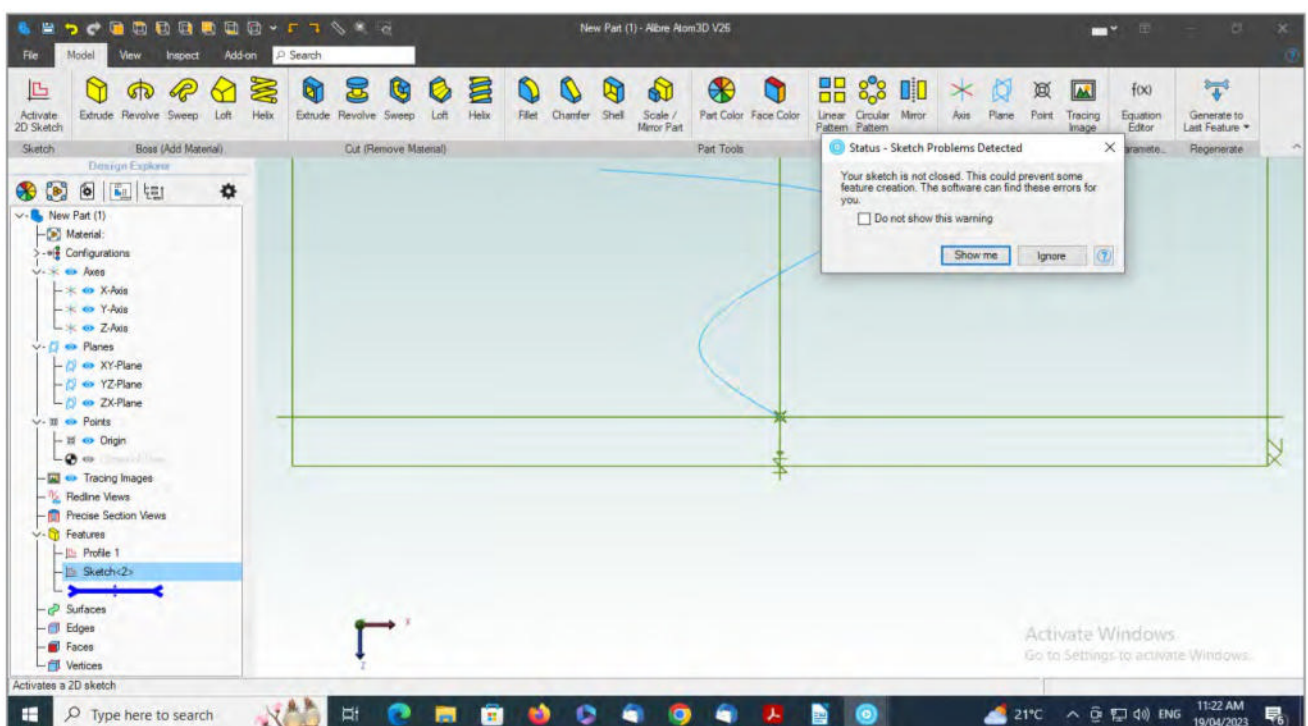


Fig. 3. Message warning that the sketch is not defined

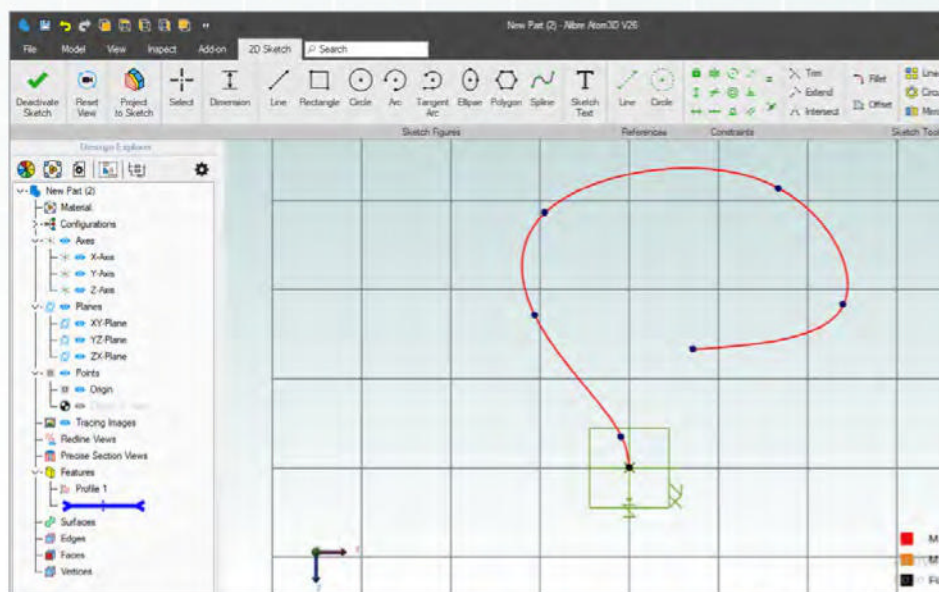


Fig. 4. Revised path

Performing the sweep

Now for the fun bit. In the Boss (Add Material) section of the toolbar, click on the Sweep tool.

A dialogue box appears asking for some information. Enter the path and profile sketches in the Path Objects and Sketch to Sweep boxes, respectively. If Alibre has chosen a sketch for the profile already, but it is the wrong one, simply click on that sketch name in the dialogue box and hit the Delete key.

Oops! In my example, an error message comes up that tells me there is a self-intersecting issue. This means that

the path is too tight for that profile shape and therefore won't work. So I need to change the path sketch to make things work. Right clicking on the Path 1 sketch in the Design Explorer table at the left side of the screen will allow me to edit the sketch. The revised path is more gentle and should hopefully avoid any intersections with the profile (Fig. 4).

A few things to watch out for

I have also altered the scale by zooming out using the mouse wheel. That means that the sketch of the path can also be broadened out more. After deactivating

the sketch, we can try the Sweep tool again. Still a problem, but this is easily overcome by unclicking the Rigid instruction in the dialogue box. Aah, success! That Rigid item is ticked by default, but most of the time I use it unticked. The finished exercise is shown in Fig. 5.

So, as you can see, there are a few things to watch out for, but it is essentially a straightforward process. You might also have realised that the profile sketch can be any shape you want it to be. By sketching one circle inside another, you can create a tube or pipe that follows the path. Great for detailing pipework. Have some fun with this by trying different paths and profiles.

A bespoke application

Let's return to our example, from the last few parts of this series, of the vee pulley. We have designed it as a solid pulley with holes in the web and with tapered spokes. Now that we know about sweeping, we can make more shapely spokes.

It is often an advantage to have pulley spokes that are like propeller blades, so that cooling air is directed over the motor or whatever equipment the pulley is fitted to. Most electric motors have cooling fins on the outside, but they need air movement across the fins to be properly

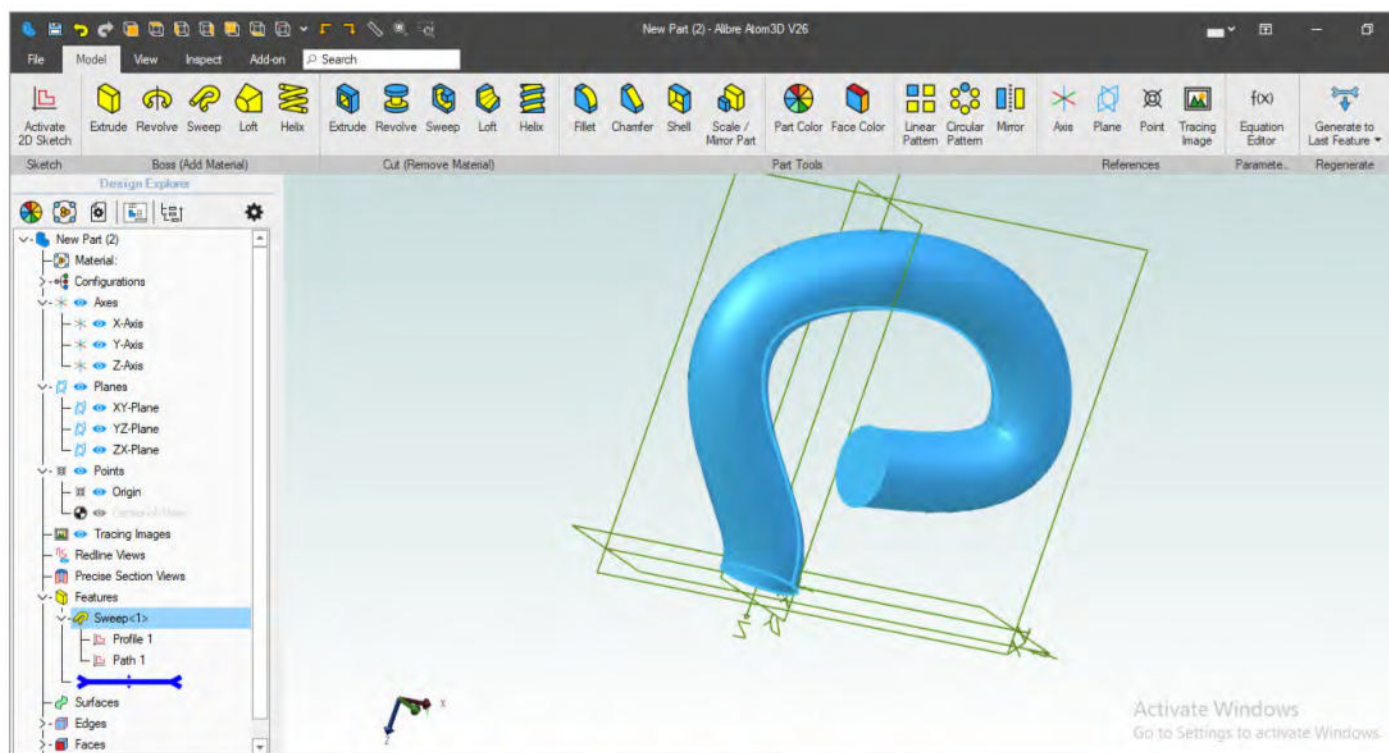


Fig. 5. Finished sweep exercise

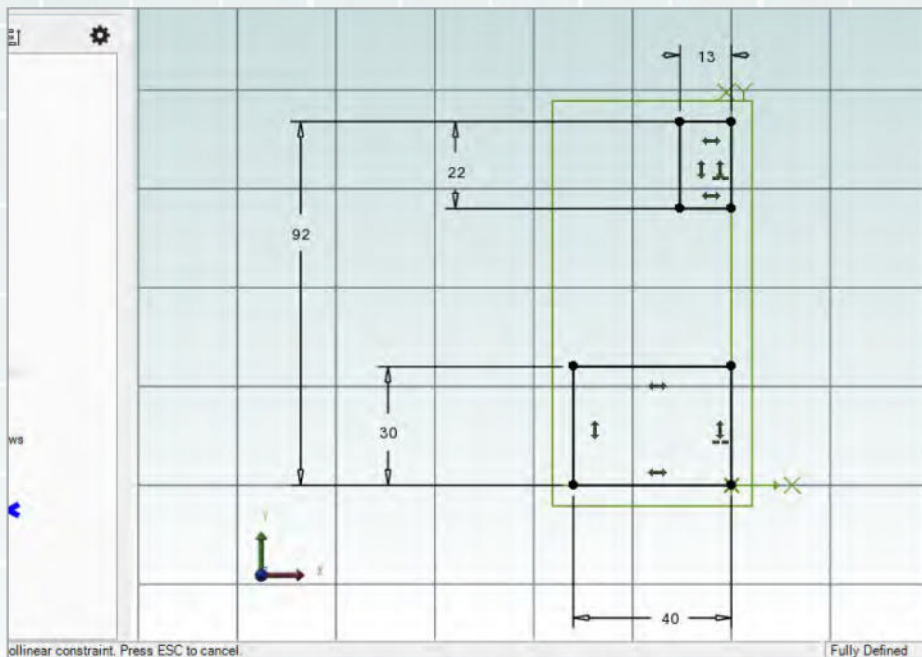


Fig. 6. Dimensions for pulley boss and rim

You should be able to make the inner boss and outer rim of the pulley with the less detailed instructions here

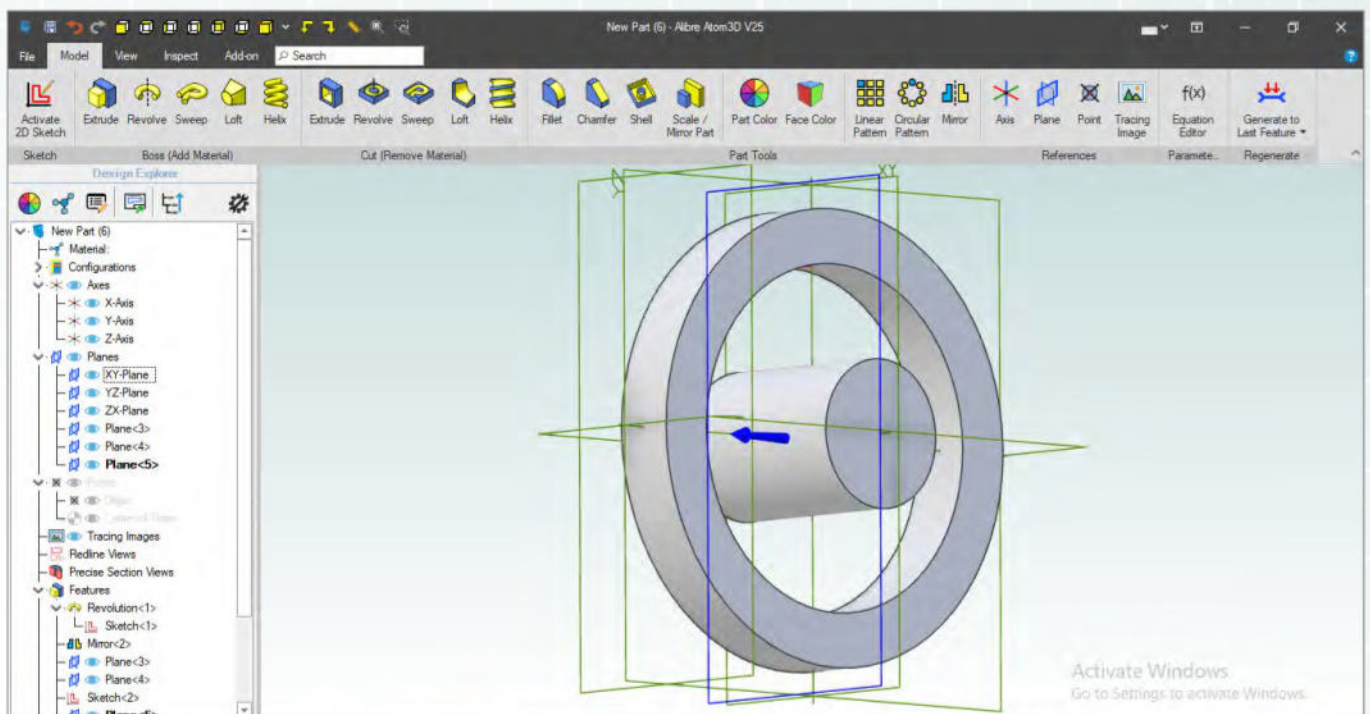


Fig. 7. Pictorial view to see the planes clearer

effective. An example of where propeller blade-spoked pulleys are used to good effect is on belt-driven compressors, where the cooling air is beneficial to both the motor and the compressor.

To produce our vee pulley again, you can look back at last month's issue of *The Shed* (April–May 2023, Issue No. 108) for step-by-step instructions. If you have been using the program for a bit now and are more confident, you should be able to make the inner boss and outer rim of the pulley with the less detailed instructions here. Sizes are shown in Fig. 6.

Start from scratch again

First, make a sketch of the two rectangles on the XY plane as shown. Remember to start on the origin point for the rectangle representing the boss and to constrain the side of the rectangle representing the rim to the vertical axis.

Use the Revolve tool to make them solid and then the Mirror tool to make the symmetrical pulley minus its spokes. Next, create a reference plane on which to sketch the spoke profile. Here is a detailed description of how to make a reference plane just as we did in our previous instalment, part five. (In case

you weren't paying attention.) The reference plane will be where we draw our spoke profile on and where the path for the sweep will pass through.

Creating the plane

Using the mouse with both buttons depressed, move the image around to an isometric or pictorial type of view, so that the three planes can be seen easily (Fig. 7).

In the References section of the tool ribbon, select Plane; from the dialogue box that appears, click on the Offset Plane/Face icon. You will ►

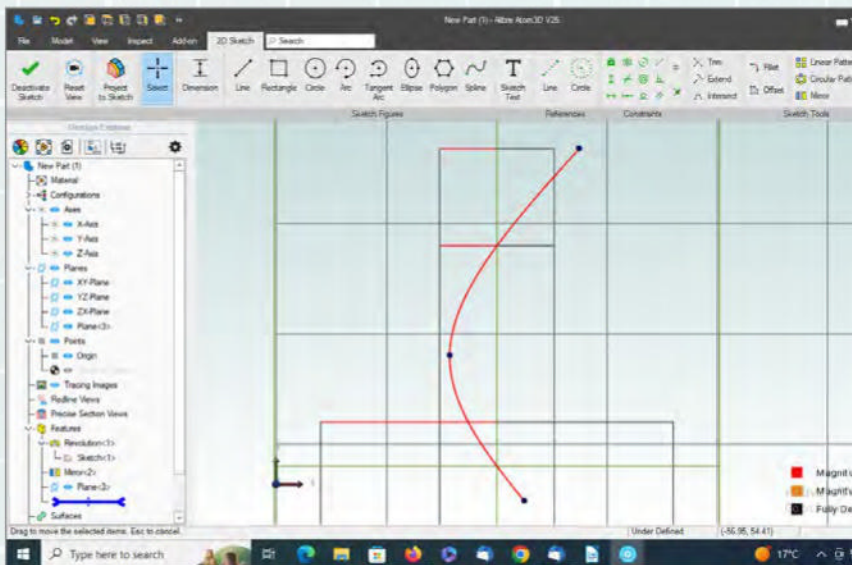


Fig. 8. Path for the spoke passing through intersections

We have now created a plane – or sheet of paper, if you want to think of it in that way

remember that passing the cursor over the top of each of the icons brings up a label saying what it does. Click on the ZX plane on the main image when the cursor makes it turn blue. Then enter an offset distance of 20mm in the dialogue box. An arrow from the ZX plane will show what direction the offset will be. If you need it in the opposite direction, you can tick the Reverse button in the dialogue box. Click apply, then close the dialogue box. We have now created a plane – or sheet of paper, if you want to think of it in that way – on which to draw the spoke profile.

Path and Profile

To see where all the edges are, we will change the view type to Wireframe. Do this by clicking on View, which is right at the top above the tool ribbon. Then click on Wireframe in the options given.

Click on Model, which is next to View above the tool ribbon, to return to the usual screen. Select the XY plane and click on Activate 2D Sketch in the tool ribbon. The new offset plane we created is shown as a green line. The path for our sweep ideally will go through the intersection of that plane and the vertical plane (YZ), as well as the intersection of the vertical plane and the under-surface of the outer rim (Fig. 8).

A curved sweep path will most likely work well and make our propeller blade spokes appear to scoop the air in. To create the curve, select the Spline tool from the Sketch Figure section of the tool ribbon. Click a starting point somewhere just below the offset plane. When you move the cursor, a line will draw out between the place where you clicked and the cursor. This will be straight until we click more places.

Next, click somewhere roughly halfway between the top edge of the boss and the under-surface of the rim.

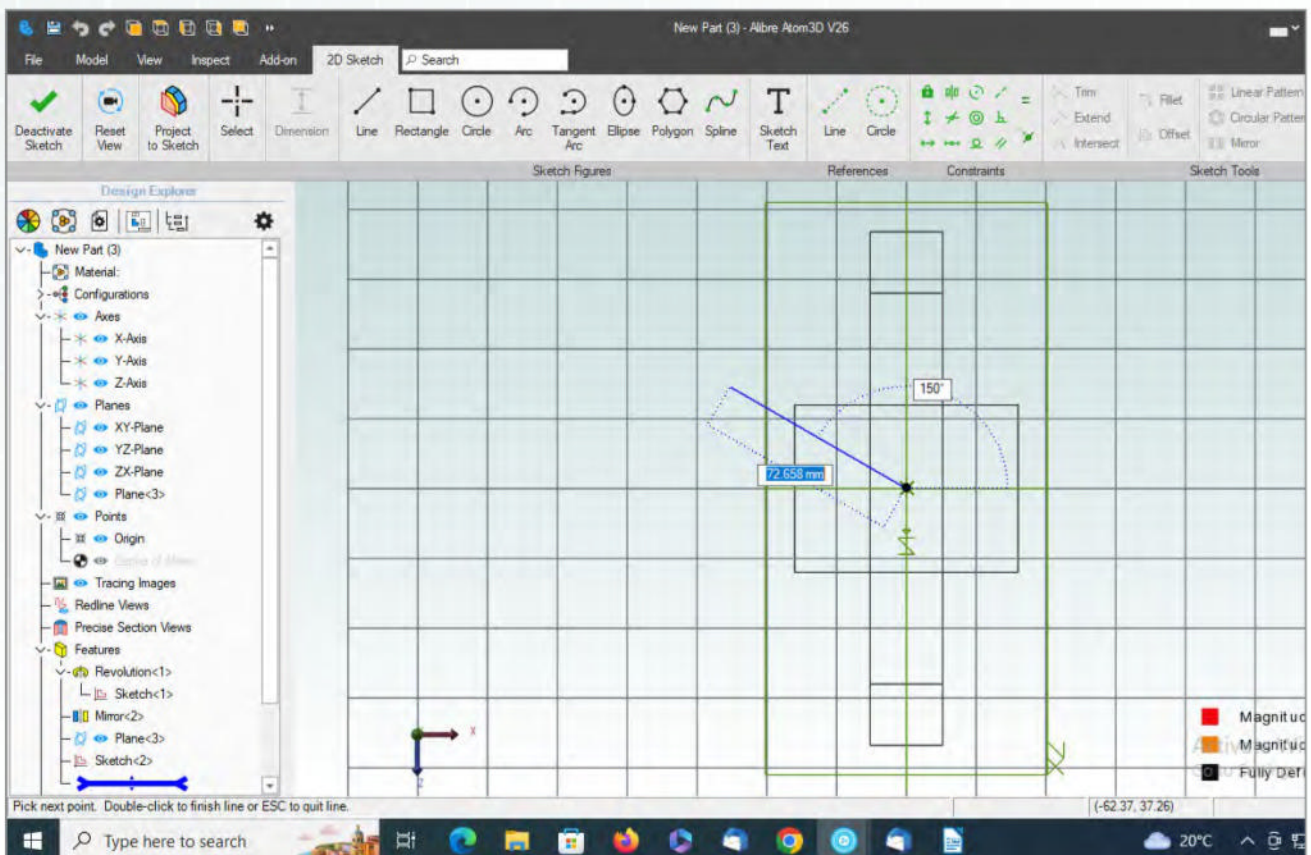


Fig. 9. Angle of the reference line – 150 degrees

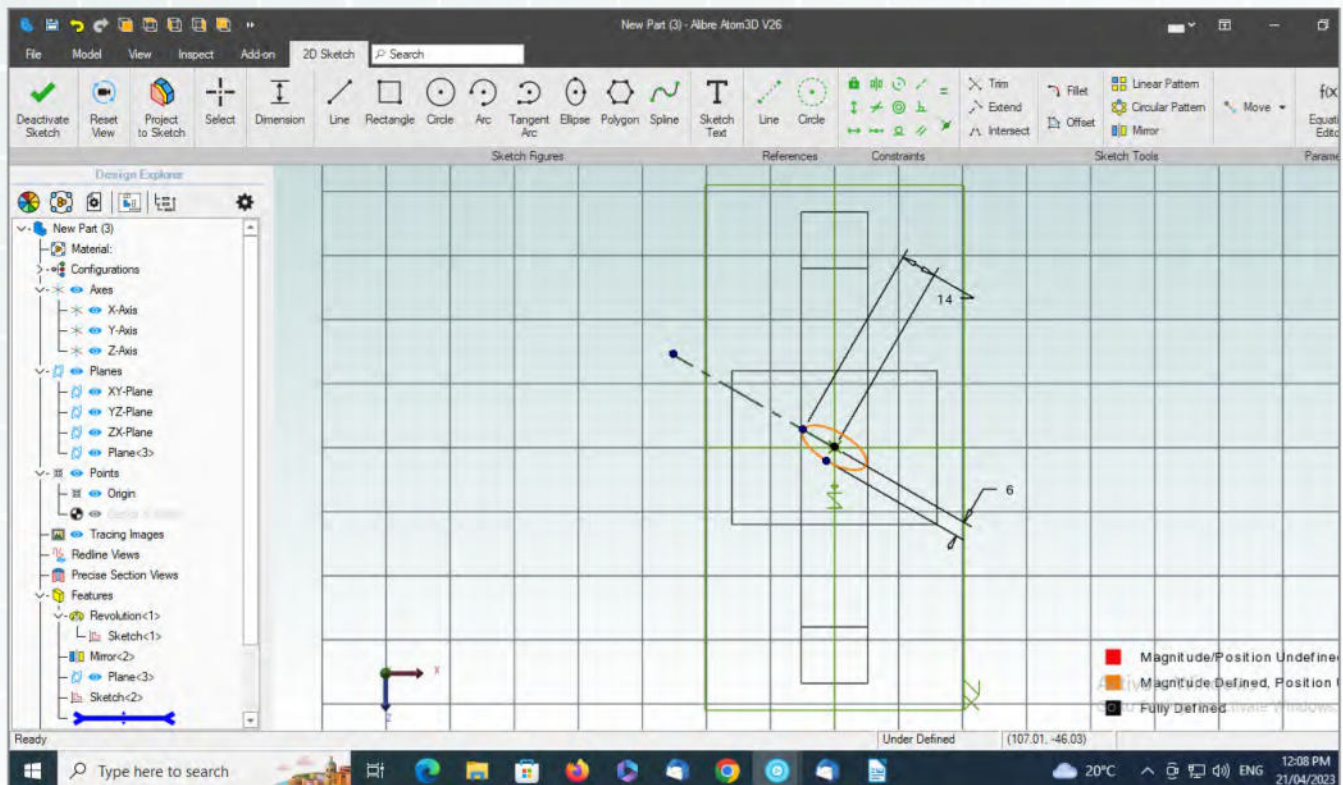


Fig. 10. Dimensions of the ellipse

By angling the profile, it becomes like a propeller blade

The next spot to click as you draw out the now-curving line should be above the under-surface of the rim and at a position that makes the curvy line pass through the centre of the rim edge (Fig. 8). Don't worry if it is not exact. Move the cursor away and hit the Esc key to get out of the Spline function.

