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SEPTEMBER–OCTOBER 2020

**ISSUE 92
THE-SHED.NZ**

THE **Shed**

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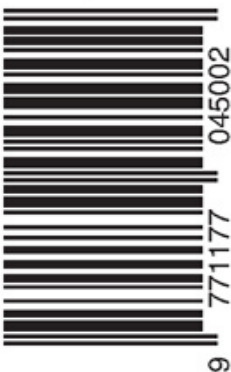
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HOW HARD CAN IT BE?

With the recent demise of New Zealand's largest magazine publisher, one of our talented *Shed* writing team suggested that it may be interesting actually to spell out how we make a magazine. It's not an overly difficult process but it may interest readers to know what we do to be accurate with our content and some of what goes into producing this and almost any printed magazine.

It's the way of the internet these days that basically you dance in your bedroom for two minutes, upload the video, and 500,000 people watch it. Advertisements are run by the app for the throng to see, and there ya go — that's entertainment.

Creating a magazine has a few more steps:

A sheddie has a yearning to make something for fun or purpose.

The sheddie researches how to achieve the desired result or is skilled enough just to get stuck in.

The idea is run past *The Shed* editor for a, "Yes, let's do it".

If the sheddie is building this project on his or her own, the sheddie writer sets up a camera on a tripod to capture images as the project progresses. Some projects can easily take 10 days or more to complete and document.

Once the project is completed, the writer spends many days putting the project steps down in poetic sheddie prose.

Once completed, the written article and project build images are sent to the editor for approval.

The editor reads the article and checks images to ensure that all aspects are covered and the article is suitable for publication.

A person called a subeditor reads the article to arrange it into the magazine's

style if required, and checks grammar, information accuracy, and article flow.

The article is then designed on a computer programme; images and copy are placed onto pages ready for printing. Here some more creative talent is applied to make the project appeal to readers. These page designs can take from an hour to a full day, depending on the subject.

Once completed to the editor's satisfaction, the article is returned to the writer for checking.

Upon getting writer approval, and with any changes/corrections made, the complete designed and laid-out article is sent to a proofreader for checking.

Similar to the subeditor, the proofreader checks the article for errors and that names are correct, and gives it a final grammar check.

The page designer completes any corrections suggested by the proofreader.

The editor has a final check of all pages and the designer completes any final corrections to the pages.

The electronic page files for the entire magazine are sent to a magazine printer, who makes a set of proofs of all pages.

These proofs are sent back to the editor for final approval, and then, if there are no changes ... the magazine gets printed.

Any of these steps can be a lot longer or a fair bit quicker depending on how well everyone has done their part.

So there you have it; now you know how to create a magazine. Not too hard, is it? However, I have been wondering whether it's time for me to learn to dance for a couple of minutes then take the rest of the day off! Maybe not, probably that clock has already 'TikToked' by. 📱

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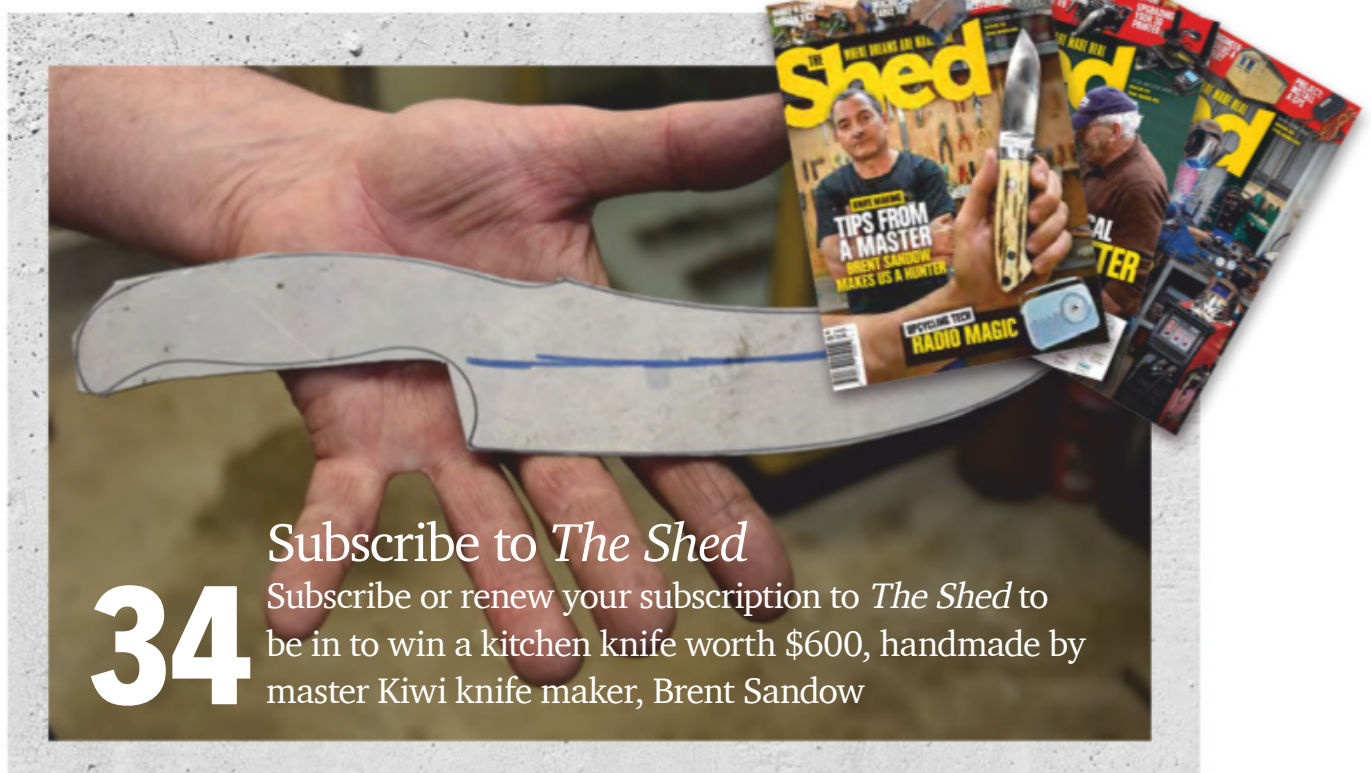


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Build a Moxon vice

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Subscribe or renew your subscription to *The Shed* to be in to win a kitchen knife worth \$600, handmade by master Kiwi knife maker, Brent Sandow

AT THE SHARP END



WHETHER YOU'RE AN ASPIRING ERNEST HEMINGWAY, A KEEN CHEF,
OR JUST A LOVER OF FINE CRAFTSMANSHIP, THIS DESCRIPTION OF
A SANDOW KNIFE WILL SURELY LURE YOU IN

By Ian Parkes

Photographs: The Shed



Global recognition

Brent Sandow has an international reputation for his knives, most of which are sold overseas. He's a fixture at a couple of the world's best knife shows and has been invited, all expenses paid, to exhibit at the new Shanghai knife show. He was one of

the people behind the well-attended 2018 and 2019 Auckland Blade shows but, thanks to Covid-19, there won't be a show this year.

Brent also visits other knife makers, such as American Jerry McClure, with whom he spends a week each year.

He reckons knife-making, and

esteem for it, is taking off big time in New Zealand.

In a world of cheap tat, there's a growing appreciation for something made with skill by hand — something that delights the eye, that is also a joy to hold and handle. ►

Workshop full of tools

Brent's workshop occupies the double garage under his house. Jerry's workshop is about four times the size of Brent's, but Brent's is just about big enough for an impressive array of machines, to which he is still adding. There's no room and not enough stud height for a CNC mill, though. Brent's goal is to set up a machine for each step of the process — or perhaps two jobs, if changing tools can be done quickly and easily.

Brent's problem is that he can't make enough knives to satisfy demand, so we're pretty lucky that he's agreed to make one for us. When he retires from his nine to five job he can really set about catching up on those back orders and go large.

Popular knives

Knife makers will tell you that there's almost an insatiable demand for large hunting or preppers/survivalist knives; big knives, with vicious-looking curves — the *Crocodile Dundee* “Now that's a knife”-style of knives — often with added serrations, for ripping through dragon scales, perhaps.

Brent makes some of those too, although his knives generally do

without the serrations. He says quietly that they don't really do a lot. He also makes the seriously wicked British Commando-style Fairbairn-Sykes fighting knives and large hunting knives in six- and eight-inch blades. He named his design the ‘Ranger’ after a customer and friend who was an actual ranger — a member of the US Special Operations Light Infantry division. He has built quite a following among members of the US military and police forces for his knives.

A wall displays templates for around 40 different knives, and on the day we visited there was one on the drawing board.



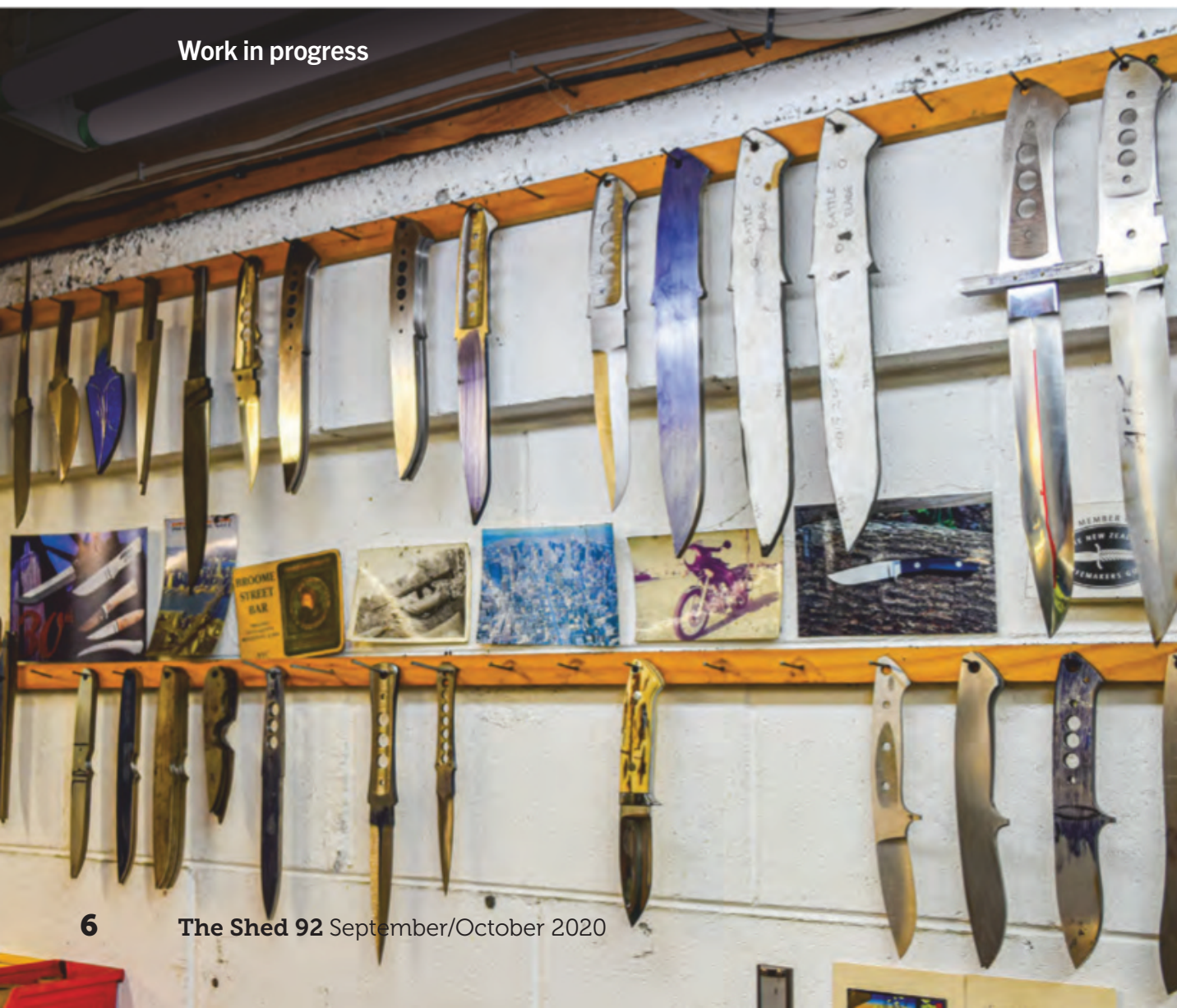
Another design on the drawing board

A style for the good keen bloke

Brent is best known for a style of knife that's much more suited to New Zealand huntin' and fishin', where fighting a bear or cutting off an assailant's arm isn't high on the list of requirements.

He visited legendary US knife maker and mentor Bob Loveless in his workshop, and has made his own version of the Loveless Drop Point Hunter. The ‘drop’, or ‘dropped’, point describes the curve from the spine or back of the blade down to the point, which brings it more in line with the centre of the knife. Brent's version is called the

Work in progress



Part of Brent's collection; the pair of scales in the front are a cross-section of petrified mammoth tusk





“It makes the knife nice and light and lively; it just works”

‘Springbok Hunter’, in acknowledgement of his South African origins.

You can see subtle differences in the profile of the two versions. Brent starts the top and bottom curves of his knife closer to the tip, and the handle is slightly larger with a fuller belly — but it’s what they have in common that puts Brent in line to join the top echelon of knife makers; people whose knives command tens of thousands of dollars among collectors.

That is the degree of craftsmanship involved. Most people know to look for telltale gaps to assess the quality of a knife. Brent carefully machines the guard between the blade and the handle to be a super-close fit on a notch in the ‘ricasso’, the unsharpened flat bit behind the blade. However, moisture could still get in there so, like Loveless, he solders that join.

Weight in the correct place

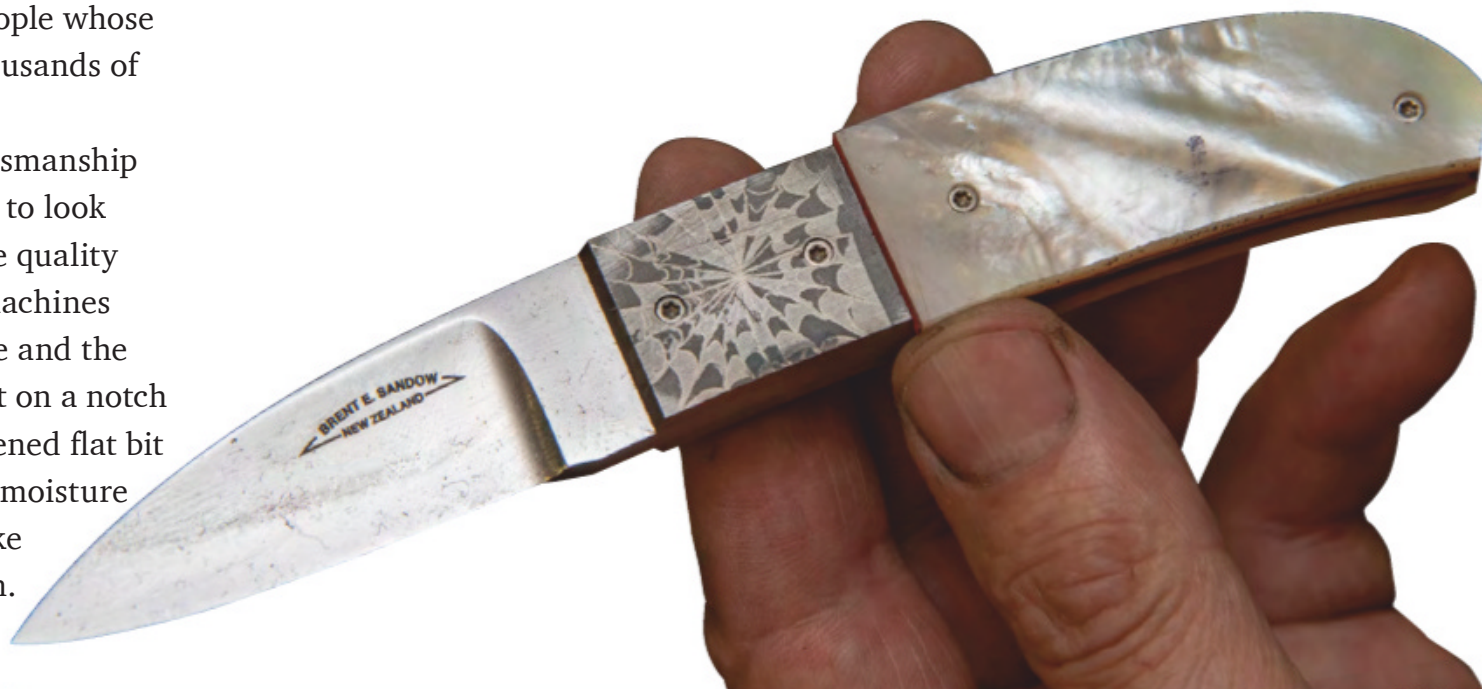
A look along the spine of most knives will quickly reveal an obvious sign of quality: whether the ‘tang’ — the bit of the knife in the handle — is tapered towards the tail. That’s done to save weight.

A high degree of thoughtfulness goes into Brent’s designs. He grinds hollows into the tang, also to save weight.

He says that, rather than balance at the guard, the handle should be lighter than the blade.

“It makes the knife nice and light and lively; it just works,” he says.

Use a knife for several hours and any extra weight will count against it. If it’s not comfortable in the hand in a variety of grips you’ll develop sore spots. ►



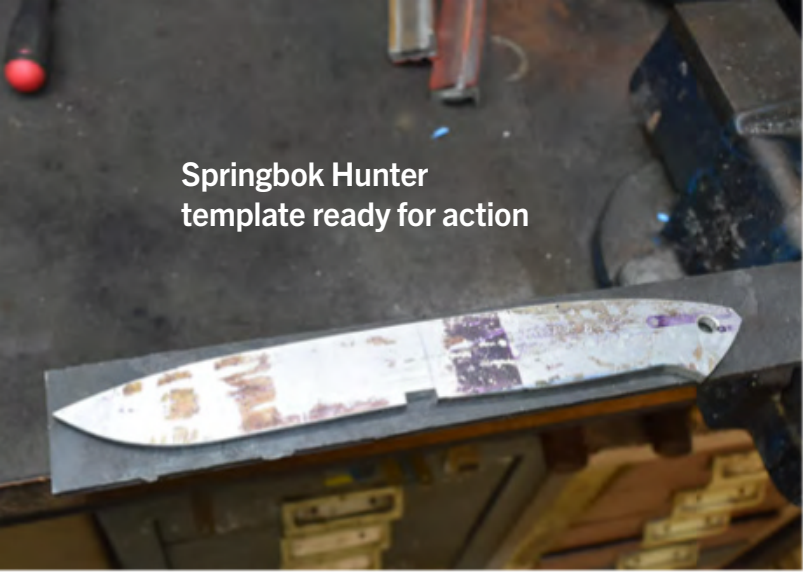
Exotic handles



Most buyers in the market for a quality knife want something special on the handle. Exotic woods include bird’s-eye maple, burr walnut, snakewood — which has an uncanny snakeskin pattern and grows only in a narrow band in Central America — amboyna, and lace oak. New Zealand has some funky woods too, but Brent tends to stick with the woods that have name recognition and a ready market in the States.

Much more popular, however, is giraffe bone, which is finer and denser than cattle bone and takes dyed colour nicely. Further upmarket is walrus tusk, which has a lovely creamy colour, but perhaps most exotic of all is mammoth tusk. This can have a coarsely ribbed and coloured outer ‘bark’ you might want to show, so you have to remember to shape those pieces from the inside before you attack them too hard with the grinder. Brent has boxes of scales in all kinds of materials ready to go.

Some of these materials are easier to work with than others. One wood, cocobolo, can give you a nasty rash, and mother-of-pearl is poisonous, so you have to work with full personal protective equipment (PPE).



Springbok Hunter
template ready for action

The steel

Brent buys his steel, usually American-made 154CM stainless steel. He likes Japanese ATS steel, but that's harder to come by. Most collectors favour highly polished stainless steel over high-carbon steel, which can be better at holding an edge but is prone to staining. Brent gives people what they want and that highly polished shine shows his skills to best effect, so he is happy to oblige.

To some people, making a knife can be as much about forging the steel as turning it into a knife but Brent says a big stamping machine would not go down well with his suburban

neighbours. So for now he's confining his forging to his reputation for making top-class knives.

He reckons that some people can get overly fussy about the type of steel because the end result depends just as much on getting the heat treatment and edge geometry right for the desired function. Different grinds suit the different different steels, and the use to which they will be put. He uses D2 steel, a tool steel, for Fairbairns and

He reckons that some people can get overly fussy about the type of steel

tactical knives. They are often finished with an acid etch, which looks mean and won't catch the light at night, to give away your position.

Cutting the blank

At this point you might be hankering to see or handle some of Brent's knives but such is the demand that his knives are thin on the ground. The good news is that, when we visited Brent, he walked us through the process he uses to turn lumps of steel into works of highly functional art.

The first step is to roughly cut out the knife's profile. Brent selects one of his templates, a Springbok Hunter, clamps it to the stock, and scribes around it. Then he stacks five or six steel blanks together, drills through them, and pins them together with brass pins, simply to speed up the process. This way, he can roughly cut five blanks at the same time on his bandsaw. It has a bi-metal blade with both 18 and 14 tips per inch in sections. He takes the blanks to one of a row of finishing machines to grind the profile down to the line scribed earlier. ►



Blanks are stacked and pinned so four can be cut out at once

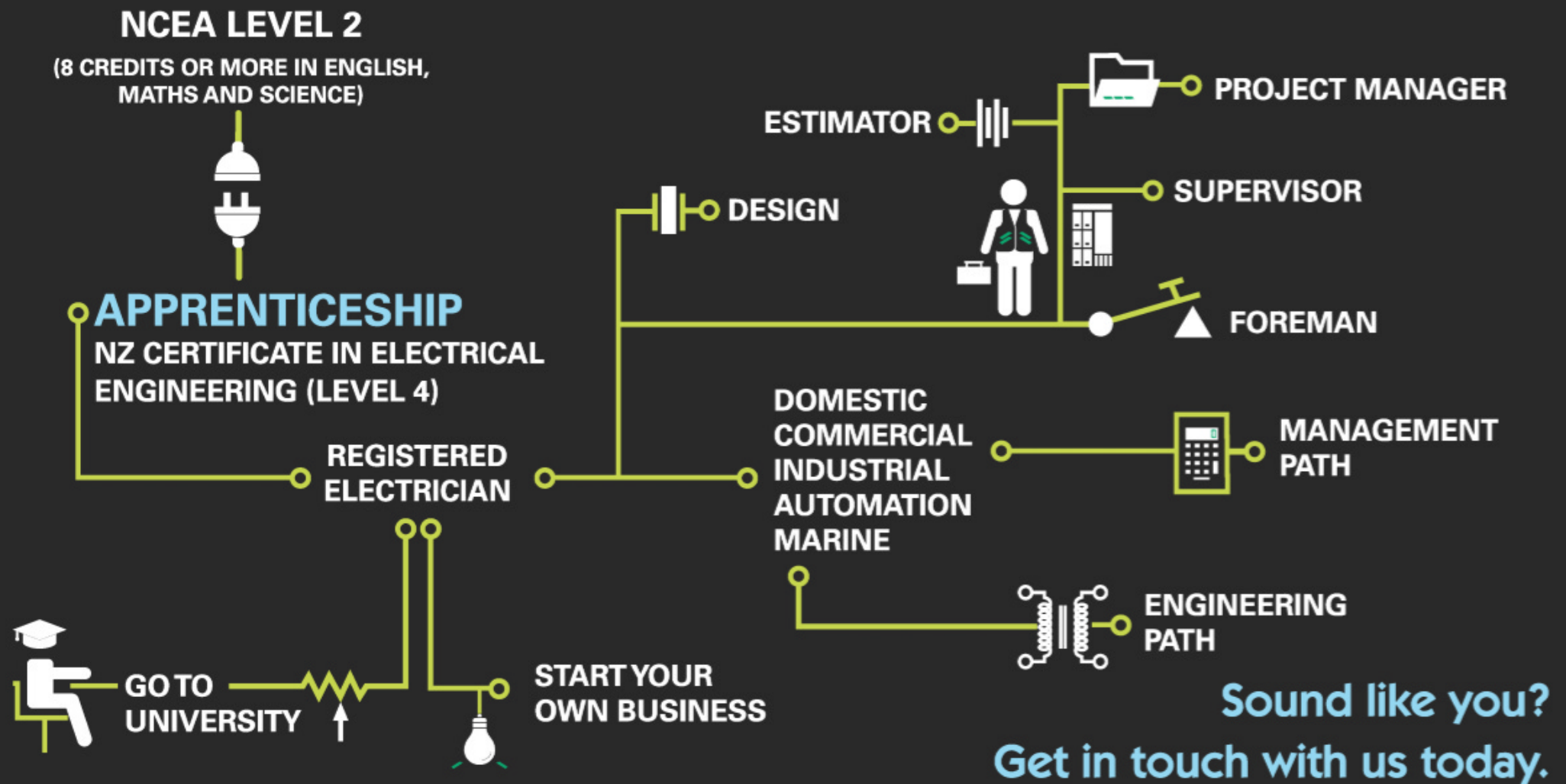


The pattern is
roughly cut out
on the bandsaw

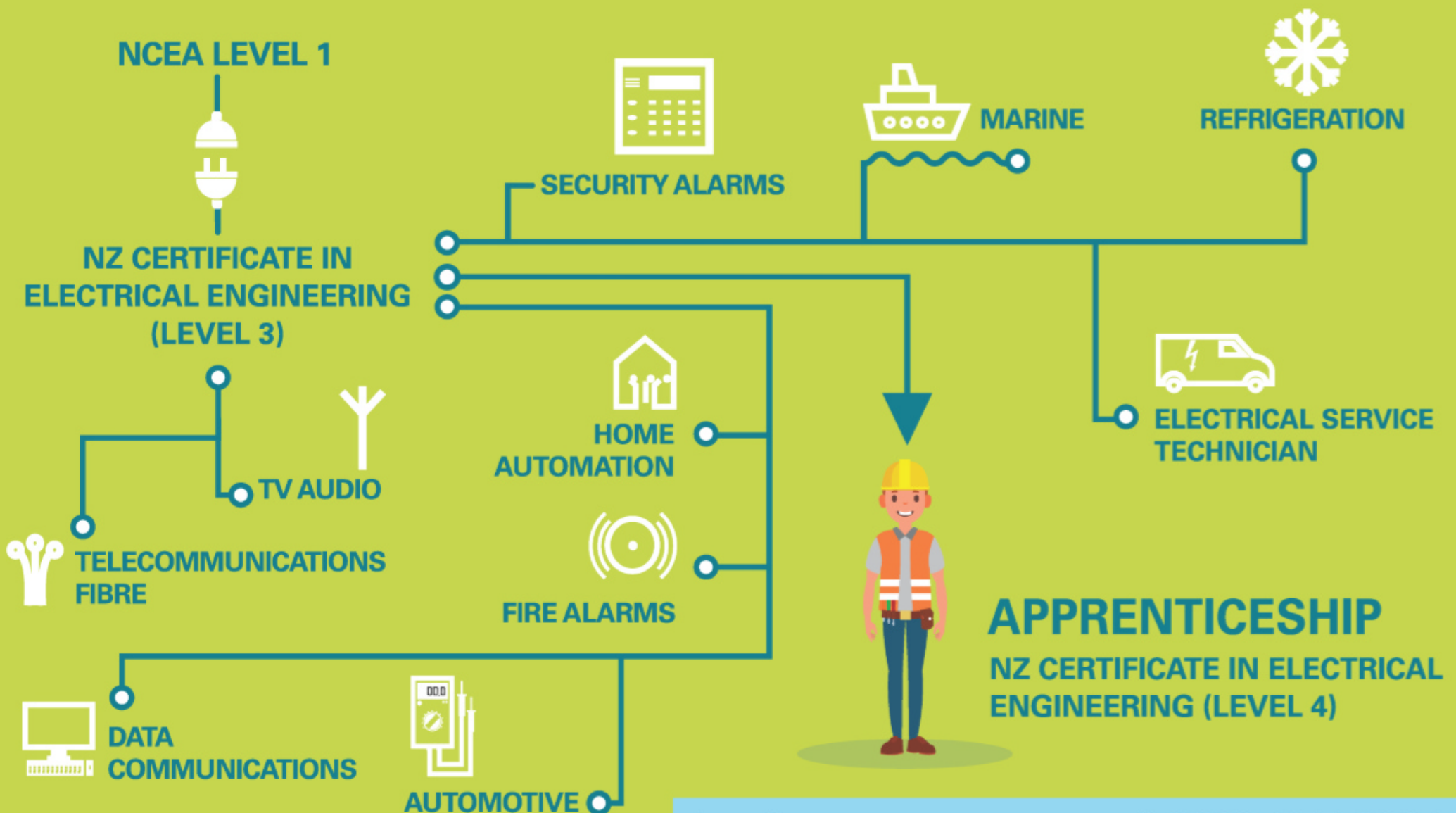


Scribing around
the template

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Brent grinds to the line

Forming the blade

Brent says 90 per cent of the blades he makes are hollow ground. He scribes a centre line along the narrow edge of the piece with a vernier caliper then starts to release the knife from within it. Working against a wheel is a neat way to remove material to taper the 5mm wide bar down to a cutting edge. And, of course, that curve looks great and catches the light beautifully, especially on a polished blade.

Hand and eye skills come to the fore here. Brent selects quite a slow speed on Attila, lines the blade up, and takes a careful full pass along the length

of the blade. He dips the blade in the bucket and inspects it at every pass.

“It’s important to work slowly as the blade has been heat treated,” he says.

He works his way through 120, 150, 400, 1200, and 3000 grit for the blades that are polished like glass. For blades with a satin finish, he still takes them to this level to remove any imperfections then works back down through the different grits to get the satin finish grind he’s looking for. He also grinds hollows into the tang, to remove weight. These hollows will be filled with epoxy resin when the handle ‘scales’ are fastened on.

“It’s important to work slowly as the blade has been heat treated”



Grinding the blanks

To shape the rough-cut blank more accurately to the etched profile, Brent heads to the row of grinders or finishers in his ‘dirty room’, which is sectioned off and comprises about a third of the garage.

Brent has names for all his machines and tells us the name as he heads to each device in his workshop. If he’s doing one knife he’ll use Attila, a favourite belt grinder he made in South Africa — one of two machines he brought with him when he immigrated 20 years ago. However, when he’s got a block of blanks he takes them to another machine where he can use a flat section of the belt, instead of grinding against a wheel. Next to that is another belt grinder running horizontally. It has a small-diameter wheel for the tight curve inside the butt of the handle your little finger rests against.

At this point, the blades are separated and sent out for heat treating. This hardens the steel so it will hold an edge.



The taper in the tang means the edge of the scale against the guard can't be cut at 90 degrees



The two right-hand wheels rotate in opposite directions

Grinding the taper

Next, he grinds the taper on the tang. He carefully wraps the blade in masking tape to avoid marking it and make it easy to handle. He uses a flat grinding disc; however, to avoid the bias that would inevitably result if he just flipped the knife over and ground the other side with a wheel revolving the same way, he has two grinding wheels next to each other, set up to rotate in opposite directions.

Twenty years into the process, Brent is still refining it. He is making a small

tilting magnetic table, which will sit on the table on his surface grinder. That will allow him to place a blank down on that surface, tilt it to the right angle, and grind off material to a preset level, so he won't have to grind the taper by eye.

With the blade still wrapped, the next step is to bead blast the handle. This helps create a better surface for the epoxy glue to bind to when the handle is fixed. There's no way a Sandow knife is coming back because the handle fell off! ►



A cork with a brass pin in the end holds the tang against the grinding wheel

Raising the game



Alongside his hopes for a regular local knife show, Brent supports the creation of a New Zealand knife makers guild. He says people are becoming more discerning and willing to pay higher prices for good craftsmanship. He also believes that substandard quality or poor service could taint the country's reputation internationally. A guild would both encourage greater quality and provide some assurance to buyers.



Cutting the slot that locates the guard

Cutting the slot

Brent then takes the piece to a milling machine to cut a short slot — about 4mm deep and 6mm wide — in the bottom edge that will locate the guard. Whatever the fore and aft dimension of the guard slot — I didn't measure it — Brent takes a piece of metal and grinds it to exactly that thickness on the surface grinder. The machine has a magnetic plate, making it easy to get the workpiece exactly flat and hold it.

He then clamps this piece upright in a milling machine called Manfred. He moves the guard piece slowly into the cutter, which makes the precise cut, turning the rectangle into a U-shaped oblong that will slot into the cut in the

bottom of the knife and finish level with the spine.

This substantial and elegant old Steiner milling machine, with its very quiet motor, looks virtually brand new. Brent says it was shipped to Singapore with a lot of other tools after World War II as part of a scheme to train apprentices but it was never put into operation. The machines sat boxed and unused for decades. A friend of Brent's acquired this one but had little use for it so Brent got it. Now Manfred has an easy life, just cutting slots for guards.

Brent fits the guard into the pre-cut slot on the knife.

The next job is to drill a hole through

the guard and the ricasso to take an alloy pin. The pin, cut slightly oversize, is tapped through. Brent then turns the knife on its side and puts the pin in a press between jaws designed specifically for this process. It compresses the pin in the hole, locking the guard to the knife. Brent solders the imperceptible gap between the guard and knife then grinds this guard to the shape he wants. ►



Compressing the pin in the guard



Ready for assembly and pinning



Manfred cuts the slot in the guard

Tools for Africa



Brent's workshop would be an Aladdin's cave to most sheddies. The first thing that greets you is a row of four drill presses in different sizes. Then there's a hydraulic press, one of two presses, and a beautiful green milling machine. On the other side is the surface grinder, a large compressor, and two lathes. On the wall above to the right is a double row of knife templates. Above the work bench, also on the right, is a shadow board of hand tools and a double row of Grace screwdrivers, lovely wooden-handled things with square black shafts — gunsmith's tools apparently.

Brent got into making knives after seeing some nice knives for sale at a show. The 16-year-old couldn't afford to buy one, so he decided to make his own and roped his dad, a skilled metalworker, into the task.

Around the corner, tucked behind the walled-off dirty room, is a tall glass cabinet with part of Brent's collection of knives from some of the great makers around the world. In it are a couple of knives his dad made. They bear a similar logo, but of course a different name. There's also a Brent Sandow knife; the country of origin on the logo is South Africa — not yet New Zealand.

Beside that is a desk where Brent does fine work on a cloth-covered table, or works through the design of new projects. Between a lathe and the compressor, on the left as you walk in, is the entrance to the dirty room. In here you will find vertical and horizontal bandsaws, four flat sanding disks, and Attila the belt sander. Attila has a sliding pulley system so Brent can use a variety of different-diameter belts on it, but he's added other belt sanders of different dimensions to speed up production in line with his guiding principle of one tool per job. They nearly all run on three-phase power with some kind of variable speed motor or drive controller. The latest (fifth) belt sander was acquired as it is a quick-change artist. Brent will allow machines to do two jobs if they can switch roles quickly enough.



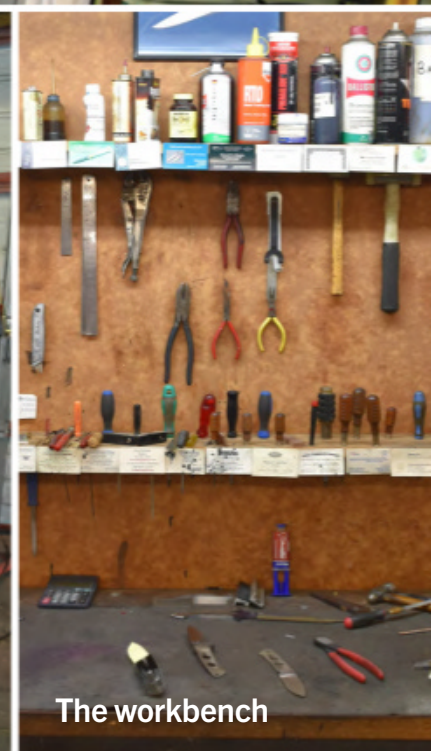
One of two lathes



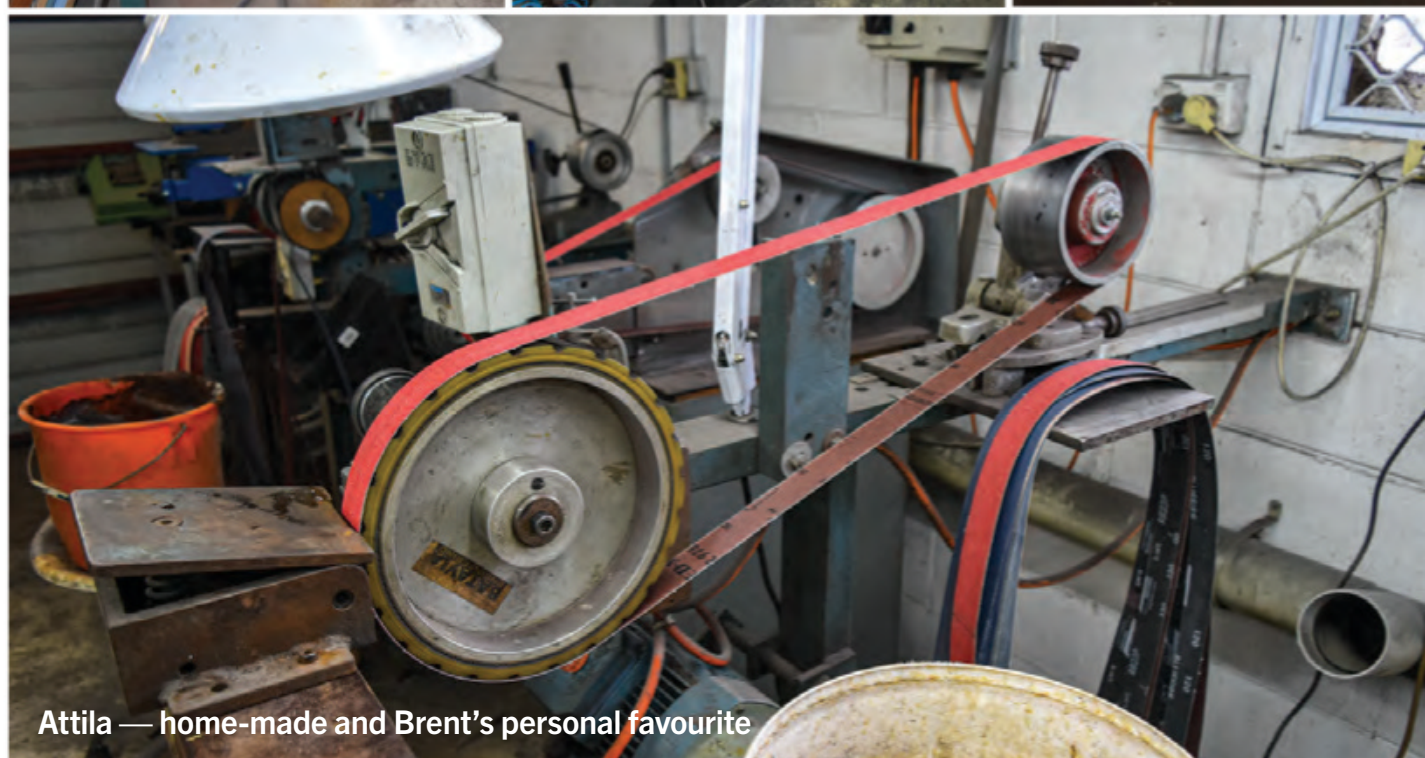
Media-blasting cabinet



The latest addition



The workbench



Attila — home-made and Brent's personal favourite



Grace screwdrivers

Handle with care

The choice of handles is as broad as your imagination: good old beef bones or deer antler can be applied to lesser knives but collectors prefer more exotic bones and teeth — or, less often, fancy patterned woods. The knife we have followed through the process is a Springbok Hunter and many styles of handle will suit it.

The best scale material for these practical knives is Micarta, which is made of linen, cotton, paper, or other woven or fibrous material set in thermoplastic resin. It was originally designed as an insulating material and is still used in electrical applications. It is totally stable and waterproof, can be shaped easily, and retains good grip when wet.

While a lot of knife-handle materials can be bought ready cut into pairs of blanks, an important job at this point is to cut the angles where the scales will butt up against the guard. As the tang is tapered, this angle is a bit more than 90 degrees. Once they are sitting snugly on the tang Brent binds them in place. The next job is to drill the holes through the handle scales and the blade. It's all done at the same time to make sure they all align nicely.



As the piece is now getting a bit bulky, and the handle scales may be irregular shapes, Brent clamps the knife using the last remaining square bit of it, the ricasso on the blade side of

the guard. Then he drills the two holes — usually; more if he is using smaller pins — for the bolts that will hold it all together and one for the lanyard hole in the heel of the knife.

A jewelled folder



Designer Jerry McClure, maker Brent Sandow



Rough-cut rubies

Among the treasures in the display cabinet is a rather dramatic little folding knife with a carbon handle, the carbon interwoven with sparkly coloured threads. When opened, the knife reveals a star-patterned dark grey and black Damascus blade. It glides open and clicks into place as a spring steel plate locks in behind the blade. This is the one-handed Linerlock mechanism invented by another celebrated knife maker, Michael Walker. It's no wonder the action is so smooth. The blade is turning on eight jewels. Just as you find jewels acting as bearings in the better mechanical watches, this knife also has jewels locating and guiding the folding blade. Brent hauls out a little bag of dusty pink dots — tiny rough-cut rubies. They have to be faceted before they can go into knives.

Brent made the knife under instruction from Jerry McClure in Oklahoma, using some of his steel and following his design. Jerry also spent a week here with Brent. As the little bag indicates, Brent plans to make a few more of his jewelled folding knives — maybe next year.



Bolts and bolt holes

The next step is to drill a countersink in the bolt holes on the outside of each scale to recess the bolts into them. There are two main types of mechanical fasteners for knives. Loveless bolts have two collars, like rounded-off nuts.

You simply pop the collars into each countersink, screw the bolt into them, and they will pull up tight. Then you cut off the head of the bolt and through the protruding collars, fairly close to the surface of the scale. They are then ground down when shaping the handle.

Loveless bolts have a distinctive look as you can see the two parts, looking like concentric circles. Sometimes

a fine gap is visible on one side, caused by the thread. It is known as 'the Loveless smile'.

Brent uses Corby bolts. He prefers the slightly smaller diameter and the cleaner look. The Corby bolt is slightly more complicated. One end looks like a bolt with an oversize slotted head. Its mate is similar but the shaft has an internal thread. You have to take care you don't countersink too deeply in the scales or the bolt will run out of travel before it has pulled everything together. No such worries for someone as precise as Brent. The main advantage of a Corby bolt is that, once ground off, it is plain and smooth. You can't see the inner circle of the bolt

within the collar, and no dirt can get in. The scales are glued and screwed on. Brent uses good old Araldite or Zap epoxy, enough to fill all the voids.

With the bolts ground off, from here on in it's a finishing process: shaping the handle, applying whatever coating is appropriate, refinishing the blade, and polishing.

This is clearly the most satisfying part for the artisan knife makers. They have crafted the shape from their design, bringing it forth from the materials they have put together, and raising the whole thing to the standard they have set for themselves. I looked at one blade that I thought was nearly finished, though it had yet to get handles. ►



Ever-finer grit belts and a steady hand create a high shine



A long way to go yet

“God, no!” says Brent. “This needs a lot of work yet; there’s still some scratch marks in it.”

I had a look and could see nothing. I got out my glasses and after a moment or two I thought I could see something hundreds of times smaller than a hair, but couldn’t be sure I hadn’t imagined it. It would get more passes with the finest grade belt plus a lot of time on

the buffer before it was finished.

Brent has firm cautionary words about using a buffer. At this stage the knife will have a keen edge and a sharp point that can easily catch in the soft compressed fabric of the buffer. He says the wheel spins downwards, so you should always work below the midpoint on the bottom side of the wheel. If the blade catches it will go down and away. If you work above halfway ... he holds

the knife to demonstrate and asks, “If this catches, where is it going to go?” You can paint your own picture.

Final touch

We didn’t see this process, but there’s one final step. The name ‘Brent E Sandow’ is acid etched into the blade in an arc over the words ‘New Zealand’.

This branding is vital for building a name for Brent among collectors and the global cutlery cognoscenti, but it also means something to Brent himself to have created such an artefact.

“I just enjoy creating something with hand and eye coordination that looks good and feels good,” he says, “something that at some time in the future someone will pick up and go ‘Who is that guy?’” 📄

Subscription prize

If you would like to get your hands on one of Brent Sandow’s knives then you are in luck. Brent has kindly donated our subscription prize for this issue so we have a Sandow kitchen knife to be won by a current or renewing subscriber. See *The Shed* subscription page (page 34) for more information.



Knives made by his father feature in Brent’s collection



SHOW YOUR SHED TO THE WORLD!



We are now calling for entries for your shed to be featured in our **2021 The Shed Calendar**. The calendar will accompany the Jan/Feb Issue 94 on sale November 30.

We can use our shed photos of course but we would rather use yours.

For more information and to enter your shed shots visit [f /theshedmag](https://www.facebook.com/theshedmag)

The prize for getting your shed photo chosen for the calendar is a one year subscription or extension to the magazine and bragging rights for all of 2021!

THE WHERE DREAMS ARE MADE REAL
Shed



WORKSHOP BUILDS A BETTER ECONOMY

Tim Boyd, the creator of The Warren, filling the gap left by canned night-school classes for adults

IN A COSY BACK ROOM, A REVOLUTION IS FOMENTING, ONE RABBIT CUT AT A TIME

By Ian Parkes

Have musings during Covid-19 isolation caused you to think you might like to do something different, something creative, something with your hands? If getting into bit of woodwork appeals now but your hand skills are rusty or non-existent, where do you learn, since the previous government canned night-school classes?

One answer is to get in touch with Tim at The Warren in central Auckland. Tim Boyd is a plumber and gas fitter by day. He's also a man with a vision and, being of a practical bent, he's putting it into action. He has created The Warren, a workshop where those wanting to get hands on with something new can take classes in all kinds of woodworking and other artisan crafts, then rent bench space as required to come in and make stuff.

This shared resource idea sounds a bit like Menzshed — but only a bit.

While the Menzshed movement is geared towards spending time usefully and in company, The Warren aims to be the foundation of a whole new economy.

Warm and inviting

For now, The Warren is a cosy narrow shop, fitted out in a wonderfully inviting style with materials salvaged from a Devonport villa, tucked away in Cross Street, behind Auckland's Karangahape Road.

Tim spent eight months creating the workshop, and the workshop and classes have been operating for 18 months. He has self-funded the project, and even now that the courses run by respected craftspeople and artists are generating an income he's putting that money into new top-shelf tools and equipment, such as a table saw, thicknesser, and routers.

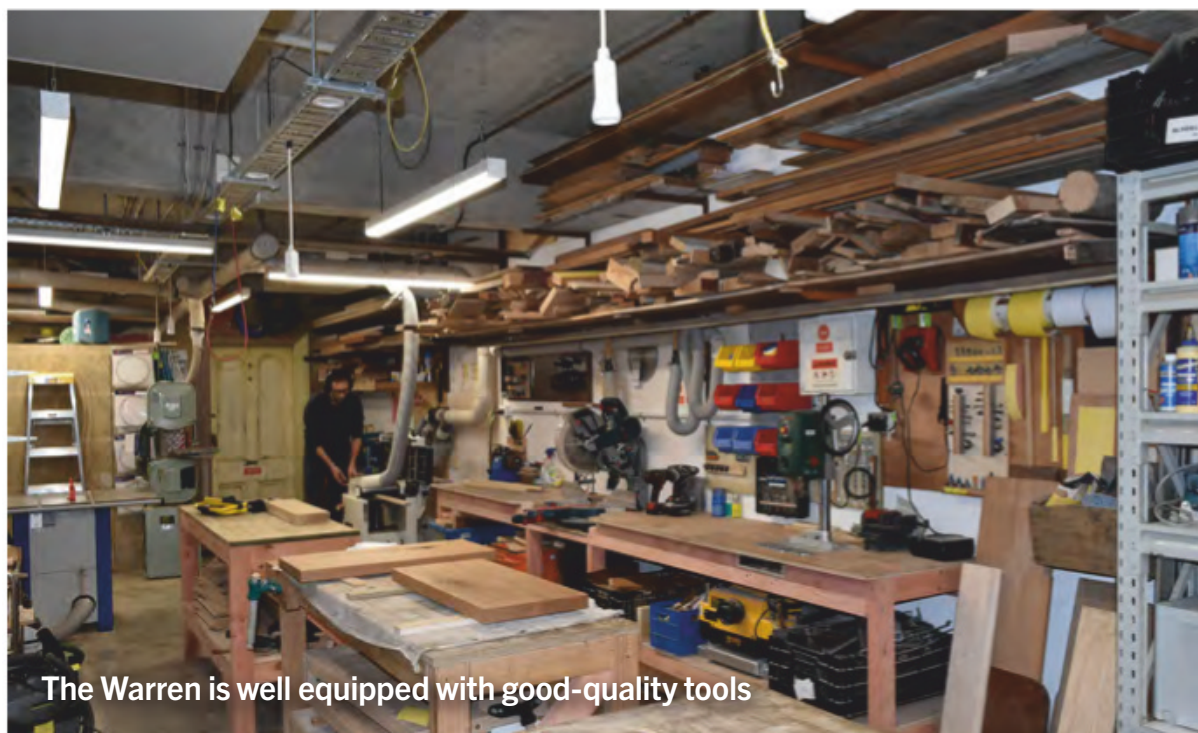
Tim doesn't subscribe to the old saw that a good workman doesn't blame his tools.

"Good tools make a huge difference," he says.

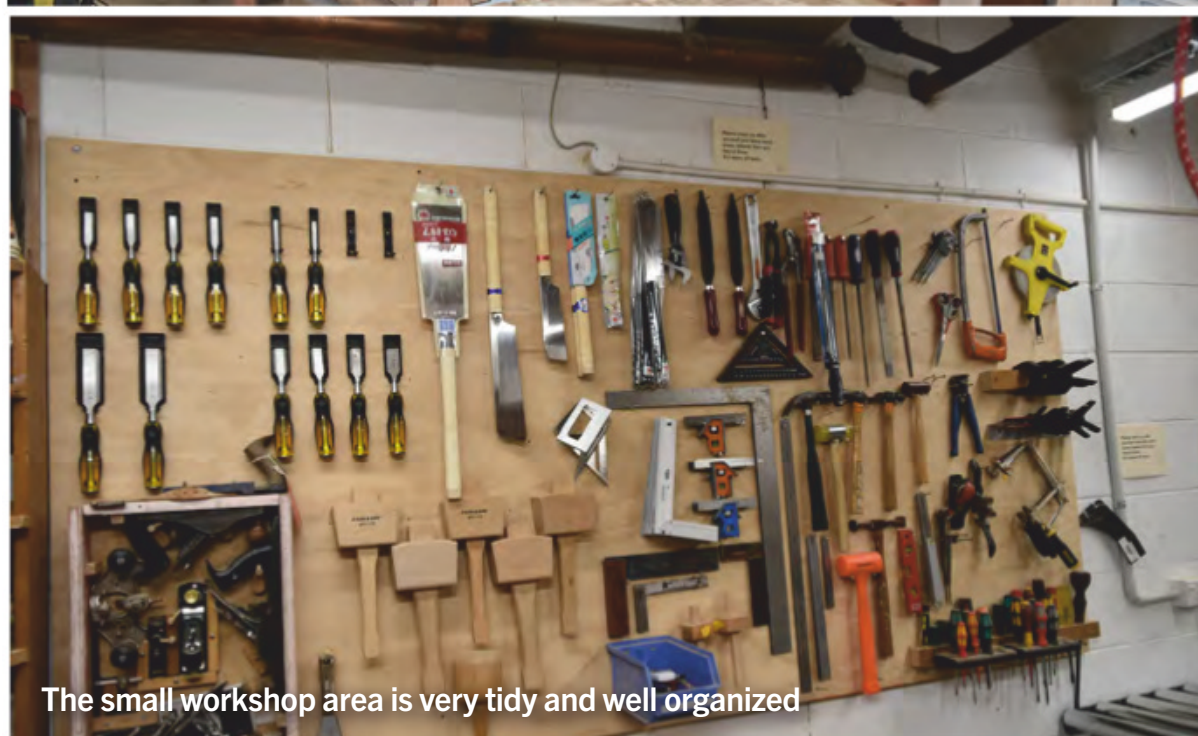
Nearly 200 people, half of them women, have attended courses and 210 have been inducted into the workshop, which operates on a three-tier safety system, upskilling people to work unsupervised.

When we visited, a woman popped in to check the place out before her course started the next day, and a local craftsman was in to use one of the tools that he doesn't have in his own workshop.

They are both examples of the green shoots that Tim hopes to nurture into a movement. The Warren is not just about running courses. He wants people to learn and share skills, see ways to synchronize their efforts to create something larger, see possibilities in both the new (often salvaged) materials and the offcuts and waste, to grow a community and a whole new circular economy.



The Warren is well equipped with good-quality tools



The small workshop area is very tidy and well organized

Sowing circles

Tim cites examples of furniture that is built to last, a chair or stool that can be repaired — classes for both — instead of junked, or repurposed at some time in the future and throughout its life. More and more people will be learning, appreciating, and sharing the ‘Way of the Chair’.

He sees The Warren concept expanding into metalwork and textiles, and into new locations. Similar movements have taken hold in other world cities. In a proposal to council funding-organization Ateed, which he hopes will accelerate the project, Tim cites a Sustainable Business Network report, *The Circular Economy Opportunity for Auckland*, which claimed \$8.8 billion in additional economic activity, and a reduction of 2700 kilotonnes in CO₂ emissions, could be achieved from shifting from a wasteful make-buy-junk linear economy to a more sustainable circular one.

It’s tempting to say that the words tumble out of Tim as he shares his vision, but his words are measured, as you’d expect from a skilled tutor. He’s organized, articulate, determined, and inspiring.

Tim is slightly troubled by the fact that the courses are not cheap. He’s not paying himself a salary yet, and he’s still building the foundation of a whole economy, but he says that after lockdown, when many people clearly realized there has to be a better way, courses filled fast. People have come from Northland, Coromandel, and Taranaki.

Seeing the gap created by the government’s killing off of adult education was one of the reasons that Tim was spurred into action. It’s clear his vision has every chance of taking hold and helping create a saner future for many of us.

Head online to thewarren.nz/ for more information. 📖

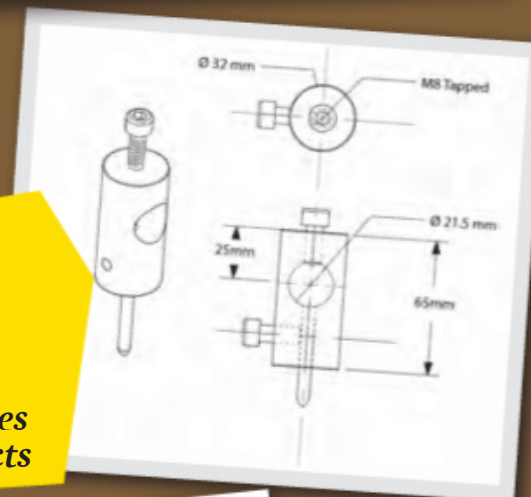
WHAT’S HAPPENING ONLINE AT THE-SHED.NZ?

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

Watch a video of Dan Cowper from Issue No. 90, telling us how he makes his amazing Cowper trucks



Learn how to make a set of trammels for ensuring accurate curves in your projects



Meet Malcolm and Bruce Anderson, who have managed to combine all the evidence of their passion for motorcycles under one roof

Construct this table and chairs set for the toddlers in your family



Letter
of the
MONTH

LOOKING FOR A GOOD HOME

I retired from general engineering a few years ago and have gradually got rid of different bits and pieces. Remaining is some of the equipment I used to build a pneumatic device requiring a computer programmer.

Naturally I have tried to sell it but have had no offers so I'd like to give it away. It consists of a SMC ECC50 Programmer and is sitting in a dusty plastic box in my shed.

The box also contains an extender, a bunch of small rams and actuators, plus a CD of instruction manual, a bunch of used switches, a voltage dropper, and Lord knows what else.

This bunch of equipment would be extremely useful to someone building a pneumatic device and I'd like it to go somewhere where it will be appreciated. There are only two conditions.

One is that it be picked up from my home near Pukekohe and the second is that the new owner can show he/she has some important project it is required for.

Deigh Davies

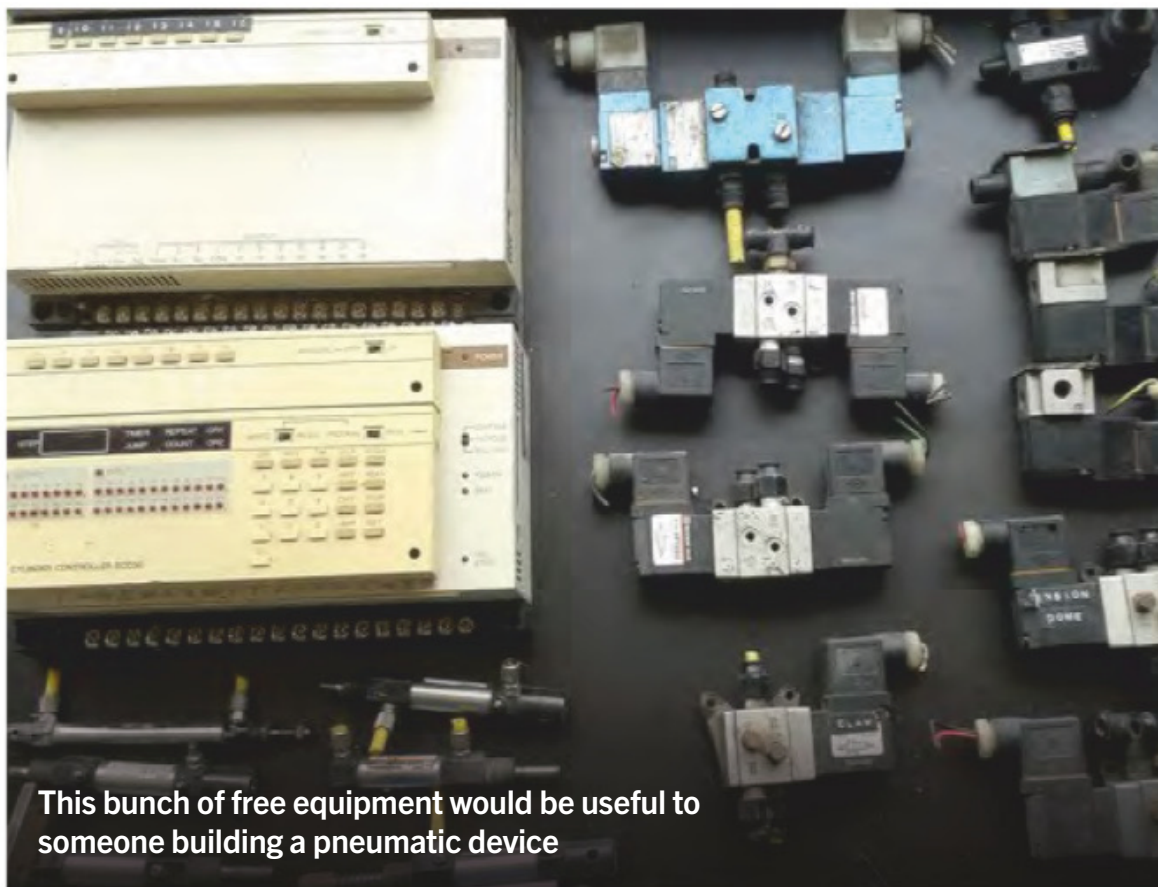
deigh123@gmail.com



LETTER OF THE MONTH PRIZE

Every issue, our Letter of the Month winner will receive a gift bag of great Selley's products. This month's prize pack is a selection of Selley's products to clean your well-used barbeque. Remember, "If its Selley's it works".

Letters should be emailed to editor@theshedmag.co.nz, or posted to Editor, The Shed, PO Box 46,020, Herne Bay, Auckland 1147.



This bunch of free equipment would be useful to someone building a pneumatic device

BEAT THOSE CRIMS

Mark Beckett's article (May/June 2020, Issue No. 90, page 78) on fitting a GPS tracker provided an excellent introduction.

I have had a GPS tracker on my motorcycle for years, providing location information on trips. Then it happened — the motorcycle was stolen. The location information showed it had only gone a few kilometres. Once the police recorded the vehicle as stolen, they were able to enter the property and take possession of the bike.

Although recovery was within the 'golden hour', the bike was already being dismantled. The GPS tracker had been found, fuse and SIM card removed, and wiring detached. Fortunately, the internal battery was continuing to transmit the location, even showing the bike was moved a few metres within the property. A good result with recovery of the bike.

A GPS tracker is insurance every motorcyclist should carry, as loading of a motorcycle into a van means it can be gone within a minute, even with a steering lock or chain.

Name withheld

I'm sorry you had that experience but glad they were caught.

The essence of the article was an introduction and to show there are alternatives to some of the more expensive monitoring services advertised.

You are quite correct to suggest:

- the theft can be local
- the theft can happen quickly
- the bike/car can be dismantled quickly.

I would suggest using the 'Parking feature' where the unit will text you whenever it leaves an area — a very useful feature to have and use.

Mark Beckett





EXTREMELY POOR SERVICE

I expect that you will not publish my letter as it is a complaint about your otherwise good magazine. I have been a reader since the outset and have every issue. Recently I had to buy a second July/August issue [No. 91] as my mail order one did not arrive until yesterday. The copies in the shops came out at least 10 and most likely 14 days prior to the mailed copies.

This is extremely poor service considering that your company has had my subscription prepaid for the last 19 months with five to go.

When I phoned to enquire I encountered a very rude woman at your office who claimed that the issues were late due to NZ Post and of course the Covid-19 excuse was also given. When I asked if NZ Post had been complained to about the poor service and delays I was told that I should do that. I point out that it is your company who contracted with NZ Post to deliver

and your firm [perhaps] paid their fees. When I told this woman that I doubted that NZ Post were not fully responsible and it was not acceptable that shops got the latest edition well before subscribers I was asked, Is there anything else? Whilst I was pointing out that I may not renew, I was hung up on before I could finish the sentence.

I now take the issue up with you.

Whoever is the delivery agent, good will toward customers dictates that subscribers should get their copy at least at the same time as shops. In previous years they got it ahead of the retailers. When things do not get delivered on time it is *your* fault. Not the company you choose to deliver. As you know there is a problem then get your material out a bit quicker. You just had a month without interruption to get this issue prepared. You had it ready two weeks early but only for some readers.

2. I am not convinced that NZ Post are responsible for a 10-day delay. I rudely, of course, suggest that the reason is more like that you want the retailers to start selling early so that you can get paid early.

It is no secret that magazine companies have been doing it tough and at least one big one put the skids under itself. Another was rescued by a government bail out. You too will have had a wage subsidy.

3. One other large media company got sold for a dollar the other day. Why? Because its talk show hosts chased away its callers. A bigger reason is its newspaper arm chased away its advertisers. One of New Zealand's biggest magazines went out of business because people got sick of seeing Kerre Woodham, Jenny-May Coffin and All Blacks with babies on the cover. ►

4. Either your company should start thinking better of its subscribers. Or they will go. You have had their money and spent it. At least have the courtesy to give them what they committed to buy. At the same time as casual customers.

5. By upsetting your subscribers you let your team down and all of the hard work done by your writers is lost if people decide not to read it.

6. I do not intend to name the rude woman who I spoke with so that you can give the whole team a shake up.

7. You have four more issues to get out to subscribers on time and get some service going. If you don't I will not renew and I will join the hordes who get their DIY information from YouTube. Magazines are a luxury and as such they are first to be cut from the budget. If I were you I would be hanging on to your subscribers as if your life depended on it.

8. Make sure your boss sees this email. Oh, you are the boss. Would you like a tip for Christmas? Wake your ideas up.

James Parlane, Te Awamutu

Thank you for your letter, Mr Parlane, there certainly are a few issues there for me to address. I will attempt to answer some of them for you to your satisfaction.

First and most important, thank you for your subscription. We appreciate your business and as a business that has been publishing media for 30 years, we value our subscribers extremely highly.

Unfortunately, the New Zealand postal service is not what it once was and it is now a fact that all mail takes much longer to get delivered than it once did. All Parkside Media's magazine titles operate the same way in so much as they are printed and ready for dispatch on a Wednesday. We publish six magazine titles and post several thousand subscriber copies for 49 weeks a year and have done so since 1990.

As the finished magazine product rolls off the presses at the printer, the very first issues are gathered

and prepared for mailing out to our subscribers. This means that by Wednesday afternoon, in Auckland, thousands of magazines in their postal wrapping, postage paid, are delivered to NZ Post for mailing.

Now, it was not that many years ago that Auckland subscribers would start receiving their copy on a Thursday or a Friday. This sadly is not now the case, and it can be up to week for copies to arrive even to Auckland subscribers.

Copies for retail sale are bundled up over those remaining three days of the working week and placed on couriers on Sunday to arrive in store for the magazine's on sale day of the week, Monday. So you can see, subscriber copies get nearly a five-day head start to get to a customer.

Occasionally a subscriber's copy does go astray and occasionally a subscriber's copy will take even longer than usual to arrive at its destination. It doesn't happen often but it does happen and there is nothing we can do about it.

NZ Post would laugh at us if we complained about one missing magazine or a late delivery as the result of a magazine going astray and I believe they should. They provide a service that is not perfect and never could be by its very nature, but I am sure they strive to be the best they can.