The curved path is not defined by dimensions or constraints, so is easily adjusted. Click on the curvy line and see how easy it is to move around and adjust. You may have to hit the Esc key again to get rid of an annoying table that appears after clicking on the line.

Curb your ambitions

Be careful not to be too ambitious about the tightness of the curve, as the Sweep function won't be happy if it is too sharp for the profile. Make sure that the line passes through the intersection of the lines of the offset plane and the vertical plane. Deactivate the sketch.

A box will appear to tell you that the sketch is not fully defined. It does not have to be in this case, so just click the Ignore button.

Click on View at the top of the tool ribbon and change the view from Wireframe back to Shaded. Then click on Model to go back to our designing mode.

Move the image into a pictorial type of view. Then select the special offset plane that we created and click on Activate 2D Sketch. This is where we'll draw the spoke profile.

In the References section of the tool ribbon, select Line. The objective is to place a reference line through the origin point at an angle so that we can draw an elliptical spoke profile along it. By angling the profile, it becomes like a propeller blade. Click on the origin point and draw the line out at an angle to a distance easily clear of the boss. The actual angle will be

indicated as you move the cursor. Aim to achieve 150 degrees (Fig. 9). Click the Ellipse tool and draw an ellipse along the reference line. Dimension it as shown (Fig. 10), and deactivate the sketch.

Scoopy spoke

Click on Sweep in the Boss (Add Material) section of the tool ribbon. The profile sketch will already show in the dialogue box that appears. Click on the sketch for the path in Design Explorer to the left of the screen and it will drop into the dialogue box. Change the box that, by default, says 'Entire Path' to 'To Geometry'. This is because we are sweeping to a curved face and, also, we don't want it to go anywhere but to the under-surface (lower face) of the outer rim of the pulley. If we said Entire Path, it could interfere with the vee groove of the pulley.

Now, click on the box to specify the geometry to end the sweep, then click on the appropriate face of the outer rim when the cursor makes it turn blue (Fig. 11).

A representation of the sweep will show on screen. If it looks OK, click on 'OK' in the dialogue box. ►

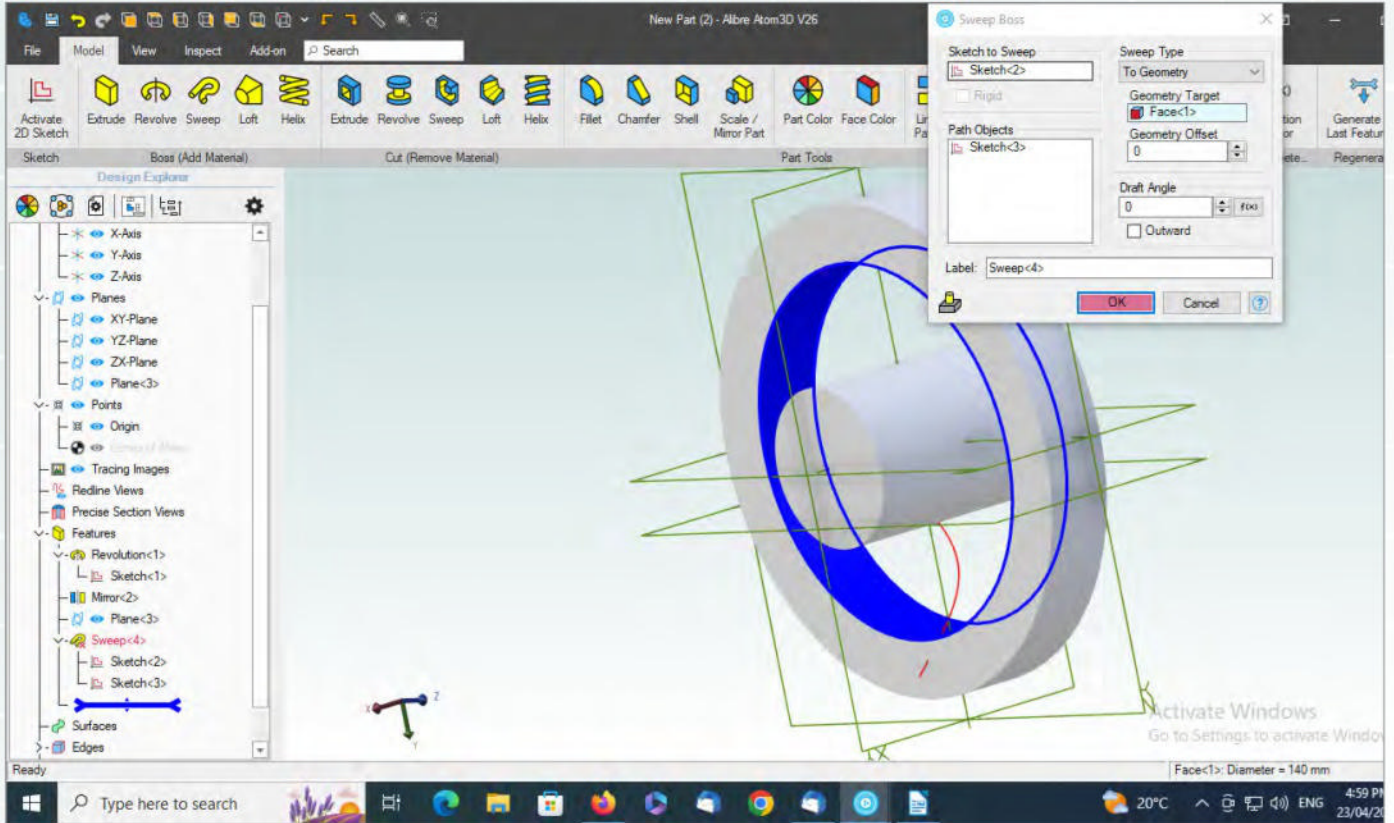


Fig. 11. Under-surface of the rim highlighted

If it looks OK,
then click
'OK' to set it
in stone – or,
in this case,
cast iron

One down, five to go

Now select the Circular Pattern tool from the Part Tools section of the tool ribbon. A dialogue box will appear asking for details. The Features to Pattern box should already be highlighted in blue, but, if not, just click anywhere in that area to activate it, then click on the sweep of the spoke in the Design Explorer panel. As these spokes are narrower than the previous ones we had, let's do six spokes. Enter that

number into the Instances box and then show 60 degrees as the spacing below.

The centre of the pattern is important, and, in this case, it is the axis of the pulley itself. Select this with the cursor. It will turn blue when the cursor is in the right position to identify it.

Once all the info is entered into the dialogue box, a preview of the six spokes should appear in our work image. If it looks OK, then click 'OK' to set it in stone – or, in this case, cast iron.

Select the Fillet tool and add a 1.5mm fillet radius to the boss end of the spoke and a 0.5mm fillet to the rim end.

On your own

Now you can pick up your previous copy of *The Shed* (Issue No. 108) and complete the pulley by following the instructions from page 74 onwards. You can do this! The completed pulley is shown in Fig. 12.

What have we learnt from part six?

We have learnt that sweeping a path doesn't have to be hard work. We have learnt that a motor can keep its cool by mating with the right pulley. We have learnt the importance of keeping all our issues of *The Shed*. 📁

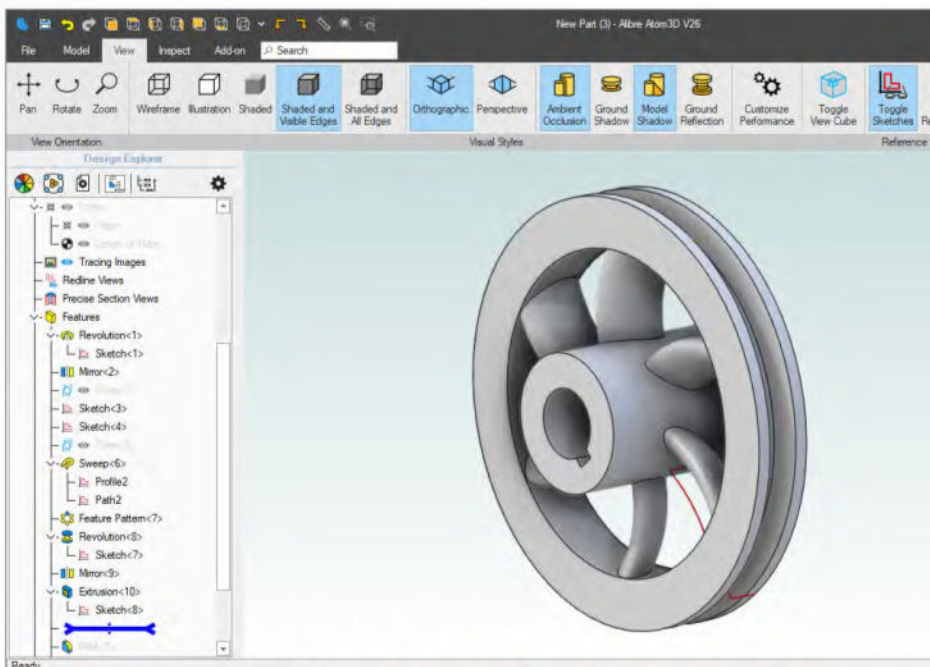


Fig. 12. Finished pulley with propeller spokes



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CREATING A WINNER

Lateral thinking and creativity come into the mix when you are trying to build a competition-beating machine

*By Richard Brown
Photographs: Richard Brown*

When it came time to upgrade my son's grass racing kart, I had two options: spend some money and buy him something already race proven, maybe making some minor adjustments so that it suited his driving position, or start with a fresh frame and build up a new one myself.

My choice was more or less decided due to a limited number of suitable grass karts for sale. It seems that kart racing

has taken off in popularity, and our local club is no exception. With a rapidly growing membership and new faces at every meeting, getting your hands on an all-set-to-go grass kart is harder than ever. With that decision sorted, it was time to find a frame.

Good score

Retired circuit karts are an easy go-to, with some tarmac karts that are only a

few seasons old being regularly replaced to remain competitive – which is great for us. I found a BRM frame listed in the deep south; it was a roller with everything except the engine – perfect!

Obviously, it would need a few adjustments to convert it to suit grass-track racing but it was all there. The 40mm axle and 28mm chassis tube size were also softer and more flexible than most of the adult frames running



The new frame ready to be converted

At around \$800 for a complete engine package, it's a hard option to go past – nevertheless I had a cunning plan

30mm or 32mm tubes and 50mm axles. Chassis rigidity in a grass kart doesn't help much with grip; in theory, a softer, loose chassis that can twist increases grip on wet tarmac tracks, so I figured

keeping the frame set-up soft to reduce understeer and increase rear traction would be an obvious choice. Not having a lot of experience with karting set-ups, I'm trying to adapt ideas and theories

from my previous race and rally cars; hopefully some of it will cross over.

Grass kart regs

Grass kart classes and regulations are set by a South Island committee, under which each of the 10 clubs runs. That means that everyone runs to the same rules at the annual South Island championships.

The class we're aiming for is the Intermediates – 9 to 13 years inclusive; 0–205cc maximum, air-cooled engines only; or 0–85cc maximum, water-cooled and power-ported engines.

I'm not a fan of two strokes, and I also wanted something with an electric start. I investigated the many engine options. By far the easiest choice would be to purchase a new Chinese Lifan 200cc crate engine. These Honda XR200 clones are a very popular choice and even have their own class. Each standard engine is sealed from new to ensure that it isn't 'played with' and the class promotes parity, with an emphasis on driver skill rather than on who has the biggest wallet. At around \$800 for a complete engine package, it's a hard option to go past – nevertheless, I had a cunning plan. ►



Work begins on the new kart while the old kart looks on



The 2001 Suzuki FXR150 donor bike, ready to be stripped down

Plan B

A complete Suzuki FXR150 motorbike appeared on the radar and I purchased it pretty quickly. The 150cc double-overhead camshaft (DOHC) engine and six-speed gearbox were extracted from the frame, along with the complete wiring loom and digital dash, giving us a rev counter, gear-position display, and a neutral light. There

are already a few of these units being used in various race classes, and they have proved themselves as a competitive unit capable of producing 20.11 horsepower (hp), 14.7kW, at 13,000rpm.

It wasn't until I tried to sit the engine on the frame of the kart that I realised there might be a little more work than I had estimated.

The first obstacle was the right-hand seat-support bar, which is welded to the chassis. It interfered with where the engine would need to sit and needed to be relocated. A quick buzz with the cut-off disc sorted that but didn't make the rest of the job any easier.

Small frame a little twitchy

Our new frame was a cadet size, designed for junior racers. For starters, it was slightly shorter than an adult kart, which wasn't too much of an issue; the shorter wheelbase makes a kart a little twitchy and more reactive on turns.

The biggest concern was the width; the overall wheel track was the same, but this frame is 50mm narrower in the two chassis rails dimensions. Added to that, the FXR150 is also quite a wide engine. When it was lined up sitting on the chassis rails, the seat needed to be pushed so far to the left of the steering wheel centre that it looked as if it were there for a co-driver.

After trial and error using some scrap metal and G-clamps, I worked out that I could push the engine over using an outrigger-style mount and gain back around 50mm of seat space. The steering wheel would still be slightly offset of centre but well within a more normal driver position.



The first engine test fit. Both of the seat A-frame side mounts needed to be removed



Trial fitting of the seat revealed an average driver position to the left of center



Mount manufacturing with mill and new DRO system



Dummy fitting the engine pushing it over trying for more room

This was probably the best investment I have made in a long time; it ensured my measurements all ended up within 0.01mm

Let's go

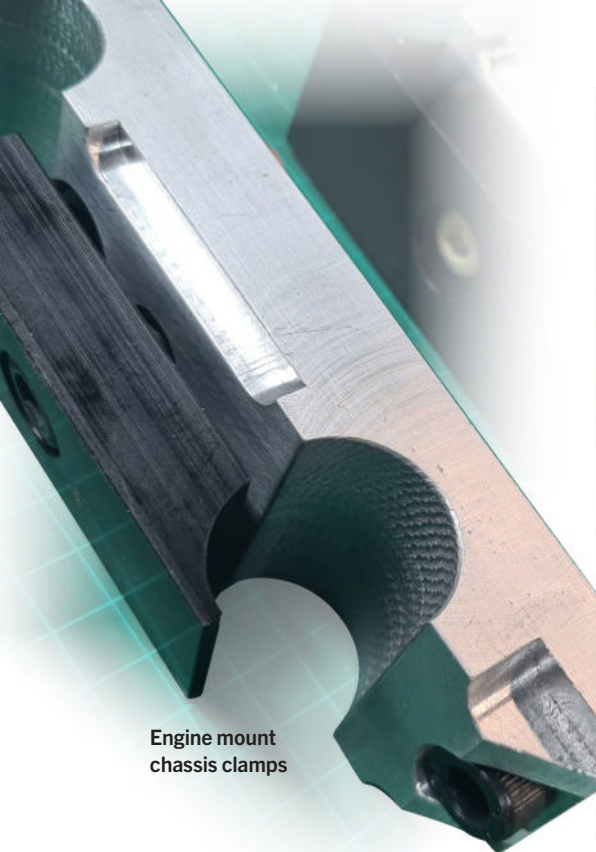
I drew up a very quick plan with the dimensions on a notepad, fired up the mill, and began removing lots of chips from a couple of pieces of 25x50x150 aluminium bar stock.

I had just upgraded my small milling machine with digital linear scales and a new Bluetooth digital readout (DRO) system using TouchDRO software, which was installed on an Android tablet for the display and mounted to the side of the mill. This was probably the best investment I have made in a long time; it ensured my measurements all ended up within 0.01mm – definitely a first for me, and a far cry from using the eye-ometer

and crossed-fingers approach that I normally run with.

To prevent any twisting of the engine, as well as to keep the engine as close to the frame as possible, I used a boring head to cut two 28mm diameter scallops at 92mm centres for the engine cradle to sit on. The two finished blocks have recessed holes to allow for flush mounting of the cap screws holding the main engine cradle mount in place. I also used a steel threaded insert to bolt up the off-the-shelf lower blocks. This allows the engine to slide back and forth on the chassis for chain tension adjustments.

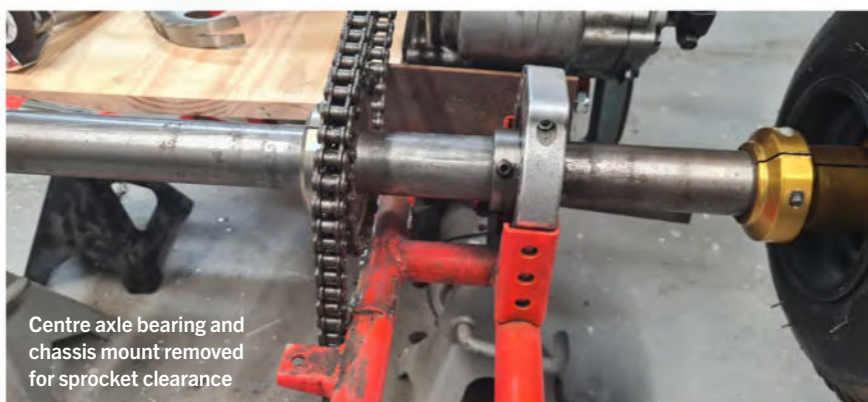
With the engine now secured to the chassis, my next challenge quickly revealed itself. ►



Engine mount chassis clamps



Offset engine mount blocks giving around 50mm extra width



Centre axle bearing and chassis mount removed for sprocket clearance

A bearing mount has to go

When setting up a kart for tarmac circuit racing, a stiff rigid chassis is paramount for converting weight transfer to tyre grip. To help with this, almost all kart manufacturers have three rear-axle bearing carriers fitted to the rear of the chassis. Unfortunately,

the middle bearing chassis mount was directly in line with the chain and axle sprocket location. Another quick trim with the cut-off disc and I removed the bearing mount from the chassis, gaining the clearance to correctly align the chain and sprockets.

Next, it was time to look at the gear

shifter. The easiest option is a push-pull linkage rod off the gearbox to a gear lever mounted on the steering column, but I had seen a few examples of Formula 1-style paddle shifters being used and had my heart set on something similar; I thought if nothing else it would be a cooler looking option.

There are a few kits available for purchase, starting from a basic cable set-up right through to a full electronic system. However, everything would have needed to be altered to fit the engine, so I decided to start from scratch and build my own.

The paddle would be a rocker arm mounted on a pivot, using the steering wheel boss bolt with two Bowden cables that pull a linkage on the gearbox, one for up-shifts and the other for down-shifts.



Steering wheel boss mounted paddle shifter with clutch pull lever at the top



Carbon sheets are tough

The steering wheel is attached to the column with a 6mm bolt, which is probably a bit on the smallish side, so I started with a larger 8mm black cap screw and drilled the boss out to suit.

The steering boss also has the clutch lever mounted to it, and the paddles would need to be spaced down to stay clear of that.

I made a small internally sleeved boss that could pivot freely while still being able to tighten the bolt holding the main steering boss to the column. I attached a 25x25mm aluminium right angle to that, then cut out two paddles from a sheet of 4mm carbon fibre.

It turns out that pre-made carbon sheets are incredibly hard on jigsaw blades – even metal cutting blades wore out pretty quickly – but I got there eventually and had two matching shapes to bolt to the aluminium section. I also spun up an aluminium collar that

could be grub screwed on the steering column to hold the outer cables in place and keep the inner cables as straight as possible to the paddles.

The paddles work well

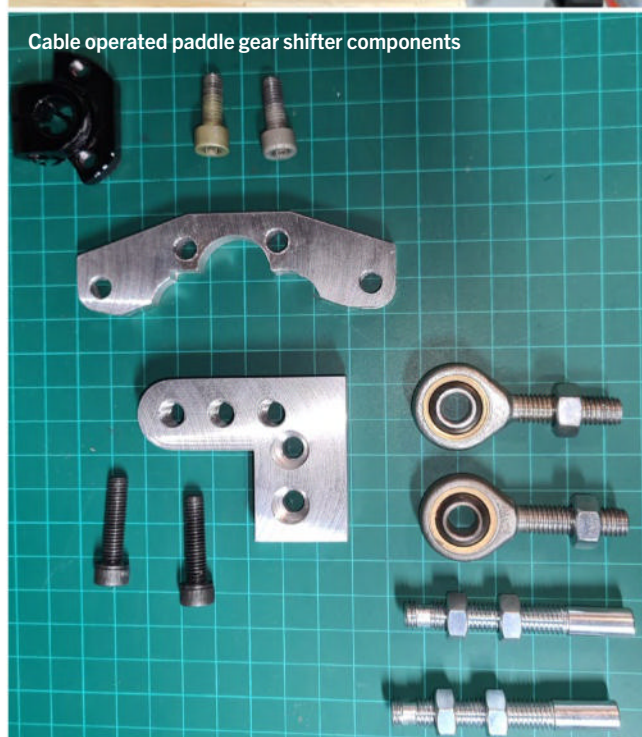
The gearbox end was reasonably straightforward once I had worked out a suitable pivot length, which was mostly through a bit of trial and error. A bit more work on the mill and the finished item was bolted to the original gear shift splined link arm that I welded on a 6mm half-moon shape with a flat surface and two threaded holes.

I made an L-shaped bracket and bolted it to the side of the top engine mount that holds two 8mm male rod ends. These would hold the outer cables in place and still allowed a bit of movement for better alignment. The paddles seem to work very nicely, with a positive feel when engaging a gear in both directions. ►

The gearbox end was reasonably straightforward once I had worked out a suitable pivot length



Gearshift cable mount and gear linkage



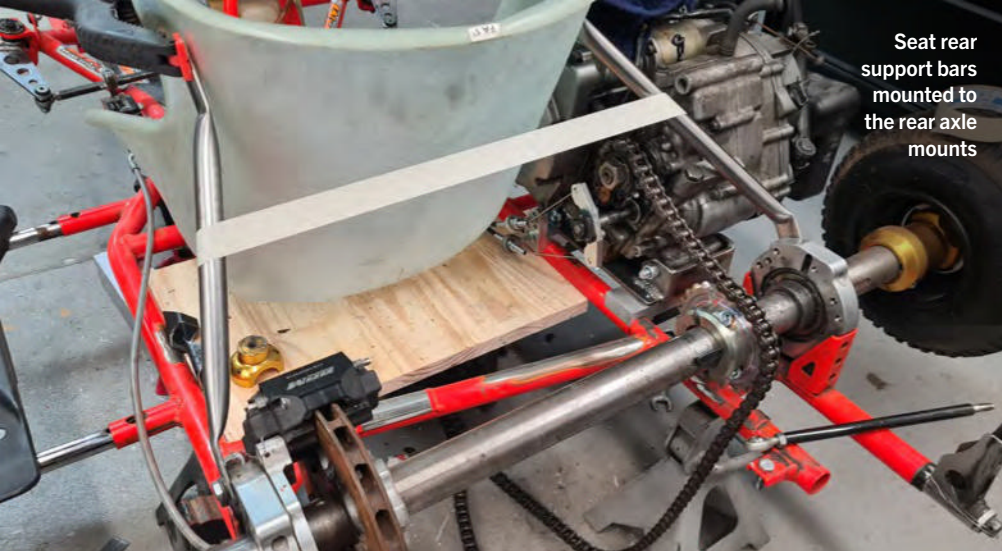
Cable operated paddle gear shifter components



Paddle shifter cable mounted to steering column



Finished steering column with Carbon-fiber paddles, and clutch lever



Seat rear support bars mounted to the rear axle mounts

was mounted, with any extra brackets fitted, we stripped the frame down and sent it out for sandblasting and powder coating. At the same time, we sent the chrome front and side bars to be coated black; it's just a personal thing for me, but I don't really like chrome on race cars.

When everything arrived back looking 'flashier than a flash thing', it was time to put it all together. All of the nuts, bolts, and bearings were replaced and components checked and cleaned, before being reattached to the frame using thread-locking compounds to help reduce anything rattling loose.