It was also very widely reported that the Covid-19 lockdown and various level restrictions disrupted postal and courier deliveries by NZ Post.

The staff member you spoke to and who hung up on you in frustration is that department's manager. Someone who has been in the subscription industry for over 30 years and has run the largest subscription service ever in this country. Our business felt like we had won staff Lotto when they agreed to come work for us in 2009.

I have personally known this senior staff member for 30 years and in that time, I have never witnessed them ever get cross with a customer or ever end a call in that manner. Our entire open plan office was aware of your call at the time and they too were witness to something they had never experienced before.

You have the privilege of being the first customer to have their call ended abruptly in that manner.

It was explained to me that you would not listen to reason or take anything that was being said as an apology from us but NZ Post was at fault and there was nothing we could do. We gave them your magazine to deliver and if it never did arrive, we would always post a replacement

The sad fact is that nowadays subscribing to a magazine to get it first can no longer be the overriding reason for subscribing. These reasons should now be: (1) making sure you receive every issue; (2) saving money; (3) supporting a publication that brings you pleasure and helping to ensure its a continuing local business; (4) being in the draw to win subscriber-only prizes and gifts. See our [Subscribe to The Shed](#) page this issue to see a very good reason to subscribe to the magazine.

Retailers receive a margin of course for selling the magazine, and the price of a magazine subscription reflects us removing that margin and passing the savings on to the subscriber. As a business, we swallow the postal costs and even though we have encountered huge postal-rate increases since 2009, we only increased our subscription rates on our magazines for the first time in 10 years in 2019.

However, Mr Parlane, you are unhappy with our service and we don't want that so I am going to do my best to to make amends and offer you a refund on your subscription — on your remaining five issues, and also to refund you for the extra copy you felt compelled to purchase. Just contact me directly to arrange.

I would advise you to get your local newsagent to reserve you every copy if you wish to continue reading The Shed as this will ensure that you don't miss out. They will be happy to do this for you, as you will be paying full retail price, \$14.95, as opposed to the \$11.50 per issue that you currently pay.

Greg Vincent

editor@theshedmag.co.nz



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Unless you are a world class athlete like Tom Walsh, who can lift 250kg, health and safety recommendations are that two people are required when lifting a 40kg bag of cement.

Tom Walsh

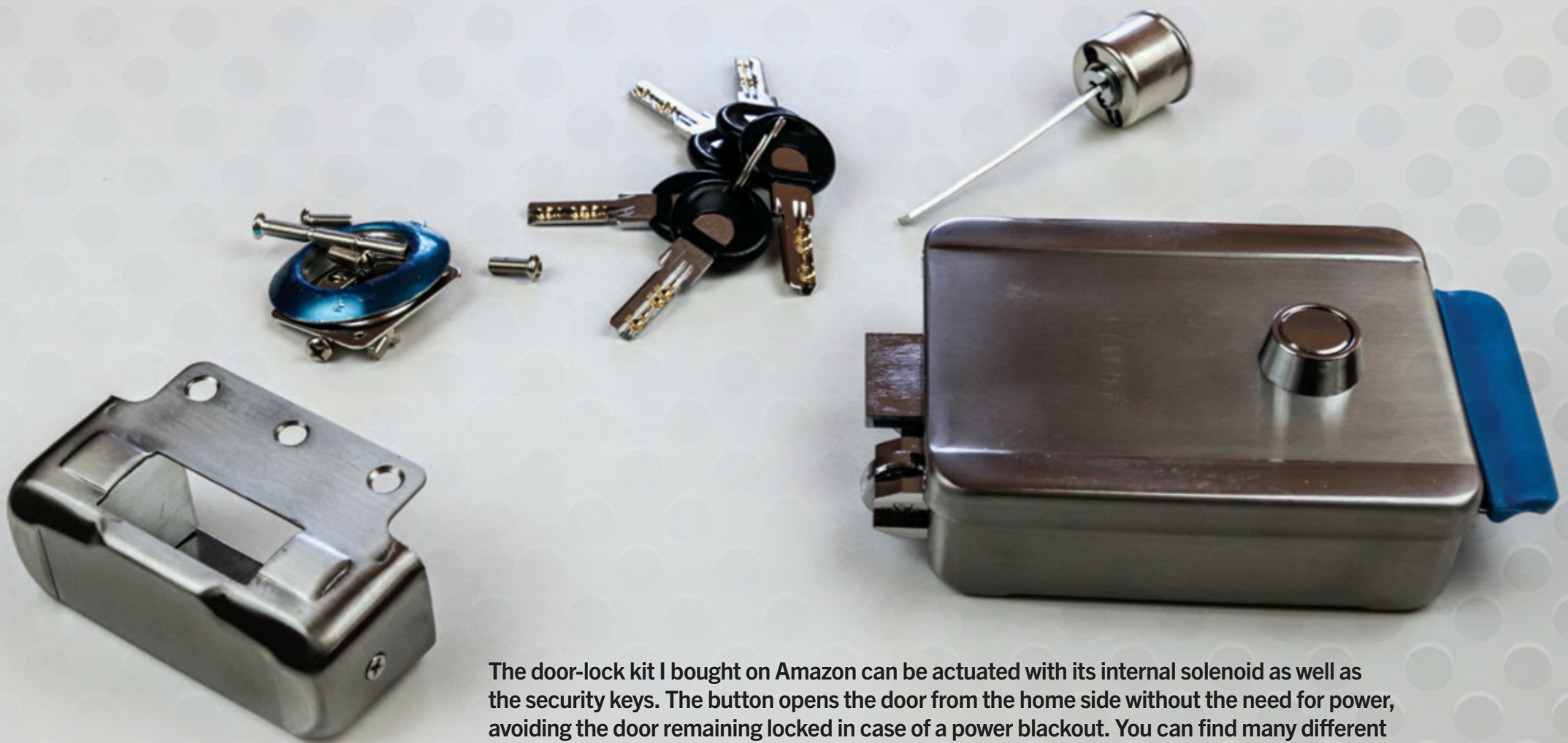
New IAAF World Champion,
Olympian, NZ record holder,
qualified builder, NZCB member
and ITAB graduate.

MAKE YOUR HOME A SMART HOME

PART 2

THIS MONTH'S SMART HOME PROJECT DRAWS ON SHEDDIES' EXTENSIVE SKILLS TO CREATE AN AUTOMATED DOOR OPENER

By Enrico Miglino Photographs: Enrico Miglino



The door-lock kit I bought on Amazon can be actuated with its internal solenoid as well as the security keys. The button opens the door from the home side without the need for power, avoiding the door remaining locked in case of a power blackout. You can find many different models online with similar characteristics; choose the size and design that best adapts to the door that will be automated

The introductory article to this Smart Home series, which appeared in Issue No. 91 of *The Shed*, explained that the projects are electronic improvements for our sheddie homes.

Behind all these projects there is a common thread that connects them all to fully control your home and make it smart. There are also common characteristics in every design: the ability to collect data and provide local feedback automatically as well as to control the home automation remotely.

Trying to imagine all the possible scenarios when designing home automation is pretty challenging. For this reason, I decided to divide the big problems into smaller ones. To do this I borrowed the concept of ‘task area’ from the early 1980s studies on

the applied ergonomics for industrial workers. I divided an ideal home into several ‘operational (task) areas’, identified by specific zones, such as

Behind all these projects there is a common thread that connects them all to fully control your home and make it smart

the kitchen, the main entry, and the toilet, and by homogeneous groups of sensors, such as the heating system, the lighting, humidity control, and so on.

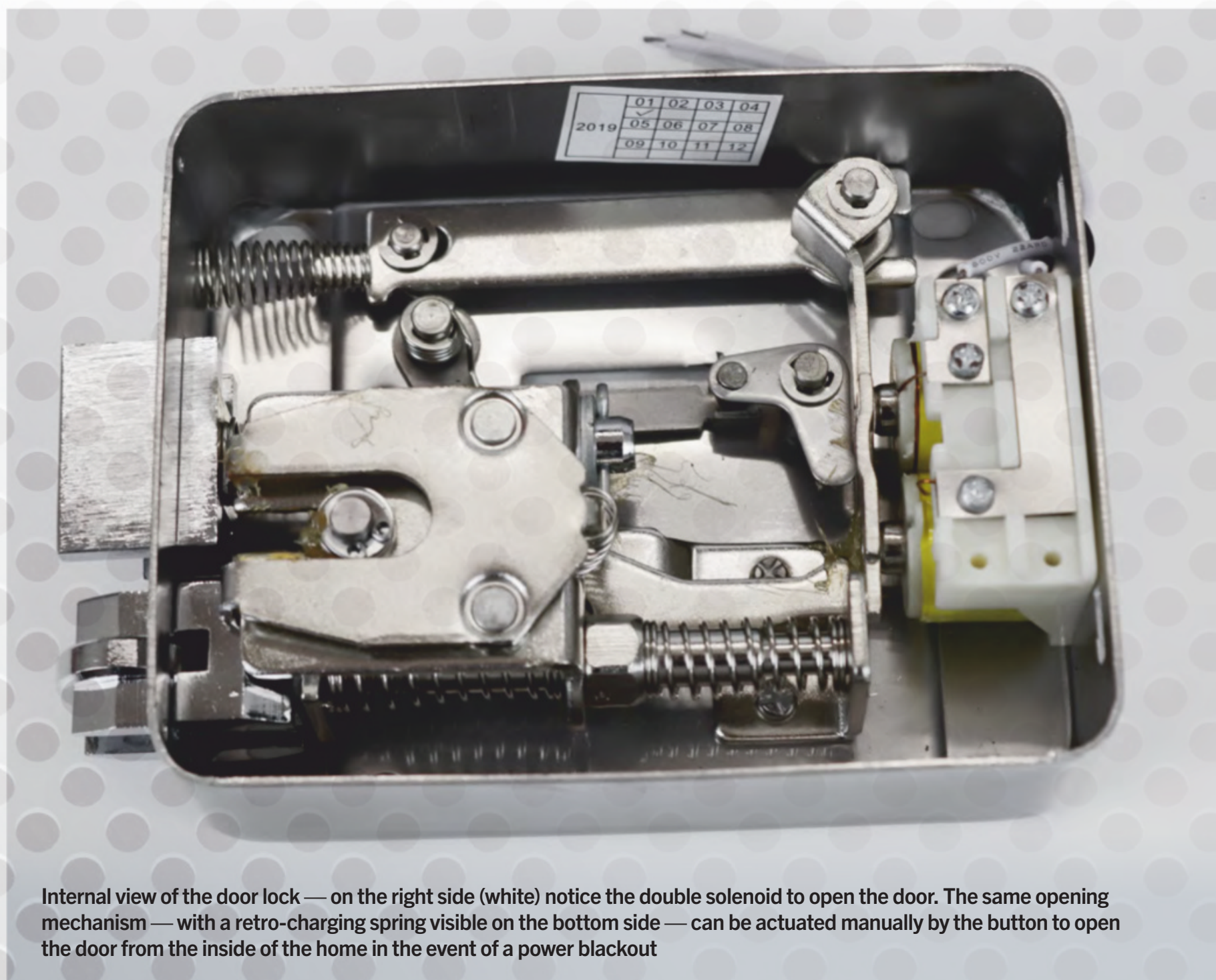
The first area we will automate is the main entry door, where we identify the doorbell, the door lock, and the door peephole.

Let’s start by designing an efficient door opener.

The components

I bought an electromechanical door opener online. It has the characteristics I need: heavy and robust. From inside the home, the opener button is mechanically activated. From outside, it can also be operated with a conventional key. It works with 12V 2A battery and has an internal solenoid response time of 100ms.

For all the parts that need multiple power sources — for example, in this case, I need 3.3Vcc, 5Vcc, and 12Vcc — I have used a classical ATX 600W ►



Internal view of the door lock — on the right side (white) notice the double solenoid to open the door. The same opening mechanism — with a retro-charging spring visible on the bottom side — can be actuated manually by the button to open the door from the inside of the home in the event of a power blackout

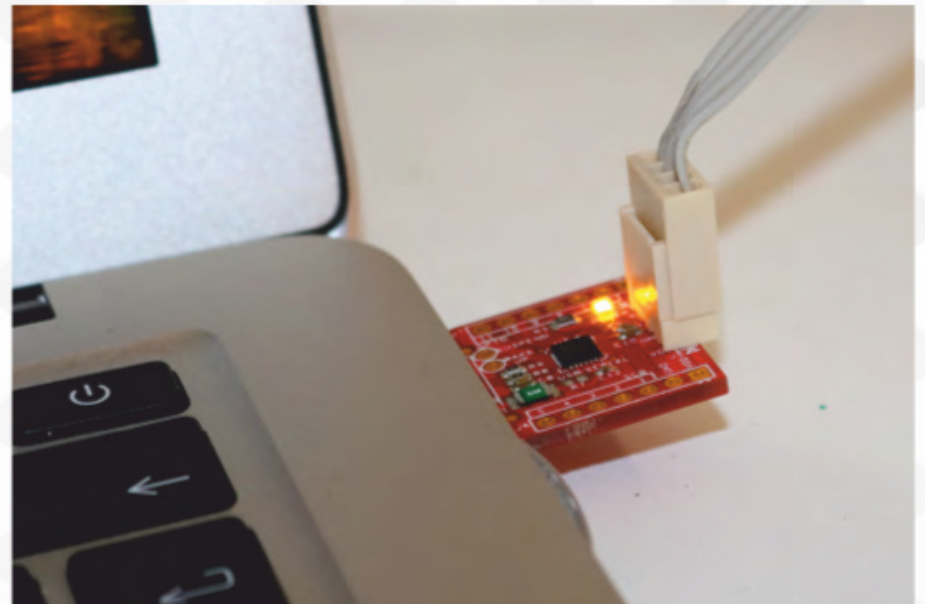
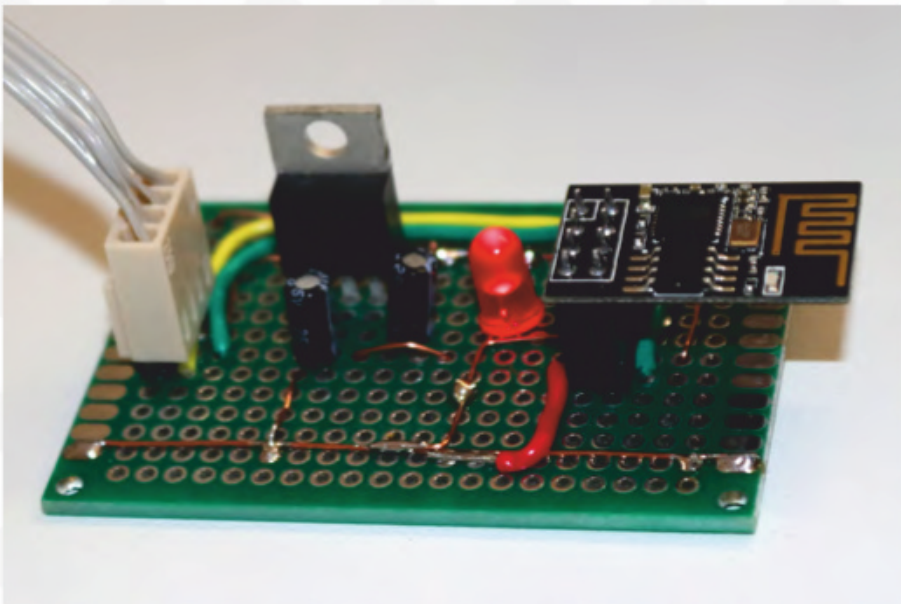
switching power supply (the same as those used in the desktop PC). The impulse to the solenoid should be controlled by a relay, for which I used an ESP8266 relay provided by Digitspace. This cheap device is very popular and is available from a number of online electronic shops as well as Amazon Marketplace. This kind of relay includes a small activation circuit

and an ESP8266-01 microcontroller. It was the first time I had attempted ESP8266 programming; being able to programme it with the popular Arduino IDE made the job really easy.

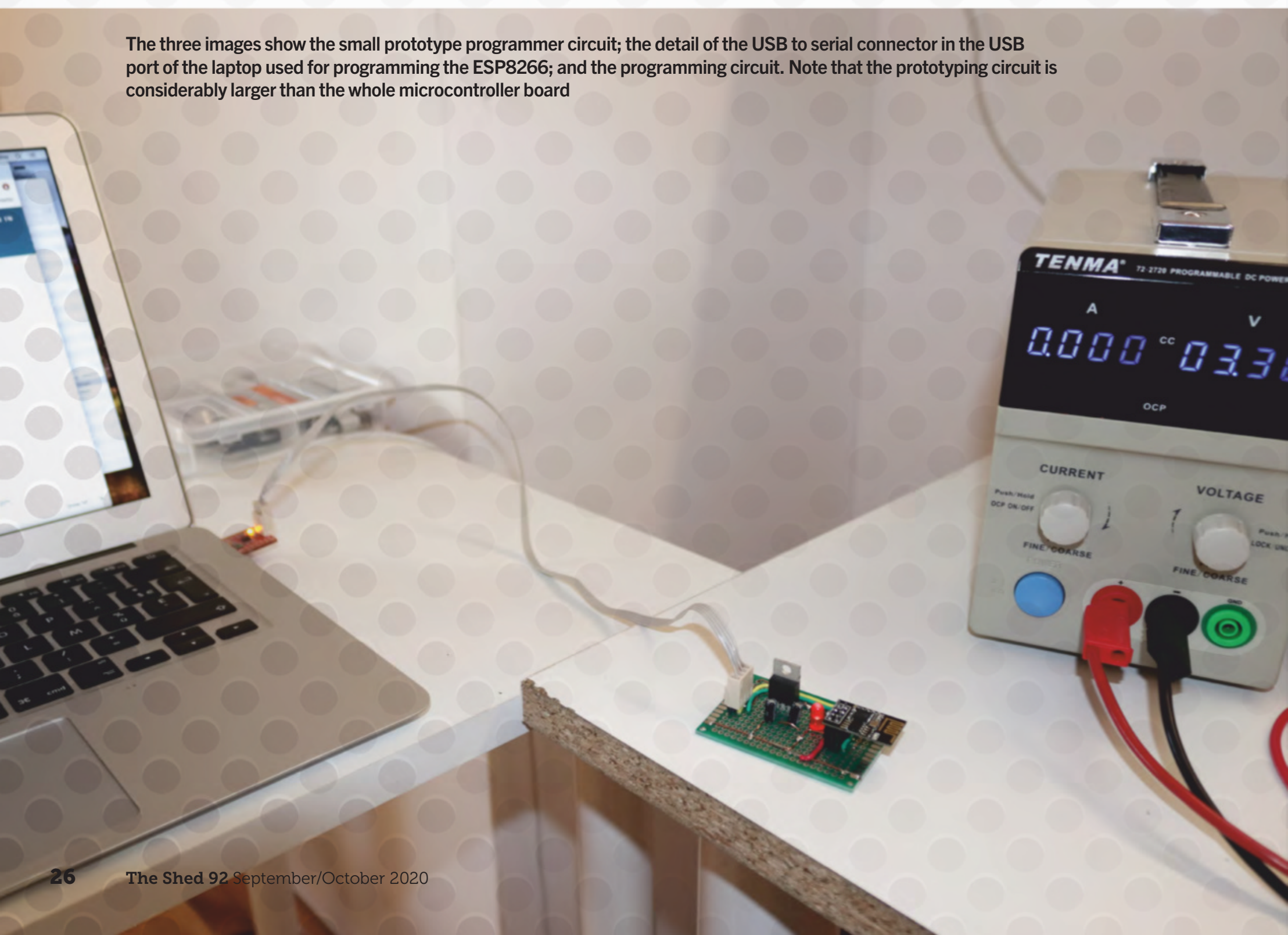
There are plenty of examples online of how to manage this small microcontroller, with a clear tutorial on how to install and set up the IDE for this model, available here:

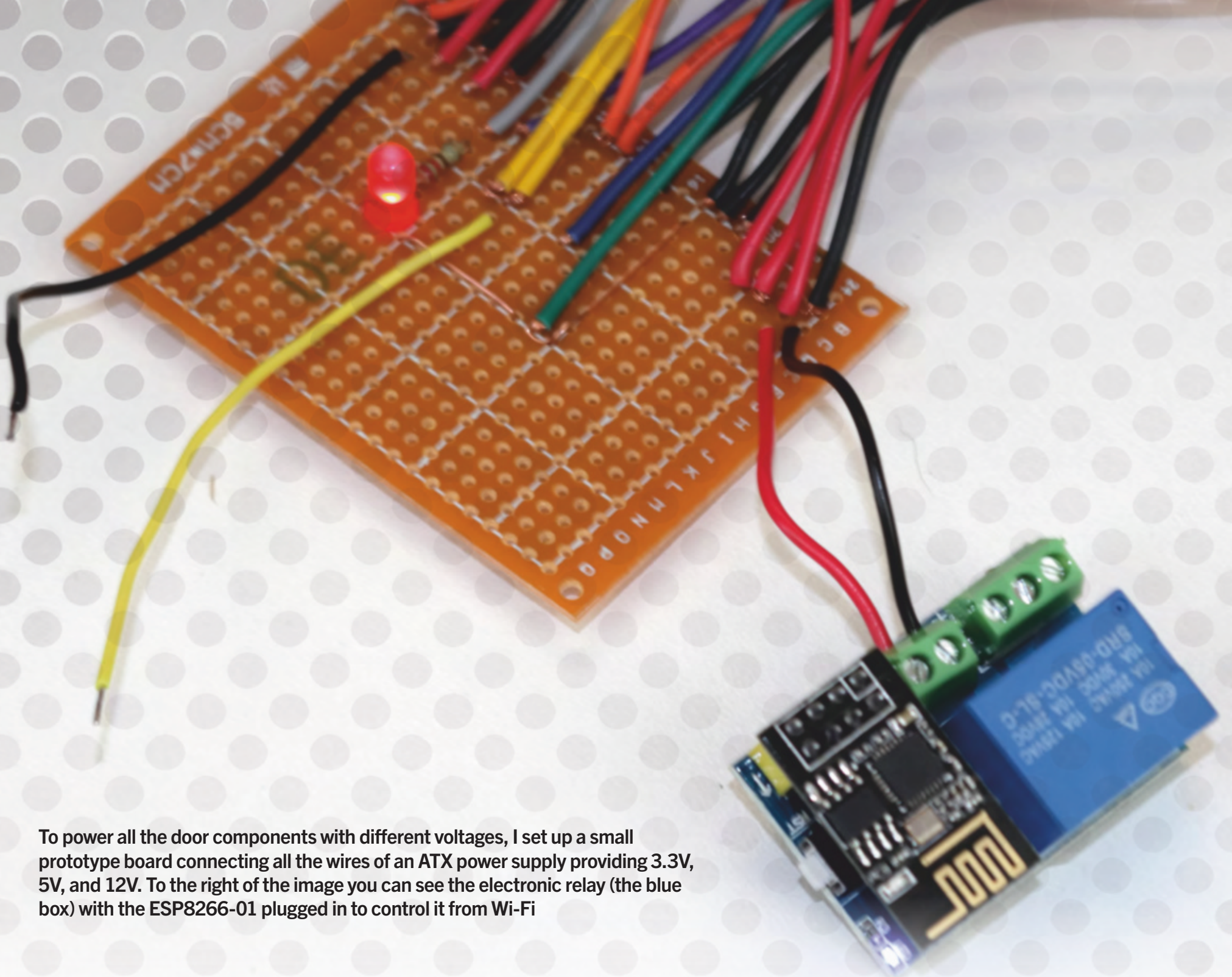
Being able to programme it with the popular Arduino IDE made the job really easy

arduino-esp8266.readthedocs.io/en/latest/installing.html.



The three images show the small prototype programmer circuit; the detail of the USB to serial connector in the USB port of the laptop used for programming the ESP8266; and the programming circuit. Note that the prototyping circuit is considerably larger than the whole microcontroller board





To power all the door components with different voltages, I set up a small prototype board connecting all the wires of an ATX power supply providing 3.3V, 5V, and 12V. To the right of the image you can see the electronic relay (the blue box) with the ESP8266-01 plugged in to control it from Wi-Fi

Developing on the ESP8266

The ESP8266-01 is one of the smaller boards of the ESP family, with only four GPIO pins — two of them are dedicated to the serial TTL connection — but it has many powerful features, as well as a considerable amount of memory available for programming, compared with similar microcontrollers.

Thanks to the effort of the ESP8266 developer group and the popularity of the Arduino IDE, it is possible to develop software on this platform after installing the Arduino IDE from the board manager. (More details can be found on the ESP8266/Arduino GitHub repository: github.com/esp8266/Arduino.)

The issue I faced was how to find the right way to wire the microcontroller for programming with the Arduino IDE and a USB adapter connected to the computer.

To make a long story short, during the first week of tests I found a series of issues that drove me crazy; the real

problem is that you can find on the internet a number of wiring schemes, circuits, and suggestions that only partially work. After the first stage — trying to keep my learning curve as short as possible — I was able to identify the most common problems, and in some cases the reason for these issues:

It is not possible to programme the ESP8266 connected to the software serial pins of the Arduino. It works fine while using the pre-installed AT commands but is not good for programming. The reason is that the software serial works at low speeds; the suggested speed is 9600bps — good for communicating but impossible to use for programming, where the requested speed is 115kbs (kilobits per second).

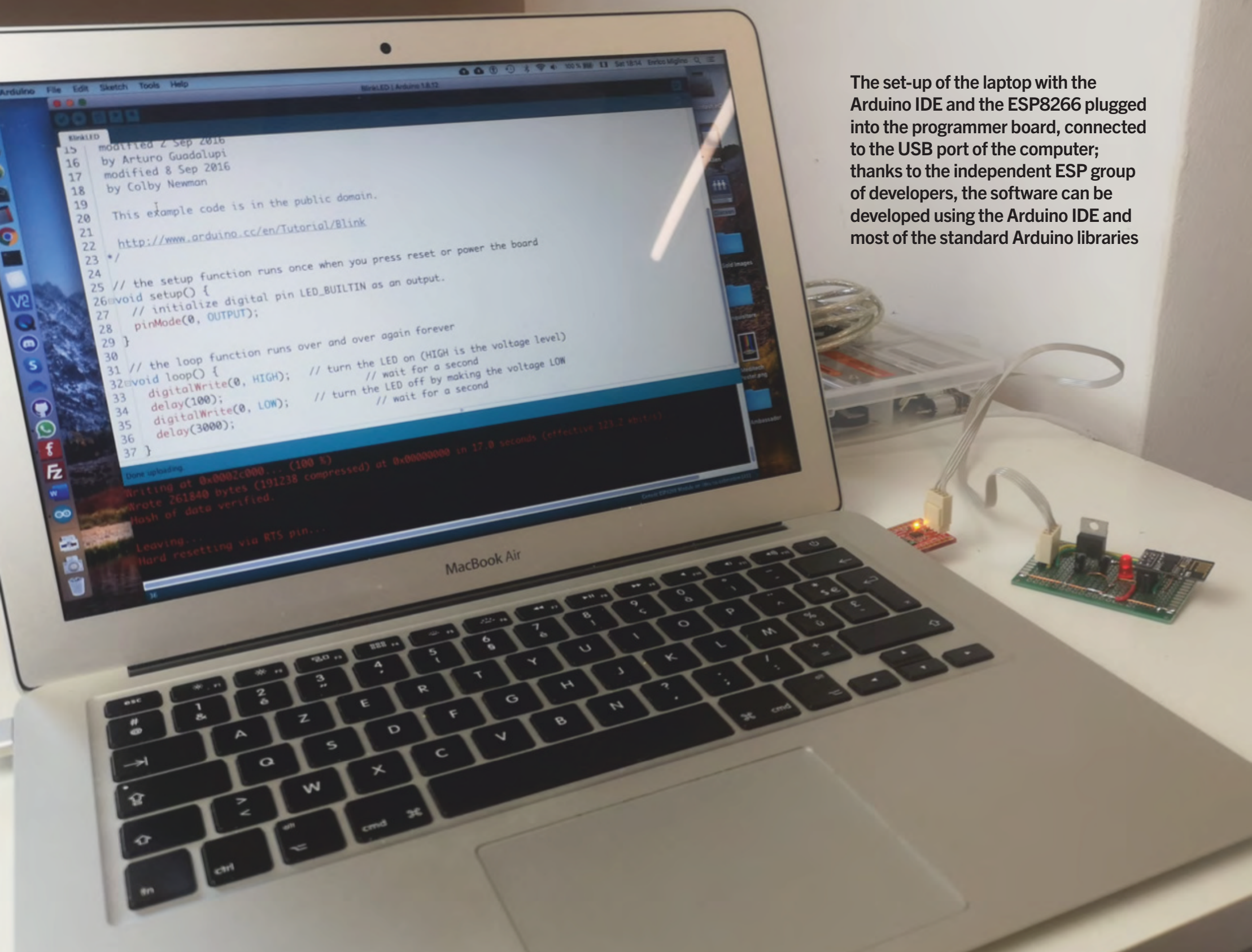
To make a long story short, during the first week of tests I found a series of issues that drove me crazy

It was suggested to me that I use a couple of resistors to step-down the signal voltage of the serial line between the 5V of the popular FTDI USB to serial adapter and the 3.3V requested by the ESP board to avoid damaging it permanently. Actually, this is not sufficient; it was the wrong solution and this method works only randomly. It needs a real step-down adapter based on a chip or using a couple of NPN transistors.

One suggestion was to connect the chip-enable pin to 3.3V and another was to connect it to GND.

Someone else suggested using a pull-up resistor while others said to avoid that.

The final piece of advice suggested pulling down with a resistor. ►



The set-up of the laptop with the Arduino IDE and the ESP8266 plugged into the programmer board, connected to the USB port of the computer; thanks to the independent ESP group of developers, the software can be developed using the Arduino IDE and most of the standard Arduino libraries

A programmer for the ESP8266

This cheap and versatile microcontroller is particularly useful for applications like home automation and internet of things (IoT) and it will be used in other Smart Home projects in the coming issues. To work comfortably planning more programming with this microcontroller it is worth making an ESP8266 programmer specific for this board and the Arduino IDE.

Without production-tailored solution, I developed a small prototype programmer (I know it can be done bigger and better) that works fine, according to the specifications of the ESP8266-01 datasheet.

Using a USB to serial adapter — I worked with a module from Cypress but any adapter works fine — it was possible to ignore the lack of signal level compatibility between the

The advantage of the LM1085 is that it already provides a regulated 3.3V voltage so no extra components for fine-tuning are needed

USB serial (5V) and the ESP8266 (3.3V). The USB 5V power line has been stepped down to 3.3V with an LM1085 power regulator and a couple of capacitors.

Note: It is important that the USB to serial adapter you use can support 3.3V logic signals, instead of 5V. You find online a lot of examples of a partition resistor being used to adapt the logic signal levels. This solution can work fine when communicating between the serial terminal and the microcontroller, where a slow speed

can be used (between 9600kbs up to 38,400kbs). However, the serial programming sends data at a higher speed (115,000kbs) and with a simple partition resistor circuit the results are not reliable and the communication generates a lot of errors, making it very difficult to programme the device.

The advantage of the LM1085 is that it already provides a regulated 3.3V voltage so no extra components for fine-tuning are needed. Tested on different machines, the final version worked fine and was stable. ►



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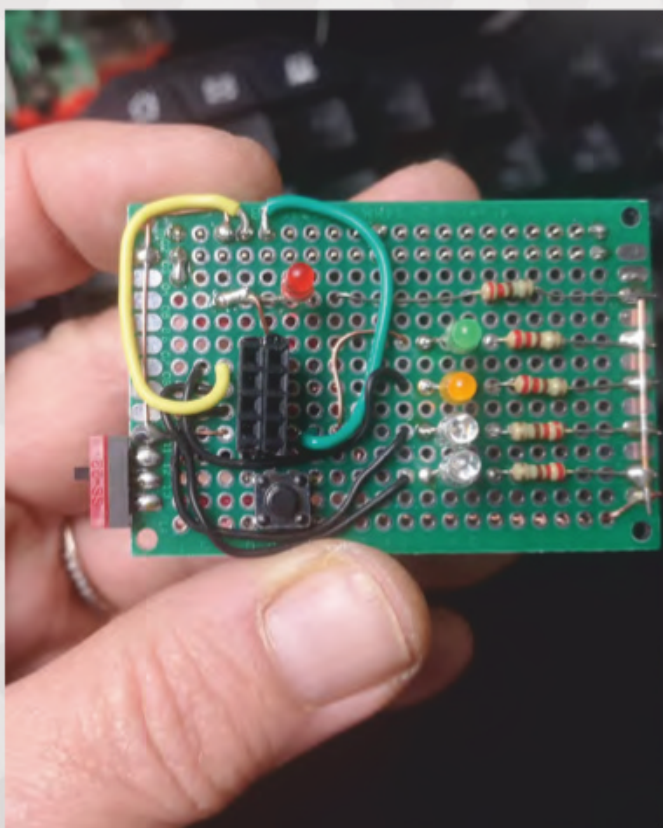
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Testing the relay with the microcontroller

The ESP8266 has only two GPIO pins available, together with the serial Tx and Rx signals; as the microcontroller is very cheap (about \$1) it can be employed in a number of situations similar to the door opener.