The well-used original aluminium floor pan looked out of place against the new blue tubes; luckily, I had a full sheet of black aluminium composite material (ACM) sign panel sitting in the corner gathering dust that would look way better. I figured that while I was making a new floor, I could increase the size of it and take it down past the seat.

The seat

When it came time to remount the seat, I looked at trying to reuse the original seat mounts that I had cut off the chassis. It didn't seem to matter how I positioned them, they always seemed to be in the wrong spot, hit something, be too short, or be at the wrong angle. The two original front mount locations were fine and more or less still in the right spot for the fibreglass seat.

I remembered reading somewhere that a good set-up trick for wet tracks was to add extra seat-back stays to the axle, the idea being that, as the driver leans back, the seat flexes and more weight is pushed directly down onto the rear axle, creating more rear traction.

Rather than the back of the seat being supported off the side and down to the chassis rails, a better option might be to make a cradle and bolt it directly to the rear-axle bearing mounts. I sort of confirmed it would work after looking at a new design

of an Australian-built kart chassis made for clay speedway tracks and seeing the same seat mount being used. The rear crossbar also gave me a good place from which to mount the capacitor discharge ignition (CDI) and relays.

Home straight

The rest of the build was very straightforward. Once I was happy that the chassis was sorted and everything



Chassis fabrication and seat mounts all finished



Fresh and shiny frame back from the powder coaters



Re-assembling the frame making sure everything is tightly secured as we go

A lesson learned

An issue that we'd had with the previous kart was with large clumps of wet grass balling up and jamming in open space under the seat. A few times it was bad enough to belly and lift the rear wheels off the ground. A longer floor might help reduce this, hopefully?

The new floor-pan sheet was wide

enough to go right out to the side pod bars, potentially eliminating a few more places for grass lumps to gather.

In an effort to further remove anything that could snag grass balls, I purchased some Tinnerman countersunk washers from an aircraft-fastener supplier to flush mount it to the chassis. ▶



Making up the new full size floor pan from an ACM sheet



Finished floor with countersunk "Tinnerman" aircraft washer to reduce any snags



Filling in time making an oil cooler mount

It did take a ridiculous amount of time for what it was, but it definitely beats gardening

Finishing off

The engine-oil cooler on the FXR150 is mounted to the bike frame, so I needed to fabricate a bracket off the engine. I could have made a quick one from some 25x3mm mild steel, but the new software on the mill beckoned me. Sadly, making it that way restricted my ability to help with some gardening duties that had been mentioned by my wife. It did take a ridiculous amount of time for what it was, but it definitely beats gardening.

The wiring was next – not something I usually enjoy, and I had hoped that using the standard loom would make this very simple.

I downloaded a wiring diagram from the web to help clarify where everything went. After removing the insulation and weeding out the unnecessary wires for lights, I placed the loom on the kart and worked out which wires would need the length tweaked. An engine kill switch and starter button were fitted to the steering wheel. I also ran off a power feed for the new fuel pump; it's a K&N electric pump that will deliver 1–2psi of fuel from the fuel tank now mounted under the steering column. The donor bike relied on gravity to feed fuel from the tank to the carb.



Sorting the wiring loom salvaged from the donor bike



Missing starter idler gears causing delays to the first start up

I'm sure the neighbours would have been able to hear my frustration

Finally, a test run

I had already changed the oil and filter, so just added a wee splash of fuel to the tank, hit the ignition, and the pump primed up straight away without any leaks. I'm sure there's some saying that if it's too easy, something isn't right. That came true when I hit the starter button and the starter whizzed up without turning the engine over.

I'm sure the neighbours would have been able to hear my frustration. I removed the side cover on the engine and, with my fresh oil running out everywhere, I discovered that the starter one-way clutch and idler gear had been removed.

At a guess, I would say the previous owner of the bike had started to convert it to a bucket racer, this being a common upgrade to increase power by removing spinning flywheel mass. Until now, I had only ever started the bike using the kick start, as there was no battery in it; that added to my frustration, mostly with myself for not actually checking that basic stuff first. ►



Almost finished, waiting for the starter parts to arrive

Never mind; chin up, I guess!

I refitted the engine cover and battled briefly by pulling the kick-starter by hand. It hit either the tyre or the exhaust system, or both at the same time. I quickly ran out of patience, gave up, and went inside to source some parts online to reinstate the starter motor.

Happiness is a running engine

A week or so later, and on the eve of the new kart's maiden race event, some used starter parts arrived and were fitted inside the engine. The overwhelming happiness that washed over me when the kart fired up on the first crack after the lightest of pushes to the starter button was something else entirely. It needed only a minor twist of the idle screw for the kart to run perfectly sitting up on the work stand.

The clutch and paddle shift cables needed adjusting but felt great afterwards, as did the newly made

throttle cable. I tidied up the remaining wiring loom, gave everything a once-over, and got it ready for a test drive.

A brief, slow test run to check the brakes, gear shifting, steering, and clutch had it all seeming very positive; my driver loved the paddle shift and said that the kart felt great. Phew! ▶

All finished and ready to for the first test run



My driver loved the paddle shift and said that the kart felt great. Phew!

Heading out for the pits for the maiden race





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A fall at the final hurdle

It was when the testing pace picked up that an engine misfire started. Long story short, the generator had also been removed from inside the engine – probably at the same time that the starter parts had been taken out – and now the battery was quickly going flat with the fuel pump and ignition coil drawing power directly off it.

Again, this is something else I should have checked when the cover was off. Now, with the final meeting of the year only a day away, we had to make the call and abandon all hope of making the starting grid.

We waited and waited for the parts to arrive. Christmas holidays rolled around, creating further freight delays. Further delays to the start of testing resulted when our driver ran out of talent, and/or ability, on his mountain bike, crashing and fracturing his wrist.

A blinder of a start combined with a determined drive meant that he notched up the first win



The first test run to check everything is working

Nervous times

When we were finally all set to go, it was again down to the week before the first event.

A very brief test in the paddock at home showed promise, with no real issues. The kart and associated gear were loaded onto the trailer on Saturday night ready for an early start on Sunday morning. In all the years of motorsport I've been involved in, I don't recall ever being as nervous as I was driving out to the maiden event that morning – and I wasn't even the one competing.

A strategy meeting in the ute resulted in the decision that it would be best to go off the back of the grid and get a feeling for the new kart. Ten karts were positioned ahead of him at the start of

first race and, as the old saying goes, 'The bulls**t stops when the flag drops!'

He managed to get up to fifth mid race before a small half spin dropped him back down the field, and he crossed the line in eighth. The driver's feedback was a glowing report.

A few tweaks were made before the next race. After starting off the back of the field in race two, a blinder of a start combined with a determined drive meant that he notched up the first win, taking the chequered flag a few kart lengths ahead of the next kart.

It seems that the new kart has some great potential. We now have a list of other ideas and cunning plans to work on, because a racer is never ever really finished, is it? 🏁



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THE CASE FOR LINING

This 'ultimate shed' is future-proofed, based on the premise that it's easier to add features during construction than face expense and disruption later on

*By Des Bromilow
Photographs: Des Bromilow*



Many sheds are not lined, and for most this is not an issue. Given that my neighbours are reasonably close, and I live in a place with noticeably very hot summers, I looked at lining and insulating my shed as part of the project. I also knew that if I didn't insulate the shed during construction, I would find it difficult to 'get around to it' once machines, power, etc. had been installed.

The first thing to do was insulate the north wall with the same type of insulation as used on the roof. Care was taken to keep the insulation out of the cable ladder – now within the wall profile – so it did not create a significant derating issue for the cables once installed.

What do you line a shed with?

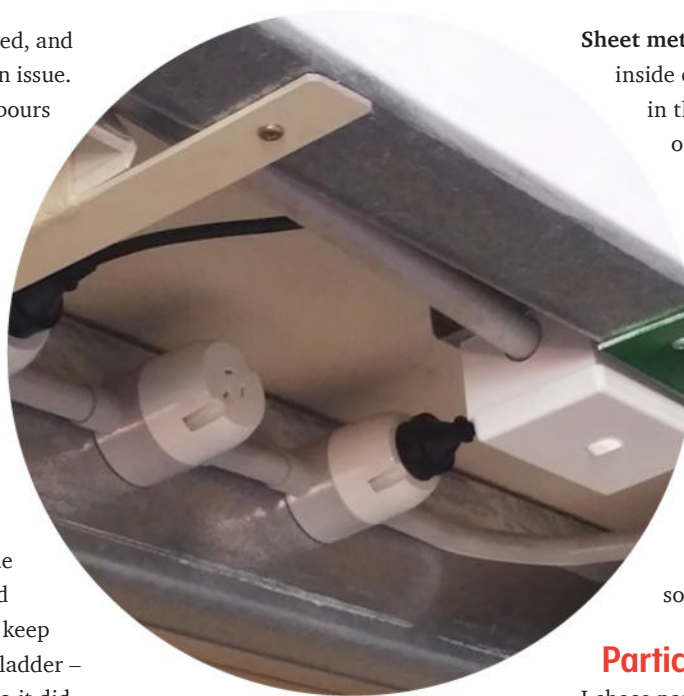
I had several options to consider, including plasterboard, plywood, and particle board. Each had its pros and cons, so I looked at other builds and asked on a few forums for advice. Cost did play a factor in the final decision.

Criteria in the decision

1. Something I could work with for the construction – not needing specialised tools or skills that I didn't already have or could not get quickly
2. The ability to hang things off the walls once lined – shelves, electrical fittings, etc.
3. A moderate impact resistance – no one wants damage to walls, but a lengthy repair afterwards is insult to injury
4. Able to be painted easily to make the walls lighter, cover stains, and so on
5. Construction with one or two people – and minor scaffolding, if at all
6. Cost and availability
7. Sound deadening – nice to have

Options considered

Plasterboard (Gyprock) with stud walls: Easy to build, moderate cost, strong walls – provided you hang things off the studs. Synopsis: Met criteria 1, 4, 5, and 6 easily, and 2 and 3 with some restrictions.



Sheet metal: I did consider lining the inside of the shed with sheet metal in the form of galvanised sheets or Colorbond sign sheets. The pricing was comparable to plasterboard, and still needed a stud frame to address the issue of spanning the distance between wall girts. I was concerned that the sheet metal would act like a drum skin with respect to quietening any noise in the shed. Synopsis: Met 1, 4, and 5, and 2, 3, and 6 with some restrictions.

Particle board wins

I chose particle board, and ordered the required number of sheets to floor the mezzanines, line the walls, and build a few workbenches. Overall, the order amounted to nearly 100 sheets of 3.6x0.8m at 19mm thick. The calculations for the sheets showed that I would end up with a number of offcuts too short to use for lining the walls. These remainders were subsequently reserved for building shelving.

The only places that stud frames were needed was for creating partition walls, and in two places where the nogs were of differing depths (door frames). These frames were built and secured in position, and the lining commenced.

The walls were prepared by ensuring that there was a nog or attachment rail every 1200mm or less. This meant adding lengths of studding off brackets in some areas where the fascia purlin was not suitable to attach the lining to due to being in a different plane from the nogs. I had also added a length of 30x30x3mm angle iron – aka equal angle (EA) – above and below each cable ladder to provide a rigid steel strip to which to attach the cable ladder covers. These pieces of EA were installed at the same time as the cable ladder – that is, before the external cladding was applied.

Temporary flooring sheets were placed, and clamped, on the mezzanine joists so that the upper wall sheets could be lifted into position and screwed in place. The sheets were supported from ►

Plywood: Based on thickness and grade, the walls met all criteria except 6. Plywood with thicknesses below 15mm were cheaper, but needed a stud wall for strength, which took the cost higher than plasterboard; 15, 18, and 21mm plywood was prohibitively expensive. Synopsis: Met 1, 2, 3, 4, 5 and 7; cost was high.

Particle board: Most grades of particle board were similar to plywood for cost and constraints. However, the particle

So I looked at other builds and asked on a few forums for advice

board used for flooring showed a lot of promise. It handled the spans I was using without a stud wall and allowed me to affix things to the wall anywhere. One side that took paint well – the other being wax treated for water resilience – and I received some very competitive pricing options for this product. Synopsis: Met 1, 2, 3, 4, 5, 6, and 7.

I chose a light colour to allow light to bounce around the interior of the shed more

the bottom on a pair of temporary stands that were moved along the wall as the work progressed (Photo 15).

Mezzanine flooring

Once the high section of the wall lining was in place, the temporary flooring on the mezzanines was removed and replaced with permanent flooring for all internal mezzanines. The external mezzanine – the welding bay – was floored with decking timber so any rain that blew in could drain off the flooring more easily. The treated decking timber was later sealed with marine varnish to provide a low-maintenance floor surface.

The wall sheet for the low section of lining was packed up off the floor by steel packers then screwed to the nogs and cable ladder covers with the appropriate Tek screws. Care was taken during the lining both to keep joints tight and keep the cable ladder opening as level as possible to aid with the future placement of covers (Photo 16).

Why paint the lining?

The lining was then painted a light cream. My reasoning for the painting was:

- The lining material has some inherent protection against absorbing fluids by virtue of the wax and glues used in its manufacture, but I did not want to rely on that as the only source of protecting the lining. I had already chosen to place the heavily waxed side towards the external cladding as an additional layer of protection against any failing of the sarking to keep moisture away from the lining.
- I chose a light colour to allow light to bounce around the interior of the shed more. Not only does this improve lighting for working, but it will also help overcome shadow effects caused when I start filling the shed with tools, storage, and projects.
- A light-coloured background wall allows a certain amount of contrast when examining things. I can hold something up to look at it, and the light-coloured background allows me to see gaps or imperfections more easily than a dark surface would.

This paint should last well

After consulting local paint suppliers, I chose an acrylic undercoat sealer,

Below: Photo 15 – The sheets were supported from the bottom on a pair of temporary stands



Photo 16 – The completed higher and lower wall panels installed on the north stud wall



followed by two coats of a water-based exterior-grade paint. This should give me several years of service and handle the anticipated effects of coolant, or other fluids, coming into contact with the walls. Using acrylic paints means that I can easily touch up the walls in the future if needed.

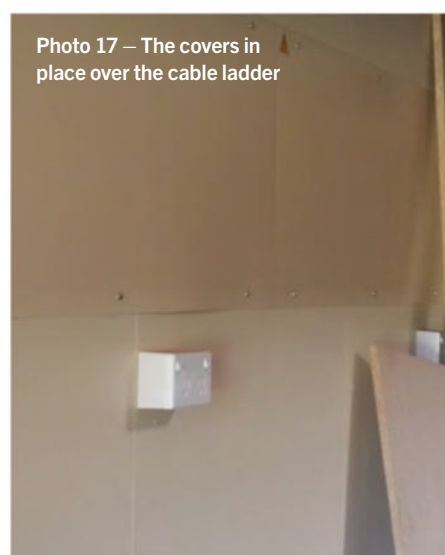
This light-cream paint was applied on the underside of the internal mezzanine flooring. The top is currently unpainted, but these sheets were installed wax side up to provide protection to the flooring with risk of them being slippery if painted. The light paint on the underside is to reflect light from the task

lighting fixtures that may be fitted to individual machines.

Cable ladder covers

The cable ladder in the walls is covered with cream Colorbond sheets. Each piece is 1m in length, and overlaps the exposed slot by 50mm on each side. Notches are then cut in this cover for any conduits exiting the ladder zone. The remaining cable conduits and layout are discussed in the next parts of the article. The cable ladder and its covers were designed to maintain a visually flat wall and provide adequate protection to the cables. That

Photo 17 – The covers in place over the cable ladder



the covers are magnetic, and located at eye level above the machines, is simply a coincidence, and the placement of magnets, holding drawings or sketches, is simply a reflection of this convenient happenstance (Photo 17).

Electrical overview

Lighting the shed was approached in a multi-pronged way. I wanted low-cost, effective lighting and to minimise wasted energy – with its related costs. This meant that task lighting was a priority, and base-level lighting was to be effective and inexpensive to buy/operate. Having a roof at least 4m up in the air meant that I wanted a way to maintain my lights without needing scaffold or tall ladders for bulb replacement or adjustments.

Lighting

The lighting was divided into three categories: ►

Photo 18 – The socket outlets for the task lights are controlled by the individual bay switches mounted near them



Photo 19 – Bay lights on hinged mount pole



Photo 20 – The low bay lights in the welding bay have a strip of sheet metal with a series of cut points similar to saw teeth to prevent birds roosting



1. Task lighting
2. Overall lighting
3. Specific lighting

1. Task lighting: The areas over workbenches, machines, and under the mezzanines were fitted with individually switched banks of task lights.

Each task light is a 1200mm fluoro light operating off a common switched supply. The fittings were purchased second hand online. The fluoro fittings allow future changeover to LED technology at a relatively manageable expense. Each fluoro fitting is held between the joists of the mezzanine by brackets made for this purpose, and the socket outlets for them are controlled by the individual bay switches mounted near them (Photo 18).

2. Overall lighting: The main workshop area is lit by low bay lights, which are suspended from brackets made from salvaged galvanised water pipe.

These brackets are then bolted to the mezzanine droppers so that they are accessible from the mezzanine deck. Each bracket has a hinge so that the arm of the bracket swings between the position over the floor and the service position over the mezzanine deck. The lighting fixture on the bracket is some low-cost halogen flood lights (Photo 19).

The bay lights in the main workshop are switched individually, whereas the two located in the welding bay are controlled as a pair. As the (included)

halogen bulbs fail, they will be replaced with LED equivalents.

The low bay light brackets located in the welding bay have a number of pieces of sheet metal attached to prevent birds roosting on the brackets – the arms have a length of fishing line strung between two small brackets to keep the taut line

This arrangement allows me to see if the light has been left on in those areas and switch it off remotely

about 12mm above the main arm, and a strip of sheet metal with a series of cut points similar to saw teeth is located above the light itself (Photo 20).

The lighting brackets for the bay lighting also contain an additional arm extension on two of the sets (visible in Photo 19). This extension allows a smoke alarm to be positioned just short of the ridge of the shed. One alarm is photoelectric, the other is ionising. The alarms can be reset by swinging the lighting bracket over the mezzanine

deck. Each alarm is cabled for alarm relay – ensuring that it is heard, and relaying to the security system. The lights are connected to the fixed wiring of the shed by means of socket bases that are controlled by switches at ground level. The socket bases are used throughout the lighting set-up – with one exception – which makes change-out and maintenance of the lights safe and simple. The exception to the use of socket bases is in the welding bay task lighting, where hard-wired weatherproof fittings are used to maintain integrity against any rain blowing in.

3. Specific lighting: This includes the lighting for the office, storage room, mezzanines, and tank storage shed. In all cases except the office and mezzanine, the lighting is simply a fluoro fixture mounted in a bracket affixed to the roof surface. The light is controlled from a switch at the entry point of the area, and the number of lights is designed to comply with standards for storage and non-detail work. As with the previously mentioned task lighting, the fluoro fittings permit the future change-out to LED technology at a manageable cost.

The office lighting is the same type of fluoro lighting fixtures, but more of them are installed to meet the lighting standard for detailed working. The lights are controlled in rows, with one row located over the workbench. The other row is more centrally located for general access.

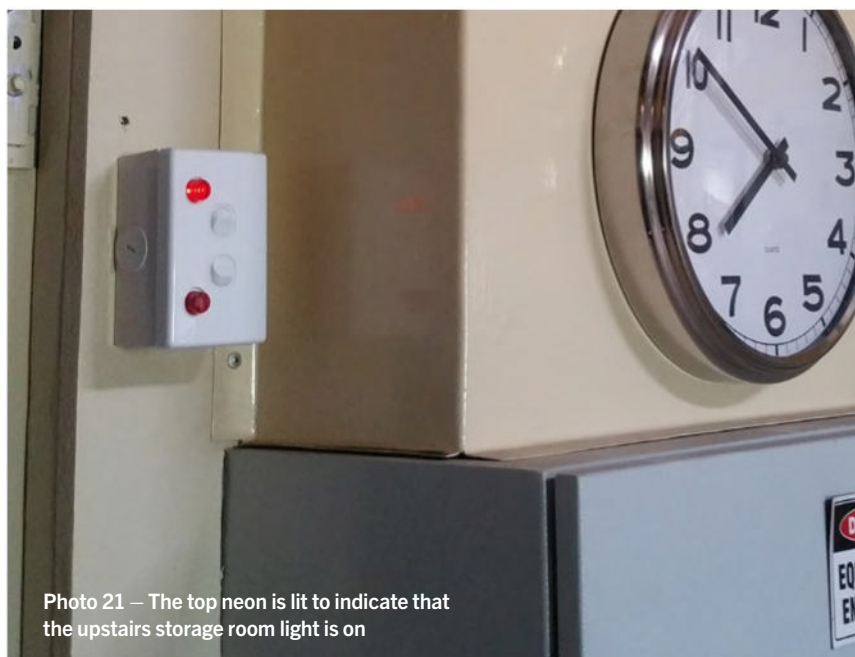


Photo 21 – The top neon is lit to indicate that the upstairs storage room light is on

This means that, at the end of a day, I can switch them all off by activating only two switches

Lighting circuits in the storage shed and upstairs storage room are wired for two-way switching, with an indication neon in the workshop. This arrangement allows me to see if the light has been left on in those areas and switch it off remotely (Photo 21).

A good tip

The lighting for the mezzanine level introduced an issue, and the solution may be of interest to others for future projects.

As seen in Sketch 1 of the upper level, a typical adult standing on the mezzanine level has only a few centimetres of clearance between the top of their head and the underside of the roof. The obvious mounting point for a light – the roof purlin – is too close to the head and would either cause injury from striking or discomfort due to walking stooped over all the time. The sketch shows that a single fluoro fitting would clash with a person's head, so an alternative lighting method needed to be found/designed.

Strip LED lighting was looked at, with the idea of attaching it directly to the roof purlin. However, the LEDs have only a 120-degree illumination angle. This means that the beam illuminating the shelving would stop approximately 400mm above the floor and not illuminate the floor of the mezzanine at all. If the LED was angled further from the roof purlin, the beam would cover the entire shelving unit and the floor of the mezzanine. The calculated angle

was determined to be 30 degrees at a minimum.

Light mounts

To implement this angled LED strip light, some lengths of 30x3mm mild-steel flat bar were cut to length, and some affixing tabs were welded on at a 45-degree angle. By using a piece of 30x30x3mm EA – tipped on the open face – as the jig, the tabs were all welded on at the same consistent angle.

Once the welding was complete, the welds were ground back to ensure a flat surface, and steel was primed and then painted with a light-coloured gloss enamel. This was done to ensure a smooth surface for the LED strips' adhesive backing to grip well and transfer heat into the steel mounting. LED strips dissipate around 5W per lineal metre, so some form of heat sink

is usually necessary to promote a long life of the LED strip.

The mezzanine floors in the main workshop represent 12 lengths of 1.8m, so each side needs to dissipate approx. 60W via the mounting strips. This same power rating is the minimum rating for the AC to 12V DC power supply that runs the light strip (Photo 22).

Master switches

All the task lights for the upper and lower mezzanines, plus the six low bay lights, are controlled via a set of master switches, as well as the individual switches for each light/section. This means that, at the end of a day, I can switch them all off by activating only two switches, instead of walking around the shed turning each one off individually. ►



Photo 22 – The mezzanine lights in use

A triangle was chosen to represent a 'point source' of light – the overhead low bay lights are point sources of light – and a rectangle was chosen to show that the light was presented as a strip – that is, fluoros or LED strips

All cables – lights and power – are concealed within conduit or within the covers of the walls via the lining or the ducting covers. This is in line with common industrial practice and conforms to the highest interpretation of the relevant electrical standards. The conduit not only adds protection to the cables but also marks their location, so holes can be drilled into walls without fear of striking a hidden cable.

Bay switches

As mentioned previously, the lighting circuits within the workshop area, including the welding bay, are controlled by two master switches. However, each bay also has its own switch.

Each low bay light has its own switch, and each mezzanine light has a two-way switching arrangement. This means that there are a number of switches located on the underside of the mezzanine floor for switching various lights. A labelling scheme was needed so that users would know which switch to operate.

A simple graphical system was devised and fabricated. The geometric

shape tells a person what kind of light it is, and the colour tells them where it is located.

Labelling and coding

A triangle was chosen to represent a 'point source' of light – the overhead low bay lights are point sources of light – and a rectangle was chosen to show that the light was presented as a strip – that is, fluoros or LED strips.

Pieces of salvaged thermo plastic were cut and heat bent to form the labels.

The colours chosen for the paint demonstrate the level location of the light source: blue is the colour of the sky, and therefore overhead, whereas green is the colour of the grass, and represents the ground floor (Photo 23).

The signs were spray painted and left to dry before being affixed to the same mezzanine beam that supports the light switches. One switch plate controls two light circuits; in that case, the colours and shapes were both shown in the same order as the switches in the plate – therefore maintaining accurate representation of the switch layout (Photo 24). ►

Below: Photo 23 – Overhead lights are represented by blue – the colour of the sky; ground floor lights are represented by green – the colour of grass



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Photo 24 – On the switch plate that controls two light circuits, the colours and shapes are shown in the same order as the switches in the plate



Electrically, this shed is patterned on a few industrial ideas – and some bitter experience

Power points and safety systems

Electrically, this shed is patterned on a few industrial ideas – and some bitter experience.