Modifying the classic example of the Arduino IDE, LED blinking, I have tested the relay working with the ESP8266.

As the relay operated, the door opener worked just fine.

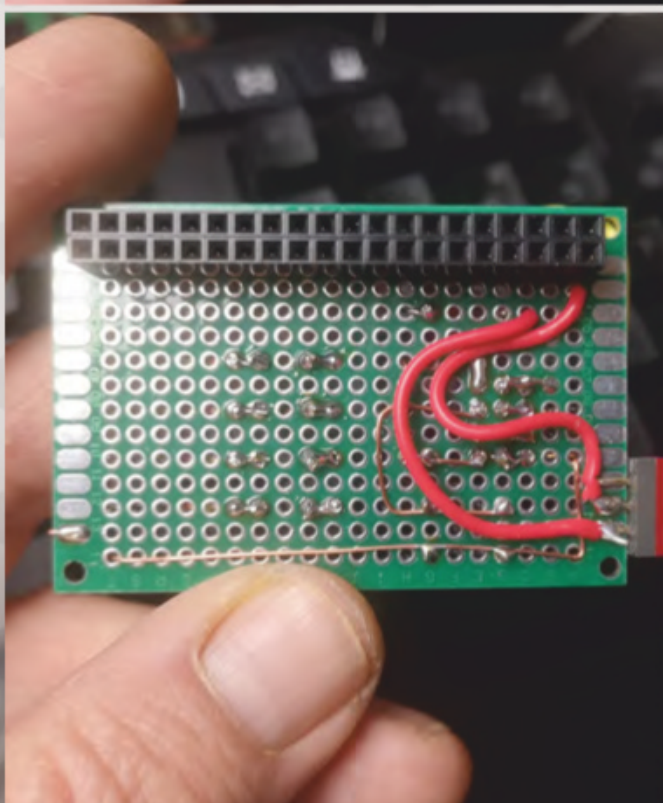
Controlling the door from the web

Why is ESP8266-01 so popular, fitting perfectly into most IoT and automation applications, with so few GPIO pins? The reason is simple: it has a lot of available memory compared with microcontrollers such as the Arduino UNO, and the processor is fast and includes both Wi-Fi and BLE (Bluetooth Low Energy). With this ►

```
/**
 * @file BlinkLED.ino
 *
 */

void setup() {
  pinMode(0, OUTPUT);
}

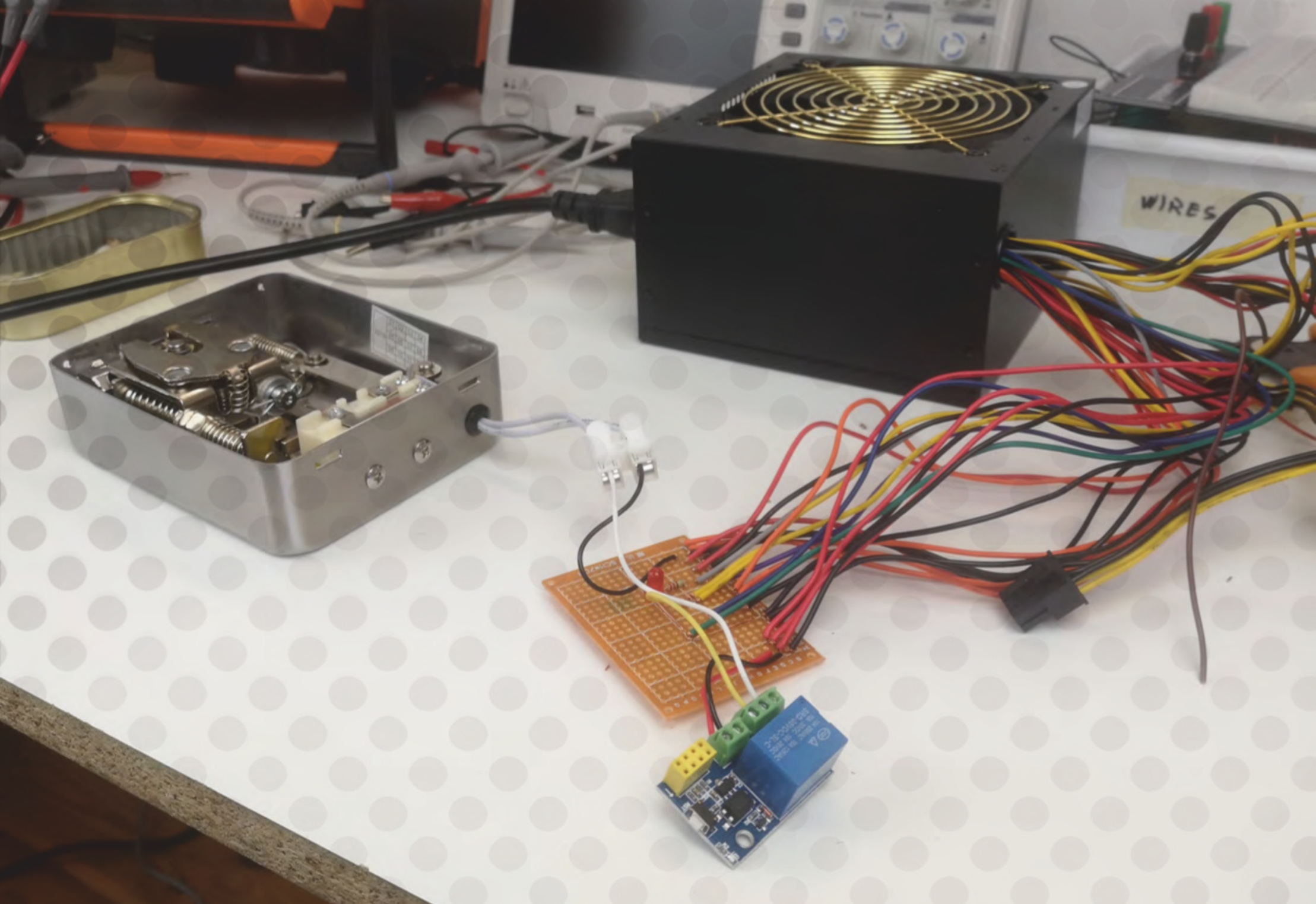
void loop() {
  digitalWrite(0, HIGH);
  delay(3000);
  digitalWrite(0, LOW);
  delay(100);
}
```



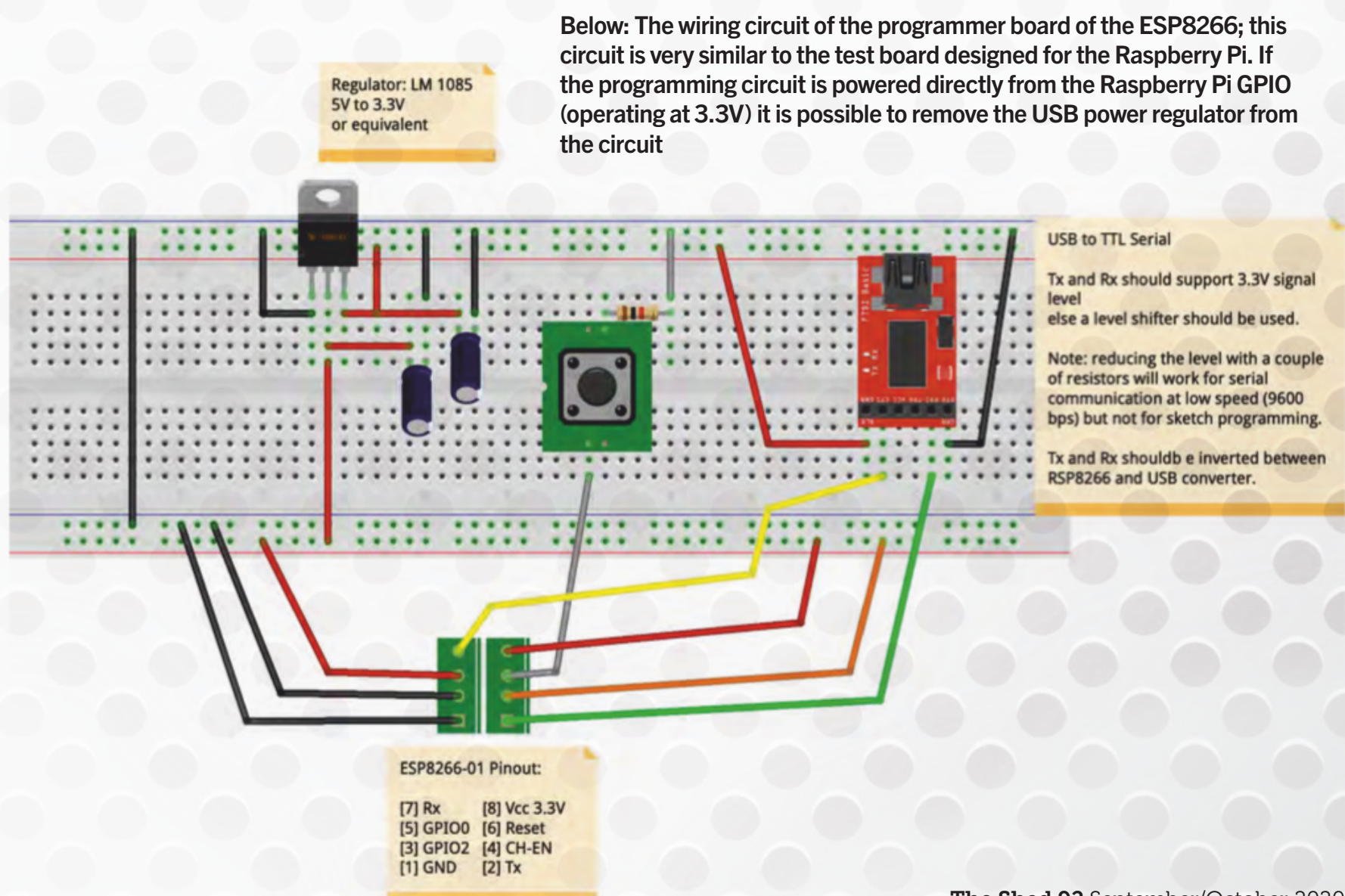
Left: Another small prototype board developed to test the features of the ESP8266 and the web-server functionalities. The microcontroller should be plugged on top of the board (the black connector on the top view), while the four LEDs show the state of the two GPIO pins (the white LEDs) and the serial communication. The push button is used to reset the board. This small tool is powered and connects directly on a Raspberry through the standard 40-pin GPIO connector (bottom view) — all the signals work at 3.3V. With a simple Python script, the ESP8266 can be tested from the Raspberry Pi through the serial port. The circuit of this board is a modified version of the one I used to programme the microcontroller connected to the Arduino IDE from the laptop

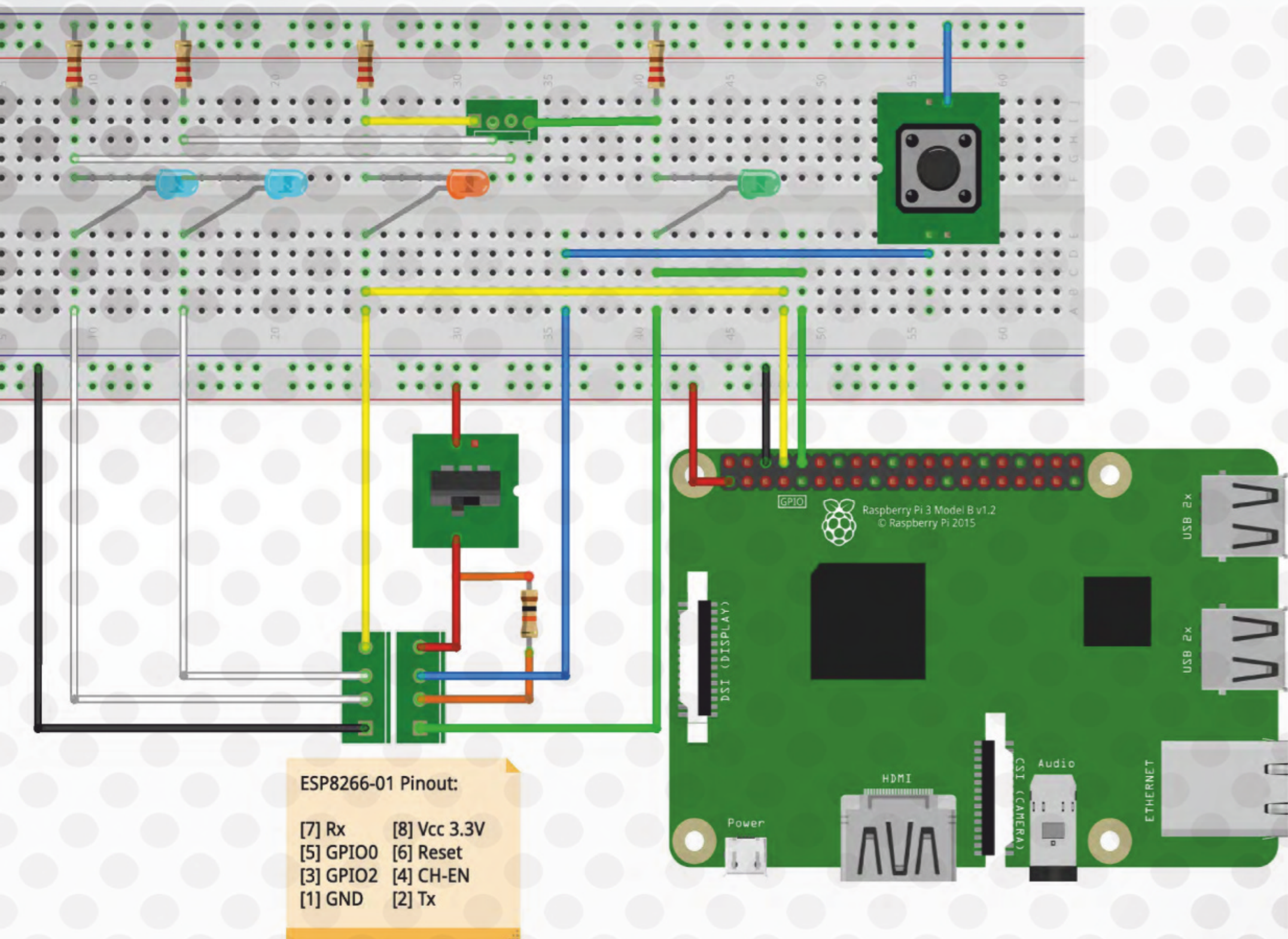
The ESP8266 test board plugged on a Raspberry Pi 4B; the microcontroller — the smallest piece of the entire set-up — is visible on top of the board





Above: The finished hardware prototype of the door opener; the door lock (left) is connected to the relay (right). The black box is the ATX switching power supply that provides the 12V to the relay to activate the door lock solenoid, as well as the 3.3V to power the ESP8266 web server that should be plugged into the yellow connector (on the relay control circuit)





microcontroller, we can activate only a single relay but we can create a web server to control the relay from the web.

Modern browsers require the https protocol (the secure connection) to navigate a web server. This means that to establish communication between the server (the microcontroller) and the client (the web browser) both should exchange digital certificates to secure the communication.

Programming a web server that supports the https protocol with the communication limitations of a microcontroller can be a very difficult task. Happily, the solution is in the examples provided on the Arduino IDE after installation of the support for ESP8266 boards.

Together with the web server

example, a simple shell script is included — it runs on all Linux computers including the Mac OS X and the Raspberry Pi, as well as the Windows 10 shell terminal — to generate the certificate and public key files needed by the protocol, in a format ready to be included in our programme.

The full source of the ESP8266 web server controlling the door opener is available on the GitHub repository: github.com/alicemirror/SuperSmartHome/tree/master/ESP8266-Arduino/DoorOpener.

The key generator script is available here: github.com/alicemirror/SuperSmartHome/tree/master/Key-Generator.

In the next issue of *The Shed*, we will see how to install the door opener and connect it to a smart doorbell. 📄

Above: The wiring circuit of the test board of the ESP8266 designed to connect the microcontroller to a Raspberry Pi; note that the power and the signals can be directly connected to the GPIO connector of the Raspberry Pi as there are no issues with different operating voltages

Source code

The full source of the ESP8266 web server controlling the door opener is available on the GitHub repository: github.com/alicemirror/SuperSmartHome/tree/master/ESP8266-Arduino/DoorOpener.

The key generator script is available here: github.com/alicemirror/SuperSmartHome/tree/master/Key-Generator.



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as I have been fully retired for 18 months now and have recently built
myself a new workshop. These new tools will take pride of place!

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Regards, Paul Burnett



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For further info or to order, visit gubbagardensheds.co.nz. Use coupon code 'theshedmaglifestyle' at the checkout for \$50 off (valid until 31 December 2020).

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It is easy to adjust and set using a simple turn and push switch. It's also rain- and UV-proof with a large, removable LCD screen that displays all settings at a glance. There's even a manual Water Now function and Safe Stop technology if battery levels are low.

Designed and made in Germany, and sold with a two-year warranty, the Water Control Master Timer is available at Mitre 10, Bunnings, and garden centres nationwide. RRP \$189. Visit gardena.com for further information.

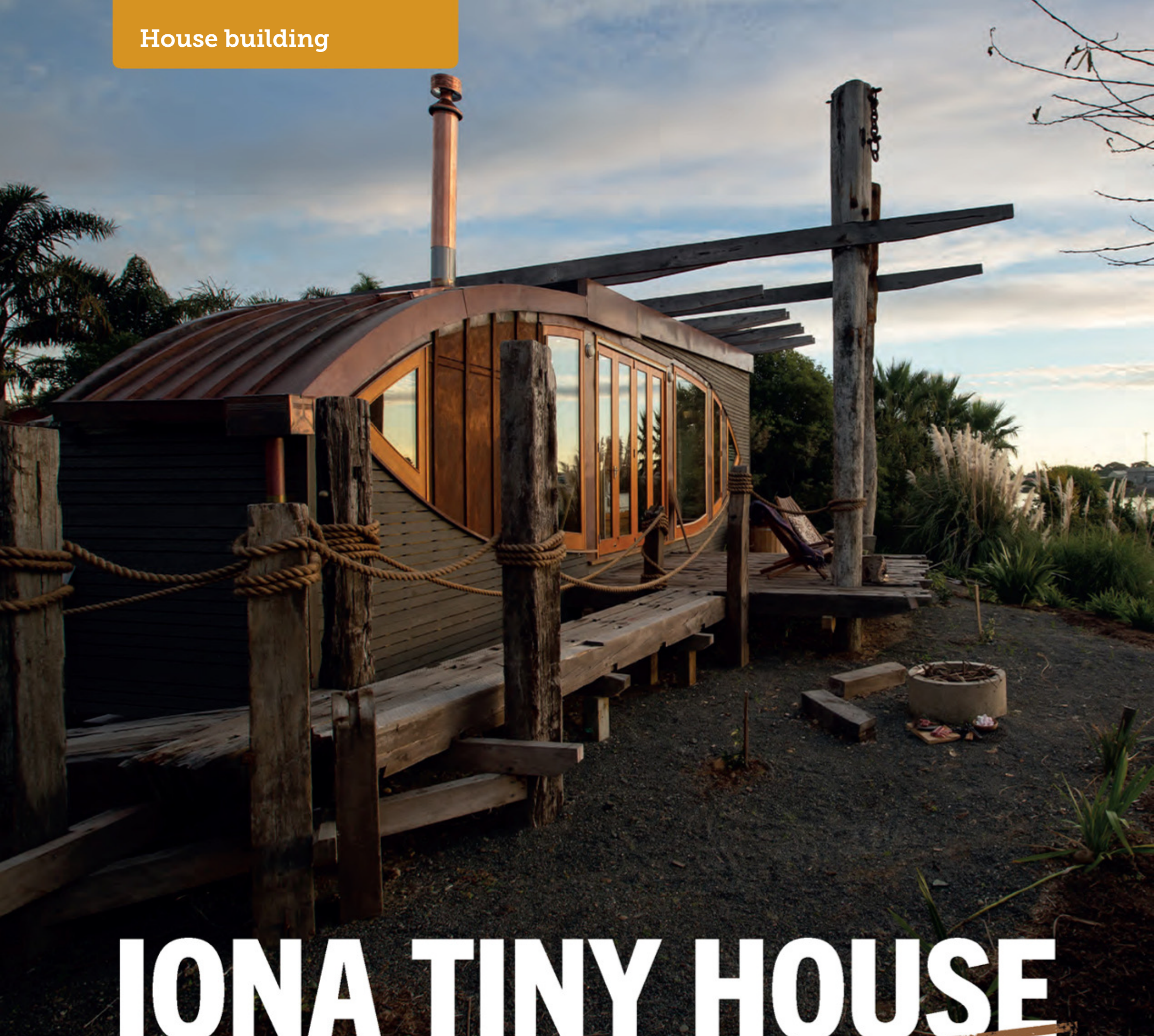


More space, fast

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IONA TINY HOUSE

A BLEND OF OLD & NEW

PART 2

IONA, A TINY HOUSE ON THE BANKS OF THE WHANGANUI RIVER, DESIGNED BY ARCHITECT ELINOR MCDOUALL, IS UNUSUAL ON SEVERAL COUNTS. THE HULL OF A 1920S BOAT WAS TURNED ON ITS SIDE TO FORM THE BACKBONE, OR SHELL, WITHIN WHICH A STUDIO-TYPE DWELLING WAS BUILT. THIS SECOND AND FINAL ARTICLE LOOKS AT THE INTERIOR LAYOUT AND THE SPECIALIST JOINERY AND COPPER WORK

By Helen Frances Photographs: Tracey Grant

Architect Elinor McDouall designed the tiny house interior, from stern to bow, to fit into the convex curves of the hull then extended it towards the decking and river. Reuse of timber is a feature throughout the interior.

A snug with an angled couch and wood burner forms the living space in the stern of the boat. The hull is visible where a cabin was removed, which exposed the planks.

Elinor based the kitchen design on Jamie Oliver's TV show kitchen, and incorporated salvaged, open-spaced, architects' plan drawers. The kitchen walls are timber, reclaimed from a building in town.



A vintage airhorn was repurposed by Kerry and fitted with a small LED so it becomes a mood light



An extra long rimu desktop from the local auction house, and a cow hide from Whanganui's tannery, brought this cupboard to life



Setting out a mortice & tenon joint on one of the windows

Using great timbers

The Fijian kauri plywood used in the master bedroom contrasts with the kitchen, and the mixed timber ceiling slats, deliberately thin at around 8mm, continue the curvature of the boat.

"Back in the day they didn't do match lining with any particular timber. You'd just get a truckload of native," Elinor explains.

Salvaged architect's plan drawers provide storage space under the divan. The raised floor leads to a single-berth nook, snuggled into the curve of the hull. A wardrobe holds linen, an ironing board, and the electrical board. There is room for a Tesla battery if the house ever goes off grid.

The tiny modern bathroom departs from the rustic look in the bow of the boat. There is a skylight, and the bathroom is white, contrasting with the timber. The wall is angled in the shape of the boat and the ceiling height gives a spacious look and feel. The slatted shower grating is made from reused decking and teak from the gunwales of the boat.

Floorboards are recycled timber; decking trusses came from the Majestic Theatre in Whanganui and the posts from Wellington wharf; the exterior rafters are new macrocarpa from the MacBlack timber yard. ►

The Iona in 2020 is anything but plain — once a working boat, now a tiny house



Interior view showing the stern of the boat painted in ochre and transformed into a couch-come-bunk, a lowered 'conversation pit' area with the hearth for the little Wagener stove, yet to be installed

Following the curve

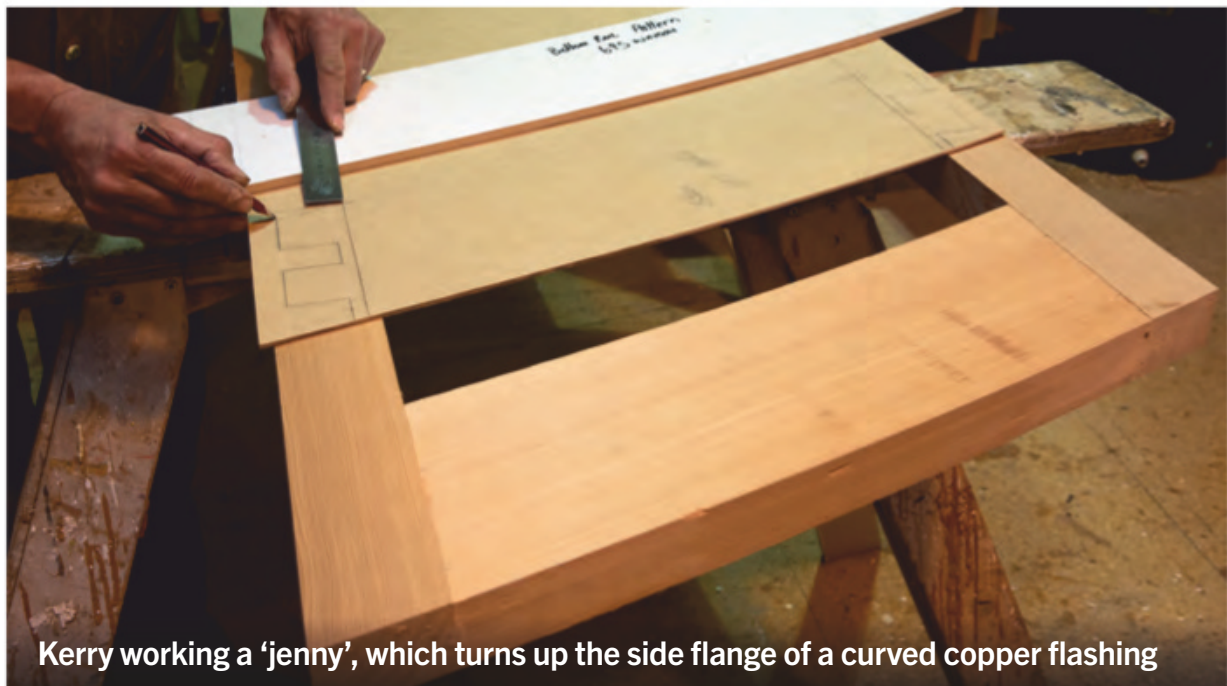
Joiner Mark Thompson of The Door Shoppe made the exterior joinery — bifolding doors and various windows — which Elinor designed to echo the shape of the hull.

“I’ve done curved joinery before but this was the most in one job,” Mark

“In the end about six different curved formers [jigs] were required to make all the different shapes”

says. “Technically there were some challenges — when they come off the former they spring back a little, so it’s not like moulding out of other materials, which retain the shape you mould them to.”

Elinor sent Mark her architect’s drawings and Mark translated them into full-sized joiner’s versions, which he laid out on his wooden shop floor.



Kerry working a ‘jenny’, which turns up the side flange of a curved copper flashing

“I made drawings for everything, and made them fit the design,” he says. “That’s probably the secret to the puzzle. That way you can set your bevels to the angles on the drawing.”

Mark says the doors were relatively straightforward: a rectangular frame with a pair of French doors at one end that could be opened up to make one big opening. However, the windows were another matter: “In the end about six different curved formers [jigs] were required to make all the different shapes. I had to make the head up

with a rebate in it that was curved, so basically I laminated two separate pieces but then I had to glue them together on the former. I had to offset one by 14mm to create a rebate where the sash fits into the frame so it’s got something to stop against at the back.”

100-year old machines

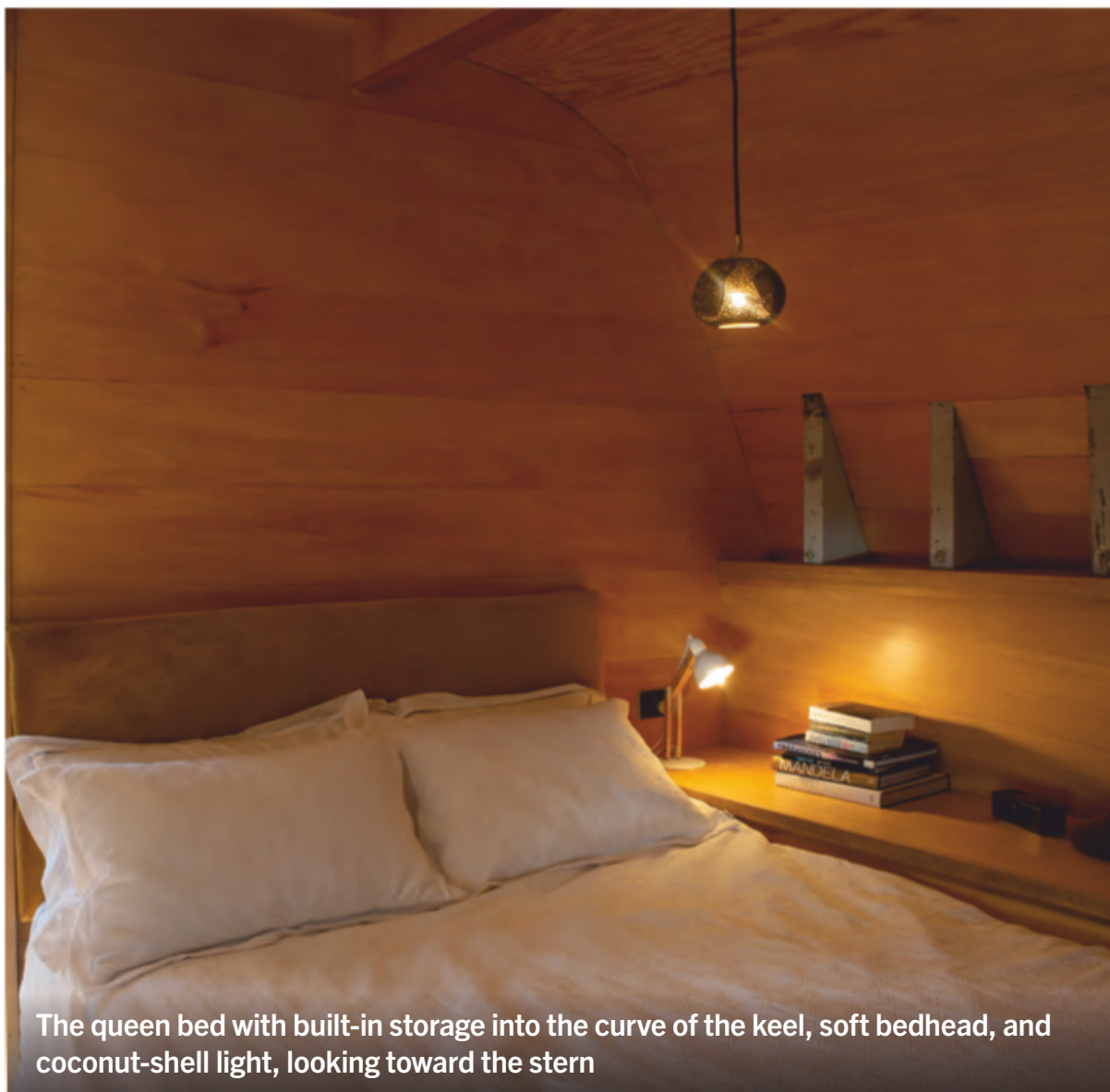
Mark made MDF patterns for the windows so that the sash would fit in the frame, and worked out how the mortise and tenon joints would form in the corner and hold all the sashes together. While dowel joints are commonly used, Mark prefers mortise and tenon, which have been around for hundreds of years. He has the gear to do it: two hefty machines circa 100 years old.

The tenon machine is ex-Railways, left derelict.

“I’ve resurrected it and I’m quite fond of it,” Mark says. “The mortising machine came from the Education Board workshops in town here. I quite like doing things the traditional way. I know they are going to work and that’s part of the art of our trade to some extent — using all those skills that have come from a long time ago.”

The sashes were all double-glazed, so Mark made patterns and sent them to the glass company so that it could make curved double-glazed sashes to fit into the curved frames for the curved building “with a little bit of poetic licence”.

“When you stand across the river and look at it you can tell what it is so I think it came out how it should be,” he says.



The queen bed with built-in storage into the curve of the keel, soft bedhead, and coconut-shell light, looking toward the stern



Sanding a curved jarrah window sill that has been removed from the curved jig underneath



Cramping a sill onto a curved jig

Beyond tricky windows

The windows threw a few more curly ones when Mark had to build some of them in the wrong order. Usually, the frame is built first then the sash is made to fit the frame.

“Then,” he explains, “you take the pattern of the sash and have the glass made. However, because we had time constraints towards the end of the project, I had to build the frame and that had to go in the building so that other things could carry on around that when it was in. I had to take a pattern of what I’d made to make the



End shot of a finished sill showing the laminations in jarrah and polyurethane gap expanding foam glue, yet to be cut to finished dimension

The windows threw a few more curly ones when Mark had to build some of them in the wrong order

sash, so that when it was finished it would fit into the frame.”

Cutting the joints was tricky because nothing was square.

“One jamb on the window was straight and had to meet a curved head and a curved sill for the two end windows because they came down to a point,” he says. “The head of the frame at one end came down and met the sill, whereas normally in a joinery unit you have two vertical jambs and the head and the sill are parallel —

they don’t actually ever meet each other — so cutting all the joints on those was a challenge.”

Mark did a lot of cutting by hand.

“Some could get into the saw — I had packers at one end and the saw angled over, so it was a bit of a challenge to get everything where it needed to be [in order for me to be able to] cut the joints at the angle they needed to be to go together properly without any caps.”

He also made the kitchen bench out of kauri recovered from the boat cabins. “Unfortunately, the lengths of timber weren’t long enough so I had to end-join all the timber to make it look long enough,” he says.

Sarking for the roof required machining to make it thinner so it could be bent around the curve of the ceiling. ►

Drawers made from salvaged architect's plan drawers, and salvaged rimu cupboards conceal a full working kitchen. The use of leathery-looking Marmoleum was an adventure that proved successful



Elinor based the kitchen design on Jamie Oliver's TV show kitchen

Timber from everywhere

Always interested in the aesthetics and the creative aspects of his trade, Mark enjoyed advising Elinor on the selection of timbers. The window and door sills are Australian jarrah, the sashes are western red cedar from Canada, the heads and the frames are a mixture of Malaysian kauri with some of the New Zealand kauri that was recovered from the cabins of the Iona.

“Some of the cabin timbers had had another life before we used them. You could see nail holes and various other things that were inside. As they constructed the cabins they managed to conceal a lot of its previous use but when I cut it up for the jambs and the heads that became evident, which was interesting, so now the kauri is in its third life,” Mark tells us.

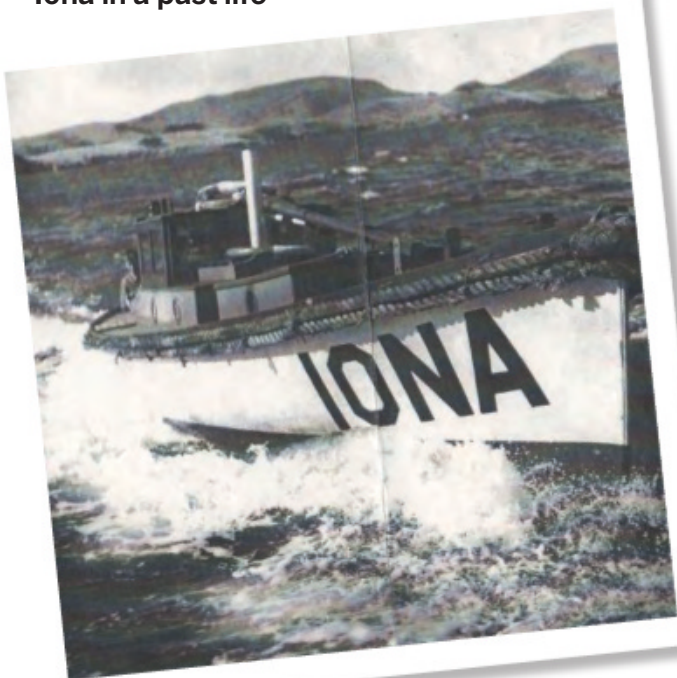
“So now the kauri is in its third life”

The timbers are all different colours, have different features, and look very good together.

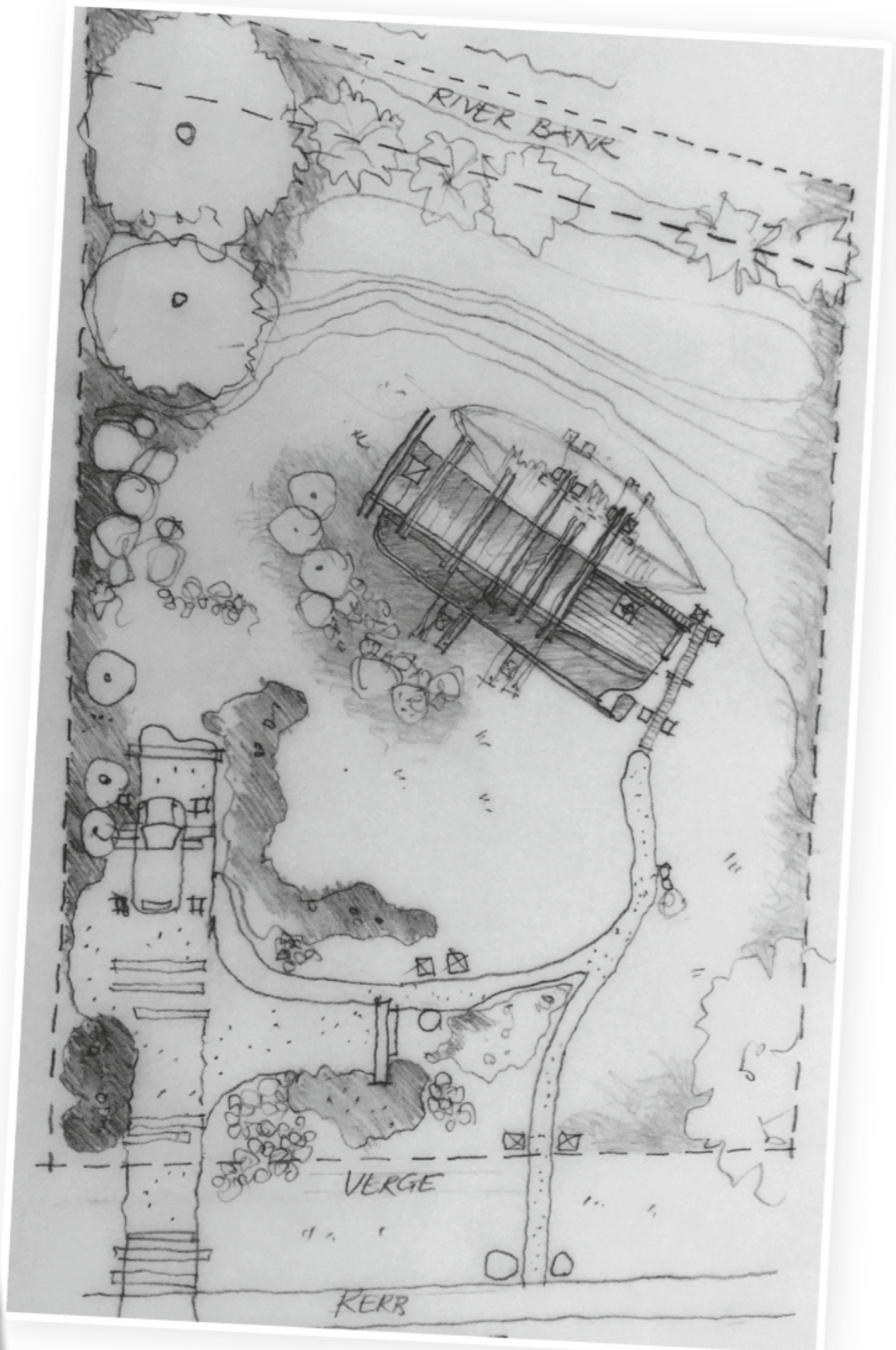
“I suggested the timbers. I’d used them before so I knew the colours and could visualize how they would look together,” Mark says. “The kauri is quite a gold colour, the cedar is a pinky grey, and the jarrah is a rich dark red with its own distinctive grain features, so I thought they’d complement each other quite well. It turned out that way, which was good.”

Mark added a water-based finish with a slight tint in it to filter out the UV light, and which enhances the timber. ►

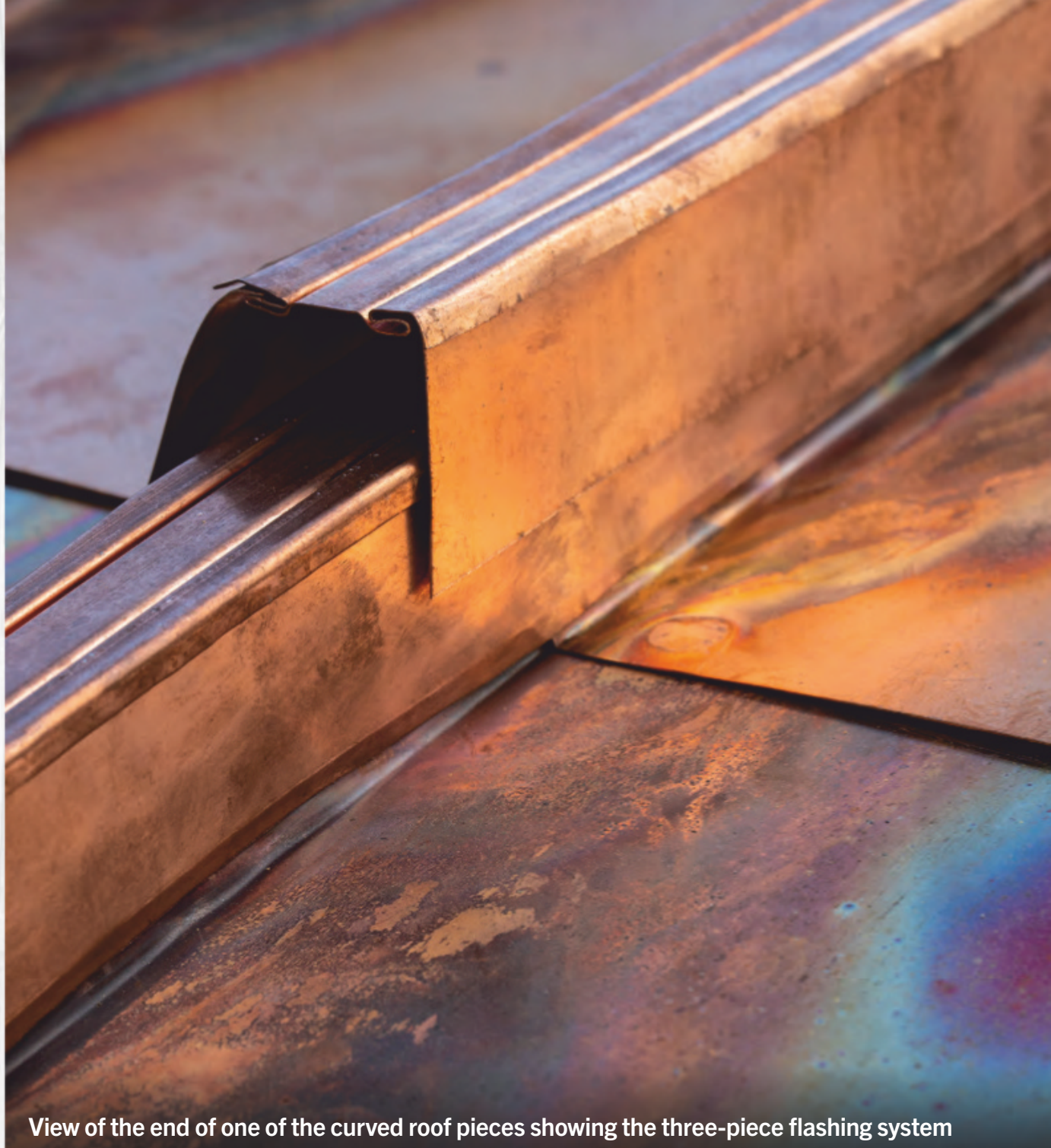
Iona in a past life



View from the road showing the reclaimed posts ex Wellington wharf and a plywood sign, watercut and painted with Resene faux rust paint - even the builder next door was fooled!



Sketched site plan showing the house on the brow of the hill overlooking the river (and the floods) The ‘journey’ along the wharf-like structure to arrive in the building was important to Elinor



View of the end of one of the curved roof pieces showing the three-piece flashing system



Installing one of the copper flashings, which were curved in three planes where the roof connects to the hull

The beauty of copper

Kerry Buchanan of Wanganui Plumbing had the traditional skills and machinery to do a craftsman's job of the copper work. Elinor had designed for copper roof cladding to suit the rustic look of the tiny house and to make more of a feature of the curved roof.

Kerry made the roof, barge flashing, penetration flashing for the vent pipe, copper window flashings, and other bits and pieces along the way.

The curved roofing was made of a number of sections 2.4m long, some of which were 3D curves. Kerry said this made it very interesting, "because you had to make them using a lock former machine, which allows you to turn a piece of metal over another piece to create a curve".

He said he had to weld the 3D flashings, tack them together at 10mm to 15mm spaces, then braze them into one. The curved wider sheets —

"Copper is soft anyway. When you bend it, it has a tendency to crease rather than bend slowly"

the main roofing sheets — had to be heated in two separate jigs, made of steel sheeting, and eased around to make the form of the roof.

Between the roofing sheets, the capping was a three-piece flashing between the copper upstands to give it rigidity and stop the water getting through.

Don't stuff up

Timber and copper behave differently; timber wants to spring back whereas copper happily bends and folds. Kerry drew templates on cardboard, cut them out, and manufactured to the template.

"You had to be quite accurate because if you got it wrong that could be \$150 of copper down the drain," he says.

They made one narrow window flashing that wasn't quite right but there was not much copper in it.

"You can't reuse it — once it's manufactured (heated, beaten, bent) it's bugged, and when it's curved you can't make it straight," he explains.

It took quite a long time to make the jigs, getting them as close as possible to the roof shape, and Kerry is pleased with the final result: "There was a lot of mucking around. I've done copper work before but not to that extent — 2.4m is quite a long flashing and when it is wide and curved it wants to bend.

"It's a big sheet to work because copper is soft anyway. When you bend it, it has a tendency to crease rather than bend slowly. You can't rush it; you just have to work it slowly and gradually around the jig support it, take a bit of wood out, let it bend a bit further as you take the heat along the sheet [with a CNG blow torch], otherwise it would go too far and crease."



Cutting flat sheet with tin snips

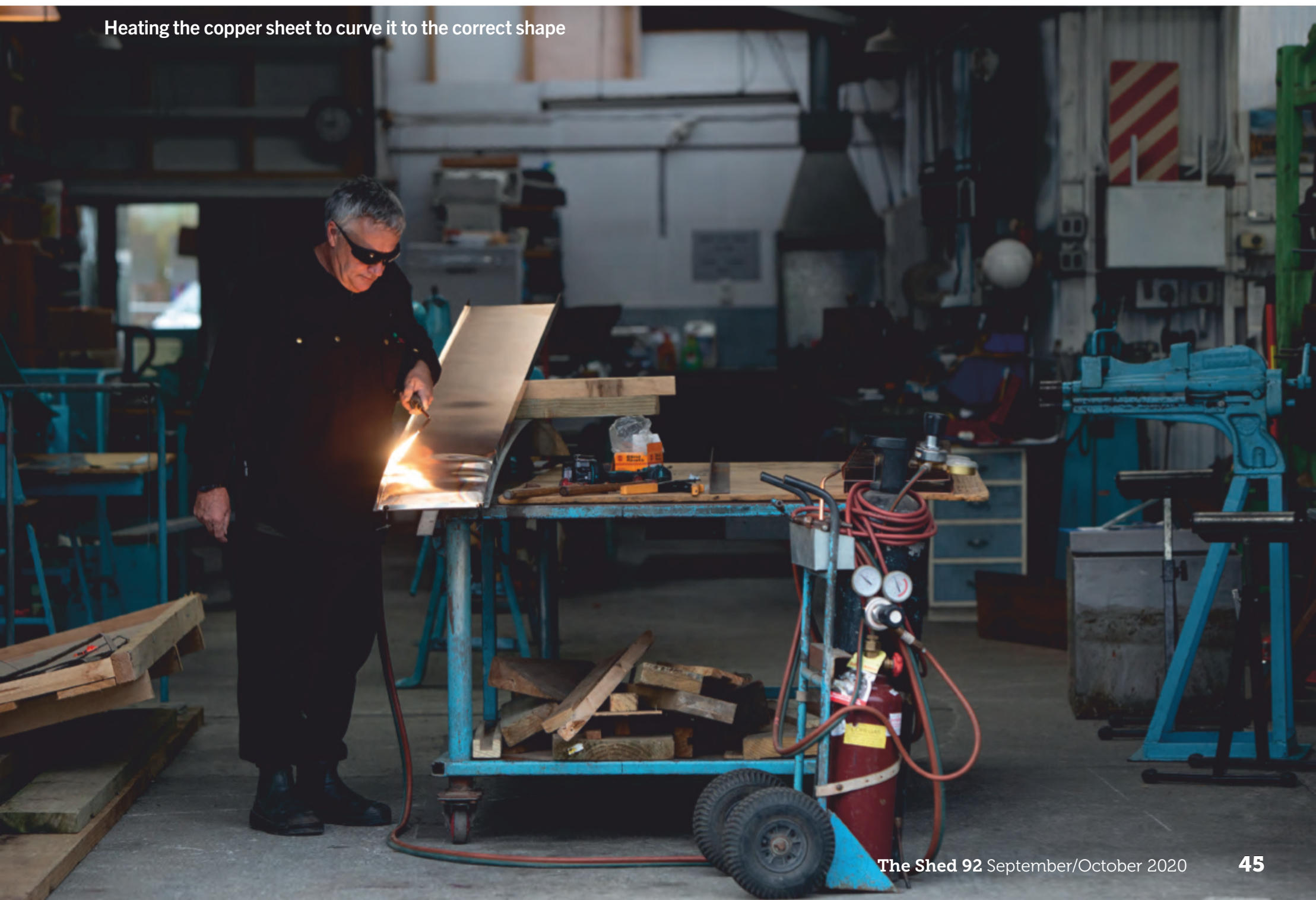
Kerry also made copper spouting for the end and finished it off with a beaded edge. To make the copper downpipe he wrapped the copper around a plastic pipe, "so if anybody tries stealing it they'd have trouble removing it".

A copper toilet cistern was put up as a rainwater header tank. Kerry took the inside out, brazed it, and said it works well. He also made the curved flashings around the doors and three-

piece flashings top and bottom of the curved windows on the river side, some of which were galvanized. ►

Timber and copper behave differently; timber wants to spring back whereas copper happily bends and folds

Heating the copper sheet to curve it to the correct shape



Pass on the knowledge or its lost

This amount of copper work in one job is unusual in Kerry's experience. Copper is not cheap and requires specialist work over a lengthy process. Kerry kept an eye on the overall aesthetic, making sure the finishing was carried through.

He says, "I put copper on the vent from the bathroom — a job like that becomes of interest to you and you want to see it done properly right to the end. It was a good build; there was lots of variation."

The flue for the wood burner has copper over the stainless-steel pipe to fit with the look of the rest of the build.

A specialist sheet-metal shop was quite a learning experience for the other workers, who also participated in the copper work. Kerry likes to pass on the skills he learned from the former employees by watching and learning from them. Wanganui Plumbing has operated since 1972 and is based in a purpose-built building — for example, it has railway irons set into the concrete floor for the purpose of making corrugated tanks.



The little Sparky stove from Wagener in Kaitaia — enough to heat the whole house all night!

"It is every tradesman's responsibility to pass on the knowledge or it's lost," he says.

Kerry's workshop houses some impressive old machines among the folders and benders that he says are fairly standard. The 100-year-old press was belt-driven back in the day and it has dye for making various spouting profiles.

"These are the original, classic shapes, which the long-run formers cannot replicate. Interestingly, it also presses ridging that clips together in a $\frac{3}{4}$ -circle shape. Once people considered a roof an important part of their house and there was variation in ridging barges, etc. That has pretty much gone and there is nothing more common than a plain modern roof on a mansion," Kerry muses.

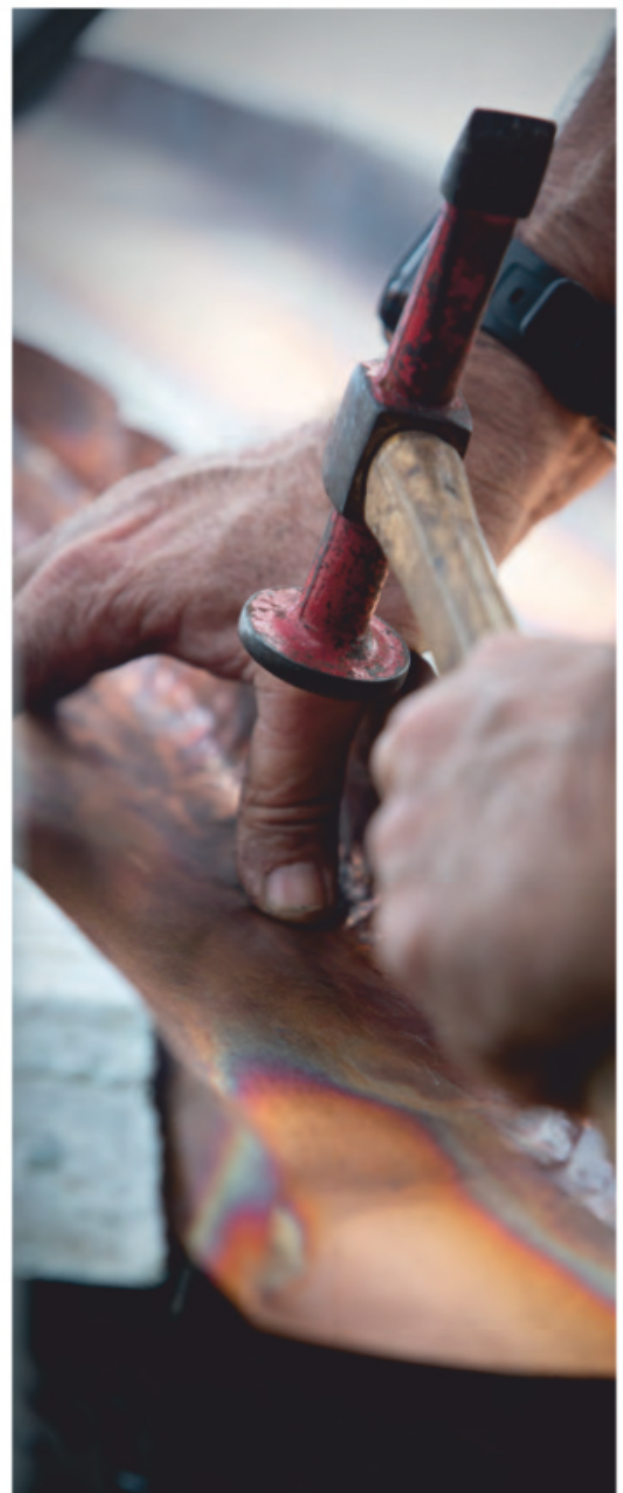
The Iona in 2020 is anything but plain — once a working boat, now a tiny house that brings together modern functionality and building standards with original design and skilled craftsmanship. 🏠



Architect Elinor Mcdouall



In the bathroom a grate over the shower tray is made of Iona's jarrah decking, and this and the last of the pointed windows contrast with the clean, modern style.



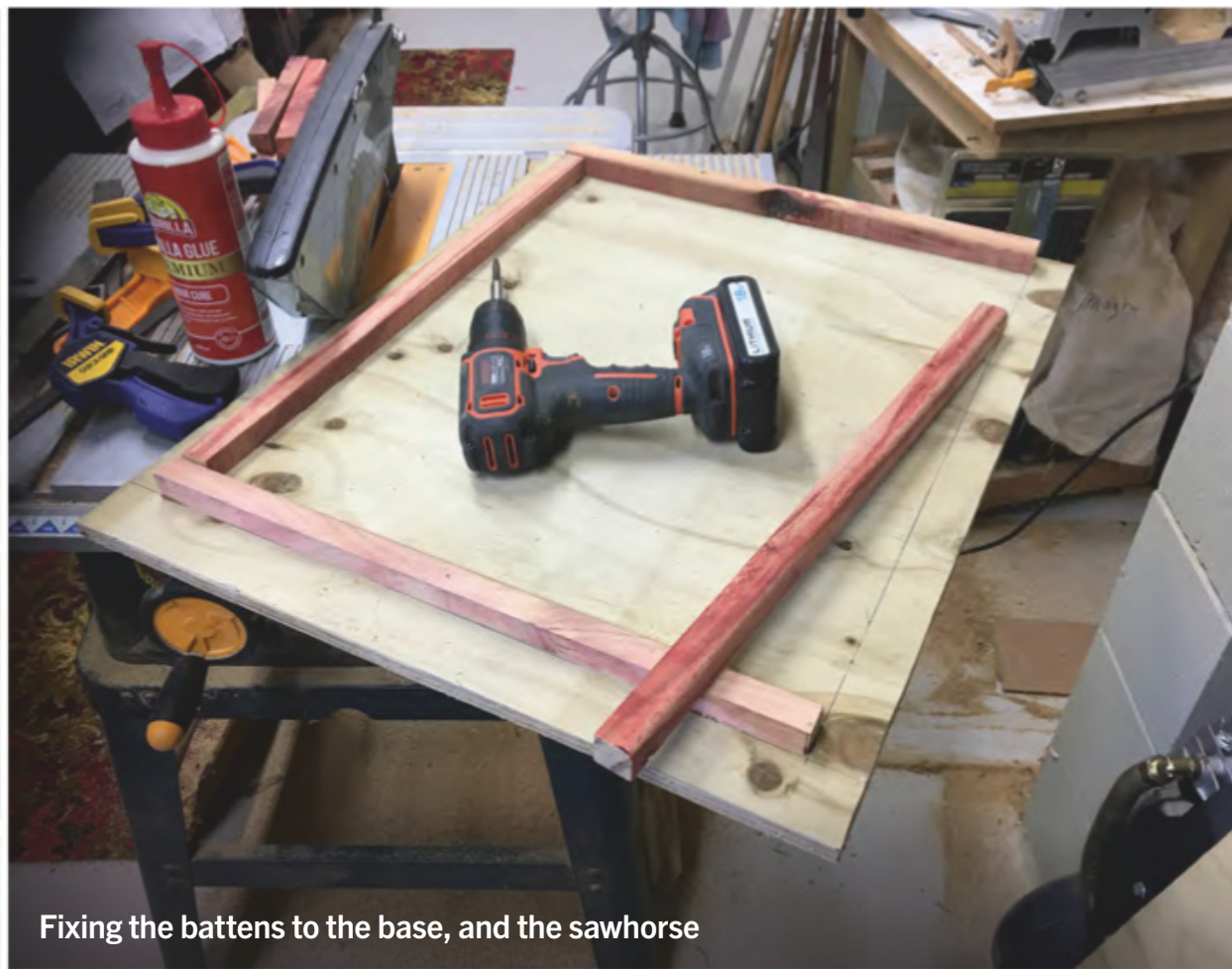


Good letter box; kind and gentle letter box;
someone please send me a letter

NO MORE EXCUSES ...

IF LESS IS MORE, THEN THIS PROJECT IS COLOSSAL

By Rod Kane Photographs: Rod Kane



Fixing the battens to the base, and the sawhorse



Gluing the back to the sides

I was stumped for something to do during the early days of the lockdown. We had planned to go to Aussie in the caravan for five months during the winter but that all went pear-shaped as so much did for everyone else.

So, you start looking for the sort of jobs that you always knew that you would have to do one day, but that you always hoped someone else would do for you, out of sheer pity and/or disgust.

My letter box is one of those rural affairs on a metal road in Waitakere, West Auckland. I use the term 'road' here very loosely; letter boxes get run over out here, and every time the

council arrives to do some maintenance — another very loose term — the road roller pushes the letter box over just another few degrees. The upshot is that

So, you start looking for the sort of jobs that you always knew that you would have to do one day

the poor postie now needs an outrigger on the side of the van to reach the infernal thing, and, when said postie does get to it, the door opens the

wrong way as they all do and it tries to take his fingers off as he snaps it shut. It is not a great advertisement for the abilities and integrity of its owner.

The perfect letter box

I was in the real estate industry for many years and I had my fair share of delivering junk mail to peddle my wares. I know what the average letter box is like: horrible, set well back out of reach, too high, too low, the door falls off, or the whole thing falls off the gatepost. When you find one that has been thoughtfully designed and placed, you break down and cry.

If a man is going to take the time ►



Spacious, dry interior — I put a wooden grille on the base so that everything remains perfectly dry

and trouble to rebuild his postal receptacle then it may as well be man-sized, and then when the postal service rides off into the sunset you could always turn it into a garden shed or perhaps a small caravan.

Further to that, it would probably be a good idea to add some gadgets so that it goes one click beyond receptacle and almost into scientific. It is here that you have to be careful. If it is a masterpiece and a joy to behold, some sod will nick it. So it has to have that air of inspired curiosity about it without being a takeaway. Therein lies the skill and the art, ladies and gentlemen.

This letter box can be any size you like, but we get a lot of bits and bobs delivered by courier and the driver could be saved an unnecessary drive down a long drive if I make the letter box big enough to take most parcels. It has to be waterproof; it has to have a door that folds down and stays down, not up; and said door should have fold-up assist. In addition to that, it should

have some device that shows you when the postie has been. I could say that I invented this feature; however I would be lying — but I will anyway. I copied

I know what the average letter box is like: horrible

the design from my neighbour's across the road. Naturally, I shall have to dismantle his.

The skill level required

Further to all this, the letter box should be easy to build out of bits and pieces, and it must look the part: rural, not a masterpiece.

My workmanship runs somewhere between intestinal and agricultural on a good day, so this was right up the proverbial alley. If you have a cabinet maker husband/wife/mate then you might want to discard this

project now. It is also one of those rare projects where you don't actually need to measure anything much, so none of that measure twice, cut once nonsense. If someone comments that it looks hideous, you just tell them that it is a new avant-garde design, it is in vogue, at the cutting edge of transient postal communiqués, and technically speaking you would be right. What can possibly go wrong?!

Plywood, oh plywood

It is all made of plywood — and could I just say here that I worship plywood. When I am down I think of plywood. When I am really down I think of stacks of plywood. There is nothing that can't be achieved with plywood. In fact, the Concorde was mostly made of plywood — or maybe that was the Mosquito? Men leave home for it, it destroys marriages, small children run after it down the road, and any sensible man would — well, you get the idea.

The letter box is 12mm tanalized,

anything-grade ply, and all joins and corners have 15x15mm battens that can be glued on both touching surfaces and screwed with Pozidriv screws. Any glue is good but an expanding glue like Gorilla Premium is the way to go. You don't want leaks in a letter box — or a caravan, for that matter. I made the two pointy ends 7mm ply. Why 7mm, I hear you ask? Because I ran out of 12mm ply, that's why.

You start with the base. I made mine 60cm deep and 50cm wide. I stepped the sides back from the edges by 25mm so that I could easily screw it to a timber base.

The first job is to glue and screw the battens to the base on all sides and

then attach the two sides, which are 20cm high and 55cm long.

The second job is to unscrew it all and use shorter screws so that you can get it off the sawhorse.