The shed was designed with ample electrical capacity – the cable that supplies the shed is capable of current exceeding 85A per phase. This was done so that I have an upgrade path in the future and fewer voltage dips on startup. The switchboard was designed with plenty of spare capacity – several spare pole positions for additional circuits – and easy for an electrician to work in (Photo 25).

The number of circuits – with separate residual current device (RCD) / breakers – is higher than that of most sheds. This was done to prevent a fault in one part of the shed dropping power to everything. The main workshop has six circuits supplying the general purpose outlet (GPO) – aka power points and power outlets – and these GPOs are separated from the circuits for the three-phase and welding outlets. Lighting is split for the same reasons – this prevents a fault in one fitting taking out all lighting in the entire shed, and that is the intent of the electrical standard I'm complying with.

Emergency stops

A safety feature that I borrowed from my old high-school manual arts dept was the use of emergency stops (e-stops), also known as 'lock-off stops' (LOSSs).

There are a number of e-stop boxes dotted around the shed; they interlock with a contactor in the switchboard. In

the 'healthy state', the e-stop shows a green neon light in the top right corner (Photo 26).

The contactor controls power to one half of the board, which includes three-phase and welding outlets, and GPOs in the workshop. This means that I can be standing at the door of the shed, see something going wrong at the other side of the shed, and interrupt power to every machine in the workshop. The same safety circuit doubles as a no volt release (NVR) for the same circuits. This means that if the power from the street drops, the machines cannot restart automatically when the power is restored. Given that I sometimes have learners in my shed, this feature is for their safety and my peace of mind.

The reset for this e-stop/contactor circuit is key controlled, making the circuit an effective safety feature. I am able to lock it out when I am not around by simply removing the key and tapping one of the e-stops as I walk out of the shed.



Photo 25 – The completed switchboard, with the full set of breakers in place



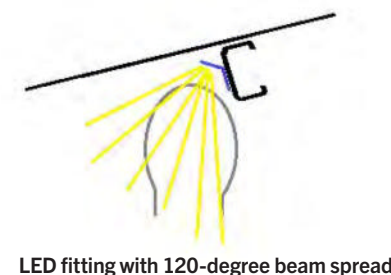
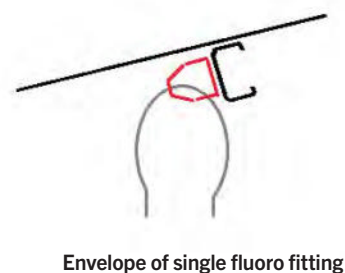
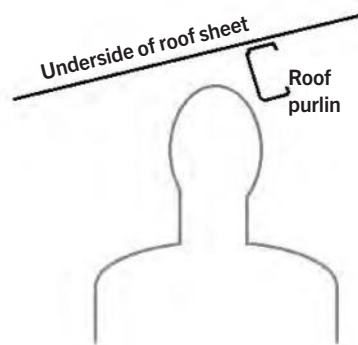
Photo 26 – The e-stop is in the 'healthy state', as evidenced by the lit green neon in the top right-hand corner



Photo 27 – The e-stop is in the 'tripped' state and needs to be reset before the contactor can be reclosed and power restored to the GPO circuits

This means that I can be standing at the door of the shed, see something going wrong at the other side of the shed, and interrupt power to every machine in the workshop

Sketch 1 – High mezzanine lighting



Safety plus

Each e-stop has two neon indicators on it. Green shows that the switch is healthy, and red indicates that it has been activated. The e-stops are wired in a sequence, and, if the contactor does not pull in, it is simply a case of looking around the shed in the correct direction to see where the tripped e-stop – or the damaged cable – is located.

All e-stops are labelled and require a positive twist action to be reset. An e-stop in the 'tripped' state would need

to be reset before the contactor could be reclosed and power restored to the GPO circuits (Photo 27).

My three-phase set-up

There are three outlets for three-phase power in the shed – they are positioned along the metalworking side, and I expect to use them for the milling machine and lathe and have one spare outlet. The position of the outlets permitted the construction of a 15m three-phase extension lead that could

reach any part of the shed footprint, including the welding bay. The three-phase power means that I can use industry surplus machines – often cheaper than single-phase machines – and the lead means that I can rent a machine and use it in the welding bay if necessary. This permits the rental of three-phase equipment to be used for one-off specialised work.

The three-phase outlets are RCD protected and individually protected for overload. ►

Sketch 2 – Electrical ladder and cable duct

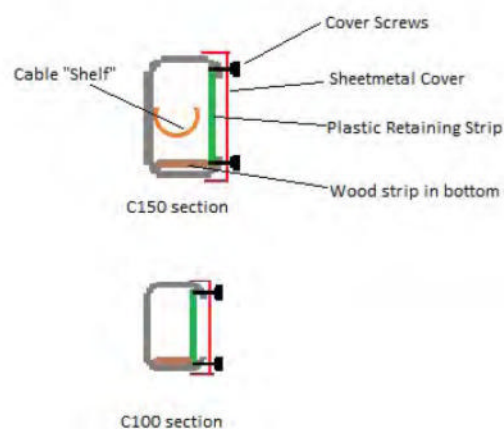
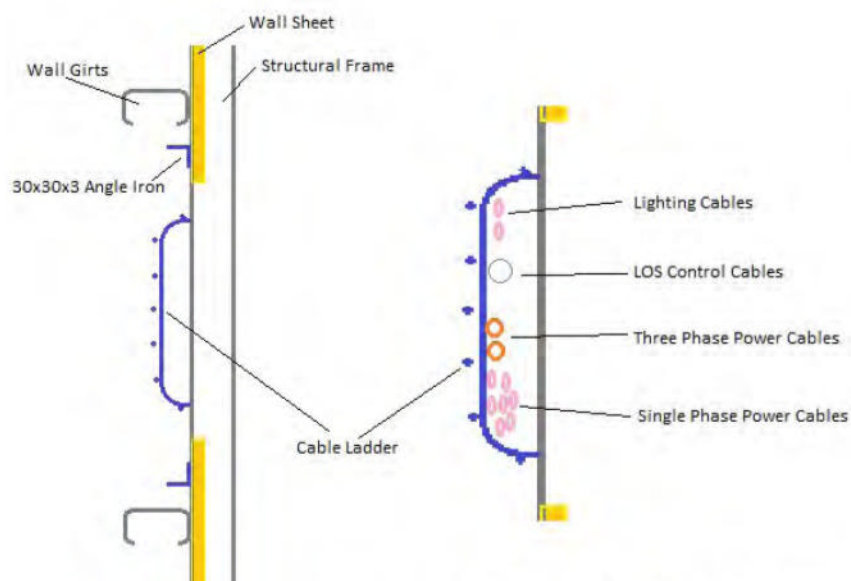




Photo 28 – Cables installed in cable ladder

**I've never
heard
someone
complain
about too
many places
to plug in**

Single-phase outlets

The single-phase GPOs are spaced around the shed at a regular interval and spread across the circuits. The GPOs are all double points and will be used for machines, accessories, and whatever else is needed. There are some single-phase 15A GPOs fitted; each has its own breaker, in accordance with the applicable electrical standard, and is positioned for use in supplying plasma cutters, welders, and other future machines, rental or otherwise.

Other GPOs are provided in the office area – concentrated in the office wall – above and below the bench, with other sockets spaced around the office to support communications equipment, etc. A single 15A GPO and circuit was installed in the office for a possible future air conditioner should it prove necessary.

Mezzanine GPOs

Each mezzanine level has a small number of GPOs fitted, mostly for driving an electric winch used for lifting things to that level, plus for anything else that may need power up there. This means that I don't have to have an extension lead draped over handrails or through doorways.

This may seem like an excessive number of GPOs, but I've never heard someone complain about too many places to plug in, and the cost of installation during construction is considerably cheaper than a later addition or extension to existing circuits.

Cable ladder

Given the amount of cabling in the design, I chose to place cable ladders in the long walls of the shed to form electrical trunkways.

The equi-potential bond system is part of the electrical safety of the shed



The ladders were made up by cutting some 50x50x4mm galvanised mesh into strips and bending the edges of the strip to add some stiffness to it (Photo 28).

I accomplished the bends by clamping the mesh between two large landscaping planks and bending the edges through with a hammer. The finished strips were then welded together to form the required lengths and attachment brackets folded up from pieces of galvanised sheet. A story stick was used to position a ladder – and conduit cover anchor strips – to the frame of the shed before cladding was commenced (Photo 29).

Conduits

The cables are routed from the switchboard to the ladders through cable conduits made from roll-form purlins (C-form) screwed to the wall. The conduit is completed by means of

a folded metal cover that screws to the conduit to enclose the trunk. Cables are simply laid inside the trunking, retained by the periodic placement of strips of plastic to stop them falling out if the cover is removed.

This style of trunking is very strong, and quite versatile – it is explained in Sketch 2. The cost involved was less than running a series of plastic conduits or metal tubes (Photo 30).

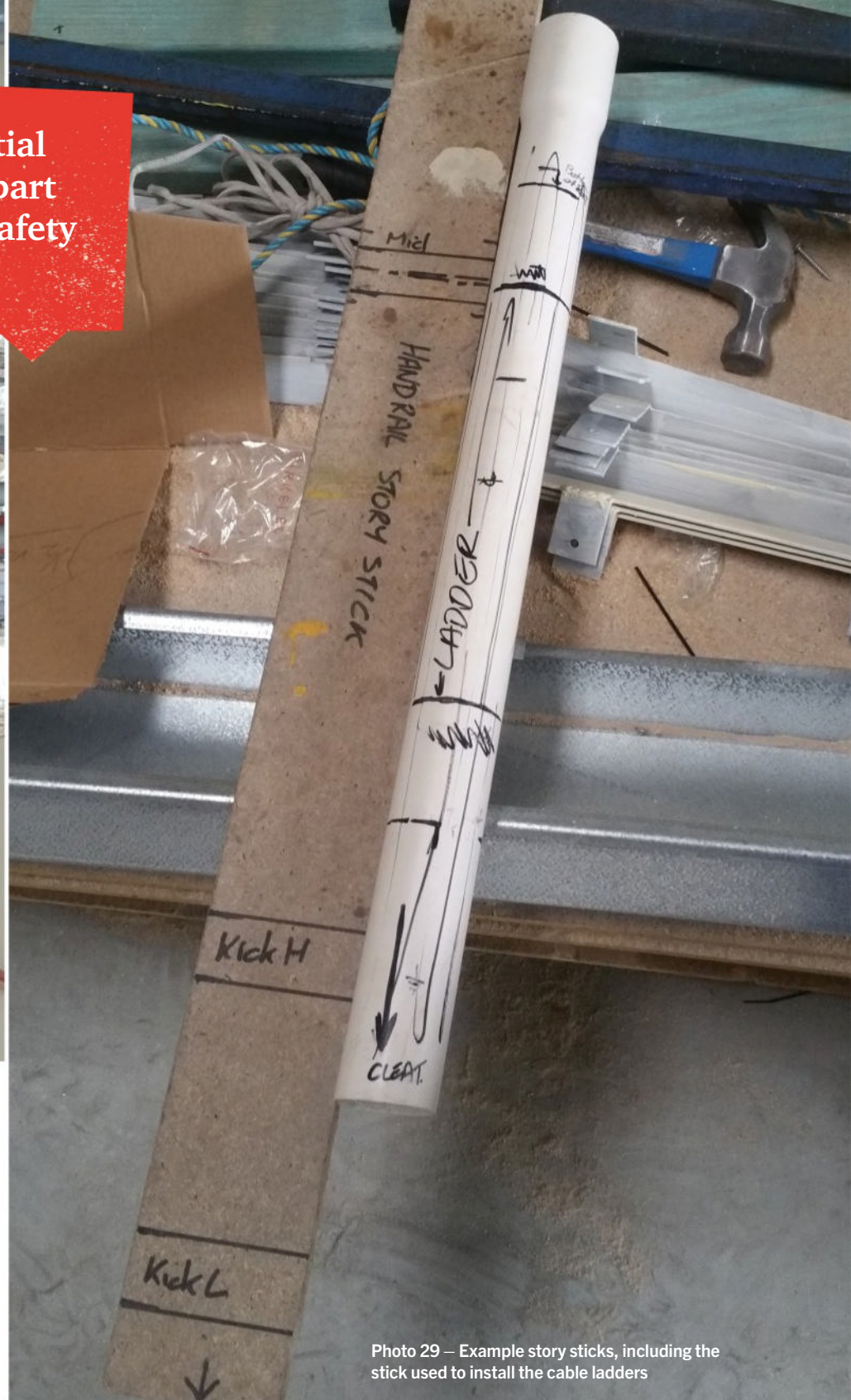


Photo 29 – Example story sticks, including the stick used to install the cable ladders

To increase cooling of the cables – and reduce derating effects – some spacers were made and fitted inside the cable conduit to stop all of the cables simply lying in the floor of the ducting.

All cable ducting and ladders are connected as part of the electrical equi-potential bond system. This connection is done via cable clamps on the ladder, and screw/lug connections on the ducting and main structure of the ►



Photo 30 – The C150 trunk, explained in Sketch 2

shed. The equi-potential bond system is part of the electrical safety of the shed, guaranteeing a low resistance path for any faults so that they are detected and the RCDs operate. This equi-potential system was tested to the earthing standard as part of the commissioning of the shed. A high resistance here can be as dangerous as a high resistance in the earthing circuit.

Communication feeds

The shed will be used for a lot of different types of work – metalwork, woodwork, electronics, etc. This means that access to information is

also needed. A pair of communications conduits was installed as part of the construction to permit the use of data, telephone, and other systems. The conduits were laid with ‘sweep bends’ deliberately, so that optical fibre could be used as a connectivity means. Pre-terminated optical fibre is relatively inexpensive from a number of sources and provides a degree of immunity to the electrical interference that long electrical cables are susceptible to.

Several sets of copper (Cat 5e) cables can also be used for data, phone, and alarm cabling. The installation of an intercom is still to be determined as

and if required, but the cables will support it if needed. Once data are available within the shed via copper or fibre, a reconfigured surplus ADSL router can be easily used to provide Wi-Fi, VoIP, or cabled connections for most devices.

The way to use a surplus ADSL modem to do this is called ‘bridging’, and it allows you to basically extend network from the main router/modem, to another location via wireless, or a cabled, connection. The same bridging can also be used to add additional VoIP connection points if desired.

Office comms

The office is cabled for internet and home network access so data can be accessed from other home computers and the internet, and can access the house printer. Over time, I see an increasing need for connectivity in the shed, as much for accessing and sharing information as for the type of things we build or use there. An obvious example is to design an object on a computer in the house and store the completed design files on a shared network drive. The computer in the shed can be used to retrieve the design files from that network drive and then output the file to a 3D printer or CNC machine located in the shed.

As with all aspects of this shed, it has been relatively easy to add extra conduit or capacity during construction, rather than face the future cost and disruption of adding it later. 📁

Part three will end the construction of the shed with internal furnishings (benches, etc.) being designed and built, and an unusual toolbox.





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MACROCARPA MAKEOVER

It's not easy to find a bench seat that's comfortable, supportive, and tip-proof – but this just might be it

*By Mark Beckett
Photographs: Mark Beckett*

Readers may recall that, back in late 2020, I was asked to help clear a few trees that had been felled next door. These were 80-year-old macrocarpa trees destined for firewood. However, several were far too good for firewood and we struck a deal to have them milled.

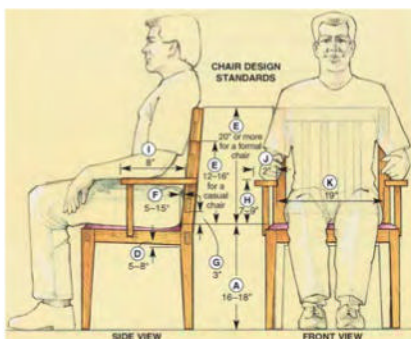
After the limbs were removed, the trunks were taken to a local mill and cut

for flitches. One was longer and larger, so that was tagged for 70mm flitches, which would suit tables, and the other was cut at 50mm for bench seats. These were stacked with clean, untreated spacers and covered to dry out while the table was sorted – see *The Shed*, Issue No. 92, September–October 2020.

Eventually, the time came to make a couple of bench seats to go with the table.



Table build from *The Shed*, Issue No. 92



Dimensions

After sorting through the pile, we settled on a length of 2.2m

The right design

I had sat on a few bench seats, and they hadn't impressed me. Most had flat bases and the angle of the back was wrong, which made them uncomfortable, so the hunt was on for the right design. The following website provided the information – albeit in inches – that formed the start point for our design: woodmagazine.com/must-have-measurements-for-comfortable-seating.

We had limited control over the width of the slabs, but we could use the widest for the base and others for the rear. This also gave some shape to what might otherwise be a couple of planks bolted together. After sorting through the pile, we settled on a length of 2.2m. This meant two seats with a decent gap between would fill one side of the 5.3m table.

The base and rear were quite weighty, so, with tipping in mind, I cut a spare 70mm slab for the support legs. We

didn't have a lot of choice of width (depth), but a little set-back meant you didn't catch your leg. Tipping backwards would now require a concerted effort by most if not all the occupants.

Prepping the surfaces

To stop water ingress and wear on the legs, a piece of plastic chopping board was cut with a hole saw and countersunk for a single stainless fixing screw. This method also allows for adjustment, as one base twisted very slightly while it was in the garage drying out.

The surface from the milling was very good; a mere hour with the belt sander made it good enough. The bark was removed and the surface cleaned up using a 100mm abrasive nylon wheel brush in the drill. This cleaned off any remnants of bark along with the wood-worm debris but left the wood surface intact. A smaller hand sander removed the sharp edges. ►



Legs with plastic guides fitted



Finished seat

Labelling is a good idea

The base angle is leant back 6 degrees from horizontal, while the rear is 103 degrees relative to the base. This fits within the guideline of 5–8 degrees for the base and 5–15 from vertical for the rear. When you're assembling the parts, it does help to add a label for the front – I did wonder why it looked strange when I swapped the legs one day! In my defence, the seat parts were upside down and rotated 180 degrees.

I initially used a 50mm flat strap to join the base and rear, but even with three supports, it was too springy and encouraged leaning backwards. Support version 2.0 uses a 25mm square box and joins the legs to the base at either end.

The welding table was invaluable in ensuring that it stayed square while it was welded and the additional 50mm

flat pieces added. Two pieces of 50mm flat were welded to form a right-angle bracket and fitted to the other side of the support leg. This approach eliminated any screw fixing from the top, which would have collected water and detracted from the clean look.

Fitting support brackets

The metal is cold-galvanised steel from a local supplier. The whole lot was assembled, pre-drilled, and trial fitted. A combination of 25mm wood screws and 45mm stainless screws through the box section fixes the supports to the base/rear/legs.

The metalwork was cleaned and a drain hole drilled before two coats of Autohaus gloss black paint from a large red retailer were applied. I was told about this by someone who makes metal

But even with three supports it was too springy and encouraged leaning backwards



Fitches: 50mm on the left, 75mm on the right



Checking for square





One load at a time, due to the weight

signs and said it was the best product he'd found for coverage and wear and tear while he transported and displayed his signs.

I searched the internet for the best method to seal and protect outdoor furniture. Oils generally need recoating after 12 months, and I wanted to avoid that. For the first seat, I tried an epoxy sealer followed by three coats of marine varnish. That worked but, as the wood dried and cracked, you could see the moisture getting under the surface and

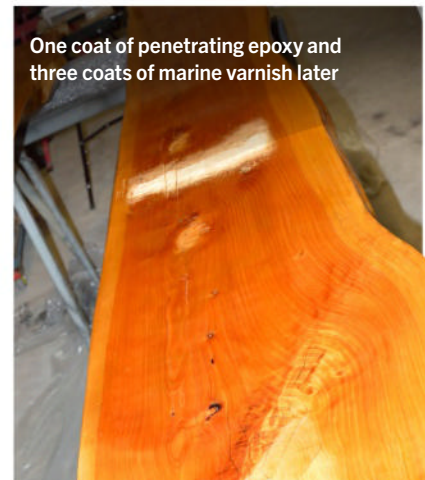
greying it. This led to more searching, and I came across the following video, which used a penetrating epoxy before multiple coats of marine varnish: youtube.com/watch?v=y11tQVG4ibc.

Locally sourced products

Unfortunately, we cannot source the products used in the video, so my research led me to Norski penetrating epoxy and Cabot's marine grade varnish. The Norski epoxy may have an amber hue, which improves the colour. I used ►



Nova Viking electronic auto-start drill is great, allowing one hand to hold the work while the other winds it down

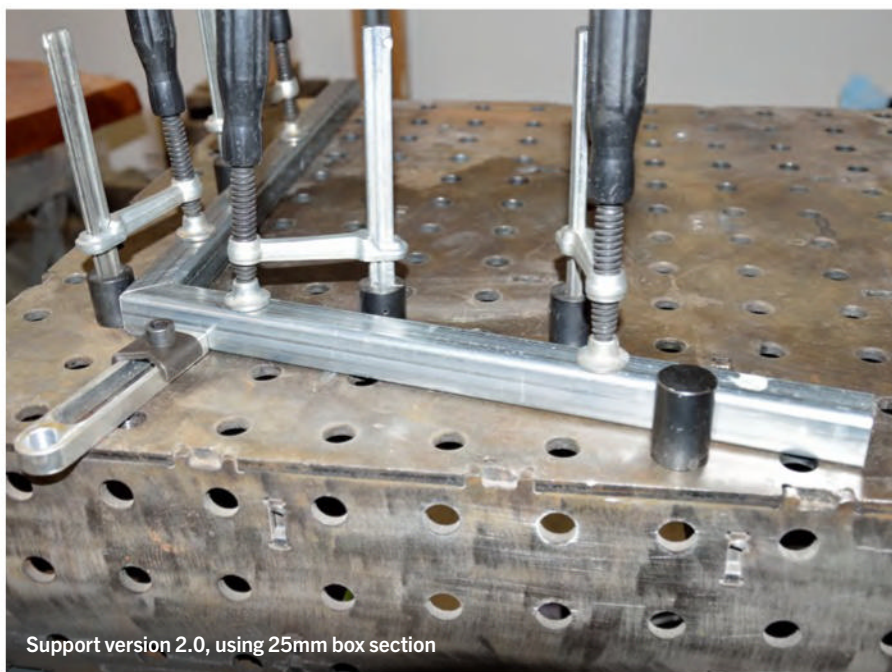


One coat of penetrating epoxy and three coats of marine varnish later

I was told about this by someone who makes metal signs and said it was the best product he'd found for coverage and wear and tear

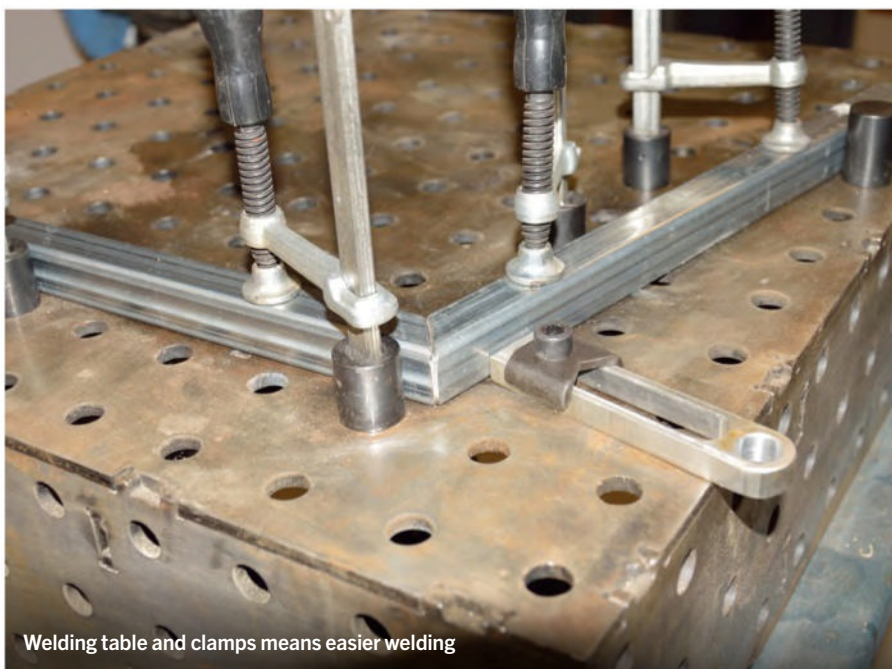


Pre-drilling the fixing holes



Support version 2.0, using 25mm box section

But even with three supports it was too springy and encouraged leaning backwards



Welding table and clamps means easier welding

a 100mm roller and made sure plenty of the product went into the cracks. Two coats of sealer were sufficient to ensure that I had penetrated the surface. After several days, both parts were turned over and any excess that came through the cracks was removed before the second side was coated.

The intention of the sealer was not to provide a high-gloss surface but to make sure the wood was sealed. Any small inclusions were sanded, and the first of three coats of marine varnish was applied. A quick sand to remove any inclusions between coats helped ensure a highly glossy surface that was ready for the birds to drop their deposits on.

Nice finish

Reassembly was interesting, as it was important not to damage the surfaces and the metal is not kind to any finish. A bit of tape and swearing helped ... slightly. Transporting the final item to the patio was also an exercise – the trailer might have been a better option.

The photos do not do justice to the finish, which is high gloss and hopefully will provide protection for many years to come.