The subtle detailing

Once you have the sides up you batten off all the edges and add the two ends. The roof angle of this one is about 50 degrees, but build it to style; it really doesn't matter. The opening front determines what it can take anyway. Obviously, you have to cut out the door section before fixing the front. I added small battens to either side of the inside of the door opening as something for the door to rest against

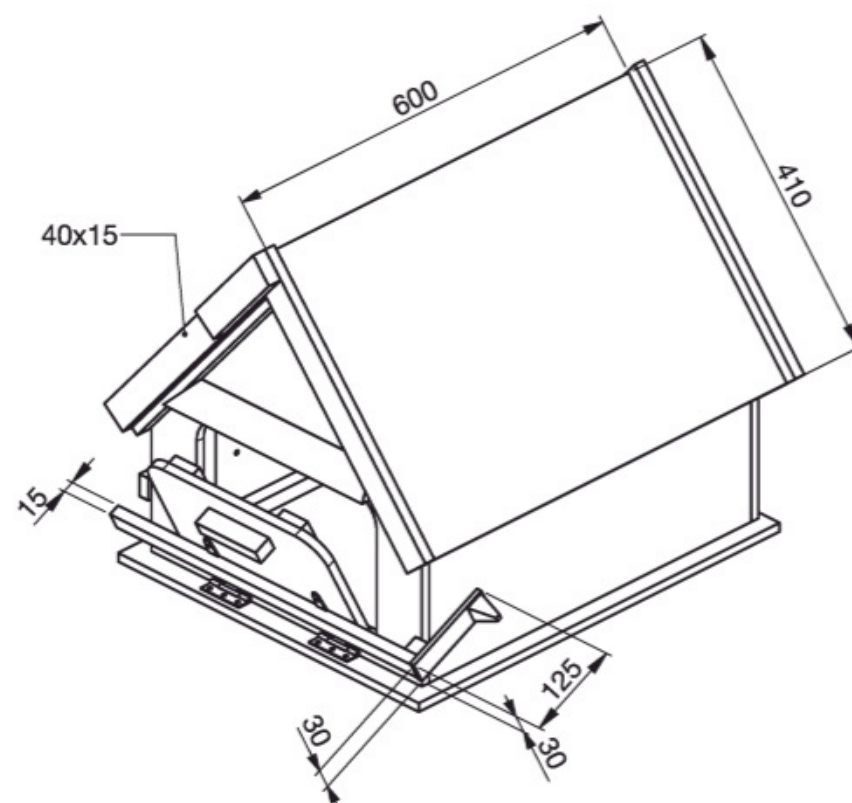
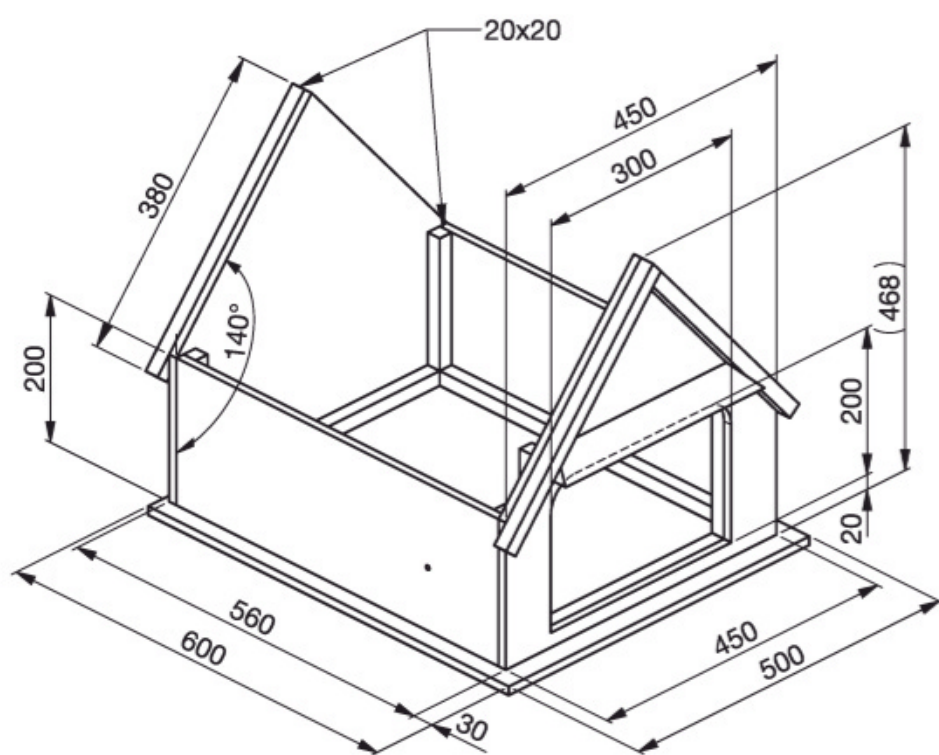
and weather sealing — sort of. Then you screw the hinges to the door.

Last of all, before adding the roof, I

My workmanship runs somewhere between intestinal and agricultural on a good day

placed a small batten right across the front, extending out past both sides. On the left-hand side it acts as a rest for a piece of hinged wood that drops down when the door is opened. This tells you when the postie has been ►





Drawings: Roger Curl

without you having to get out of the car. A lazy man will always find an easier way!

On the right-hand side I attached a small lever pointing to the back, with a lead sinker on it. I borrowed the sinker from my mates, who wouldn't know how to use it anyway. This acts in the over-balance principle, or 'inverse rolling centre of gravity' effect, which is a name I just invented. But I digress; it is a simple way of having the door close itself after halfway without springs and all the drama. You just need gravity and there is still plenty of that out there right now.

Then the arrow is attached for telling the postie there is something to pick up, the roof goes on, plus some embellishment on the ridge and at each end, and Bob's your uncle.

Nature supplies the paint

I considered staining it but I would have to stain it mud brown or dust grey — why bother when the council supplies a liberal amount of that colouring free?

The next job was to dig a hole on the roadside to take the post, which takes

"Why 7mm, I hear you ask. Because I ran out of 12mm ply, that's why"

the plank, which takes the batten, which — you get the idea. It has to be at a suitable height for the postie. Mine drives a red van; however, I have absolutely no doubt some will be in

a pedal car and others will drive a Kenworth. I settled on a height of 95cm from the road to the bottom of the letter box.

As I haven't managed to sabotage the road roller yet, I decided to brace the post to take the hammering that I just know is on its way. The box was screwed onto the new post, as was the neighbour's letter box, and I have to say it doesn't look too half shabby. But I would say that, wouldn't I? And the other half probably does look shabby.

I have included a before and after photo, and, to all the comedians out there who will say they can't see any difference, can I just get in first and say: neither can I.

Now, if only someone would post me something. 📬



Putting in the post, brace, and cut-outs for the rails — note: the spirit level and safety gear are photo bling only



Bad letter box; nasty viral letter box!



Detail of door counterweight, arrow, and 'Postie delivered' indicator; no plans needed



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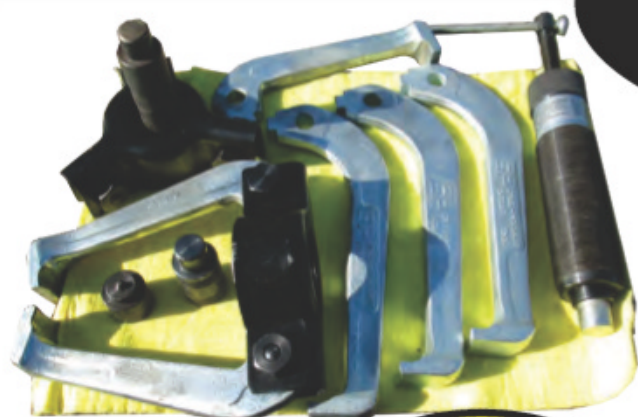
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Temperature controller allows for consistent brewing temperatures

THE HIGHS AND LOWS OF TEMPERATURE

FERMENTING AT THE OPTIMUM TEMPERATURE MAKES FOR A MOUTH-WATERING BREW

By Bryan Livingston Photographs: Robyn Livingston

Have you ever noticed how your favourite beer tastes different when brewed at different times of the year? Fermenting temperatures have a major influence on the taste of the beer — in fact, you will notice a difference in your beer if you brew it 4–5°C warmer than your normal brewing temperature. This is largely due to fruity esters generated from the yeast as it ferments the beer.

In the heat of summer your beer ferments faster in the warmer conditions and this can lead to the beer tasting ‘fruitier’. In winter, if brewing temperatures get too cold, this can also create undesirable flavours as the stressed yeast struggles to do its job.

So what is the ideal temperature to brew the perfect beer?

Consistency is the key

The first trick is to make sure you are brewing consistently. Using a temperature controller can help to ensure your favourite beer brews at the temperature you set irrespective of the heat of summer or the cold of winter.

The right temperature at which to brew is largely determined by your

Fermenting temperatures have a major influence on the taste of the beer

yeast selection. While there are many different types of yeast strains in the world, brewing yeasts can generally be grouped into four different groups.

Types of yeast

Before we look at the different yeast groups, a word of caution: the beer style on your beer kit doesn’t determine the brewing temperature. For example, many lager and pilsner beer kits actually use an ale yeast rather than a true lager yeast, as this allows brewers to brew their beers at a warmer temperature. You need to know the yeast strain to determine the brewing temperature. This will make more sense when we look at the following yeast types.

Ale yeasts

Ale yeasts are top fermenting yeasts and they can ferment at a wide temperature range.

Generally, I find 18–22°C is ideal for brewing a great pale ale or an



Selecting the best strain for your style of beer will help make the best brew

exceptional IPA, but there are a couple of exceptions. Wheat beers can be brewed warmer, as this can emphasize the banana and clove character that you expect in a German-style wheat beer.

Similarly, saison beers can be brewed slightly warmer — in the mid 20s — to generate more of the spiciness and fruity character that you expect in a Belgian saison.

Lager yeasts

Lager yeasts are bottom-fermenting yeasts that brew cleanest at colder temperatures. These yeasts give you the crispness of a good lager or pilsner. While different lager yeasts have different temperature ranges, most brew best at 10–14°C. Because of this lower temperature range, many brewers prefer to brew their lagers in winter, as this works with ambient temperatures at that time of year.

Hybrid yeasts

While ale and lager yeasts are pretty clear, there are a few strains that have the characters of both. Yeasts such as California Lager are lager yeasts, but they brew ideally at ale temperatures. While not a replacement for a good lager yeast, these yeasts do mimic that lager crispness while brewing at 18–20°C.

You need to know the yeast strain to determine the brewing temperature

New Kveik yeasts

These Norwegian-originating yeasts brew warmer and faster than traditional strains. There are several strains in this group, some fermenting clean and some better suited for ‘farmhouse ales’. One of the more common strains is the Voss, which ferments clean in character in its ideal temperature range of 30–35°C. These temperatures mean fermentation is typically done in three to four days.

Planning your brew

Selecting the correct yeast strain for the style of beer you plan to brew is key. It will help ensure that you get the expected taste and aroma in your beer and reduce the chance of getting undesirable yeast characters. Then, making sure you ferment at the ideal temperature for that yeast strain will help improve the quality of your brew. 📄

Recipe: NZ Pilsner

23l All Grain

4.5kg NZ Pilsner Malt

250g Caramel Pils

100g acid malt

120g light crystal

40g Motueka (60min boil)

35g Motueka (15min boil)

15g Motueka (5min boil)

25g Riwaka (flameout)

75g Riwaka dry hop on day four (for five days)

Saflager S-189 lager yeast (ferment at 14°C)

Mash at 65°C for 60 minutes. Boil wort for one hour with hop additions as in recipe.

For the extract version, replace NZ Pilsner Malt with two 1.7kg cans Black Rock Blonde Malt. Use steeping grains and hop additions as recipe above.

A LONGCASE CLOCK RESTORATION

EMIL NYE ENLISTS HIS SKILLS TO REHABILITATE A CLOCK THAT WAS BUILT AT
THE SAME TIME AS COOK WAS MAKING HIS FIRST VISIT TO NEW ZEALAND

By Emil Nye Photographs: Emil Nye



Passing a closed antique shop last year, I spotted the side of an oak longcase clock through the window. I was afraid it would be a ‘30-hour’ clock. I have never liked the idea of winding a clock every day; once a week is usual! ‘Month’ and very rarely ‘year’ longcase clocks can be found but they are invariably high in quality and value.

When I was looking for a grandfather clock back around 1970, the better ‘eight-day’ ones were increasingly sought after and prices were rapidly escalating. The 30-hour clocks retained a more moderate and steady market and were often in a good-quality oak case; oak was common in England in the 1700s!

European and particularly English clocks are widely considered the pinnacle of quality and a London clock is considered the ideal. I was lucky enough in 1970 to find one such eight-day clock that I could afford. It needed some restoration — but that is another story.

A prompt visit to the antique shop next morning to investigate the oak case confirmed it housed an attractive eight-day movement that looked basically sound — but it did need attention (see Photo 1).

The owner was correct in saying that, when restored, it could be quite valuable — although prices have eased over the past 10–20 years, except for the exceptional examples; meantime, there is increasing recognition of the quality of ‘good’ provincial makers — some were very good.

A deal was quickly struck and I brought the clock home to assess restoration.

Should I restore?

There is endless debate about not restoring or polishing antiques, and so on. Should they look like new? Some of the changes are part of the antique’s history. Is it a sin to polish brass that has taken years to acquire a patina?

Is the whole even original, or a ‘marriage’? Replacing missing bits has to be OK sometimes, as does cleaning awfully deteriorated silvered dials — ‘chapter rings’ — with the black waxed numbers. Why have a clock if you can’t read the time on it?

Dials are easily re-silvered. The maker would not expect deterioration to go unchecked for 250 years! Similarly, it is surely right to sympathetically replace broken or missing bits.

Each person must make their own decision about how far restoration should go; it is theirs to enjoy!

I am not an horologist and think I know my limits, but there was evidence of very amateur work on this clock. The weights and wires were a messy tangle. One weight lacked a hook or eye on top and hung from an ugly sling of wire passing to and fro between screws in each side.

The first and simplest restoration was to replace a suitable screw-eye. ►

1.
The
movement
appeared
sound



The nitty gritty

While not bad from a distance, some of the silvered parts were blackened (see **Photo 4**) and in several places brass was showing through the silvering (see **Photos 5, 6**). All the brass was heavily tarnished and very dirty (see **Photo 7**).

The upper dial was blank with a convex space behind, covered with dark blue crystals completely obscured by dust. A cut-out at the bottom of



4. Some of the silvered parts were blackened



5. Brass was showing through the silvering



6.

the convex cover (see **Photo 8**) gave evidence it would have contained a moving object, the motion of which is usually synchronous with the pendulum. Closer inspection confirmed a hole for a securing pin in the arbor carrying the arms of the escapement that controls the pendulum (see **Photo 8a**).

I used a strip of venetian blind sample to make a template for a shape that would reach the space in the small dial (see **Photo 10**); this confirmed the concept. To attach an actuating rod to the seconds arbor, I made a small plate from a remnant of 0.3mm brass sheet. I rolled the back and top edges round the wire rod, which I had bent to the shape of the template.

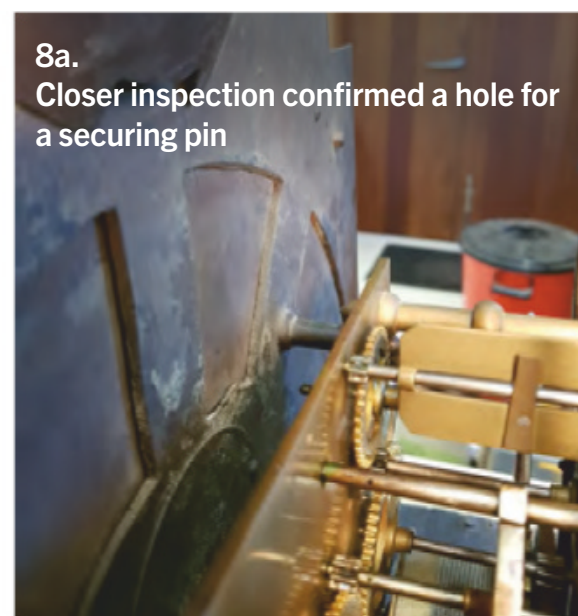
I rolled the bottom edge round an old drill of the same diameter as the pendulum arbor, trimming it to encircle just over half of it as a 'press fit'. It was secured in place by a pin



7. All the brass was heavily tarnished and very dirty



8. Evidence once of a moving object



8a. Closer inspection confirmed a hole for a securing pin



10. I used a strip of venetian blind for a shape that would reach the space



11. The pendulum arbor was secured in place by a pin passing through a pre-existing hole

passing through it and the pre-existing hole (see **Photo 11**).

What should the automaton be? It is often a sailing ship. An image of *Endeavour* might have been particularly appropriate, as the replica visited for the 250th anniversary of Cook's arrival in New Zealand, and this is the approximate age of the clock. However, we live in the Bay of Islands and there was some opposition there to the commemorative visit.

Let's be original

My wife suggested a dolphin. I found illustrations and copied one, amending it a bit and scaling it to fit the space. I stuck the picture on an offcut of the brass sheet (see Photos 12a, 12b) and cut round it, leaving extra bits to bend over to secure it to the operating rod, which is almost completely concealed behind it (see Photos 12b, 13b).

I could have soldered it on but I am not good at soldering; plus, adjustment

would be more difficult and there were other pros and cons. The dolphin could slide off the rod if I decided to change it. If I made the actuating rod of brass this could double as both the central mast of *Endeavour* and a good attachment point for the rest.

I drilled a hole for the dolphin's eye, engraved lines round fins and jaws with the Dremel, and blackened them.

The next step was to remove the dial plate and dismantle its attachments.

Clockmakers often bought in dial plates, the cast corner spandrels, and even hands. They might attach their own dial rings, hands, etc. in front of their own movement.

The dial plate is fixed to the clock movement by tapered pins through the base of the legs (see Photo 11). These pins, like those securing the hands, were easily removed and placed in the 'work-in-progress' jar. Brass pins in steel and vice versa. ►



12a.
I stuck the picture on an offcut of the brass sheet



13b.
The operating rod, almost completely concealed

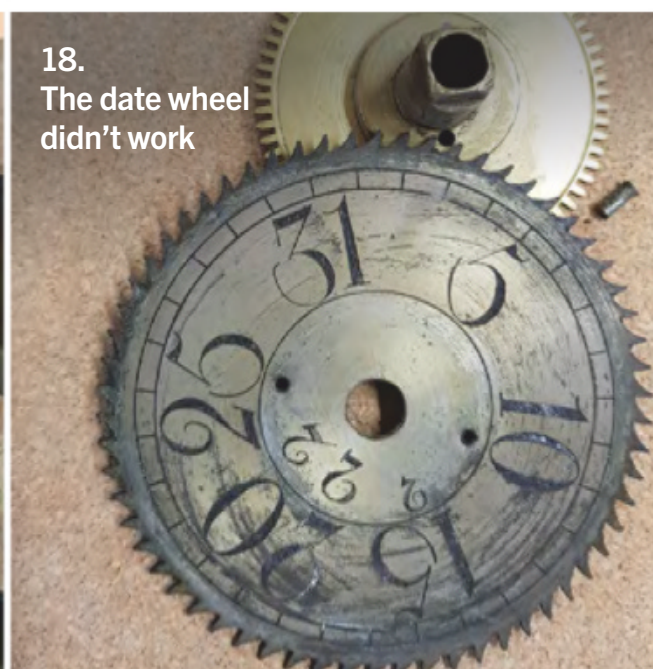


12b.
The operating rod, almost completely concealed





17.
I drilled out the old rivets



18.
The date wheel
didn't work



19.
The actuating pin on the hour
wheel boss had been cut off

Silvering

The silvered main 'chapter ring' with the wax-filled engraved numerals was in quite good order but the smaller ring and the blanking plate — where other makers might fit a seconds-hand mechanism — with its decorative compass points was dirty; the silvering was tarnished and absent in places, with the brass showing through (see **Photo 5**). The rings were all secured by rivets, which I removed by drilling out the centre of the head (see **Photo 17**).

A silvered brass date wheel showed in a sectored cut-out (see **Photo 18**) but it didn't work. Its 62 teeth passed close to the hour wheel boss, so clearly it was moved twice a day. Further examination confirmed the actuating pin on the hour wheel boss had been cut off! (See **Photo 19**.) I drove out the remnant and replaced it with the base of a broken 3.2mm drill (see **Photo 20**).

Later, when I set the clock up in a new place, it went well, as before — but tended to stop a few minutes before 12. The mystery of why someone had sawn off the date actuating pin — which I had replaced — was now explained. The 62-tooth date wheel is very close to the boss. The same-sized 3.2mm replacement pin is too thick, meaning there is too much 'depthing' as it engages. I suspect my predecessor replaced the original with a slightly larger pin and when it didn't work he just sawed it off. A clockmaker would probably blank the hole and redrill for a smaller one. However, I removed 'my' pin and filed the end to half the diameter in a tooth shape, the result being that now the date will advance half a day every 12 hours as originally designed.



20.
I replaced the actuating pin with the base of a broken 3.2mm drill



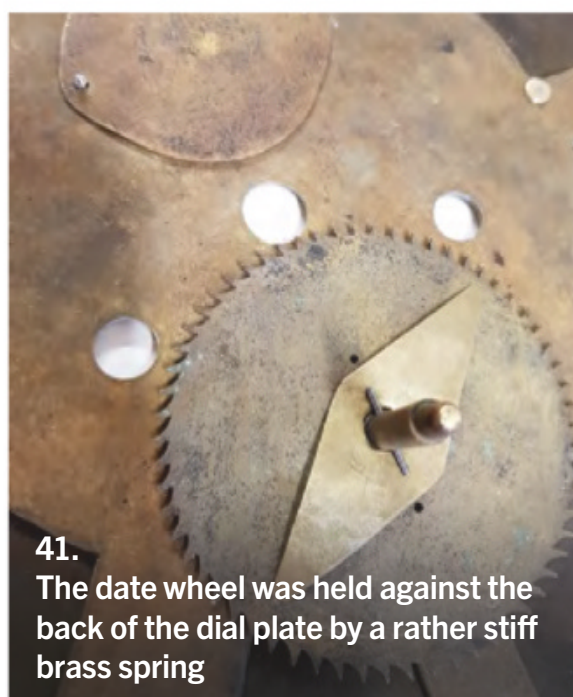
40.
I found a thin Tufnol washer, which I drilled out to fit over the location pin

How do I clean for resilvering?

The date wheel was heavily blackened and tarnished and also needed resilvering. It was held against the back of the dial plate by a rather stiff brass spring (see **Photo 41**). I was concerned that this would cause abrasion of the silvered face. To prevent that I found a thin Tufnol washer, which I drilled out to fit over the location pin (see **Photo 40**).

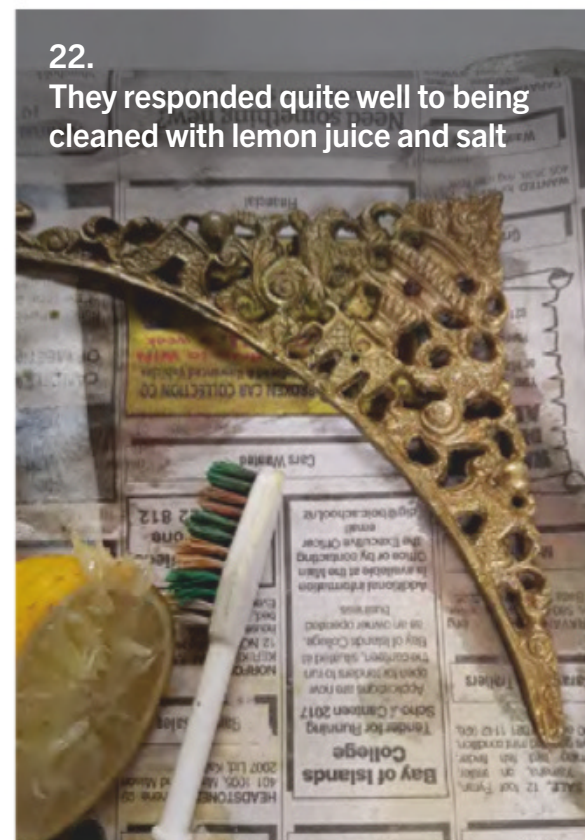
I put all accessory bits aside with the dolphin for cleaning or (re)silvering. This is not difficult and something many sheddies could, and probably do, take on. The decorative brass spandrels were secured from behind as usual by little flat-headed bolts and were easily removed. They responded quite well to being cleaned with lemon juice and salt (see **Photo 22**), but the same could not be said of the other attachments or the basic brass dial plate; they resisted my every effort.

All the impressive results on YouTube,



41.
The date wheel was held against the back of the dial plate by a rather stiff brass spring

using recipes of vinegar, baking soda, and so on, didn't work. A cut lemon and salt produced a fair bit of green (see **Photo 23**) but little actual cleaning effect — nor did Brasso. My elbow grease was exhausted and so was I. I became quite disheartened. I suppose there was 250 years' worth of tarnish and dirt to remove!



22.
They responded quite well to being cleaned with lemon juice and salt



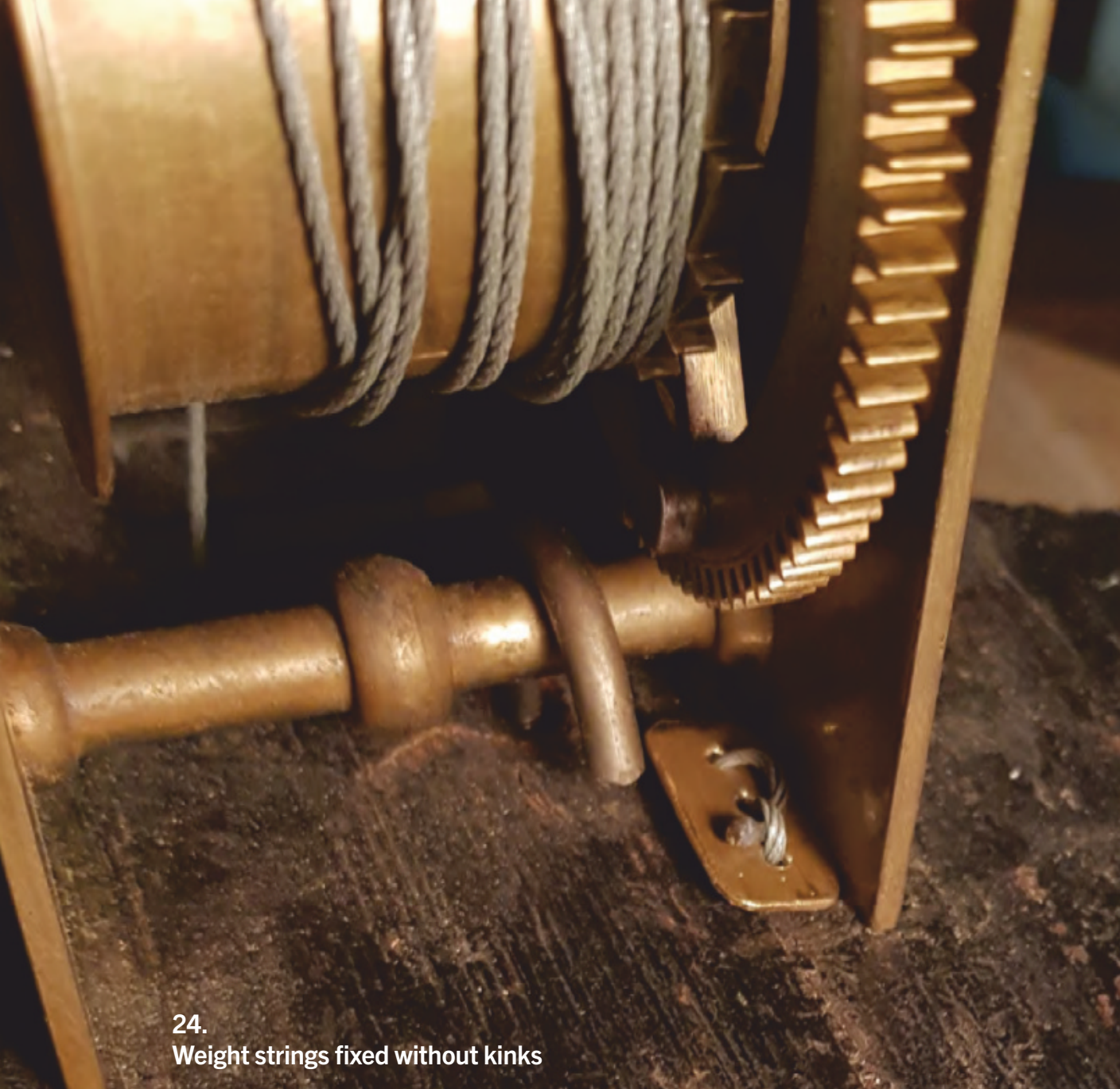
23.
These attachments resisted every effort to clean them

Chemistry to the rescue

I finally decided stronger treatment was the only way. In a secure cupboard in a double container was my 'spirits of salts'. This is strong hydrochloric acid; my chemistry is many years past, but this would quickly dissolve zinc or copper, which makes ... brass. However, the dial plate is quite thick brass and if I tried carefully and quickly, well away from the decorative ringed winding holes and hammered centre — and had running water to hand — could I do serious harm?

A touch with a lightly loaded toothbrush had immediate effect; I rinsed it at once — cleaning was, after all, not impossible. Emboldened at last and with diluted spirits I cautiously continued and quickly had it clean.

I did the same for the spandrels, for which the toothbrush was ideal. All was not so bright the next morning. ►



24.
Weight strings fixed without kinks

Brasso has inbuilt constituents to prevent tarnishing, so I polished them with that. I decided not to use lacquer at the present time. The filthy inside of the convex cover behind the top ring was covered with crystals, which I didn't want to loosen.

I very gently washed it with water and a very soft bristle toothbrush. I then used jewellery cleaner; the crystals proved to be dark blue (night sky?). I cleaned the filthy back of the convex plate and other accessory parts as before.

The movement was not too bad; I gave it a basic clean and oiled it with clock oil.

Replace the original catgut?

The weight strings should be catgut but are often replaced with wire. How original should one be? I do have replacement catgut.

The free end is often untidily secured or knotted through the baseboard. I have seen several solutions; a good one avoids knots and kinks. The end is threaded through three holes in a round or oblong piece of brass and trapped under the loop; so I made up a couple (see Photo 24).

The baseboard carries the weight of the valuable movement plus its two 12-pound weights. It was perched on the narrow sides of the case. Splits bore witness to the attempts to locate it securely with nails (see Photos 42, 43).

Strips on the underside were not located near enough the sides to prevent it slipping off — which raises questions — so I added hardwood ones close to the narrow edges (see Photo 42). The movement is secured to the base by a single hook, the nut

of which had, over the years, worked obliquely at least halfway into the pine baseboard. With a spade drill I levelled the base of this recess, glued in a pine dowel, and redrilled (see Photo 42).

The strike mechanism was the older 'locking ring' type — the later 'rack' striking is always in sync as the 'snail' that regulates it is attached to the hour wheel. To allow for synchronizing the hour strike without removing the hood I made a small lifting lever (see Photo A on first page) operated by a cord, which could be reached through the main door. There was already a small hole in the baseboard, ideally placed for the cord (see Photo 42).

The pendulum

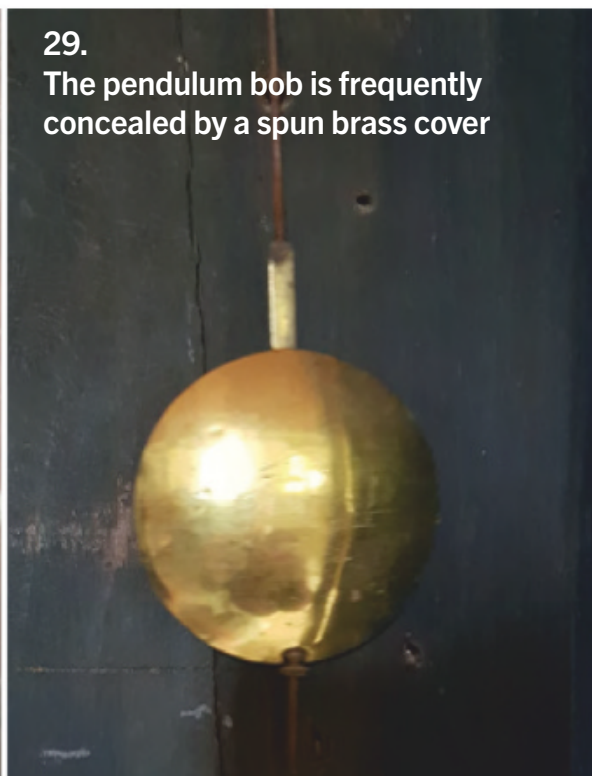
The pendulum was very basic. The bob is always lead but is frequently concealed by a spun brass cover (see Photos 28, 29). Until the late 1700s it was often visible through a lenticle in the case (see Photo 1). Although that doesn't apply in this case, the bob looks so rough that I decided to cover it. I had a thin piece of scrap brass (0.2mm) and decided it would be fun to spin a cover. I had tried spinning once before, making a larger paten for our church as wafers kept slipping off the smaller one. My wood-turning friend turned a pattern against which I 'spun' a scrap of 2mm copper gutter, using a metal rod. It's necessary to anneal the disc



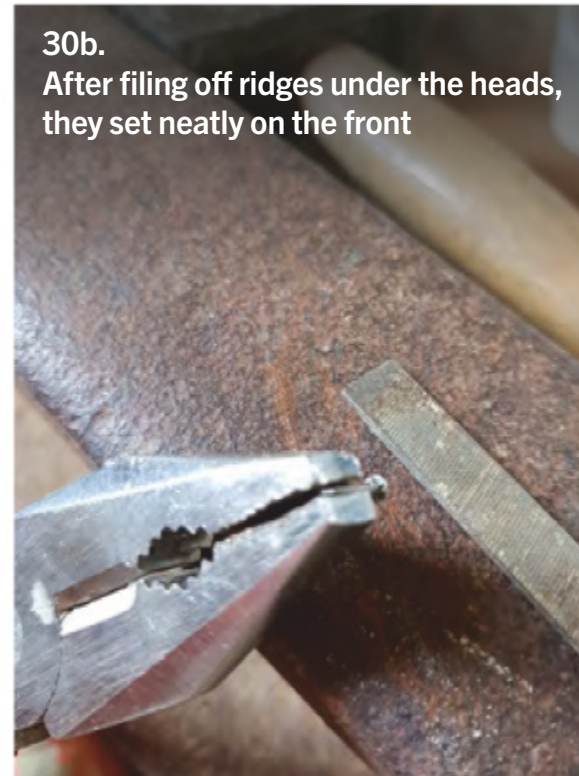
42.
I added hardwood strips



28.