Looking at the finished product, it's satisfying that the concept worked out as I envisaged it; the style suits the table. Hopefully, the weather will eventually settle so we can use it more often. 📷



String line to ensure all three supports are in line



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Detail of the movement of the hammer along the trajectory. For better reactivity while playing, the hammers are positioned near the tongues, reducing as much as possible the time needed to hit the surface of the tongue drum to make sounds

A STEEL DRUM

In part six of Tales for Makers, our expert uses 21st-century technology to create a historic musical instrument

By Enrico Miglino
Photographs: Enrico Miglino

In the Tales for Makers chronicles, a legend tells that Ray encountered a strange building for worship during one of his adventures – not a temple but something undoubtedly connected to the spirituality of the world he was exploring.

It was a majestic metal structure, as high as a five-storey house and as wide as a football field, and was positioned

in the centre of a valley, surrounded by 11 – Ray was sure it was 11 – granitic columns.

During the celebration of important events, the valley filled with people, like fans at a rock concert. A monk stood firmly on top of every column, holding in their hands a long-handled hammer – following a perfect ceremonial synchronicity, they were able to create

incredible melodies, each hitting their hammer at different points on the monumental structure.

Regardless of their profound meaning, I imagined how spectacular these celebrations would be to experience. It's not difficult to imagine how the audience would have been moved. That is the reason I decided to build a real-world hammer bell.

The tongue drum produces a bell-like sound when a hammer hits one of the tongues

Drafting the concept

In the real world, of course, smaller examples of the hammer bells have a name: steel pan drums. There are many sizes and models, so the dimensions of this project are tailored to the shape of the steel pan I bought on Amazon – you can search for ‘steel pan drum’ and find several options.

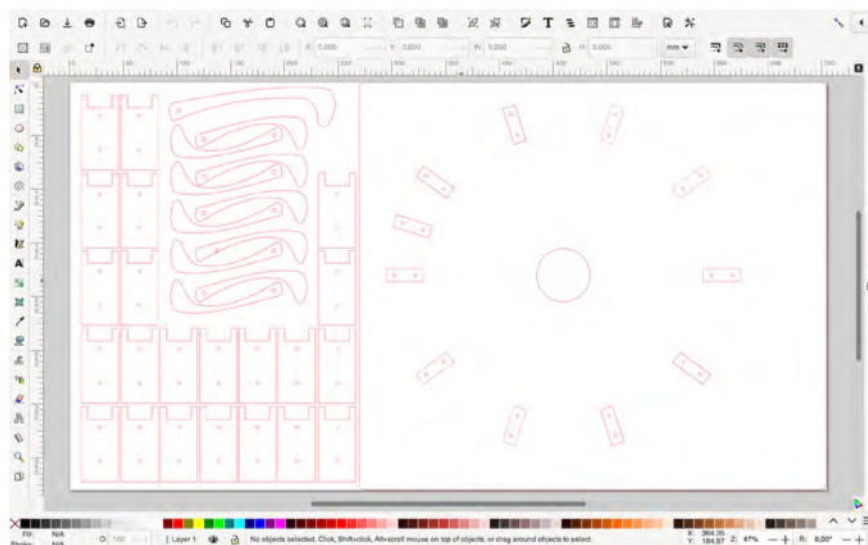
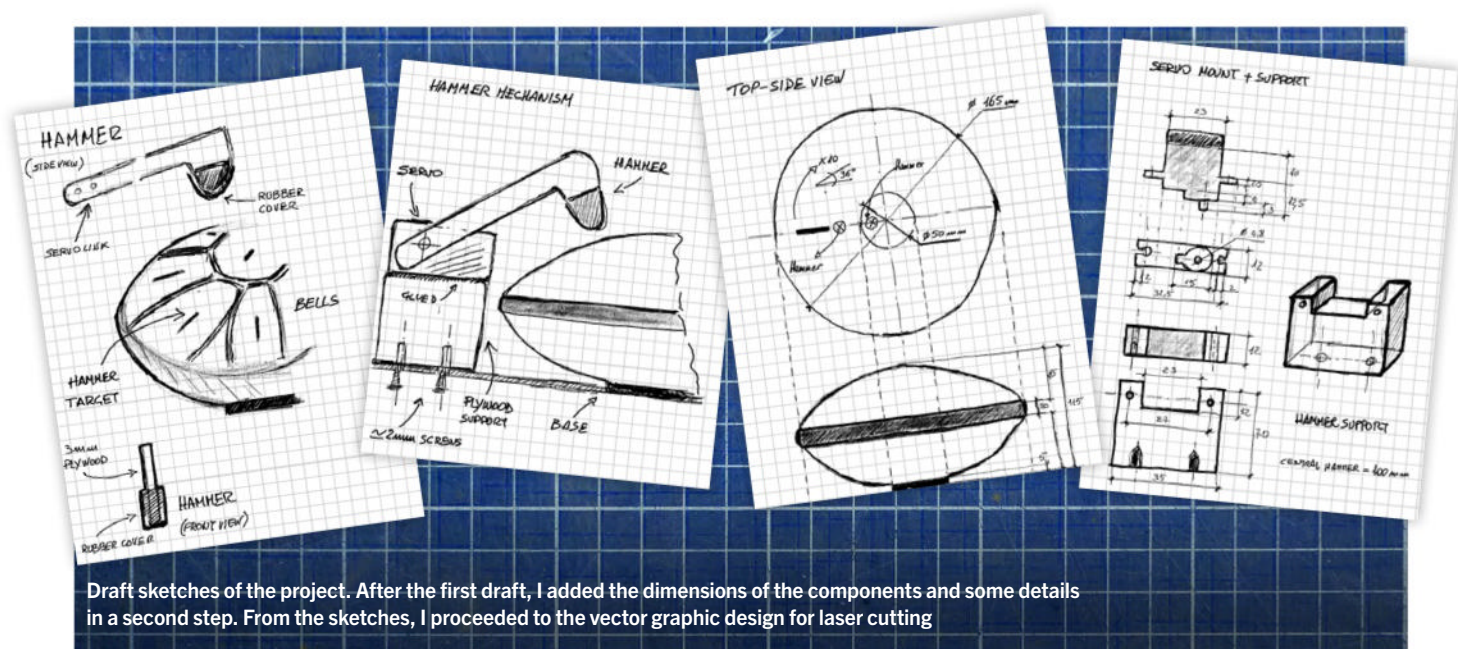
There are two main categories of this percussion instrument: the steel pan drum that reminds one of a pan, and the steel tongue drum – similar but with tongues carved on the top half of the instrument. The tongue drum produces a bell-like sound when a hammer hits one of the tongues, each one producing a different sound. For this project, I opted for this second type.

My 11-note bell

My model – a cheap one bought on Amazon – has 11 notes tuned in C major. To make the bell sound, I thought to use a specially designed hammer actuated by a servo for every note. The cheapest way to manage many small servo motors is to use an Arduino Mega 2560 that can drive up to 48 devices.

Before developing the design, I experimented with several materials for the hammers: plywood, MDF, wood, and acrylic. The best sound was obtained with 4mm thick acrylic hammers.

Another essential requisite was the possibility of making all the components with laser cutting only; the final choice was plywood for the base and transparent acrylic for all the other



The Inkscape vector drawing of the pieces to laser cut. From this vectorial image, two files have been exported in SVG format. On the right side, the base rectangle with the rectangular holes for the supports and the centre hole to host the steel tongue drum; this piece was cut with 4mm thick plywood. On the left side, the hammers and the support components were cut from 4mm thick transparent acrylic



A CO₂ laser cutter was used to make the components. This has a more powerful laser, works faster, and can cut thicker materials. CO₂ laser technology also has the advantage being able to cut a more comprehensive range of materials; in particular, it is possible to cut most of the coloured acrylic that is not reactive to the desk laser cutters, using LED laser emitters.

The laser is controlled by software that can use the SVG designs as described in this article

parts. This also made the design easy; I used Inkscape and exported the laser-cut design in SVG format – Inkscape is a popular Open Source multi-platform application available on the Internet at <https://inkscape.org/>.

The design

The squared plywood base of the structure has been designed to include the Arduino Mega 2560 and a small printed circuit board (PCB) circuit to host the wiring of the servos' connectors. To make the servo supports, I used a 4mm thick laser-cut piece of acrylic. I

designed 11 supports to host the servo on top, built of three identical profiles screwed together.

The distribution of the tongues on the curved top surface of the steel tongue drum made it easy to place the supports, as it followed a regular 10-sided polygon. The 11th-note tongue is on the top centre of the instrument, so extra support with a longer hammer was necessary, fitted between the other two servos.

From the single SVG design file, a couple of laser-cut operations – one for the plywood and one for the acrylic – were adequate to obtain all the parts.

The progressive assembly

I consider myself lucky because the design of the components did not require any modifications on the first attempt.

However, it was impossible to follow a linear approach; the first step was to assemble the 11 supports joining the three laser-cut profiles with two 3mm screws. I then glued every support in its right position, a rectangular hole cut in the plywood base.

The second step was to test the servos to make sure they worked before gluing them on top of the support, temporarily fixing them with adhesive tape. I used one of the example programs provided with the Arduino Servo library to test every servo. After this test, I wired the servos and designed a small PCB to collect the 11 connectors, associating every note to the correct position from 1 to 11.

With the wiring in place, I ran another test before permanently fixing the servos to ensure all worked as it should.

Special care was required for the assembly of the hammers connected to the servo shafts. Depending on many factors, when the servo motors are powered, the initial position is not the start or end of the motion range but a random position. First, I glued the servo's support to the hammers. Then, powering one by one, I connected every hammer to the servo shaft in a position that the partial rotation was sufficient to hit the steel tongue drum and open to the opposite position without forcing the instrument.

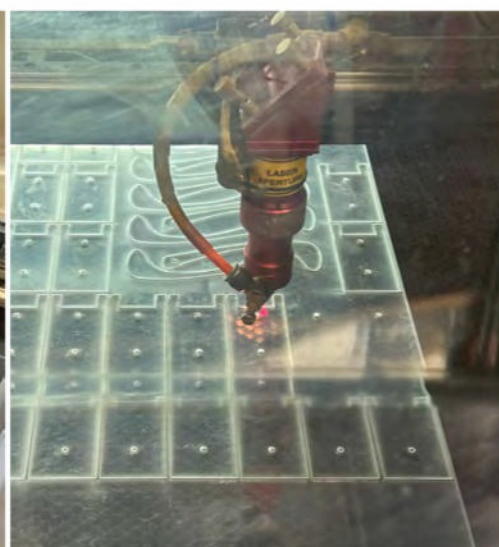
Due to the necessity of adopting this method, I had to calibrate the software for every servo to make it work properly. Only at that point was it possible to permanently screw the hammer to the shaft and then glue every servo on top of its support.



The first part of the project: the plywood base with rectangular holes for the supports. One of the limitations of the small desktop laser cutters is the relatively reduced penetration capacity. Cutting 4mm thick material is insufficient for a powerful laser, but the cutting head should be able to move vertically. The laser head power should be regulated accurately, depending on the kind of material. If you use a high-power laser with plywood, for example, there is the risk that it will start burning instead of being cut



The second cut of the transparent acrylic sheet: the hammers and the parts of the supports for the servos



A last-minute update

Testing the behaviour of the servos on the finished structure with some experimental software, I figured out that I had missed one important detail. When powering the system, the servos position the hammers randomly.

I need to be able to set up the hammers in two specific positions: hammers closed at a couple of centimetres from the tongues to play notes, and hammers open entirely extended to the opposite side to make it possible to place and remove the steel tongue drum.

To solve this problem, I added a small switch to force the open/closed position. Therefore, when the software keeps the hammers in the open position, it will

not be possible to play any bell sounds.

After everything had been tested, the finished structure, including assembly, worked as I had planned, so I moved to the software development.

The Arduino software

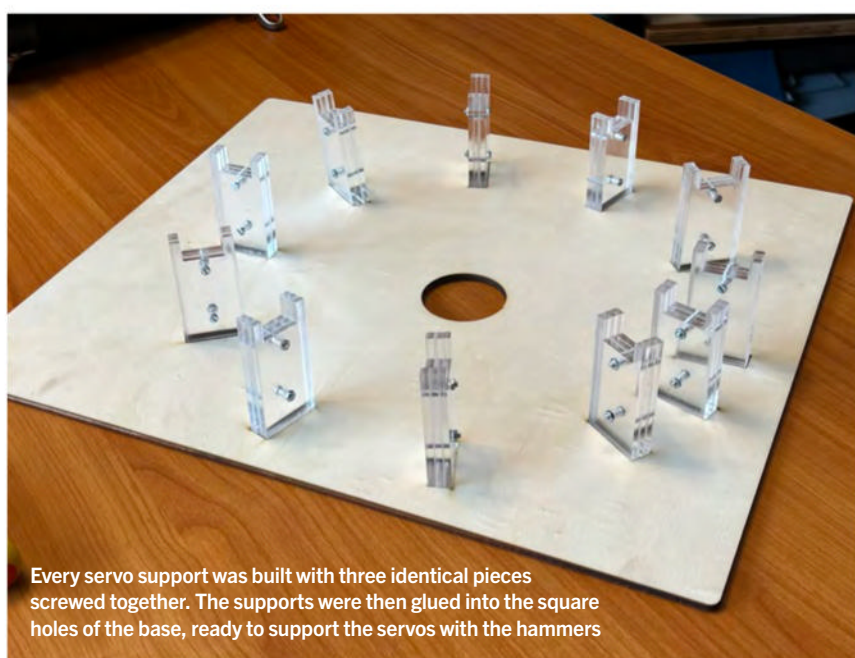
The current software version of this project includes all the functions to control the steel tongue drum to make sounds. The version can be easily upgraded to have sounds controlled from the USB to a serial connection or through a MIDI connection, as well as to run a hard-coded application.

To simplify controlling the 11 servos independently, I have added an initialisation function that preloads the configuration of the servos at boot-up. ►

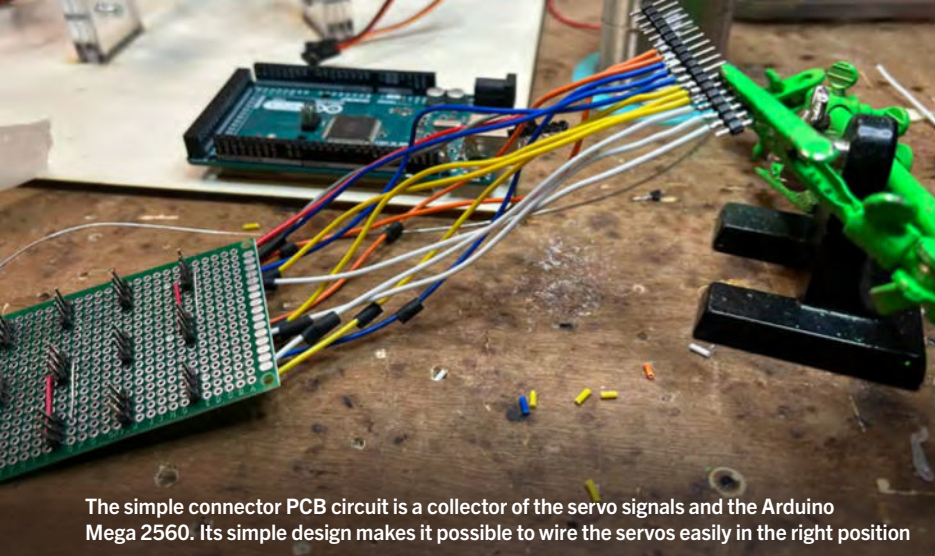
```
void initData() {
  notesData[0].servopin = SERVO_PIN1;
  notesData[1].servopin = SERVO_PIN2;
  notesData[2].servopin = SERVO_PIN3;
  notesData[3].servopin = SERVO_PIN4;
  notesData[4].servopin = SERVO_PIN5;
  notesData[5].servopin = SERVO_PIN6;
  notesData[6].servopin = SERVO_PIN7;
  notesData[7].servopin = SERVO_PIN8;
  notesData[8].servopin = SERVO_PIN9;
  notesData[9].servopin = SERVO_PIN10;
  notesData[10].servopin = SERVO_PIN11;
```

```
  notesData[0].servoPlayUp = SERVO_POS_1;
  notesData[1].servoPlayUp = SERVO_POS_2;
  notesData[2].servoPlayUp = SERVO_POS_3;
  notesData[3].servoPlayUp = SERVO_POS_4;
  notesData[4].servoPlayUp = SERVO_POS_5;
  notesData[5].servoPlayUp = SERVO_POS_6;
  notesData[6].servoPlayUp = SERVO_POS_7;
  notesData[7].servoPlayUp = SERVO_POS_8;
  notesData[8].servoPlayUp = SERVO_POS_9;
  notesData[9].servoPlayUp = SERVO_POS_10;
  notesData[10].servoPlayUp = SERVO_POS_11;
```

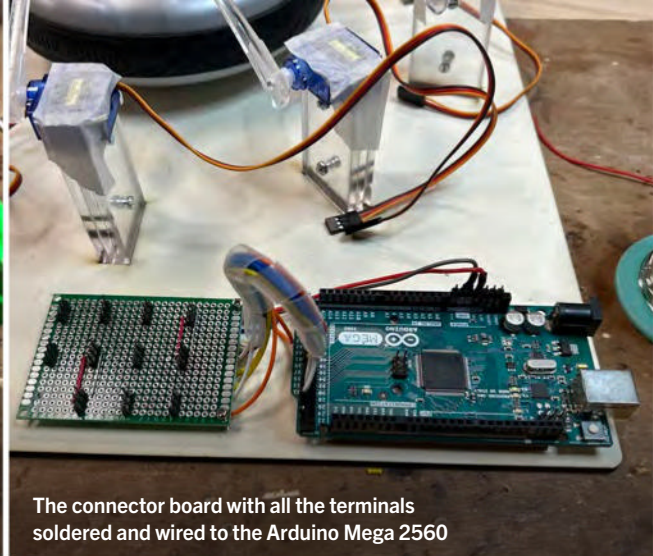
```
  notesData[0].servoPlayDown = SERVO_POS_PLAY1;
  notesData[1].servoPlayDown = SERVO_POS_PLAY2;
  notesData[2].servoPlayDown = SERVO_POS_PLAY3;
  notesData[3].servoPlayDown = SERVO_POS_PLAY4;
  notesData[4].servoPlayDown = SERVO_POS_PLAY5;
  notesData[5].servoPlayDown = SERVO_POS_PLAY6;
  notesData[6].servoPlayDown = SERVO_POS_PLAY7;
  notesData[7].servoPlayDown = SERVO_POS_PLAY8;
  notesData[8].servoPlayDown = SERVO_POS_PLAY9;
  notesData[9].servoPlayDown = SERVO_POS_PLAY10;
  notesData[10].servoPlayDown = SERVO_POS_PLAY11;
}
```



Every servo support was built with three identical pieces screwed together. The supports were then glued into the square holes of the base, ready to support the servos with the hammers



The simple connector PCB circuit is a collector of the servo signals and the Arduino Mega 2560. Its simple design makes it possible to wire the servos easily in the right position



The connector board with all the terminals soldered and wired to the Arduino Mega 2560

The function fills the structure, where the position in degrees for the different hammer positions is defined for every servo: SERVO_POS_ positions the hammer near the tongue; SERVO_POS_PLAY hits the tongue.

The Arduino Mega 2560 pin assignment for every servo is also defined.

For better code readability, the application constants are defined in the defaultnotes.h header file, and the data structure is defined in the tipenotes.h header file.

The position keeping the hammers open is not defined, as it corresponds to zero degrees.

```
typedef struct servonote {
    // Servo hammer pin
    int servopin;

    // Servo hammer position to play
    int servoPlayUp;

    // Servo hammer position increment while playing
    int servoPlayDown;

} noteParams;
```

The initData() initialisation function should be called once as the first function in the setup(). It is used – also in the Arduino setup() – to connect the 11 servos to the library with the function attachServos().

```
void attachServos() {
    int j;

    for(j = 0; j < BELL_NOTES; j++) {
        notesServo[j].attach(notesData[j].servopin);
        delay(SERVO_ATTACH_DELAY);
    }
}
```

The Software Logic

The whole software logic is defined in the loop() main function.

```
bool hammersStatus = false;
bool lastStatus = false;
```

The two global variables that control the system's status, according to the

position of the switch, are hammerStatus and lastStatus. As shown following, only if the switch is set in the On position is the hammerStatus variable TRUE and the notes played. If the status is FALSE, the notes are not played, and the hammers are in the open position.

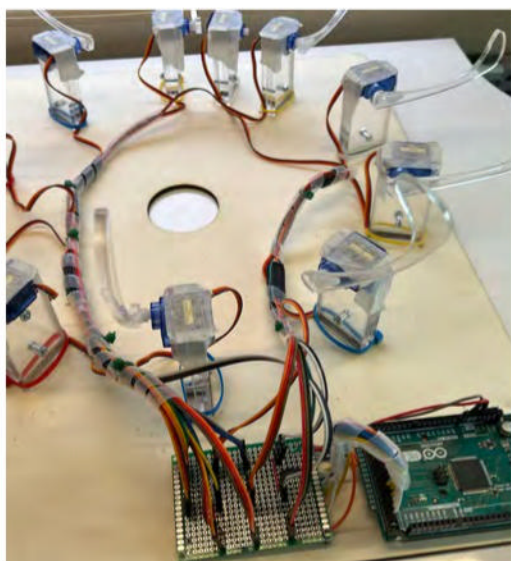
Keep an eye on our website, the-shed.nz, for a video of the completed and working steel pan drum.

References

The software and the laser-cut file are available under licence GNU GPL on GitHub at <https://github.com/aliceimirror/HammerBell>.

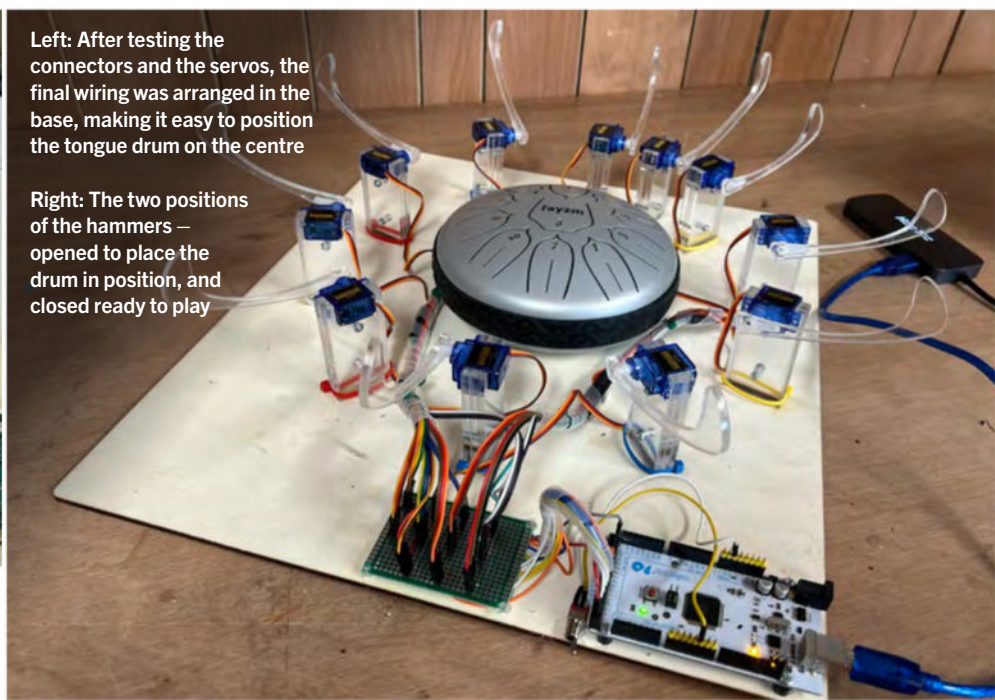
This project has been developed in the Ingegno Maker Space/ De Creatieve STEM, Drongen, Belgium ([instagram.com/ingegnocreatieve/](https://www.instagram.com/ingegnocreatieve/); [facebook.com/IngegnoMakerSpacedecreatievestem.be/](https://www.facebook.com/IngegnoMakerSpacedecreatievestem.be/)).

Special thanks to Lennard Ameys for his invaluable help and suggestions.



Left: After testing the connectors and the servos, the final wiring was arranged in the base, making it easy to position the tongue drum on the centre

Right: The two positions of the hammers – opened to place the drum in position, and closed ready to play



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GARDEN PARTIES AND OTHER THINGS ...

“I went to a garden party ... They all knew my name” (Rick Nelson)

By Murray Grimwood

Photographs: Murray Tounson, Murray Grimwood

In two weeks, I've attended three gatherings – not that I had to leave home for the second one. They've made me think deep, long, and hard about community, friends, support, life, and priorities. So I told her I was moving out to the shed – just kidding!

The first 'garden party' was a 50 years of hang-gliding reunion, limited to those of us who partook in the first decade: 1973–'83. Talk about a bunch

of old renegades ageing disgracefully. Interestingly, several of us were still sporting long hair; yet these days I can walk the length of Dunedin's main thoroughfare and be the only one. What was it about that echelon of people? We congregated on a lifestyle block near Rangiora – a sea of remembered and part-remembered faces; stories being told and retold; those no longer with us remembered.