29.
The pendulum bob is frequently
concealed by a spun brass cover



30b.
After filing off ridges under the heads,
they set neatly on the front

from time to time as it work-hardens. It was very satisfying and worked well, and I had it silver plated.

This should be even easier; I could make the pattern myself with a hole saw and 19mm ply, chamfering the front face to match the bob.

Hidden repairs

It can be very difficult to be certain that a clock movement and case are in every way original. Hands are fragile and have quite often been replaced. Other parts may have been substituted over the years. Repairs that are not original may have been very well done so that a 'marriage' may be difficult to detect. The important feature in the eyes of a specialist is that the various parts be consistent — for example, the hands may or may not be original but are appropriate and in good condition.

Rusty hands can be simply sanded clean then 'blued' again by placing on a tray of sand, heating from below, and watching the colour develop. Cleaning silvered parts is not difficult and resilvering is almost equally easy. Re-waxing numerals or other black decoration is a bit more involved but also not difficult; it wasn't necessary here.

The part to be silvered needs to be spotlessly clean. Don't be afraid to expose more brass; use very fine emery paper, 400 grit or finer — some fully silvered dials have a visible grain. Wash with soapy water, rinse, and dry. Silvering powder (Horosilv is basically silver chloride) is applied with a small

cotton pad using a circular motion; the brass magically turns silver.

The dolphin came up well. For small areas I use a cotton bud. The area is washed and usually finished with Horofinish (basically tartaric acid) which brightens it. As silver tends to tarnish, lacquer is often applied; purists quite often use clear wax.

Refixing the dials

I couldn't easily source tiny rivets to refix the various dials to the backplate — I was also concerned that it would be hard to peen the ends on the front face neatly and I would be risking local damage.

For the chapter ring I used small French nails. After filing off ridges under the heads, they set neatly on the front (see Photos 30a, 30b).

The holes in the dial plate are larger than in the chapter ring, so, to make



31a.
I made little washers of brass rod

it easier to peen the ends nicely on the back, I made little washers of brass rod with a clearance hole (see Photos 31a, 31b). I supported the heads of the nails on the edge of a small metal block on the bench and easily peened the back over the washers (see Photo 40). ►



31b.

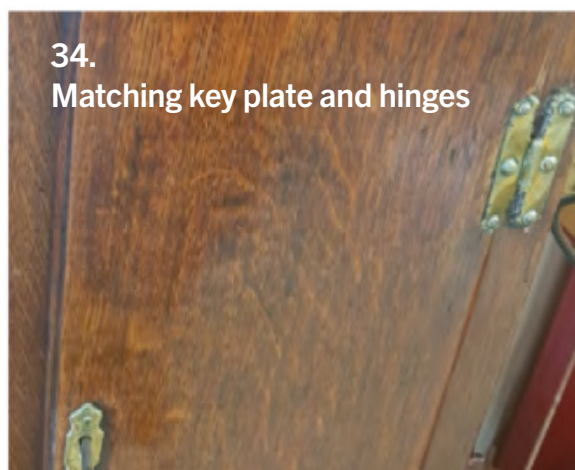
As an alternative to even smaller rivets for the other parts, I was pleased to find a box of tiny nuts and bolts online, some of which had ‘rivet heads’ that looked perfect.

The wooden case

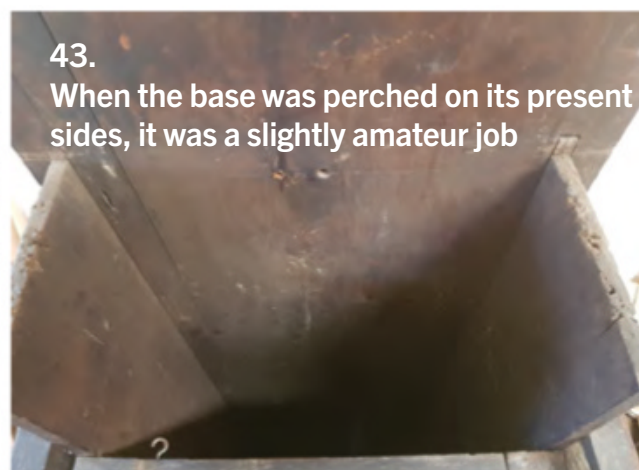
Restoration of the case is not part of this story, but the history is; signs are not hard to find and are significant. Old clocks stood on damp stone floors, and the bottom has almost always been cut off — sometimes to fit lower ceilings — and often not replaced.

The wider base part below the ‘trunk’ consists of a basic piece usually with one or two pieces of ‘skirt’ at the base to strengthen or decorate. In my clock the lower edge of the first is smooth and apparently original. The second has clearly been shortened (see **Photo 32**); it would originally have been deeper, either plain or possibly shaped as feet.

I might remake this in due course, after more research. A clockmaker would have his own style; he would often not make the case himself but would have his favourite casemaker. Some cases, particularly lacquer ones, were sent overseas for decoration.



34.
Matching key plate and hinges



43.
When the base was perched on its present sides, it was a slightly amateur job

Locks and fittings

The lock is not original. Despite the internet, it is difficult or impossible to find locks of a size that fit an original cut-out in antique furniture — anyone who knows a source should publish it.

The current lock was well chosen and fitted; the key plate, which matched the hinges, was moved slightly (see **Photo 34**). It is clear that the case was in poor condition and lacked a lock for some time, as the door was evidently held closed with a simple thumbscrew at the top corner. I would not try to conceal this; it’s all part of the clock’s history.

It is not unusual to find that a movement has been placed in a different case. My movement and baseboard ‘match’ and appear original. However, the fact that I had to add wider bars under the baseboard to hold it securely in place suggests

rather strongly that it may have originally stood on a narrower case. When it was perched on the present sides many years ago, it was a slightly amateur job, with the nails roughly placed in the thin edges to hold it in place (**Photos 42, 43**). The sides appear to have been shortened an inch (**Photo 43**). Could the case once have housed a smaller movement? However, the clock and case are pleasing and, if not originally paired, they are not obviously inconsistent.

It is very pleasing to have an attractive restored clock that keeps excellent time and deserves, and now has, a better location than my shed workshop (see **Photo 35**). 📦

32.
The second lower edge has clearly been shortened



35.

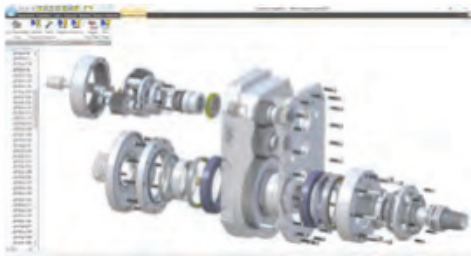


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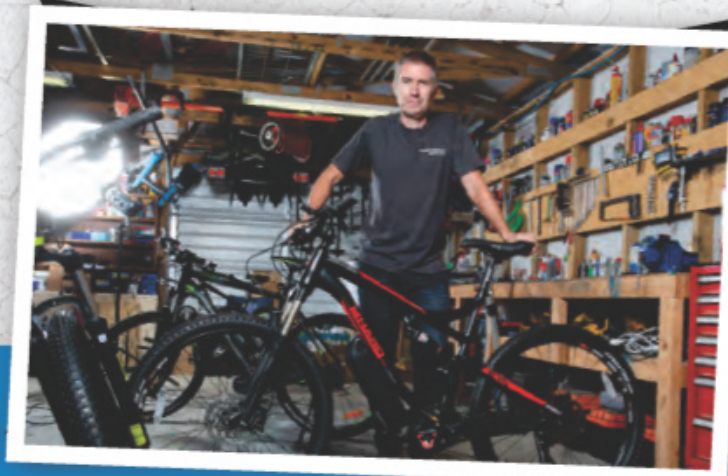
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A vintage hand-cranked drill is shown against a background of the words "DRILLING TODAY" in a distressed, blue, stencil-like font. The drill features a wooden handle, a large metal gear, and a metal drill bit. The background is a light, textured surface.

By Jason Burgess

Photographs: Jason Burgess

A white picket fence is all that separates a suburban side road from the grounds of Rotorua Settlers and Steam Museum.

Beyond the palings, in a garden strewn with ancient farming equipment, windmills, and time-worn timber wagons, a whitewashed Arts and Crafts homestead sits like an anomaly among an enclave of distinctive frontier buildings. Every so often, a ride-on diesel train with its cargo of kids and parents pops out of a tunnel to complete a loop of the turn-of-the-century Whakarewarewa Post Office.

On 'live steam' days, a beautifully restored 1892 McLaren traction engine may also be seen making slow laps along a gravel driveway between the corrugated iron exhibition rooms. For history buffs and curious sheddies alike, it is a compelling — if slightly confusing — tableau. Rest assured, a visit here will not disappoint.

From the entry door forwards there are no shortage of friendly volunteers, banging, sawing, drilling, and ready

Rest assured, a visit here will not disappoint

to share a few memories, expertise,
and experiences about the museum's

34 different collections and life in general. Most of the volunteers are as proudly aged as some of the museum's unique exhibits. According to museum secretary and co-ordinator Bruce Chapman, without these guys' knowledge and energy the place would buckle at the seams. ►





An original farmers cottage now serves as a general store exhibit

Below: Max Hyde overlooking a 1960–'70s Westbury Precision mill/drill that he has stripped and rebuilt. Westbury was a very famous and well-read model engineer in the UK up to and after World War II, very prolific at designing machinery and models for modellers. This drill was among assorted heritage machinery that arrived from an estate



The museum has six Weir pumps, three of them attached to an 8hp Anderson boiler. Weir is a Scottish firm that still makes pumps, mostly hydraulic



A men's shed

Bruce rocked up here about 15 years ago, as a volunteer. He now manages the team and day-to-day operations. That means everything from asset and funding procurement, restoration work, and curatorial and promotional work to front desk duties. He admits that he would rather be out the back, “getting my hands dirty,” fixing and restoring things. He sees the place as a men’s shed attached to a museum.

“All our members are tradesmen of some ilk. The museum aspect spins some of our wheels but the balance of our people are here to continue doing what they have always done, which is to make, build, and keep busy.”

“We ad-lib, think laterally, and fix our own problems”

Busy they are. The daily to-do list is as long as it is varied. Constant maintenance and restoration of century-old buildings and archaic but trusty technology plus the ongoing conservation of the treasured displays is enough to make anybody lose sleep. Bruce admits that he often does.

“Like many similar institutions, we are underfunded and understaffed. We ad-lib, think laterally, and fix our own problems with any field of maintenance or build that can be done here.”



This restored windmill taps into a natural spring to drive a rebuilt water wheel



General view of woodwork shop — all restoration and renovations of the old building are managed from here





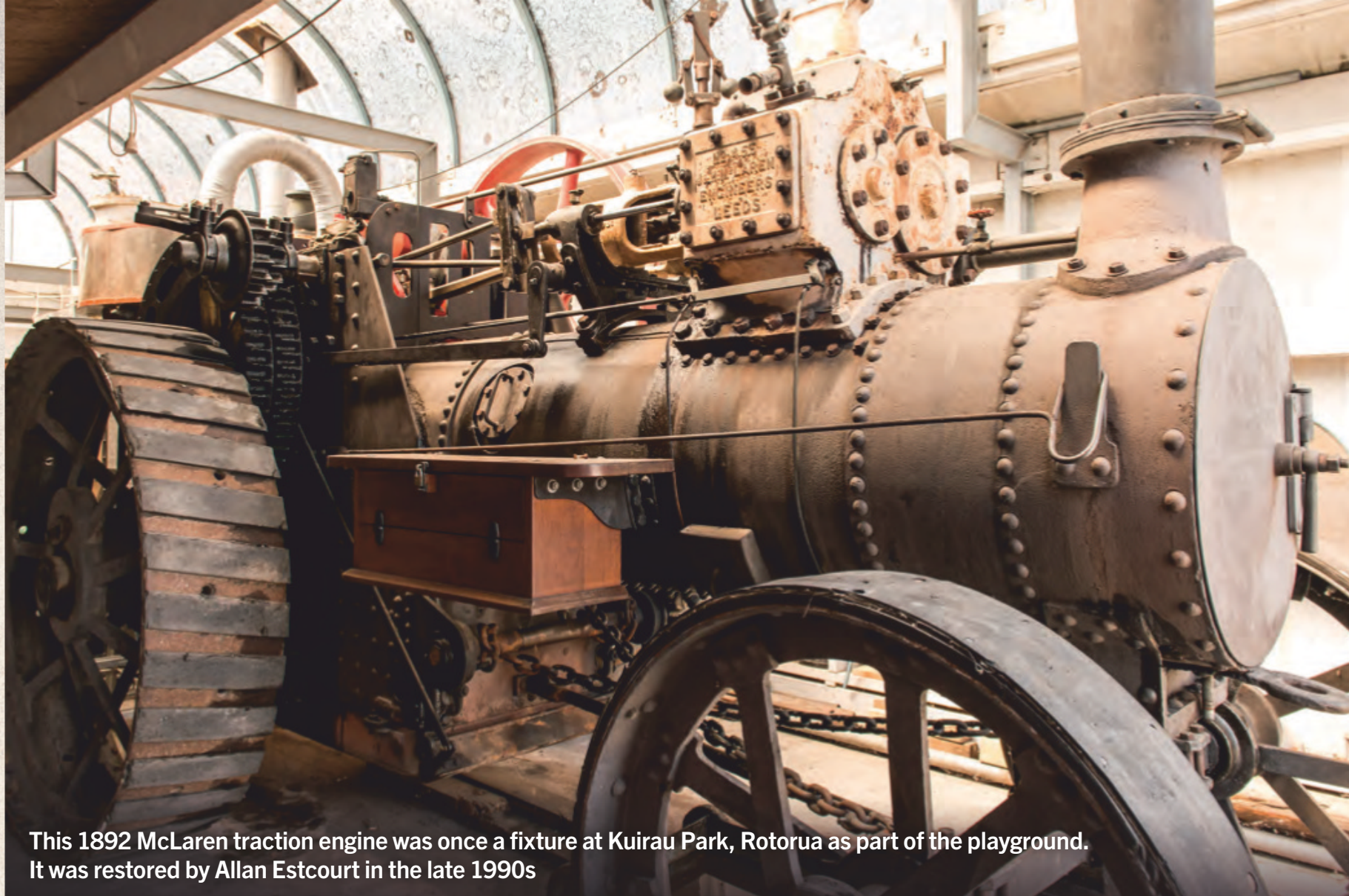
According to museum secretary and coordinator Bruce Chapman “without these guys’ knowledge and energy this place would buckle at the seams”

The workshop

Much of that work is achieved in a wonderfully overcrowded shed doubling as a metal shop and woodworking area. Many of the tools and much of the machinery are pre-World War II — right back to the days of the Industrial Revolution. Case in point is the overhead flat-belt drive system that runs a grinder / wire brush spindle, a large column drill press, an eight-inch double ended grinder, and a 14-inch flat-belt-driven lathe — late 1800s technology that, with appropriate TLC from the museum team, still works as good as new. In fact, once the new workshop is signed off, they plan to connect other colonial-era tools, such as a turn of century JA Fay bandsaw, a 1908 Drummond radial arm drill press, and an unidentified lathe with English metalwork and kauri framework, to complete a full belt-driven working display area. ►



Close-up of part of the fully restored and operational Myford ML7 lathe, circa 1960s



This 1892 McLaren traction engine was once a fixture at Kuirau Park, Rotorua as part of the playground. It was restored by Allan Estcourt in the late 1990s

The steam stuff

“We have technology here that dates back 150 years,” says Bruce. “We don’t necessarily know the details about some of it. We are constantly researching it. Our oldest mechanical thing is a David Murray Whanganui. Steam people think it’s absolutely marvellous because it is really old and it was made in New Zealand. What we do know is that prior to the Second World War, it was used to run a generator at the Spa Hotel in Taupo. Steam technology is a rare commodity; it’s a hard thing to have. It’s hot and you have to go through some hoops to

“Steam people think it’s absolutely marvellous because it is really old and it was made in New Zealand”

run it. Every year we have to renew the boiler certificate on our 1956 Anderson boiler, and we have to have people who know how to use it. Meeting modern health and safety requirements with this kind of technology is a major constricting factor.”

Enjoying the work of a blacksmith

Another challenging area for the team is the working forge.

“Our poor old blacksmith used to be here every weekend knocking up something and it was cool to watch. But now his eyes have gone. People love it when things are being made in there. Most of the boys will have a go at knocking up a fire poker or something simple — it has to be simple because being a smithy is actually difficult work,” Bruce explains.

Across from the forge is an electric power hammer from the 1930s or ’40s.

“A seriously wonderful machine,” says Bruce. “It takes the labour out of shaping heavy stock. But you need to know how to use a manual hammer before you come onto this thing! Everyone thinks they can come here and make the *Titanic* propeller shaft but actually it’s quite delicate; I have had to rebuild the driving pin on it three times.”



Bruce Chapman pushing and Max Hyde pulling a circa 1920s Waterloo Boy engine into the workshop. The museum specializes in restoring machines that kids can watch and interact with

Working with the community

The museum attracts a lot of interest from out-of-town school groups. The team specializes in restoring machinery, often making modifications to create interactive educational displays — take a water pump that uses an old dentist's treadle for power or a 1920s reciprocating vacuum pump that a child can wind over to see how a vacuum effect is created. Outside, hand pumps and a restored windmill tap into a natural spring to drive a rebuilt water wheel — simple looking and infused with number-eight wire, but careful stripping, reconditioning, and

rejigging of seized mechanical gear can take years.

The crowded engine hall, with its collection of working-order stationary engines, does not look like your typical playground. However, Bruce says, “Most kids who come here are let go, to use their hands, their eyes, and their brain. Give them a handle to play with or something to do and they educate, enlighten, and enjoy themselves.”

Recently the museum worked with a Scout group exploring the possibilities of motive power and with a high school focusing on technological changes over the years. ►



Max Hyde checking out the ‘new’ tumbler, hand built by Bruce Chapman from items lying around in his shed. There is stone and steel shot in the tyre and it is used to remove rust and scale from nuts, bolts, and other small items



Max Hyde moving an 1920's Anderson stationary engine through the “Engine Hall”

Below :General view of the workshop, including a Myford ML7 lathe and large motor-driven drill press, plus grinder/wire brush spindle, large column drill press, eight-inch double-ended grinder, and 14-inch flat-belt-driven lathe



Simple looking and infused with number-eight wire, but careful stripping, reconditioning, and rejigging of seized mechanical gear can take years

Early New Zealand

Apart from the workshops and engineering exhibition halls, the most recognizable feature of the museum is the Dutch Colonial-style Douslin house. The home was built from matai and rimu sourced from the Rotoma–Rotoehu area and was finished in 1925.

Architecturally, it pays homage to the farmhouses of Rhodesia (Zimbabwe) where former owner, Horace Balfour Douslin, lived for some years, before establishing an Ayrshire stud farm on this, his once-extensive

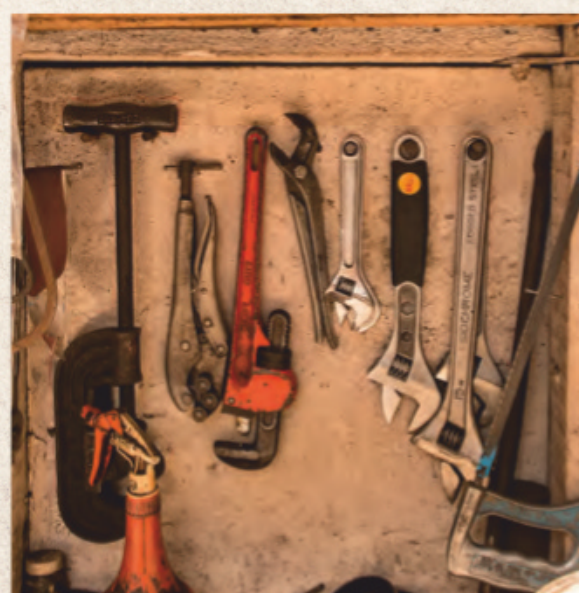
Norma had catholic tastes and was known to collect ‘everything under the sun’

property. It was the first house in the area to be connected to electricity and the water supply. The Arts and Crafts style of the interior features period furnishings and an incredible range of exhibits, extending to a wonderful room full of taonga such as woven feather cloaks and carved tekoteko from the Sheward collection. For volcanologists, there are fascinating and fittingly dusty displays of artefacts and photo records from the 1886 Tarawera and, later, Waimangu eruptions.



Above: The hat shop and haberdashery display, all from the Norma Evans collection. “Norma was a milliner by trade,” says Bruce. The hat shop is housed in the original Rerewhakaaitu Post Office building

Below: The picket fence and entry gate to the museum, also known as Te Amorangi



Before power there was elbow grease, a small selection of hand tools from the main workshop.



Bruce Chapman pulling in the dog clutch to drive the 1904 power hacksaw

“History is disappearing; I’m keen on any damn thing that comes through that door”



Max Hyde transports the restored Westbury drill on the museum’s 1956 International Harvester DED3 Farmall tractor



The leather-goods store display in the gaol. Also sourced from the Norma Evans collection. The buildings on this strip have been renamed ‘Evansville’!

Extensive local collection

Outside, the cluster of historic buildings affectionately known as ‘Evansville’ contains significant exhibits from a local collector, the late Norma Evans. Norma had catholic tastes and was known to collect ‘everything under the sun’, some of which is now entrusted to the Rotorua museum. In Evansville, her extensive cache offers a great take on Aotearoa country life circa 1920s. The buildings housing Norma’s collection include Rotorua’s old gaol — now home to a haberdashery — a forestry hut, an original farmers cottage that serves as a general store exhibit, and the original Rerewhakaaitu Post Office, now Norma’s hat shop. Across the garden is the Whakarewarewa Post Office, which brims with New Zealand postal and telecommunications history among so much more.

Despite the museum’s 15 buildings and exhibition spaces, safe storage is a constant issue.

“Sometimes,” says Bruce, “people see this place as a repository for their grandad’s history that they don’t want anymore. We have to be ruthless about what to take — one in one out, one way or another. While I have a bent more for the smelly side of things, I don’t have any particular favourites. I don’t care if it’s a tea cup or a steam engine. History is disappearing; I’m keen on any damn thing that comes through that door.” 📁

Rotorua Settlers and Steam museum (aka Te Amorangi Trust Museum)

43–45 Robinson Avenue, Holdens Bay, Rotorua, towards the airport

Open: Thursday and Sunday, 10am–4pm. Groups by appointment

The second Sunday of each month is ‘live steam’ day.

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Blackberries pick

Apple dehydrating

Hazel nuts to harvest

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Bike fixing ✓

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Prune Currants

Prune Raspberry

Plant Willows

Peel + Chop Garlic 6/4 ✓

Deal to blackberry under nuts + apples

Seal guttering

Berry Netting

- fix holes

- re-sew joins

- clear base

Thermette

Jennie

7:17 mins

Cam

10:11

Wizzi

16:26 mins

Order charge controllers:



Jennie jigsawing the bottom out of a bath, to allow the migration of ground-sourced moisture and microbes

GROWING OUR CAPACITANCE

LOCKDOWN PROMPTS MUSINGS ABOUT RESILIENCE AND PASSING KNOWLEDGE ON TO THE NEXT GENERATION

By Murray Grimwood Photographs: Murray Grimwood

Recent events have had me thinking about what sheddies can do for themselves and others. I've also been contemplating how important it is that sheddie knowledge gets spread wider.

Society clearly needs to be able to weather shock-load events better, the buzzword for this being 'resilience': the capacity to cope with, to absorb, to withstand.

Instead, we have evolved a just-in-time, minimal-inventory system dependent on cheap production 'somewhere else', because the number crunchers reckon unmoved stock and reasonable wages to be a 'waste of capital'. Warehoused stock and local production capability should really be counted as capacitance.

Sheddies — engineers in particular — know all about capacitance. We don't build something that's just enough; we build it with a 20 per cent or 50 per cent margin, build it to last longer than we need it, build

it to be easily maintainable. Most of us here can do that by eye and do it instinctively; we've a lifetime's experience of what breaks when, how much you can get away with, and how entropy (rust, corrosion, rot, and wear) can be parried.

We don't build something that's just enough; we build it with a 20 per cent or 50 per cent margin

Looking after yourself

At a personal level, the more we can fend for ourselves the less it costs and the less we are vulnerable. Food comes top of the list, which is why the first lockdown project hereabouts was another glasshouse. I came to home food production late, initially just building whatever my greener-fingered better half required. Then I

realized that energy, which I spend so much time discussing, researching, and contemplating, is mostly solar and that growing food is the most direct, efficient, and cheap way to tap into it. Now, I'm a convert but she is still way ahead of me; she has us years ahead in preserves and months ahead in stored produce.

An ideal material for glasshouses is second-hand glazing; in our case it was a stack of discarded ranchsliders. Growing spaces don't have to be big; a piece of spouting with some clear plastic draped over will suffice if space is confined. Raised beds are an easy sheddie project. We use baths hereabouts — up to 50 at one stage. Oddly enough, baths retain moisture while resisting decay — who'd have guessed? I've seen everything used: washing-machine drums, toilet bowls, tyres, corrugated iron, and timber all the way from formal to repurposed pallets. Watering systems are fun to nut out and assemble. ►

We used to be better at resilience

If we haven't the space ourselves, there are community gardens all over the country, the spin-off being that the kind of people one meets in them tend to be doers; people with a positive bent.

Our parents and/or grandparents gardened their way through two world wars and the Depression, sharing seeds, produce, and tips. They ate well and saved money — obliquely saving energy that could be diverted into the war effort; no bad deal!

Counterintuitively, being resilient can be the antithesis of being efficient — something it took me a long time to understand. We were better at resilience/capacitance some years ago, with our 'No. 8' mentality. That attitude can be traced to a time when we were a months-long sailing-ship voyage from suppliers of machinery — years long by the time a mailed order resulted in an item on-site. If we had to do something, it had to be done with

what was on hand. Repurposing and pragmatic maintenance were par for the course.

I've seen a hardwood piston in a Model A motor, I've driven home on a leather big end — yes, my jeans stayed up — and I've driven home on bolts tapped through stripped splines. My most-prized tool is an old file repurposed as a chisel sometime before 1857.

*I've seen a
hardwood piston in
a Model A motor*

Sharing all that knowledge

Sure, machinery has gotten more reliable, with associated metallurgy and machining-tolerance improvements, but I've long contemplated the benefits we could be getting from passing on the skills learned yesteryear to oncoming generations.

I never drive past a rest home

without thinking of all the knowledge held within, and the joy it would bring to both parties if the old hands could pass on skills gathered over a lifetime to receptive youngsters. I have a nagging feeling that transferring manufacturing to low-wage countries, while paying for the results with increasing debt, will be a move we come to regret.

Lockdown taught me where I'm resilient — where I have the capacity to withstand — and where I'm not. I ran short of jigsaw blades, although I was pretty confident I could create some from hacksaw blades — which suggested a need for more hacksaw blades! I need to do something about my (lack of) drill-sharpening skills. And I never have enough of any kind of tape: insulation, masking, duct, double-sided, aluminium. Bolts, nuts, washers, rivets, and screws are not far behind, nor — despite strenuous efforts at frost protection — are hose fittings. Let's just say I've got a little list ... 📝

KZ Lockdown completed and renamed

In the last column (*The Shed* Issue No. 91) I recounted building a 10-rater pond yacht during lockdown, using only on-site materials. As we went to press it was code-named *KZ Lockdown* and unfinished. We finally settled on *Spirit of Lockdown*, and she's ready to go.

After several coats of rubbed-down paint and varnish, she is resplendent; not concours but good enough for a working model. I cheated and got a friend to spray the final coat. We won't mention *Spirit* falling off its stand during sanding, opening up a fracture line atop the keel — or the time I took getting it back to where it had already been. My ever-tolerant better half sewed up the sails and I built a 'cabin' to cover the radio-control gear waterproof-ly.

The cabin is bigger than the low-profile hatches the old racing fellows built, but I wanted an aperture big enough to get my hands into and I didn't want water inside. Brass eyelet washers encircling puddles of varnish over black paint made passable portholes. The inspiration was the boat in this clip: [youtube.com/watch?v=PF-N9tgrxaY](https://www.youtube.com/watch?v=PF-N9tgrxaY).

Standing rigging I did with 0.7mm stainless fishing trace, looped and swaged. The usual adjustment would be via model-sized turnbuckles but in the spirit of lockdown I improvised, firstly breaking out the brass bits from electronic chocolate-strip connectors then finally plumping for links of old brass bath-plug chain as deadeyes, with cord lashings. Running rigging is nylon venetian-blind cord, as are the fore and back stays, for 'if you see it you won't walk into it' reasons.

The mainsheet requires quite a length of pull, so there's an endless loop mounted on two strips of ply, which are fed into the hull separately then screwed together. A drum winch servo drives the loop, to which the sheet is attached. Another drum winch winds the jib sheet, and a rudder servo takes care of the steering.

A stand, made from old decking and a tie-down strap, finished the project — just in time, too; that list of 'things to do to get more resilient' isn't getting any shorter.





The lockdown glasshouse one month later; note the winter growth

“Lockdown taught me where I’m resilient ... and where I’m not”



A perfect use here for an old paddle



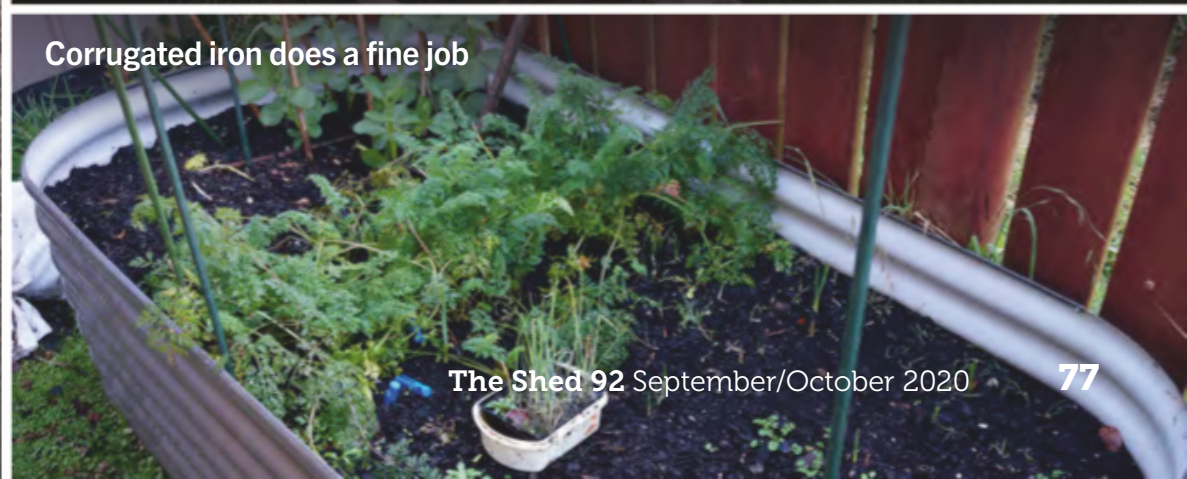
A perfectly adequate glasshouse made from recycled windows; a useful space



Resilience: raised beds and tall plants can block ground-level water sprinklers. An old bunk rail and an old paddle (above) work as mobile raised stands



Baths — at one stage we were using 50 of them



Corrugated iron does a fine job

GETTING CREATIVE

IT'S NOT ONLY NECESSITY THAT IS THE MOTHER OF INVENTION; PASSION CAN ALSO PLAY A PART

By Coen Smit Photographs: Coen Smit

There are a number of drawbacks to my being a sheddie of limited means, not the least of which is an unending desire to accumulate as many tools as possible for jobs that might not ever eventuate but for which the tools are nevertheless 'necessary, just in case'. Another is the attitude that if I can't afford it I'll build it instead. This is precisely what happened when I first came across a Moxon vice.

The Moxon vice consists of two strong timbers that clamp together with two screw drives and can be

either temporarily or permanently fixed to a bench. It is useful for holding unparallel objects, such as chair legs,

Another is the attitude that if I can't afford it I'll build it instead

as well as large objects requiring more clearance than is available in a standard metal or woodworking vice.

In some ways it has been superseded by the 'hobbyist's workbench', which incorporates much the same principle in having a top that clamps with two independent screw drives.

Make your own vice

I came across a short video in which a young woman demonstrated how to construct one of these vices using a hardware kit designed for the purpose.

It was very clear and well presented, and fired up my acquisitive juices once again. Unfortunately, when I started



Moxon working as an extra pair of hands

looking for the hardware kit its cost of around A\$350 immediately ground my plans to a halt.

However, another sheddie had made a YouTube video of a ‘cheap’ Moxon vice using $\frac{3}{4}$ -inch threaded rod and some nuts in place of the dedicated hardware kit. That would certainly work well if somewhat more slowly because of the finer thread.