The first
'garden party'
was a 50 years
of hang-gliding
reunion

Still doin' it

The fellow who got the prize for oldest person present was 80. He still regularly flies his microlight, but chose to fly up from Southland with a 72-year-old mate in a four-seater. He explained – straight-faced – that when he arrived from Ireland in the mid '70s, he perhaps lacked a moral compass. Then he encountered the Otago Free Fliers – OFF, which should give you a hint as to their style – and thought, “Here are a bunch of responsible people; if I join them, I might become responsible too.” The room erupted in laughter, long and hard – and I went back in my mind to visions of ... well, never mind.

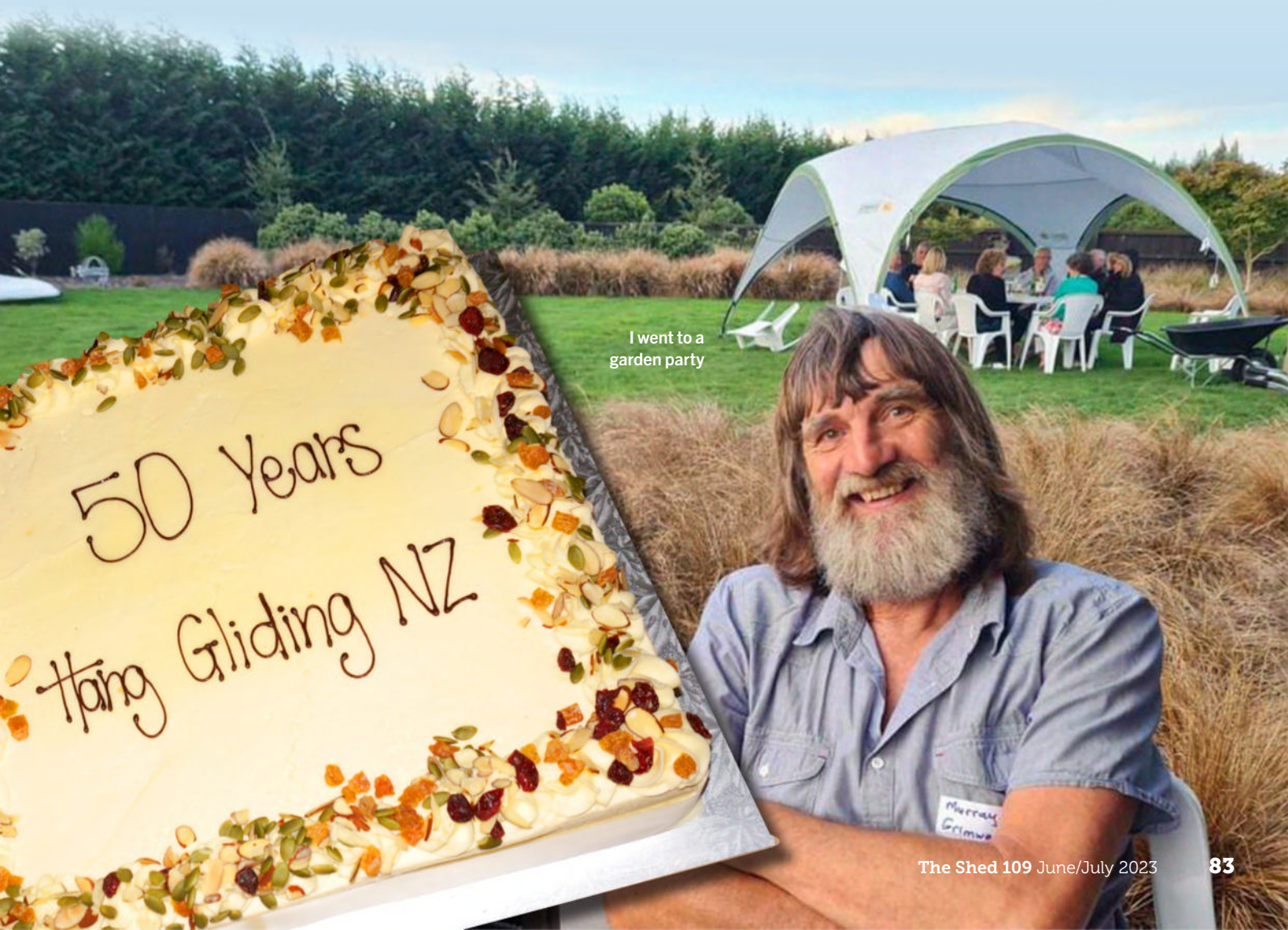
Not many of us are still hang-gliding – only one has flown competitively from 1973 until now – but none is wasting time; some are into sailplanes, some into microlights, a couple fly helicopters – at least one commercially; a lot of us took to sailing. I didn't ask, but I doubt there was anyone there who didn't have a shed/workshop.

I think we all sensed that this was the right time to reunite; another 10 or 20 years ...

The balloon-drop fellas

A highlight for me was meeting the other person who had dropped from a hot-air balloon back in 1980; he at 3000 feet over Hagley Park, me at 2000 feet over Canowindra, New South Wales. These were the third and fourth balloon drops in Australasia – we didn't bother to work out which was which; the earlier two were heart-in-mouth battenless-glider affairs. We swapped memories; I had left Sydney with a flatmate to spend Easter at his family home in Cowra – and to find places to fly the three hang-gliders on our roof-racks. We stumbled upon a crowd of balloonists on the Canowindra football reserve and asked them if they'd be into dropping us off. They were a tad wicker basket and champagne; we were obviously Tooheys straight from the can – or maybe worse; they said no. But the TV people were doing a special on them – and, visually, balloons are boring – and they said yes. Yes won; we were to present ourselves at 6am, before thermals killed their day – the opposite of us, who revel in them. ►

“Here are a bunch of responsible people; if I join them, I might become responsible too”



I went to a garden party



Pre-parachute, a quarter-inch nylon rope, a knife, and a count of three – those were the days

It was a pivotal life moment, and a memory that I'll cherish until I'm gone

A plan was hatched

We went back to my flatmate's mum's place and contemplated our options. The Wedgetail 3 had rigid preformed alloy battens, and its king post – the post carrying the upper rigging – was 200mm aft of the top of the A-frame, which was the centre of gravity.

This unusual separation – most designs had them one atop the other – meant that the glider would hang nose

down statically; a good start. My mate thought he'd use our Eipper Antares; rigidly battened but complicated by having a bowsprit and no cross-tubes. We whetted up two of his mum's best kitchen knives, cut off two 6m lengths of 6mm nylon cord, and awaited the dawn.

We found only one willing balloonist; I won the toss, and the Wedgetail was the best option. I tied the nylon to his

basket and to my keel – through that king-post hole – handed him the sharper kitchen knife and my trusty Nikons. We agreed on a count of three. I walked in underneath him, then had the odd sensation of going up backwards – but at least the nose-down thing seemed to work.

At 2000 feet, we were getting out of range for the TV cameras.

"You ready, Murray?"

"Yep!"

"1, 2 ..." – I can't remember hearing "3". I had the bar hard into my gut, was bent fully over it, and we were away! I reckon I was flying properly within 30 feet, and then it was a doddle; a couple of wing-overs and a landing in the same field we'd left – a surprise to the balloonists – who never do.





Talk about a bunch of old renegades ageing disgracefully

Darn, no photos

The balloonist was so busy venting – it's not every day you lose 130 kilos from your balloon in a fraction of a second – that he forgot my camera; all I have nowadays are a few Instamatic shots taken from the ground. However, it was a pivotal life moment and a memory that I'll cherish until I'm gone; one of those good ones.

A few years later, I tried setting up a sequel for an Otago air show. The stipulated requirements included a

swivel in the line and that the hang-glider pilot did the releasing. I fed the trip-line up through the glider inside taped-on garden hose to stop it snagging; it tripped a spinnaker-pole release – introducing the need not to trip it accidentally! Came the test day, slung under the rafters of the old New Zealand National Airways Corporation (NAC) hangar at Taieri, a couple of feet up over two tyres. Whack, thump. The brass swivel whacked the roof – probably asbestos, come to think of it – as I landed

on the tyres. The observing engineers said, "That was positive", and went back to work. I went home and removed the swivel – what a silly idea; it could have taken out a balloonist's eye! As it happened, the day was too windy and the drop didn't happen. Such is life.

The '70s were great

At the reunion, we talked until 1am: politics; the future of humanity; the uniqueness of the era that was the '70s; how so much development happened in such a short period. Many of us climbed into the back of our vehicles to catch some shut-eye before driving home – just like old times. Unlike old times, there were a few creaks and groans; a bit more trouble reaching those shoelaces.

Garden party number two

The second garden party was at home; we invited the local branches of MenzSheds – there are five within cooe – to come and see our off-grid systems, tools, and toys. We vaguely expected 20 people; we got more than 40.

They poured down the drive, filled the parking area, overflowed hither and yon. I didn't get to partake of the afternoon tea, and Jennie didn't get outside; we were too busy running tours and pouring cuppas, respectively.

Interestingly, this crowd mostly didn't need me to tell them why we were doing what we were doing; most of them



The Wedgetail 3, here launching tandem. Note the king post (top) aft of the centre of gravity (where we are hanging from)

seemed to know that the planet was in trouble. That contrasts with 'environmental' types we sometimes host, who – in my experience – are less likely to have thought through the bigger issues. Hands-on people seem to 'get' strategic thinking and leverage points better.

Not a bad Plan B

The third gathering was a knock-on from the second: a return invite to the showing of a local group Shed To Other Sheds, followed by lunch and a formal regional cluster meeting. I'd initially turned the invite down, as the South Island Paper Tiger champs coincided with it, but a slipped disc put paid to the sailing option and this looked to be a good Plan B.

I'd last set foot on those Hawksbury shed premises in 1972, when the place was a mental-health facility; the shed had housed its maintenance equipment, and I'd spent a summer working in the kitchens – those who are familiar with my cooking prowess, will appreciate the irony.

Red tape for sheds

I stayed to observe the meeting, which raised some interesting questions – which in turn, raised others. The government is tightening the screws on incorporated societies; how a shed with eight members is supposed to pay a licensed auditor each year is beyond me, but the bigger question is: why the push? The answer



The sheddies visiting us – Pelton-wheel tour number I've-lost-count-there-were-several. They're examining the spare rotor

is: governments no longer raise enough to do what we demand of them, so they are draining the accounts of us all in an attempt to bridge the widening shortfall. That widening is showing up in bigger deficits, longer waiting times, decaying infrastructure, and deferred projects, as well as increased costs. Having run out of physical commons to commandeer, they're turning parasitic on societal ones, among which are the things we do voluntarily.

Free babysitting

That same government inability to fund showed up in another discussion item: the attempt to place folk who need some level of 'minding' with sheds. In essence, the health system is looking for a free babysitting service. The antidote was clearly articulated by those present: such folk are welcome provided they come with a fully responsible caregiver – which, of course, is exactly the cost the health system is trying to duck. ►

How a shed with eight members is supposed to pay a licensed auditor each year is beyond me



I've never had so many sheddies in my shed



The Spirit of Lockdown

I never really sorted the radio-control side of *Spirit of Lockdown* (*The Shed*, Issue No. 92, September–October 2020). The rudder servo was too small; the mainsheet needed refinement; and the jib sheet just got lashed to the mainsheet one, its servo never satisfactorily mounted. The boat – nearly 2m long and no lightweight – then got parked on a high shelf, inaccessible without quite some palaver.

So, first, I built an easily accessible cradle for it alongside the stairs. Then I turned to the radio controller, pulled everything out and started from scratch. It has two grunty old drum-winch servos, but they are big, and the best way to run these things is not to wind and unwind the sheet on and off the drum, but to drive an endless loop with the drum and attach the sheet to that. This eliminates the snags and snarls that can happen when attempting to wind in a slack line.

The hole through the deck is not big enough to accommodate the length of either endless loop, so these had to be prefabricated, inserted, and assembled inside; laparoscopic surgery sometimes, using a mirror and an inserted torch – ‘frustrating’ and ‘fun’ do both start with an ‘f’!

After two stillborn iterations, I mounted the winch bodies up under the side decks, out of the way but with their drums finger-accessible. The remnants of the old mainsheet endless loop are there, but it’s essentially a new two-track system.



Discarded iteration number two: the pair of grunty old winches



Both endless loops assembled outside the hull



Winch bodies tucked away under the deck, endless loops assembled (Anglo-Saxon commentary re. surgery, not shown)



Those of us who get pleasure from making things – and/or from being out there doing something – are lucky

This happened at the same time that an incorporated society of which I'm a part – a think-tank that has no subscriptions, no income, no employees, and a few hundred dollars in the bank – was updating its signatories at the bank. Apparently, now, everyone on the committee – not just bank signatories – needs to be registered with the bank; full name, address, the whole nine yards. Either they've had trouble chasing debt, or they're anticipating it; neither bodes well.

It is going to get harder to maintain/fund facilities such as sheds – and, indeed, any not-for-profit organisation – so it was good to see such cohesion and information sharing.

Good buggers

I came away from all three garden parties with a happy heart but a sense of foreboding; proud to know such wonderful people; worried about what is ahead of us all. I figured that I needed to spend

more time socialising but to do so meant prioritising – even triaging – my own projects, of which there are already too many. So, I've passed on a beautiful partly assembled kitset model of the Dutch royal yacht that I'd been given; it would have been No. 3 boat project hereabouts, and I have many other demands on my time.

It's gone to a home where it will get finished, as it deserves to be. There are a couple of things here in the 'never quite finished' category, and I'll finish them.

No time for that

To return to a flying analogy, I'm well aware that I must be running out of runway, and some project, sometime, isn't going to get finished. So what? The self-induced pressure to 'get things done' has to be tempered with time for others, time to continue learning, and time just to indulge. In my case, indulging means sorting out the radio-control in the Ten Rater I built during lockdown – *The Shed*, Issue No. 91 – so that I can spend a few hours on the local riverbank learning how to drive her. My goal is an hour a week, minimum, through winter; just because.

Those of us who get pleasure from making things – and/or from being out there doing something – are lucky; boredom is something we haven't got time for. 🛠️

Hawksbury Men's Shed – gathering of the clans



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**NEW ISSUE
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We visit the Petersen Automotive Museum in Los Angeles – just one of the articles in the May/June 2023 issue



Our cover story this issue is on the remarkable Imp. The car first came out as a Hillman in the 1950s and, as with many cars of that British motoring era, it also morphed into many other versions over the following years.

PLUS: A 1972 Mazda RX-2 that has just undergone a 10-year restoration by its owner and a Corvette Stingray that we literally stumble on in Taihape during a road trip. We feature a treasured 1990 Toyota Land Cruiser and a 1970 Rolls-Royce hearse, we go exploring the back roads of Dargaville for roadside relics, and we visit The Pointon Museum to drive a Reliant Scimitar. But wait, there's more ...

For a fully illustrated rundown of what is in this issue, head to our website, classiccar.co.nz.

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Richard Harris with
one of his company's
Woodsman Serene Petite
burners and a copy of WH Harris
Tinsmiths' 1931 catalogue

A MATTER OF THE AIRSHED

Ingenuity provides a solution in the balancing act between
creating a warm home and contributing to air pollution

*By Ritchie Wilson
Photographs: Ritchie Wilson*

The original version of our house was tiny – only slightly larger than the minimum size allowed in the city plan – so it wasn't especially difficult to heat, despite not having double-glazed windows (a major mistake) and having cathedral ceilings.

When our house was built, night-store heaters were the go. These contained heavy heat-retention bricks, made of some ferrous substance, which were heated with cheap night-rate electricity. The heat was released in a controlled manner during the day. One drawback of these heaters is that they are surprisingly expensive to install; another is that, all too often, they are heating a room that, because of unexpected warm weather, doesn't need heating. So, you quite often pay for heating that isn't required. Yet another drawback is that, in a large earthquake, the hot, heavy heaters can fall over – as ours did in the 2010 Christchurch earthquake, luckily not starting a fire.

A heat pump appears

Next, we had a heat pump. This was installed, at no cost to us, by some incognito organisation – perhaps the Earthquake Commission (EQC). A man knocked on our door a short time after the quake and offered us a free heat pump. Just a few weeks later, it was installed. I can't remember signing any paperwork or paying an electrician. It seemed just to appear. Its drawback was that, especially in very cold weather when its efficiency dropped, it

didn't produce enough heat; its heat output was too small for the space to be heated. It also made noise and created a small draught.

When we built our house, it was impossible to get permission to install a fireplace. To reduce Christchurch's smog problem, installing fires for heating was banned and there were financial incentives to remove open fires.

When we built our house, it was impossible to get permission to install a fireplace

Smog city

On some winter nights, particularly if the sky is clear, a temperature inversion occurs over the City of the Plains. Because of heat losses by radiation, the ground becomes cooler, cooling the lowest layer of air – the layer in contact with the ground – so that it is colder and more dense than higher layers. This

has the effect of imprisoning the air over the city in a type of bubble.

In the days of open fires, smoke from the chimneys would be trapped close to the ground and visibility would plummet. Sore eyes and a sore throat would result from being outside in the city at night during winter.

As a schoolboy, I used to bike into the central city to visit the public library. One evening, there was exceptionally thick smog – fog, really – and visibility near the library, which was next to the Avon River, was very low. I had to walk, pushing my bike, and use the roadside gutter to navigate. I can remember stretching out my arm and not being able to see my hand; visibility was less than a metre. The smell of coal smoke was very strong.

It is well known that smog, which contains small, solid particles, is a health danger, perhaps causing death in vulnerable people. Hence the fire ban.

Wood fire heat is impressive

During the Covid-19 restrictions on international travel, our family stayed, on separate occasions, in two Central Otago holiday houses during winter. Both houses had a wood fire and a generous supply of dry firewood. The amount of heat that the fires produced was truly impressive and emphasised the inadequacy of our own home heating. ►





Our log burner arrives at Casa Wilson

In the past few months, a house similar to ours has been built on the site of a demolished earthquake-damaged dwelling. As the new house is adjacent to the flood-prone Heathcote River, it sits on tall wooden piles to raise the floor level – just as ours does. However, unlike ours, the new house had a conspicuous flue sticking out of its roof. There was also wood stored under the new house. They had a log burner!

How come they've got a log burner?

One day, I screwed up my courage, climbed the steps, and knocked on the front door.

"I see you have a log fire," I said to the young man who opened the door.

He must have been unimpressed by my appearance, because he replied, "Oh! Do you want some wood?" – thinking, I suppose, that I was going door-to-door,

begging for winter fuel.

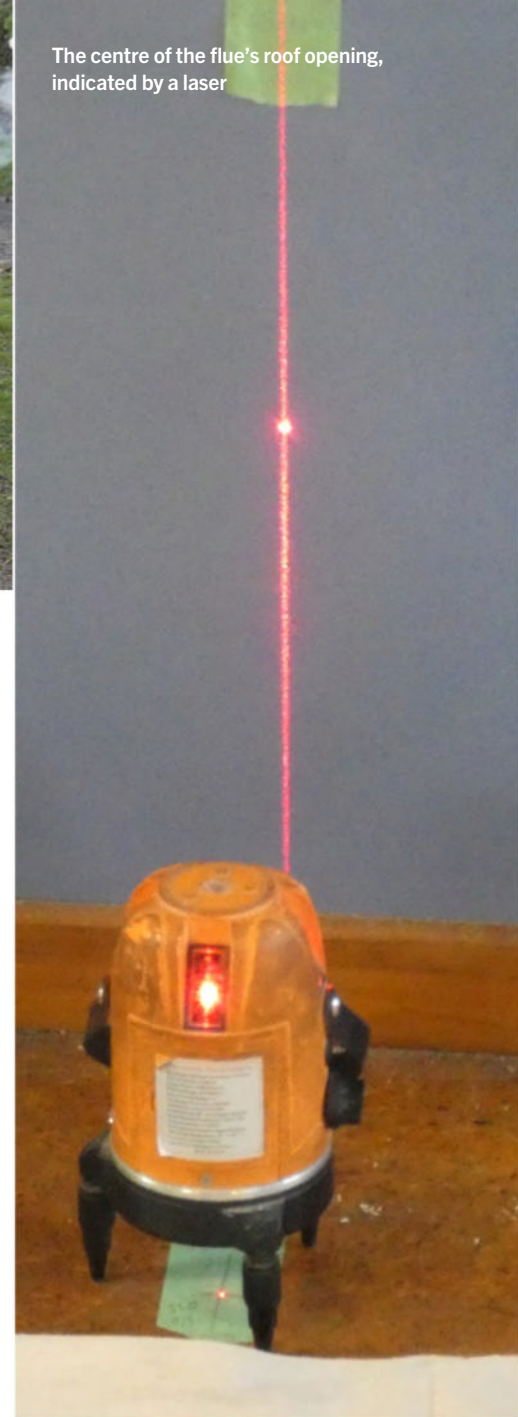
"No, no," I protested, waving my hands. "I was just wondering how you got permission to install a log fire, because I thought it was forbidden."

"You had better come in and talk to my mother," the young man said, opening the door wider and ushering me inside.

His mother told me that there had been no difficulty, or major expense, in getting a permit from the city council to install the fire. Another son, who was also in the room, said that he had installed a log burner recently in his property in a beachside suburb, and that the permit had cost less than \$500. He said the fire's installers had arranged the permit and the process was very smooth. There had been no difficulty. He mentioned the company that he had bought the fire from.

It was an easy decision for us to get a log fire installed.

The centre of the flue's roof opening, indicated by a laser



Measuring the burner's position on the floor



Aiden marking the outline of the roof opening

Installation of the Woodsman Serene Ultra Low Emission Burner

The shop we bought the fire from arranged to have another company install it. The manager visited, viewed the room, drew a sketch plan with the position of the fire indicated, and sent us a quote for the installation. This covered installation of the fire and flue – standard fee \$800 – plus the cost of the additional hardware required, such as the roof flashing (\$156); the flue bracing rods (\$74); screws, paint, etc. (also \$74); and the city council's building consent fee (\$339) plus a filing fee (\$95). The flat, thick metal plate between the fire and the floor was surprisingly expensive. Although the price included the flue kit, we had to pay extra for an additional flue section because our roof ridge is so high. ►



Completed roof opening — the wooden framing assembled inside the roof is just visible





Fitting the flue casing, which separates the flue from the framework inside the roof

A few days after the payment had been transferred, the installation team of Aiden and Dylan arrived with the wood fire and lugged it up the stairs and into the living room. Aiden confirmed the fire's position and then, using a laser, determined the position of the centre of the flue on the sloping ceiling. He has been working on fire installations for years and was very quick and efficient. A hole was drilled vertically through the roof at the appointed position, and, using a template and a battery jigsaw, he cut an oval hole in the ceiling material, through which the flue would pass.

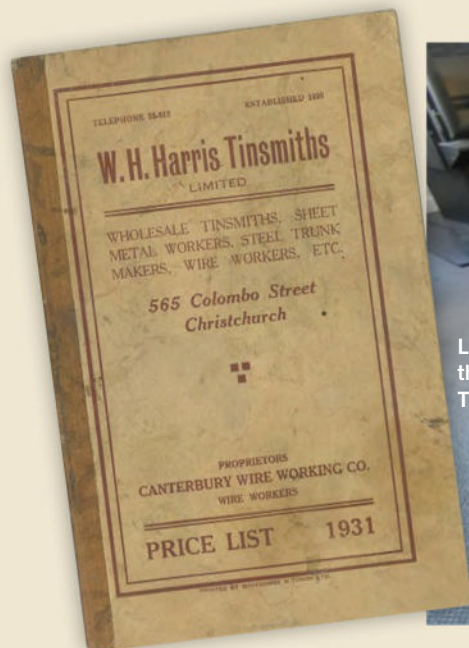
External fittings

On the outside of the steep roof, Aiden attached a sturdy piece of timber with screws passing through

the roofing iron into a ceiling joist. Perching on this, he again used the template – centred on the hole he had drilled from inside the house – to cut a matching oval in the roof's corrugated iron. A square frame of 100x50 timber was assembled around the hole, in the space between the roofing iron and the internal ceiling, in much the same manner as a surgeon does keyhole surgery. A casing was attached to the framing; this would separate the flue from the wood. The flue was assembled on the ground, the galvanised-steel Sloping Ceiling Kit and the bottom of the flue were painted with special heat-resistant paint, and the bottom part of the casing was installed – poking out of the casing into the air.

The flexible flashing was slid ►





Left: Cover of the WH Harris Tinsmiths price list



Tin trunks made by WH Harris, displayed in the company's showroom

From tinsmithing to log burners

If you were setting up a business in New Zealand, in the early years of European settlement, what type of business would be best? Baking, banking, and brewing would all have been good choices, and your descendants, living on their family trusts, would, I'm sure, have been suitably grateful. But what about tinsmithing?

Tinsmiths convert flat sheet steel into items such as buckets, watering cans, and tin trunks by cutting, bending, riveting, soldering, and crimping. Tinsmiths would have enjoyed an advantage over business concerns that imported this type of goods from overseas, because the freight on the sheet steel would have been far less than the cost of importing the bulky finished objects. The sheet steel would have taken up far less space in the holds

of ships coming to the young colony and consequently been much cheaper to import.

Two Christchurch companies that started out as tinsmiths in the early days are still in business today – although not as bucket or tin-bath makers. Photographs taken around the time of World War I show that both Oakley and Sons and WH Harris were quite large companies with a respectable number of employees. Today, Oakleys is a retailer of high-end bathroom fittings and WH Harris is a manufacturer of wood and diesel heating stoves. Both are proud of their long histories. In its wood-fire showroom, WH Harris has examples of the tin trunks that the company used to manufacture. My father had his gear in one when he was in the navy in World War II; it was often part of our games when young.

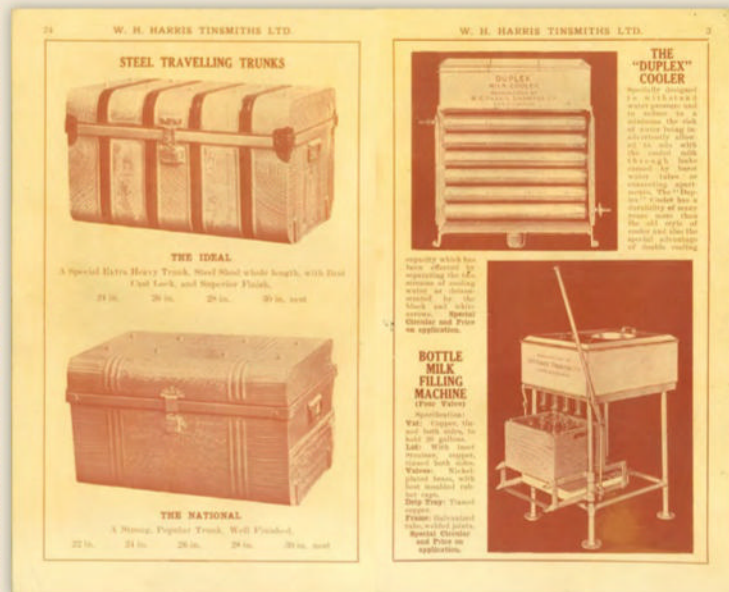
Both Oakley and Sons and WH Harris were quite large companies with a respectable number of employees



Tin-trunk label



A WH Harris cabin tin trunk repurposed as a wabi-sabi garden pot



Pages from the 1931 WH Harris Tinsmiths catalogue



over the casing and attached to the roofing iron using tech screws with rubber washers to prevent leaks. The top section of the flue was installed, complete with its movable cap, and two braces were positioned between the roof and the flue. The cap, in a Teflon bearing, moves as the wind direction changes, stopping rain entering the flue and reducing the likelihood of entry by birds.

Aiden was most concerned with the final appearance of the fire and the part of the flue inside the house. He carefully cleaned the paint and touched up any scratches that had been caused by the installation. Several weeks later, he revisited to repair the almost imperceptible damage to the white ceiling paint around the flue's ceiling kit.

After packing away his gear, Aiden gave us a quick lesson in lighting the fire. He told us to open all the windows when we first used the fire to allow fumes from the paint to escape.

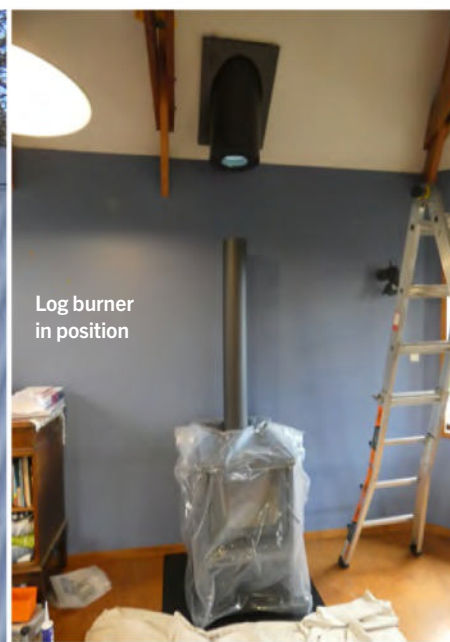
Was it worth it?

My wife thinks the installation of the log burner is the best thing we have done with our house since it was built. As a bonus, month-on-month comparisons of our electricity bill show a pleasing reduction in electricity use from the same period last year.

We generate quite a lot of burnable wood from the trees in our garden, so we probably won't have to buy much firewood, but we will have to build a woodshed to keep the rain off the wood and allow it to dry. ►



Fitting the Dektite Soaker flashing around the flue casing



Log burner in position



Dylan guiding the flue downwards through its casing; a great deal of trouble was taken to minimise scratches to the flue's special paint

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Inversion layers

In general, because almost all of the heat arriving from the sun is absorbed by the ground, and the air in our atmosphere gets most of its heat from the ground, the air gets colder as you get further away from the Earth's surface.

This means that the warmer, less-dense air near the ground can easily float upwards through the cooler, denser air above it. Being hot, the matter produced by a fire – a mix of gases and small solid particles – naturally moves upwards because the hot mixture is less dense than the cooler air it is floating through. The mixture, of course, is smoke and, as we know, smoke rises – usually.

Just as warm ground heats the air, so cold ground cools it. This is what happens on clear winter nights. Earth's surface radiates heat into space and the ground – and the air near it – cools. The cool air is more dense and can no longer rise through the less-dense air above it. This is called an inversion layer because the usual situation – air getting cooler and more dense the further away from the ground it is – has been inverted. Consequently, unless the air is stirred up by wind, anything in this ground-hugging layer of air tends to stay there – most noticeably, smoke.

Inversion layers form on clear, still nights and trap smoke and other forms of air pollution close to the ground, where we live and breathe. Some places are more prone to inversion layers than others – for example, London, Los Angeles, and Christchurch. All of these cities were

once notorious for air pollution: London fog, Los Angeles and Christchurch smog. The solid particles responsible for the murk came from coal fires (London and Christchurch) and petrol and diesel engines (Los Angeles), but in all three cities, the fog or smog could be trapped near to the ground in an inversion layer.

Atmospheric scientists have a name for the air near the ground – the air we breathe – in a particular geographical area. They call it the 'airshed'.

Density

The density of an object is its mass per unit volume – how 'heavy' it is. Density is usually given in grams per cubic centimetre: g/cm^3 . Light metals like aluminium have relatively low density, while heavy metals like copper have a much higher density. A cubic centimetre (cm^3) of aluminium has a mass of 2.7g, while a similar amount of copper has a mass more than three times as large.

As substances are heated, they expand, so their volume increases while their mass stays the same. As a result of the increased volume, the density decreases. Obviously then, standard densities are measured at a standard temperature – often 25°C .

Because the gram was originally defined as the mass of a cubic centimetre of pure water at 4°C , 1cm^3 of water has a mass of 1g, so the density of water is exactly 1g/cm^3 . Anything less dense than water floats; anything more dense than water

sinks. Steel ships and aluminium dinghies float because the volume of the hull below the waterline is large enough that the overall density of the submerged part of the vessel is (just) less than 1g/cm^3 .

The human body is, famously, mostly water, but our skeleton, made of bone, is usually a bit denser. How then, can we float?

When our lungs are full of air, our overall density is a small amount less than 1g/cm^3 , so we float; a drowning person's lungs fill with water, making their body more dense than 1g/cm^3 , so they sink. A few days later, gut bacteria have produced sufficient gases, trapped in the digestive system, to enable the unfortunate person's body to float to the surface, perhaps to be washed ashore.

In 1783, people first left the Earth's surface, floating upwards using a hot-air balloon constructed by French paper manufacturers, the Montgolfier brothers. The air in a huge paper bag was warmed by a fire, causing the air to expand and forcing some of it out of the paper envelope. The mass of air inside was thereby reduced, while its volume was unchanged. The balloon's crew was carried upwards because the overall density of the whole contraption – envelope, hot air, fire, basket, and crew – was less than the density of the air surrounding it. French scientist Jacques Charles was involved in the project, which had been funded by contributions from the ordinary people of Paris, and had developed a mathematical



relationship between the volume of a mass of a gas and its temperature, which is known today as Charles' Law.

Later that same year, a balloon filled with a low density gas, hydrogen, carried Charles and a co-pilot aloft. Until the advent of the modern LPG-fired hot-air balloon in 1960, virtually all balloons used either hydrogen or the much heavier helium for lift. The hydrogen balloon was considered safer than the combination of paper envelope and straw-fuelled fire used in the hot-air device.

Density in g/cm³ at 25°C, except where noted

Cork	0.26
Dry pine	0.5
Water	0.997
Bone	0.92–1.39
Concrete	2.37
Aluminium	2.7
Iron	7.87
Copper	8.95
Silver	10.5
Lead	11.3
Uranium	19.1
Gold	19.3
Water	1.000 at 4°C
Hydrogen	0.00009 at 0°C
Helium	0.00018 at 0°C
Dry air	0.0012 at 0°C

Clean air standards

Air pollution can be either gas, such as ozone, or solid particles mixed with the air. Both are dangerous to health.

The diameter of airborne solid particles is measured in micrometres (µm), with 1µm equal to 1/1000mm. Particulate matter with a diameter of more than 10µm, known as PM10, is generally trapped and removed in the nose and the large airways leading to the lungs, but smaller particles – especially

particles smaller than 2.5µm – can be breathed deep into the lungs, potentially causing very serious problems.

In Christchurch, the air is considered safe if the PM10 level is kept below 50 micrograms per cubic metre (µg/m³) of air. Last year, that standard was exceeded on only one day, the level generally being less than half the permitted maximum. Interestingly, the share of PM10 produced by home-heating fires has been steadily reducing over the past few years, as modern ultra-low-emission log burners replace older models. The particulate matter emitted by vehicle exhausts has increased over the same period, as the number of internal-combustion cars and trucks on city streets increases.

Workers in wood can be exposed to high levels of PM10 when sawing or sanding wood in an enclosed environment. These tiny particles, practically invisible to the naked eye, are very difficult to filter out of the air and can be totally removed only by extracting all the air that they are in. This requires moving large volumes of air from around woodworking machinery, using powerful extraction pumps and large-diameter pipes leading to the outside.

Sheddies who have studied dust extraction in detail point out that professional wood shops are required to have very high-powered systems to get rid of these insidious airborne particles and to keep their workers safe. PM2.5 is considered to be the most dangerous and the most difficult to avoid. ►





A happy Harris Home Fires employee folding a sloping ceiling fascia on a folding machine – called a break

Making a Woodsman burner

The Woodsman Serene log burner that I purchased was manufactured by WH Harris. I contacted the company and was invited to visit its factory in central Christchurch. I was conducted around the large manufacturing area by Richard Harris, great-grandson of one of the company's founders.

The process starts with the loading of a stack of large sheets of 8mm thick steel plate into the computer-controlled laser cutter. The steel is made at Glenbrook, just south of Auckland, by New Zealand Steel, from the North Island's west coast iron sands and scrap steel. Richard Harris

speaks highly of the quality of the steel and considers it to be greatly superior to imported steel, which they have used in the past.

The laser cutter is Italian and cost well over a million dollars five years ago. It is entirely automatic, and will cut the required pieces from the least number of steel sheets in the most economical fashion. Richard said that a change of as little as a couple of millimetres in the dimensions of the finished log burners can, in some cases, lead to a worthwhile reduction in the waste steel produced by the cutting process.

Complex air passages

Five very large folding and bending machines, called 'breaks', bend and fold the steel. The components are then welded in the welding shop with MIG welders. To reach the required low level of different types of emitted solid particles produced by the burning of wood, sophisticated management of the air entering the fire is needed. This requires a complex internal system of air passages, which are formed by the components being carefully joined together. The welds are cleaned up with



A line of breaks



Welding the components of a log burner together



Italian CNC laser cutter



A log burner in the paint shop



WH Harris makes the flues for the burners

angle grinders, and the outside of each stoves is painted.

Richard says that a log burner experiences the most extreme conditions of any home appliance. The internal temperature of the log burner can often be as high as 1000°C – a most challenging environment for the paint that covers the exterior of the appliances. Paint manufactured in Europe is used despite its high cost. This is the constant theme: the materials used in the Woodsman fires are the best available. An example is the firebox lining – An example is the firebox lining – a type of compressed vermiculite called ‘stove board’, made in Denmark by Skamol. A cheaper Australian variety was trialled some years ago but was found to be much less durable, with a tendency to delaminate.

Time is money

Some log burners use ceramic firebricks as a lining, but, because of the brick’s greater thermal mass, they take longer to heat up – you have to wait longer before the fire starts releasing significant heat.

Generations ago, a kitchen’s wood-fuelled stove would have burned almost continually, so slow initial heat production didn’t matter as much. Log burners are naturally slower to start producing noticeable heat than other home-heating devices and anything that can speed their heating up is valued by the people using them. The firebox lining is there because it is an insulator, slowing the movement of heat to the outside, so that the fire can burn hotter and consume more of the undesired solid particles that would otherwise escape up the flue into the

city’s airshed. On the first occasion on which a Woodsman fire is brought up to operating temperature, residual solvents from the paint evaporate and cause a smell, so – as we had been advised by our installers – it is best to have the windows open to allow the vapours to escape while the first lot of wood is burnt.

The door needs to fit well

The door of a log burner has a difficult job to do. It has to provide an air-tight seal to stop unwanted air from entering the fire. A strip of fibreglass rope around the edge of the door acts as a gasket, stopping the air from getting in. The door needs to fit well against the body of the stove so the rope doesn’t have to be very thick. The Woodsman Serene has a door made of 2.28mm thick steel bent and welded into shape. ►



Grinding weld smooth

This comparatively light-gauge metal is used so that the door can flex slightly when closed to fit as closely as possible to the stove body. Clever design means that the door appears to be made of the same thickness of metal as the rest of the log burner. Some other fires have a door made of cast iron, which is very rigid; consequently, the fit is not as perfect, so the rope seal needs to be thicker.

The door's window is ceramic glass – made in Germany – because ordinary silica glass couldn't endure the high temperatures. The door's handle is made locally from Bakelite – a thermosetting

plastic invented in 1907 by Leo Baekeland – which has excellent insulating properties and looks good.

WH Harris also makes the flues, which carry the gases produced by the burning wood to the outside.

Steady workflow the best result

It turns out that log-fire sales are seasonal, with sales being slow in the summer. This creates a problem for manufacturers: do they ramp up production over the winter and lay off staff when warmer weather

arrives, or do they spread production evenly over the whole year and have to store large numbers of fires for many months until they are sold?

WA Harris has tried both. The company used to run a night shift during peak sales months but found that recruiting and training new workers every year was onerous. Instead, it bought the empty confectionary factory across the road and uses that during part of the year to store the hundreds of fires awaiting sale. Log-fire manufacturing can now be spread evenly over the whole year, using a stable, experienced staff. 📦



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How cool is Gary's little XL 100?!

GARY, THE COLLECTOR OF '70S COOL

Don't leave it too late – set out on that adventure now

By Mark Seek
markseek@rocketmail.com

Today's appreciating classic motorcycles were once commonplace, often parked on the kerbside outside office blocks or found leaning against grubby factory walls. These time machines are now highly prized, polished, and ridden by gents in snug-fitting leathers.

It could be an inline six-cylinder Honda that resonates with you or the crackle of the infamous 'Widowmaker' from the lads at Kawasaki. Each relic

of the past is intrinsically fixed in our memory banks. We have all known the apprentice who snaffled a brochure on the way home from the dealer on Wednesday night only to return on Saturday morning with his entourage of leather-clad mates, eager to see him throw his brown pay packet down on the counter as a deposit on the latest Barry Sheene replica.

So where did all those brochures go? We'll get to that soon enough.



It could be an inline six-cylinder Honda that resonates with you, or the crackle of the infamous 'Widowmaker' from the lads at Kawasaki

Time for a new adventure

In my recent travels, I met a bloke who reacquainted himself with two wheels after some 50 years in the doldrums. He decided that it was time for a new adventure, and began the process of restoring a '70s 100cc Honda XL.

Retirement offers you the opportunity to play golf and be respectable – or, as the saying goes, ride a motorcycle and grow old disgracefully.

My acquaintance hasn't veered too far

from the path of respectability; along with a recent purchase, Gary's small restoration bike will be more of a sentimental nod to his past life, so to speak. The other Honda will be Gary's everyday ride. He explains that he was intrigued at the advertised mileage of a 20-year old Honda 125. You see, the bike had only spun its wheels for 27 original miles.

One of the marketing catchphrases of the past went something like this: 'You always meet nice people on a Honda'. In this case, it's true; a nicer bloke you could not wish to meet. In suitable fashion, Gary is running-in his trusty steed by exploring the many scenic inland routes around Banks Peninsula.

Collecting memorabilia

Now, Gary is a bit of a collector of vintage number plates and, having what he describes as a fascination with the 1970s era of motorcycling, this was his motivating factor in collecting period brochures – a pastime that brings him such satisfaction.

This collector extraordinaire's choice is Japanese printed brochures for the New Zealand and Australian motorcycle market, which apparently differ from the American and English versions.

Gary says, "It's the layouts and the font choice that gives it its place of origin."

Gary has amassed several thousand of these printed memorabilia.

Pictures can truly tell a thousand words, and these certainly triggered a few memories for me. Many of us were seduced by these glossy images in our teens and had them in our top drawer or under the bed in the shoebox along with other glossy printed material.

No time to lose

If you have any of these sales brochures or you're a collector of all things '70s cool, contact Gary via my email; I'm sure he would appreciate it. I wish Gary all the best with his new-found freedom and hobby. If he chooses to grow a wild-looking beard and only wash his Honda T-shirt now and again, well, good on him.

I know that his message to other blokes out there is: "Don't leave it too late!"

He says, "I'm glad that Mark created an opportunity for me to reconnect with something that, as a young bloke, made me feel on top of the world. I probably should have done it sooner." 📄



A variety of Gary's 1970s brochures

Gary's super rare American number plates



The fully restored pram now being put to good use by Trevor's granddaughter and family

RESTORATION REMINISCENCES

An unexpected treasure found at a vintage car swap meet brings joy to several generations

*By Trevor Stanley-Joblin
Photographs: Niki Harris*

The Canterbury branch of the Vintage Car Club of New Zealand (VCC) held its first public swap meet on the weekend of 8–9 September 1976, at its site at McLeans Island in Christchurch.

The meet proved to be such an overwhelming success that it has been held every year since that date, except

during the Covid lockdowns. Each year, the number of swap sites has increased; there are now regularly more than 500.

Colin Hey is a well-known member of the club. He has been the organiser of the annual Canterbury All British Day for 35 years, having introduced the event in 1988.

I clearly remember the day in 1988

when my phone rang and Colin asked, “What are you doing?”

“As a matter of fact, I’m reading in the *Restored Cars Australia* magazine about an All British Day over there,” I replied.

“What a good idea!” Colin exclaimed. “I’ll start one here” – and so planning for the first annual Canterbury All British Day began.

I put it to one side in a 'one day when I get time' type of scenario

My site

I can't recall the precise year, but somewhere around 1977, I took out a site at the swap meet. I have had only one shift of site number since then – when the branch redesigned the swap meet layout, probably due to the ever-increasing numbers of site requests. Since then, my site number of 181 has been next to that of my good friend Colin, who currently owns 18 Wolseleys. He recently took to the track racing a Wolseley 1500 in the VCC class at classic race meetings such as the Skope Classic.

Colin was always selling British car parts while my wife, Lorraine, sold plants for 16 years. I had a sprinkling of a variety of car parts over the decades, largely depending on the make of car I had just finished restoring. The '36

Ford V8 Roadster took me more than 13 years but a full restoration of each of the others generally took me about three years.

Swap meet find: a dolls pram

In 2009, Lorraine bought an old dolls pram from Colin; original condition but showing its age. I do not know what decade it was made nor what make it was – probably made in England but maybe even here in New Zealand. I put it to one side in a 'one day when I get time' type of scenario.

Many years passed before I finally got time to turn my attention to this unique dolls pram. After restoring many vehicles over several decades – some starting from just several trailer loads of parts – I assumed that ►

Trevor has restored several cars over the decades but never anything like a pram before



this tiny wee thing would be a piece of cake.

This is not going to take long, I thought to myself.

However, I hadn't factored in the huge earthquake of 4 September 2010 and the other much worse one on 22 February 2011.

I had finished the body, axles, and wheels, and delivered the pram to my friend Wayne Patrick at Patrick Auto Trimmers in downtown Christchurch; a few months later, the earthquakes devastated the inner city, including Wayne's large concrete block building!

"Well, that's the end of Lorraine's dolls pram," I thought.

A survivor

Believe it or not, it took me several years to pluck up enough courage to go and ask Wayne what had happened to the pram. To my surprise and delight, he just pointed to the pram, sitting not more than a couple of metres away — undamaged and retrimmed in white as requested. I later had a folding hood made for it in dark blue canvas. The hood is quite unusual because it includes an inner lining in white vinyl, which covers the hood irons.

The pram stood as a showpiece in the hallway of our replacement home in Amberley, North Canterbury, where we moved after being red-zoned out of Avondale in November 2011.

The earthquakes devastated the inner city, including Wayne's large concrete block building! Well, that's the end of Lorraine's dolls pram, I thought.



The pram survived the Christchurch earthquake at the trimmers, but it took many years to discover that it had and was fully retrimmed

The restoration is complete

Our eldest granddaughter, Nicola Rose, gave birth to our first great-grandson, Alfie Richard James, on 15 June 2017. One month and one day later, Niki visited us out here at Amberley and she placed Alfie in the dolls pram for a wee sleep.

Recently, I returned the pram to Wayne to get a tonneau cover made for it, in tan canvas. That completed the long-drawn-out restoration of one straightforward little pre-war – or post-war — dolls pram.

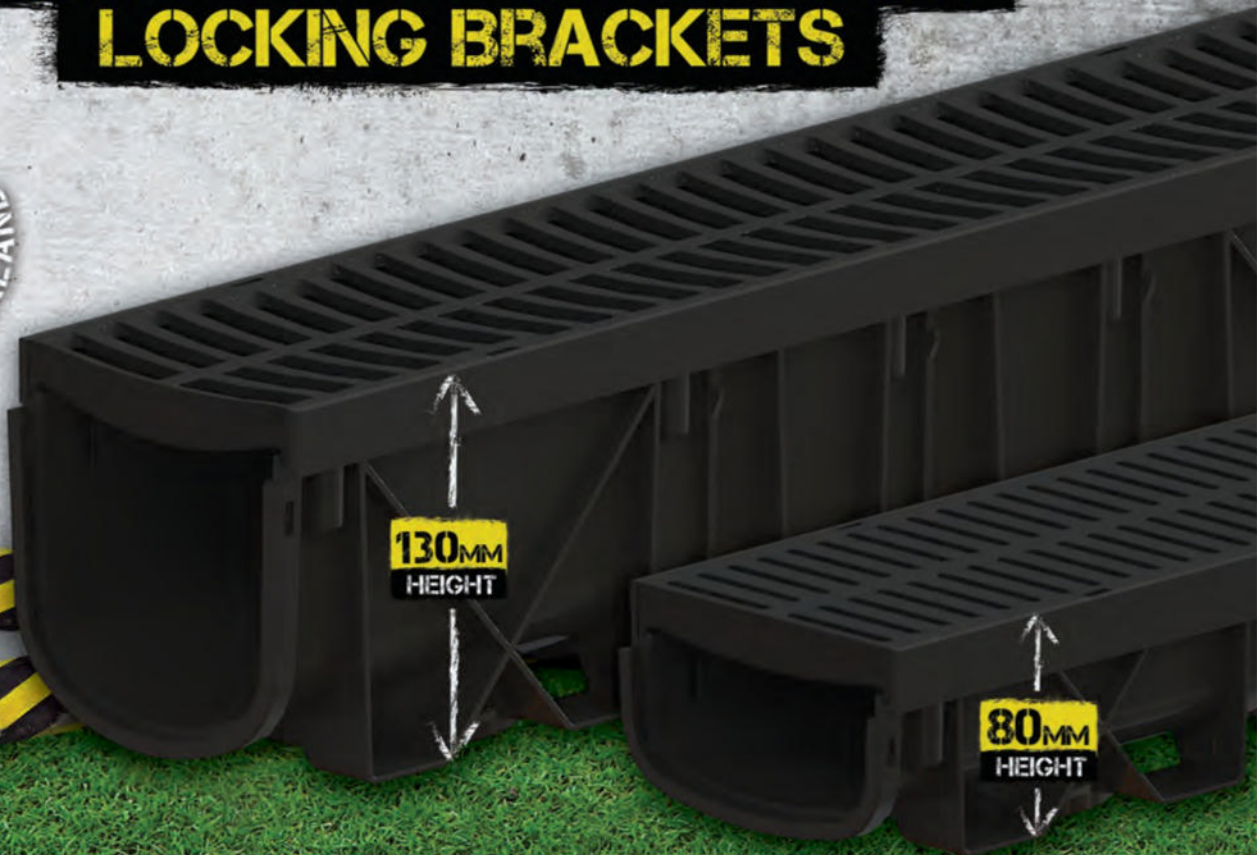
Lorraine always maintained that she would like our eldest granddaughter, Niki, to inherit the pram. Accordingly, I delivered it to Niki on Christmas Day 2022. It now stands in her house on display, just as Lorraine asked. 📦



The restoration took much, much longer than expected

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Chev in primer, ready for colour

MODEL INSPIRATION

A skilled craftsman has found a way to satisfy a car lover's need to have their beloved nearby at all times

By Quinton Taylor

Photographs: Quinton Taylor and Gary Petersen



Many of us can recall schooldays when a trip to the local hobby shop with our hard-earned pocket money rattling in our pockets meant the beginning of hours of work on a kitset model aeroplane or car – sanding, gluing, and painting our favourite models. Ah, the smell of glue

permeating the house – which Mum always complained about when you were supposed to be doing your homework, the wafting fumes giving you away! The result was usually something that we proudly displayed in a glass cabinet or hung from the bedroom ceiling for all to see, testament to our skills and patience.

An eye for detail

Few developed their hobby to such a high level as Invercargill scale modeller Gary Petersen. Gary's eye for detail and his constant striving for higher quality finishes in his models have earned him a reputation throughout the country as a top modeller. He is also a member



How the woody all comes together

of a nationwide group of like-minded keen modellers.

Many of us petrolheads want nothing better than to be able to sit back when our mates visit and look at a miniature replica of the pride and joy we keep in the garage. Years ago, Gary recognised a need for a craftsman to create exact miniature replicas of our metal marvels. His hobby has taken him to all corners of New Zealand and its car culture, with many car lovers now calling on his skills.

A family hobby

It all started by accident – literally. Gary's father became interested in modelling while looking for something to occupy his time as he recovered from surgery for a back injury. He later gave his models to Gary's uncle, little realising the impact that they would eventually have on his own son.

"Some of the models used to belong to my dad. I was about 12 or 13 years of age when I started with models. I spent a bit of time at my grandparents' place ►



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It wasn't long before custom car and truck modelling became a family event involving Gary, his father Alan, and brother Greg

during the school holidays. One day, I found a box of old model parts my uncle had been playing with years before. They had been left in the bottom of a wardrobe. As kids of that age do, I dragged it out to have a bit of a play with them, and it sort of all took off," Gary explains.

It wasn't long before custom car and truck modelling became a family event involving Gary, his father Alan, and brother Greg.

"Dad was an ex-fireman, so he had a lot of models of fire engines. My brother got into sci-fi and movie models, such as cars from *Back to the Future*

and *Home Improvement*, Mad Max's Interceptor, and that sort of thing. He also built a Chevy Nomad like Tool Man Tim's but, unlike Tim, he didn't drop a beam on it!"

The family took part in competitions held by the New Zealand Model Vehicle Club (NZMVC).

"My dad, my brother, and I all competed in competitions at that stage, over three years. The NZMVC had two competitions a year. You had your May school-holiday competition and you had your August school-holiday competition. Between the three of us, we won over 80 awards over those three years."



Graeme Trillo's '34 pickup



An eye for detail with all chassis parts handmade



Steve and Lynette Evans' 1960 348-cubic-inch-powered Chevrolet



Happy in his work – Chris Daley's Holden HQ Monaro coming together

Obsession

Gary's interest grew, but he never thought his hobby would turn into what it is today.

"By the time I left school, I had got into it quite religiously, buying a kit a week. A couple of friends were also into modelling. I had always wanted to be a panel beater or a car painter, but I couldn't handle the industrial environment because of my asthma. Building model cars was the next best thing – I got the best of both worlds. I guess you could say it grew from a hobby into an obsession," he says with a laugh.

Time for the real thing

As time went by, Gary became interested in real cars, and needed a job to support both his model car hobby and running a real car. It was also a turning point; he realised that he didn't want to just build models.

"I didn't want to build model cars just for the sake of it," he says. "I wanted it to relate to something. I must have been 18 or 19 when I saw a couple of cars in town and liked the look of them. I thought I would build something to represent [those cars], and that was where it was all hatched – this idea of building model replicas."

The starting point was an invitation to display his models at a Southland Chevrolet Club Super Chevy Sunday car show in 1995. A chance remark by a spectator at that show about "wasting his time with toys" only hardened Gary's resolve to raise the bar and lift his model-making skills to new heights. ►



Three '32s – one for Mark Wilkins, one for Colin Willoughby, one for Gary Petersen

A chance remark by a spectator at that show about "wasting his time with toys" only hardened Gary's resolve to raise the bar and lift his model-making skills to new heights





The late (RIP) Jock McGilvray's hot rod, made for the annual Jock McGilvray Memorial Run



Colin Willoughby's 1940 Ford pickup

Finding solutions

Gary is now nationally recognised for his skilled craftsmanship, modelling cars and replicating them in miniature exactly as their owners have built the real examples. Word-of-mouth reputations are everything, and social media has played a big part in Gary's success. He is particularly proud of one example of this: "Some of the cars I have built have been very difficult to find parts for. For instance, take the lady who contacted me a while ago. She had been trying to get a model of her husband's XP Ford Falcon for him as a gift. She couldn't find a model anywhere, and then someone told her to contact me to make it for her."

Model kits for the car did not exist, but, after some research in magazines, Gary had an inspiration.

"I used the kit of a '61 Ford Ranchero and a '64 Ford T-bolt. The panels looked pretty close to what I wanted, so I combined the two of them with a little bit of aftermarket plastic to make up the tail-light and boot pieces. It all hinges on your imagination, and it takes time to sit down and think about it."

Gary looked at the '61 Ranchero kit

and thought, *There were the side panels for it*, and there was the body styling he needed.

"Then I thought about what I needed

for the top half of the body – the roof and the tops of the doors. It just happened that the '64 T-bolt was the same styling as an XP Falcon – so I went through all my bits and thought, *I can chop that up and I don't need to chop up a brand-new kit!*"

Gary superglued it to set it in place and see how it looked tacked together, and the problem was solved. Just like that, an XP Ford Falcon!

His friends think he has it easy nowadays, because, when he builds a model of the real thing, he doesn't have to choose the body colour, interior trim, or mechanical bits, as he is just copying what is already there and he knows what the finished product should look like.

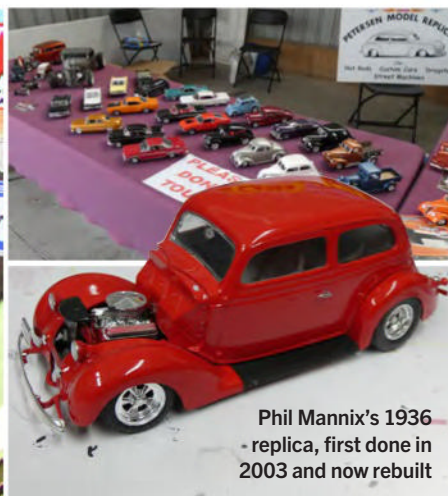
"She couldn't find a model anywhere, and then someone told her to contact me to make it for her"

The model of this XP Falcon was made from a couple of other kits, as a kit for the Falcon did not exist





Gary's fast-growing collection of '32 Fords in the cabinet



Phil Mannix's 1936 - replica, first done in 2003 and now rebuilt

The Mad Modeller

Gary readily describes himself as 'The Mad Modeller' and admits that he is obsessed with making the best possible model; his creations border on art. As a keen modeller in my school days, I always find a visit to Gary's impressive workshops to be an eye-opener. Some may think these creations are just toys, but they are far from it. These models are very important to their owners and their families.

"Some people come back as regulars, and I've made some really good friends – people I would never have met if I hadn't got into modelling hot rods. Craig Stare from Christchurch – [event founder of] Muscle Car Madness and long-time hot rodder – and Graham Rollo from Dunedin are two examples. I've done three models

of Graham Rollo's cars: a '30 Model A coupé, a '39 Tudor, and a '59 Chrysler Imperial. I usually set up a display at the annual Muscle Car Madness in Rangiora," Gary explains.

Travelling with all these models is always going to be a challenge. Gary has solved the problem, travelling to shows in a Chevrolet El Camino pickup complete with an alarmed and weather-proofed canopy.

Gary's wife, Tracey, is fully supportive of his model-making.

"Tracey told me these are the only models I am allowed to play with," he jokes.

She has been to a couple of the car shows where Gary exhibits his models, helping to set up displays, and enjoys the atmosphere and meeting people. ►

"Some people come back as regulars, and I've made some really good friends – people I would never have met if I hadn't got into modelling hot rods"



Floor-to-ceiling model kits. Gary holds a rare King Chopper model



Chris Jones's Ford Model A is special, with a '32 grille and chassis and miniature Moon tank up front



Mike Watkins's 1949 Ford coupé



One for his own collection

A model regularly takes more than 100 hours to complete – one took five years – with extensive research required to find or make parts, manufacture specific items peculiar to the model being constructed, and paint them. The work takes patience and skill. The longest a model has taken Gary was 160 hours, but that was exceptional.

Most of the models are mounted on a display plinth and encased in a clear display case to protect them and to retain any parts should the more delicate items be dislodged. Gary often makes a copy of each one for his own collection, which is now quite substantial and includes all manner of scale sizes.

Expanding workshops

Gary has moved from the cramped garage beside his house, where he used to create

The longest a model has taken Gary was 160 hours, but that was exceptional

his delights alongside his hundreds of boxed kitsets and displays of completed

models. All are now housed in separate workshops / man caves that include a ventilated spray booth and a storage room.

He has a huge collection of plastic model kits, and cupboards and drawers full of aftermarket parts such as wheels, superchargers, seats, and a multitude of minute detail pieces. His miniature items are gathered from all over the world, with some being extremely rare. His tools and equipment would be the envy of many a jeweller – all necessary for creating minute, small-scale detail. Gary probably has more hot rods and modified and custom classics under one roof than anyone else in the country, and his collection just keeps growing. Rather than throwing unwanted parts and kits in the rubbish, people donate them to Gary. ►



New man cave with a Chev 350 as a centrepiece



Gary's extensive stock of paints



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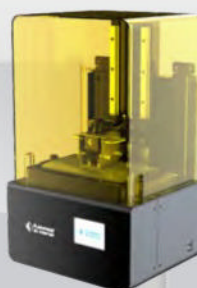


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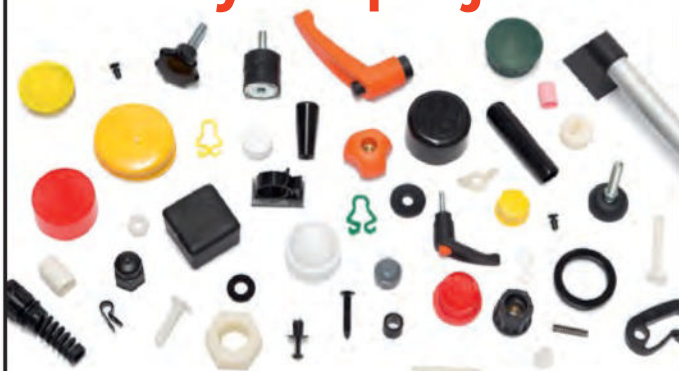
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His workbench also boasts a holder for his Dremel power tool that does double service as a milling plate for machining a myriad of small parts

A circuit-board holder is ideal for holding delicate parts

New tools

Gary has cleverly adapted tools normally used for other purposes, such as the electrical/computer circuit-board holder that he uses at his workbench to hold intricate parts while he grinds them into shape and adds tiny parts.

His workbench also boasts a holder for his Dremel power tool that does double service as a milling plate for machining a myriad of small parts.

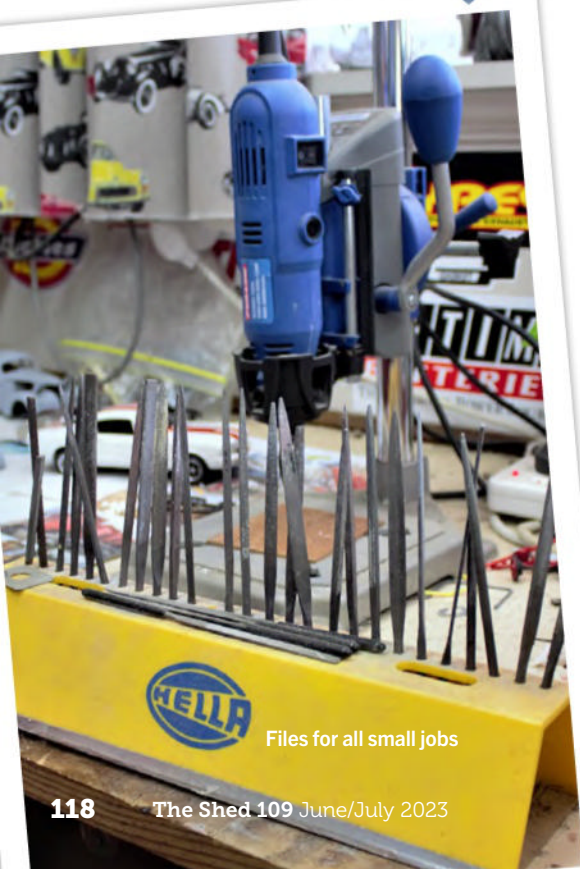
He has display drawers picked up from various auctions and sales, repurposed to house an array of brushes, files, knives, and all manner of parts and items needed to create his models. There are drawers full of paints, and cabinets where he stores tins of car paint – the remains of a particular job often donated by local car refinishers, and gratefully received into this Aladdin's cave.

Gary has also adapted tools not normally associated with modelling. A fine razor saw is ideal for cutting delicate balsa wood and plastic sheet, for example.

"You have your normal run-of-the-mill craft knives, and I've got tweezers

for small fiddly parts and things that are like a dentist's tool-pick set," he explains. "There are needle files too. Because of the way I modify things, I use a lot of tools people don't usually think about using, such as a soldering iron to plastic weld things back together, build plastic up, and shape it to get the final base layer before priming it – similar to when you finish a full-size car."

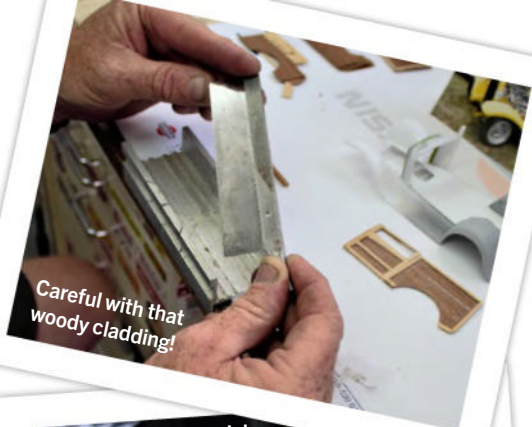
An array of glues is essential for different requirements: "You've got different glues too. You've got needle-tip glue for very fine stuff; it's a very liquid glue. Then you've got your Humbrol tube glue, which is a thicker concentrate. I use Superglue too; it's three or four bucks for a card of 10 and it's good for doing a temporary tack if you want to hold parts for a short time while you work on them. You can crack it apart or you can put another drop on it and it will come apart. There are all types of glue. I try to stick to model stuff where I can – unless I am sticking something like rubber, where I've got to find something totally suitable."



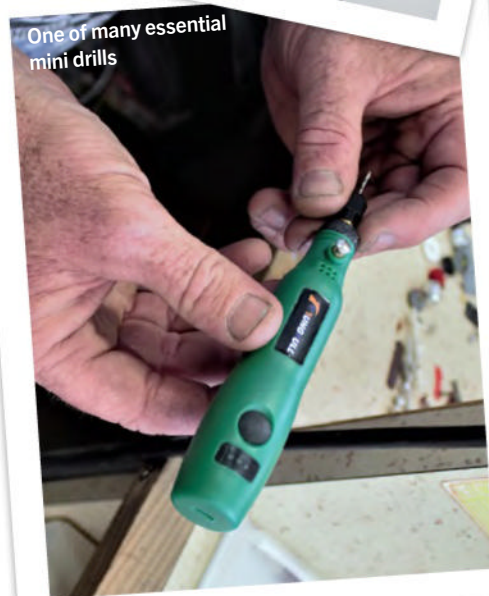
Files for all small jobs



Essential micro drills



Careful with that woody cladding!



One of many essential mini drills

Spray booth

Gary's new cleaning/painting area enables him to clean models safely with dedicated paint and decal cleaners prior to priming and painting in a separate externally ventilated spray booth, where he has cleverly adapted a kitchen range hood as his ventilator.

An array of airbrushes for different painting requirements fills drawers in the paint shop, although Gary tends to favour Badger single-action airbrushes. Paints are expensive, and sometimes he has to get paint codes to get exact colour matches. Some of his paints are from suppliers who sold him orders that customers had ordered but not picked up.

It's not unusual for Gary to have up

to 10 models on the go in various stages of construction, and the detail and paintwork are impressive. Even though there are now liquid plating options, which can be quite expensive, chroming parts is always a challenge. Gary says that he still occasionally uses adhesive silver foil or a chrome marker pen. A friend in Auckland recently supplied him with a 'superchrome' liquid – "Not cheap at \$27 a bottle! That's the latest stuff I am working with, although I still will use the old-school foil."

Electroset rub-on lettering will be familiar to many model railroaders for signage and detail lettering. It is no longer available, but it is among the many items Gary has squirrelled away for future use. ►



Primer booth in action

Comprehensive reference library

Gary has an extensive – make that a massive – collection of cabinets and drawers full of American, Australian, and New Zealand hot rod magazines, which he uses as reference material.

“I look through a lot of car magazines,” he says. “If I see something I like, my brain starts ticking over and I will start building it. I know I’ve got that model car sitting at home [and I start to] think about where I can get the wheels for it. That’s already floating around in my head ... *That’s a nice car ... I’d love to build that.*”

Gary explains that many projects provide real challenges: creating parts exactly to the scale specifications of the subject matter and having the patience to sit down and work on them for so many hours means that it’s no different from someone working on a real car or panel beating a car. However, that is also what is so special with these cars: “That’s another thing with building stuff like this. You can push the limits of things. You can think outside the box and think of things to use. I might get a two-door car and change it to a four-door, or hardtop it instead of [it being] a two-door convertible.”

“I look through a lot of car magazines. If I see something I like, my brain starts ticking over and I will start building it”



Gary getting inspiration from a magazine for this build



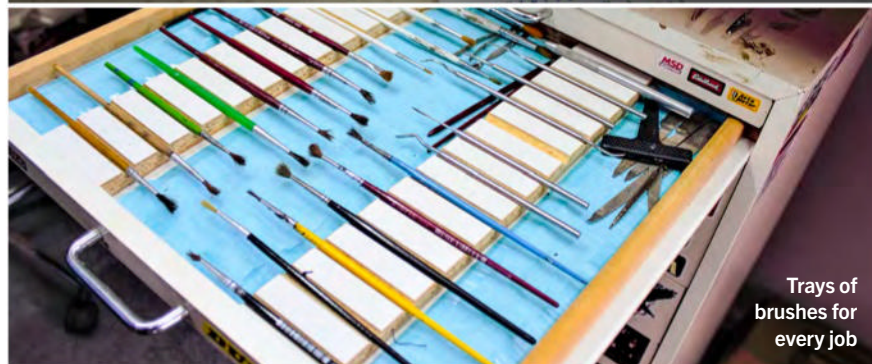
Chris Daley's smokin' HQ Monaro



Another project begins



While making Chris Daley's Monaro, Gary made a copy to exhibit at car shows



Trays of brushes for every job

Aussie muscle

Gary's favourite style is American but increasingly Australian Holdens and Falcons are being made for clients. They range from HQ Holden Monaros to an XB Ford Falcon coupé recently imported from Australia. Gary has already completed an XB Falcon sedan, an XT Falcon sedan, and an SLR Holden Torana.

"There is quite a bit of stuff starting to happen now with kits but it is also starting to get very expensive," he says. "People don't realise how much money is involved in the kits."

Gary uses mainly plastic-cast or resin-cast kits, but a possible future source of parts could be 3D printers. At the moment, most of the lower cost printers tend to layer the plastic, which is easily split. However, he reckons that the more expensive ones do a pretty fair job. ►



Many models, such as this Holden ute, start out as a resin kit shell



Damaged and now immaculate – the eight-ball shift knob survived



Detail and quick-change diff



This '32 Ford grille will eventually be Gary's display sign at car shows

Pride of his collection

Revell 1932 Fords form a big part of Gary's own model collection. He also has a full-sized plastic replica '32 grille surround, which will form the basis of a new illuminated display sign for car shows. He is also keen to display his models with his brother Greg, as a new way to create interest in his

extended array of models.

"I'd hate to try and work out just how many kits and bits people have given me over the years or I've bought off people as they got out of modelling. [The number] would be huge," he says.

Pride of Gary's collection is a big T-bucket model he first built in the late '90s. He ran out of space and sold it

to someone in Christchurch. As it was damaged in transit, the new owner pulled it apart and sandblasted it. Gary bought it back.

"I've completely rebuilt it like a real car," he says. "It's a Monogram Big T, and this is the next step up: the Golden T. There was the Big T and then they brought this one out in the late '80s. I have enough T-bucket parts to build or convert some more. That one took me four-and-a-half weeks. I had to replace chassis bits that were missing, and I was pleased the eight-ball gear-lever knob I made for it was still there."

We asked Gary about building the real thing for himself.

"I'd love to do that, but, with everything involved such as certification and specialist mechanical skills, I don't think that is going to happen. Besides, I haven't got a garage big enough!"

Thanks to an increasingly busy classic car show and street machine scene in New Zealand, demand for Gary's skills shows no signs of abating. 📁



One-eighth-scale Gold T-bucket – pride of the collection

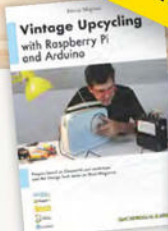
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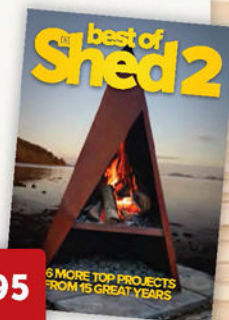
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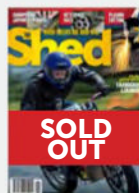
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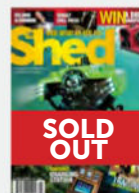
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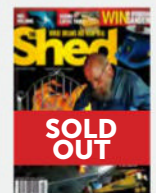
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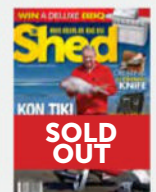
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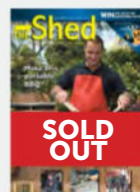
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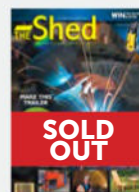
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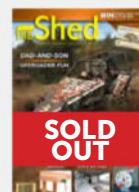
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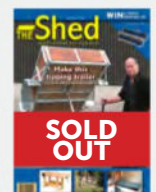
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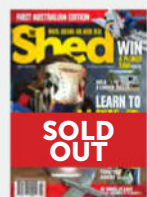
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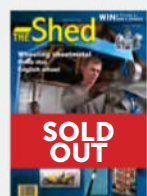
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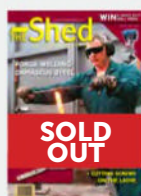
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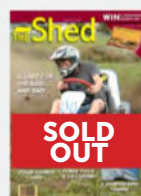
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**THE MEN'S SHED MOVEMENT IS ABOUT
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A shed brings men together in one community space to share their skills, have a laugh, and work on personal projects or within a group for the shed or community.

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:

Northland, Auckland - David Broadhead 021 324 762 regrep1@menzshed.nz
Waikato, Bay of Plenty, Gisborne - Keith Dickson 025 025 96454 regrep2@menzshed.nz
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OVER THE DITCH

Vive la différence!

By Jude Woodside

So, our cousins across the ditch have decided that New Zealanders living in Australia can again become Australians and maybe participate in their economy as equals instead of being second-class citizens.

At present, New Zealanders who arrived after 2000 are entitled to no assistance from the Australian Government in the form of either welfare benefits or free education – in spite of paying the same rate of tax as Australians. In many respects, we are treated worse than any other immigrant group. In my view, this was solely due to some nasty xenophobia spread by certain conservative politicians looking for someone to hate.

Strong contributors

Kiwis have always been strong contributors to the Australian economy. We have a reputation of being hard workers and well educated. There are many Kiwis holding very senior positions in both industry and government in Australia. I worked there for 15 years and even did my degree there, courtesy of Gough Whitlam, who made university tuition free. At the time I went to Australia, you were automatically granted a visa – indeed, you didn't even need a passport; I got my first New Zealand passport while in Australia! I was entitled to all the rights that Australians enjoyed, and the same still applies for Australians in New Zealand.

That means, however, that now I am of an eligible age, I have to apply for an Australian pension. I don't want to, but it's mandatory. I don't want to because the Australian pension is means-tested and that entails a lot of intrusive questions. Australians do bureaucracy a bit too well. I am ever grateful that New Zealanders rejected means-testing of the pension.



We have a reputation of being hard workers and well educated

We are different

Our two countries do have much in common, but we are also quite different. Australia was settled, often forcibly, by a different class of British subjects. In many cases they were Irish; in most cases they were working-class people. Being Irish meant they were also predominantly Roman Catholic.

New Zealand, on the other hand, was a planned settlement with a supposed cross-section of British

society – all voluntary settlers. They were predominantly Protestant – even the Irish – and primarily Presbyterian, with all the virtues that entails of being sober, hard-working, and rather dour.

Aussies, in contrast, appear to be louder, brasher, and far less inclined to be obedient.

Similar bad habits

Both of us have a habit of drinking rather too much. The Australians appear to be more self-confident and outgoing – we call it brash; we tend to be self-effacing and introverted – we call it humble.

I loved living in Oz; it changed me for the better, and I believe more of our young people should cross the ditch to broaden their outlook. Most will return, but some will stay – and that's not a bad thing; it might prevent the xenophobia that has so poisoned our relations lately. 📺

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