A check at my local Bunnings turned up a $\frac{3}{4}$ -inch threaded rod for A\$20. Add nuts and I would be up around the A\$30 mark. What I really wanted, though, was a more aggressive thread that would enable the vice to operate with fewer turns yet was still cheap — specialized square threads and nuts are

usually expensive, so they were out of the question.

A eureka moment

It suddenly struck me that there is an overabundance of the sort of thread I

These have a good large thread and come complete with a nut on one end and a winding mechanism on the other

was looking for in every car-wrecking yard across the country: the humble

scissor jack. These have a good large thread and come complete with a nut on one end and a winding mechanism on the other. Better still, they seldom command a high price. A quick trip to my local wreckers and I came away with two perfectly good, matching scissor jacks for A\$10. I already had a good Tasmanian oak beam from a dismantled school bench, so suddenly the project was back on track.

I decided to build the vice for use on my outside work table (see Diagram 1). I cut the rear 90mm by 40mm beam at 1200mm so that it could be easily clamped to the short side of the table. I cut 50mm in each side of the bar so that the top of the ►

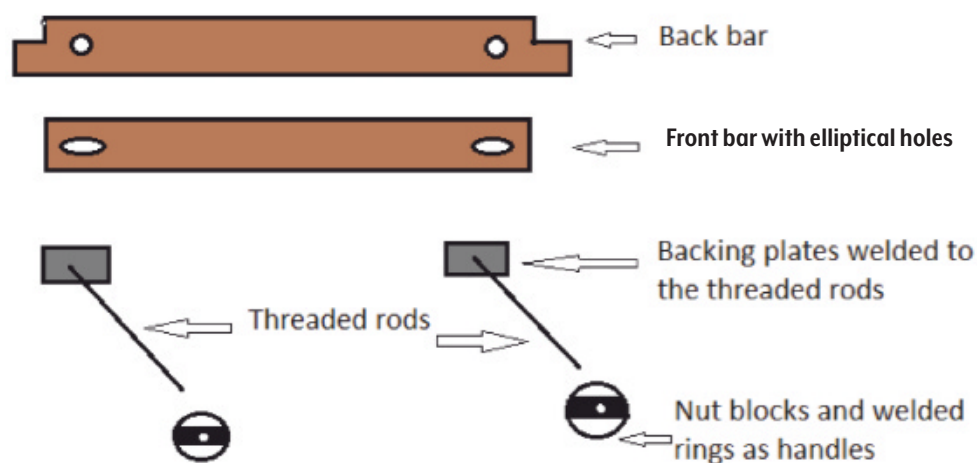


Diagram 1: The basic layout of the Moxon vice with fixed threads and revolving screw blocks

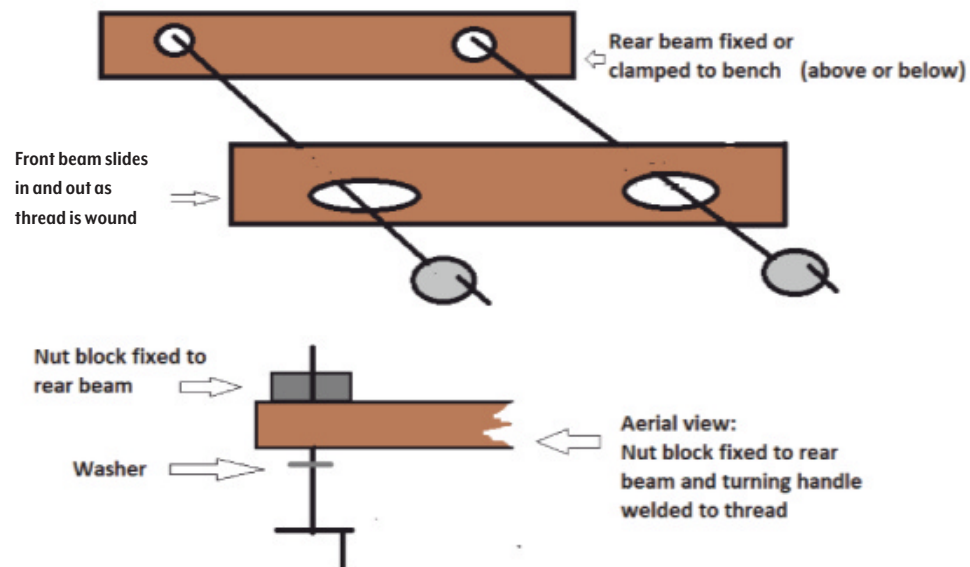


Diagram 2: Options for the Moxon vice

clamps would not protrude over the top of the vice. The front beam is 1100mm long and gives a working length of 950mm between the threads. As you can see from some of the photos, the thread length is ample if you want a vice capable of holding very wide timber. I decided to cut the threads down and limit the vice's jaw opening to 115mm simply because I hate getting hung up on protruding equipment as I'm working and moving around.

Size is up to you

However, if you want to retain the extra wide opening jaws it's easy enough to locate the screw nut blocks on the rear beam and turn the threads themselves, in and out. This way they will protrude over the bench and not interfere with you moving around.

Alternatively, if you intend to make the vice a dedicated and permanent part of your workbench then the threads can

be positioned so they screw in and out under the benchtop and don't interfere at all with your movement or other tools lying on the bench (see Diagram 2). The nut blocks work perfectly by themselves

The threads can be positioned so they screw in and out under the benchtop and don't interfere at all with your movement

to do up the vice if you don't want to go to the extra hassle of welding a ring or arm onto them. I went the extra step because I had a bit of old pipe just right for the job and it does make it easier to spin the vice open and shut.

The grip the two threads have is astounding — locating the short

board you see in the photo in the vice and just hand tightening a half turn, put enough pressure on the board to start deflecting the front beam. Each scissor jack was rated to lift 1400kg, so the threads are obviously capable of applying considerable pressure.

Metal Moxon

That was the woodwork side of my hobby sorted! However, it occurred to me that a Moxon vice adapted for metalwork would be equally handy. My metalwork creations often need something more substantial to hold them in place than the standard engineering vice and a metal Moxon would be handy for awkward welding, cutting, and grinding jobs. It could double as a lightweight sheet bender. So, back to the wreckers I went!

I stripped the next two scissor jacks as before. However, this time I decided to turn the nut blocks down, top and bottom, as shown in Diagram 3. ►



Representative selection of scissor jacks



Basic starting materials



Essential bits extracted from the scissor jack



Thread cut down ready for its new job



The two parts of the vice cut and marked



Close up of the backing plate welded to the thread and screwed to the back bar of the vice



Ring welded onto the nut block to make using the vice a bit easier



Moxon vice clamped to the table and doing its job



Basic parts for the metal Moxon



Close up of the screw nut block and the supporting blocks welded in place

*As you can see,
the metal Moxon is
more demanding
in its construction*



Rear jaw completed



Metal Moxon handling an awkward object



The front and rear beams of this vice are made up of two sections of 50x5x750mm angle iron each. The screw nut blocks are captured in the rear angle-iron frame and able to swivel to allow for different-shaped objects. The guide blocks are located in the front beam and can also swivel. In this vice the threads turn, as opposed to the screw nut blocks in the other Moxon. To ensure the rigidity of each beam frame, I welded four sections of round bar on the bottom angle iron, then bolted the top angle-iron section down onto them. I didn't weld the top section in case I have to replace a screw nut block or thread at a later date.

Avoiding swivel

With both the screw nut blocks and the guide nut blocks able to swivel, the metal Moxon can work as a parallelogram or an uneven-sided quadrilateral. If this is too much of a good thing, consider making a couple of small plates that can be bolted on top of the screw nut blocks on the top side using the bolts that hold the round-bar sections. With the vice closed up, bolting the top of the screw nut blocks down will reduce their inclination to swivel and still ensure that they are correctly aligned. Or, if you're sure you will never want that option, you could simply weld the pivot points up, with the vice closed, and then it will work exactly as the woodwork version.

The next job was to drill the various holes in each of the angle-iron sections by carefully planning where to put the swivel points and round-bar sections. I also decided to drill four 6mm holes in the faces of the angle iron at the far ends. These will be used to hold in place optional thin strips of wood with carborundum tape glued to them, to improve the vice's grip should it be necessary.

With all the holes pre-drilled it was now a matter of inserting the screw nut blocks, bolting the round-bar sections to the top part of the beam, and welding the bottoms to the lower angle iron, ensuring that the nut blocks swivelled freely but without excessive up and down movement — otherwise

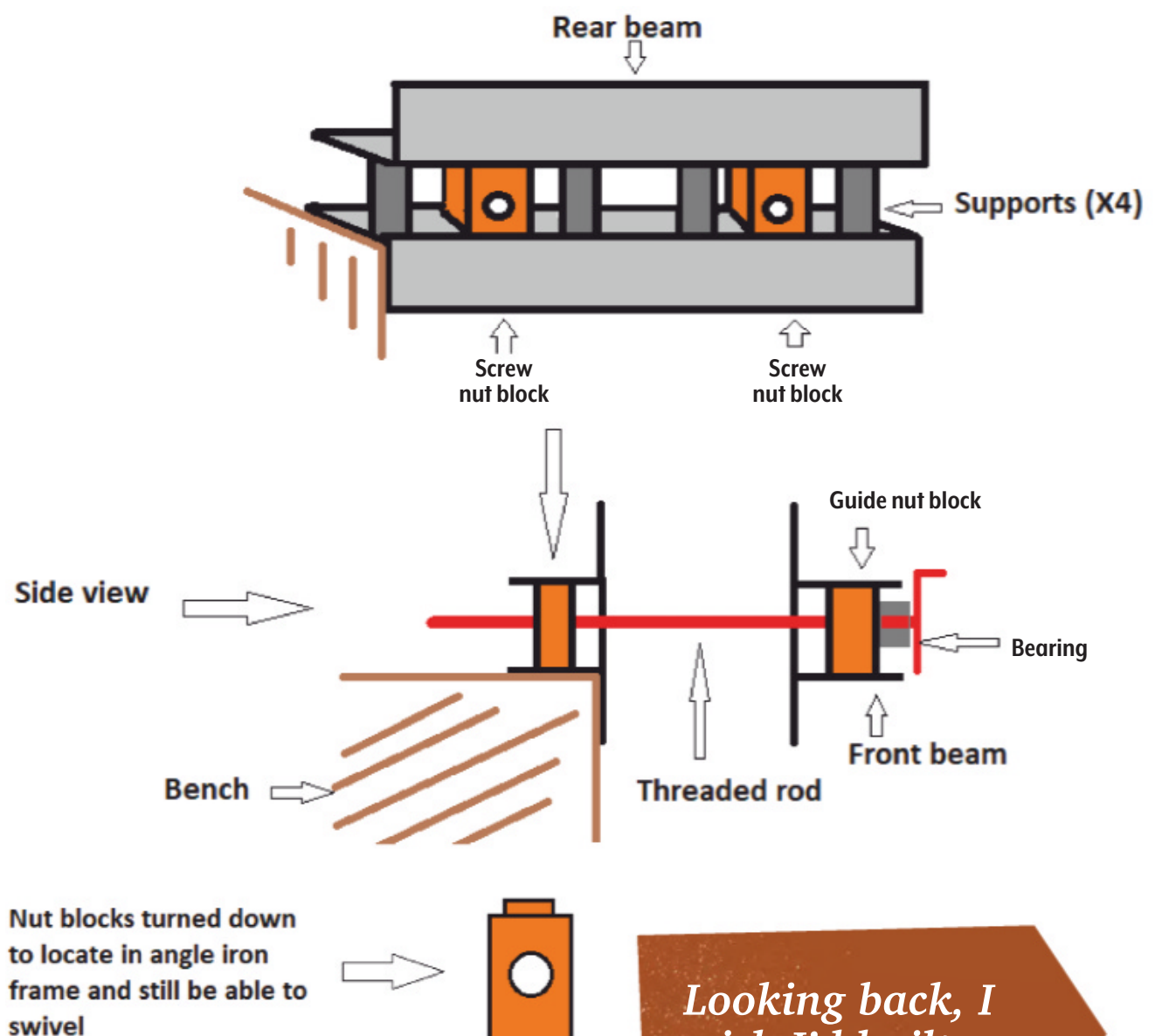


Diagram 3: The metal Moxon

the vice jaws will droop.

I repeated the process for the front jaw of the vice by winding in the threads a short distance, aligning the front jaw with the rear, and clamping them together before welding the round-bar sections. To clear the angle iron with the turning handles, I made up a couple of spacers to fit between the bearings butted up against the guide nut blocks and the handles.

Change to suit your needs

Neither of my Moxons will retract the front jaw when they are loosened. I don't mind that, as I think it is handy to be able to open the vice up and clasp the object between both jaws with one hand while tightening up the screw thread with the other hand. If, however, you would like the vice to retract the front jaw as it is opened up, set your Moxon up so that you turn the threads — as in the metal Moxon — and weld a washer onto the thread screw just inside the guide nut block. This means the front jaw is captured and will move as the threads are wound in or out. Make sure that the washer and guide nut blocks are set back from the jaw face; otherwise the washer will stop the vice

from closing completely.

As you can see, the metal Moxon is more demanding in its construction, with various little parts needing to be turned up as well as the tapping and drilling of the round bar sections. Now that I've built it, it's obvious that the metal Moxon could do both jobs if wooden strips were bolted to its jaws to protect the project. So, if you have only the space or inclination to build one, I recommend you build this one as it will cater for both aspects of your hobby.

Postscript

During the construction of the metal Moxon I was temporarily diverted by my wife, who wanted a small table built for our cattery business, as a viewing platform for a couple of cats in their outdoor family room. It was a good opportunity to put the Moxon to work.

As you can see in the accompanying photographs, it proved ideal as a pair of extra, steadying 'hands' while I built and attached the legs. Being able to remove the front jaw completely means it is possible to hold objects such as the table even with the legs attached. Looking back, I wish I'd built one years ago! 📸



MAGIC RADIO

ADDING NEW TECH FEATURES TO A CLASSIC FAVOURITE

By Enrico Miglino
Photographs: Enrico Miglino

PART 1

This is a new three-part upcycling project for all vintage technology lovers who also love making music. I have planned this upcycling project to encourage readers to try a project that is easy to replicate and can be modified for similar devices.

This Radio Magic project is not very complex but it covers several different topics, from mechanical implementation to the creation of an analogue

synthesizer based on the popular NE555 timer integrated circuit (IC). Over the next few issues we also see how it is possible to integrate physical computing — using some Arduino boards — with a simple internet of things (IoT) application controlling the device from the web.

I have kept this project modular; you can decide to develop a single module or follow the full path to create a fully integrated system.

What we will learn

In this upcycle project we will cover how to:

- control a rotary encoder and a seven-segment LED display with a shift register
- make an analogue synthesizer with a bunch of components like the NE555 from last century (but still popular and available on the market)
- digitally control analogue switches with micro-controllers
- connect all the modules together to make an old-school electronic musical instrument.



In the background, the back cover is visible and on the right is the front cover and speaker (removed to make space for the motor). The internal front side of the radio contains almost all the components: the printed circuit, the tuner mechanism, and the power supply transformer. On the back side, easy to remove with only a central screw, there is the antenna connector and the battery holder

Transistor radio

I used a mid-'60s baby blue Bush radio for this project. It is not difficult to find these online, as this model was very popular, but the project can also be easily adapted for similar vintage devices.

Electronic progress

The move from electronic tubes to transistor technology was a gradual transition over a decade or so. The last part that survived from the 'old-style' radio receivers is the tuning system actuated by a variable capacitor driven by a tuner knob through a complex set of thin but robust cotton wires.

It is very difficult to reach the precision needed to control the radio frequency via a rotating capacitor shaft due to its reduced rotation angle covering the entire frequency range.

One of the roles of the tuner knob is

to de-multiply the rotations, as well as in many cases showing the frequencies along a horizontal scale or a very large round knob, as in the Bush radio I used for this project.

The project can also be easily adapted for similar vintage devices

Hacking the radio

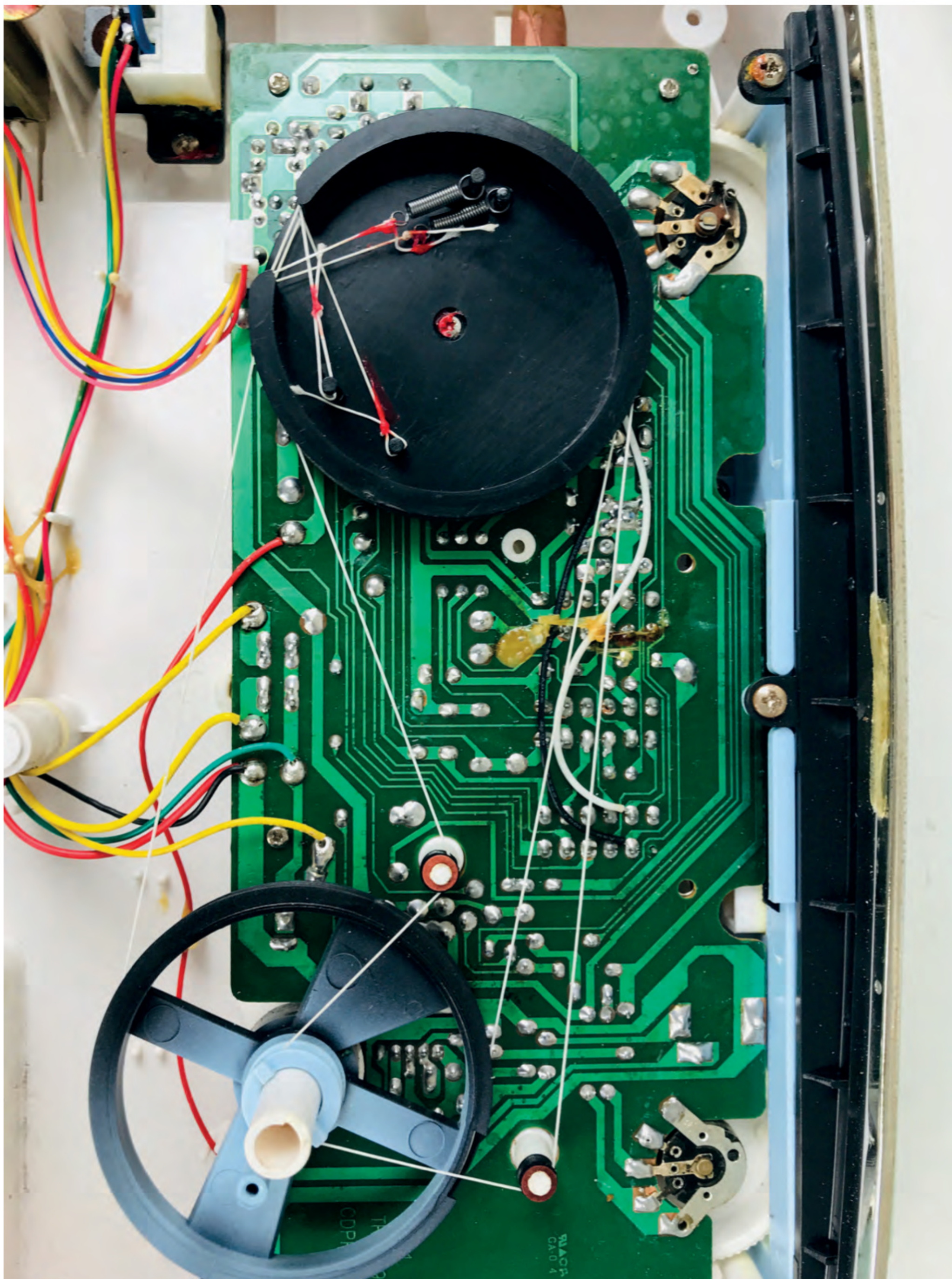
To be able to use the radio to generate sounds that can be sampled for further processing (for example, using them to build a MIDI bank for an electronic instrument), you need to be able to control the radio frequency with a microcontroller, changing it continuously to generate a sort of controlled noise.

The original tuner mechanism has to be replaced with a modern digital tuner so that it's possible to manage the radio circuit.

The radio tuner is pure mechanics — it includes a very impressive engineered solution — so I tried to do the same on the electronic side, improving the manual tuner features by introducing the use of a stepper motor.

The internal radio structure is built around a large frame with a separator in the middle. On the back, there is the antenna connector and the battery case.

On the front, there is the electronic circuit exposing on the top the mechanical tuner mechanism, the AC/DC transformer (for the 220V AC supply), leaving a space of about 20cm for the speaker. The first step is making space inside the front part of the case. ►



At the top, the black tuner pulley is actuated by the blue tuner pulley knob at the bottom through complex wiring of robust thick cotton. Originally, complete rotation of the big frontal knob only moved the tuner pulley a few degrees

Retaining vintage looks

When upcycling, I always try to avoid as much as possible any external alteration of the device, as well as trying to keep most of its functions intact.

I modify the internal parts without hesitation, upcycling and hardware-hacking the device.

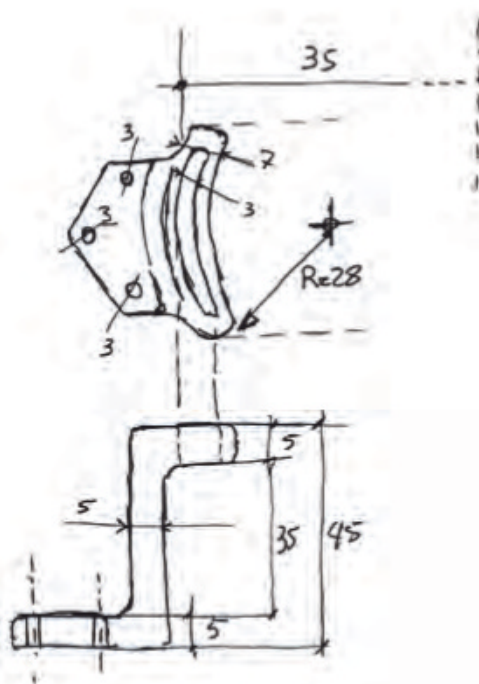
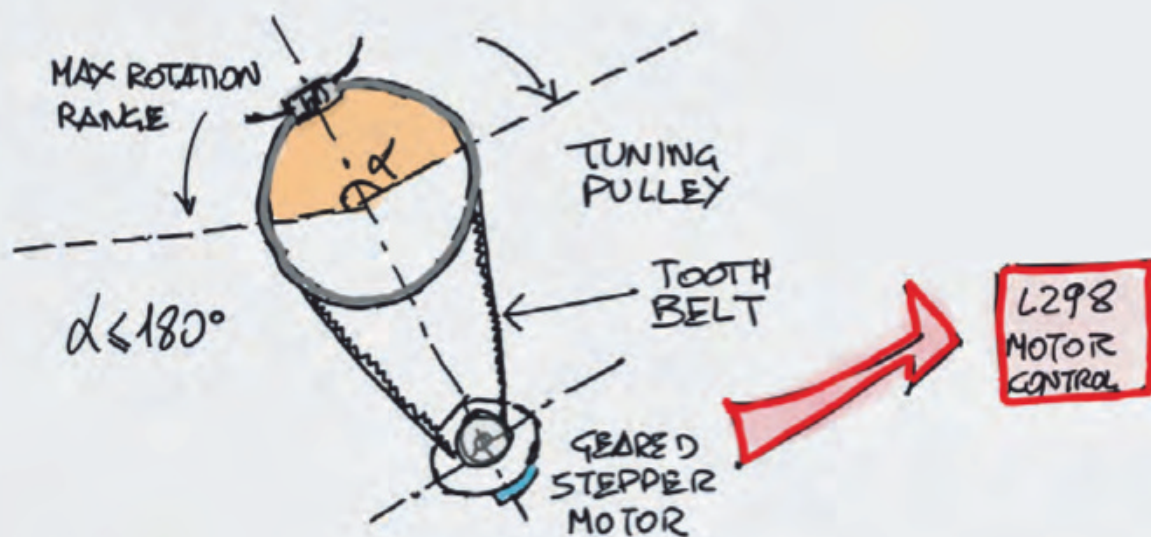
As I am planning to use only the external audio output (the earphones jack), I removed the internal speaker, freeing the space I need to hack the tuner.

The wires that move the tuner capacitor through the big tuning knob have a reduction between the two connected pulleys; several full rotations of the big knob cover the entire frequency range, while the tuner only rotates (very slowly) just under 180 degrees.

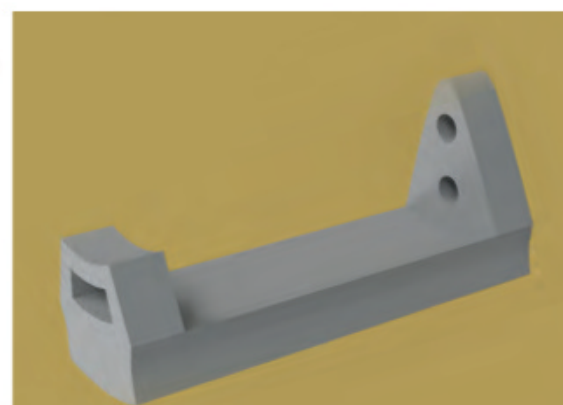
The idea is to rotate the tuner with a stepper motor, ideal for very small rotation increments, converting the knob into a passive indicator showing (approximately) the corresponding frequency. ►

You need to be able to control the radio frequency with a microcontroller, changing it continuously

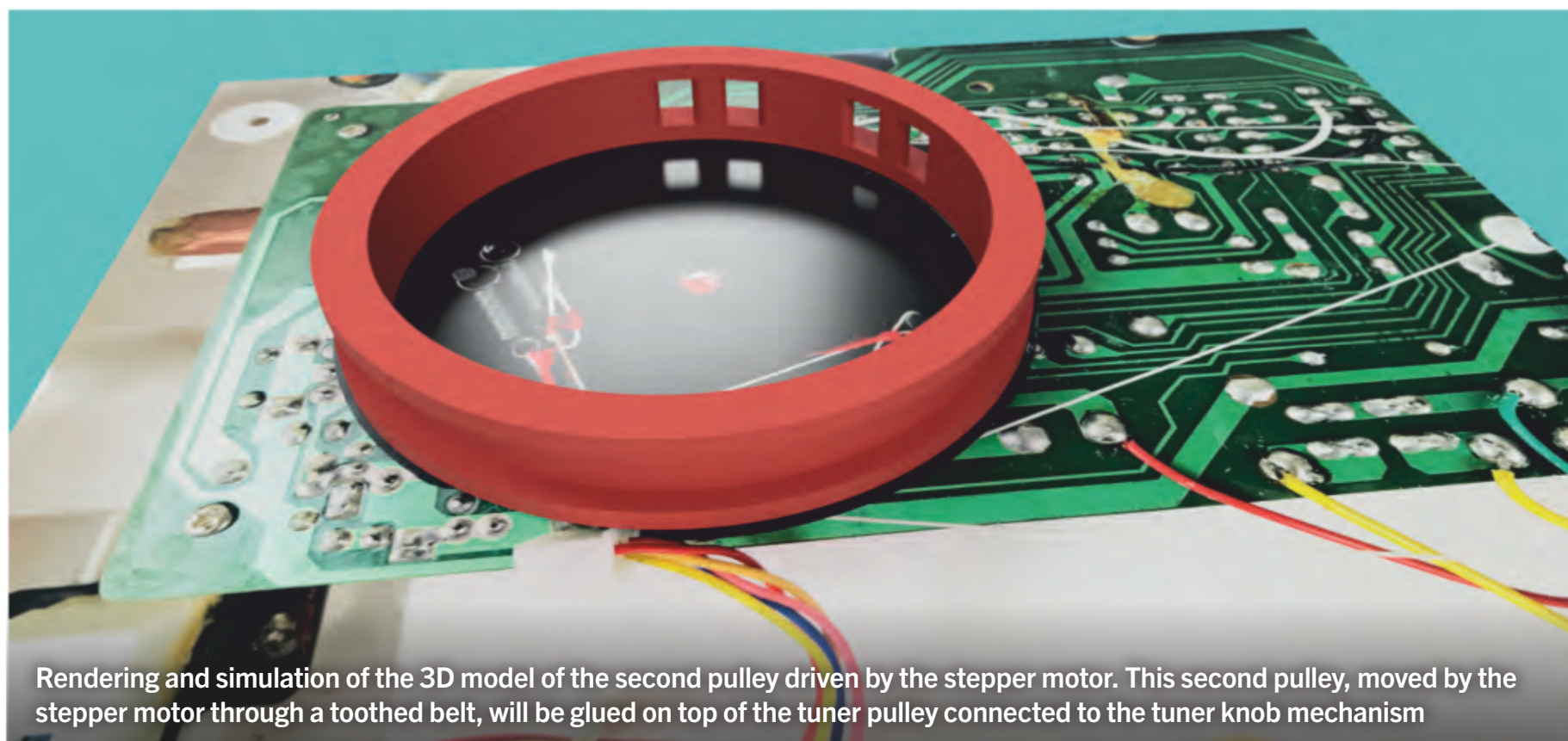
Scheme of the tuner pulley rotation. As the rotation is less than 180 degrees, the driven pulley blocks the toothed belt driven by the stepper motor pulley



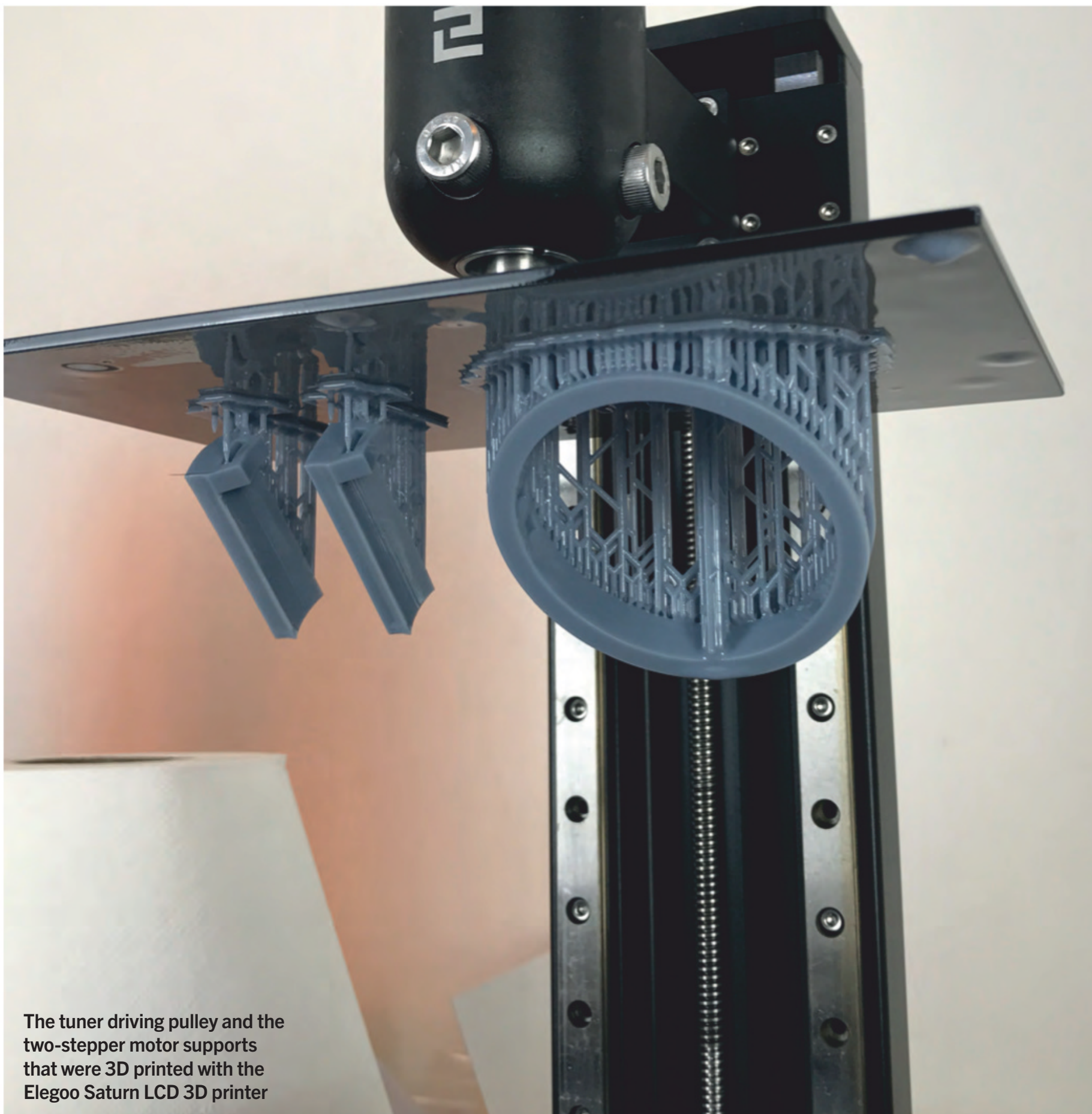
Based on the size and design of the stepper motor (I used the popular and cheap geared stepper motor 28BJ-48), I drafted the motor support. The final 3D design has been changed but the quotes and the structure remained essentially the same



Final rendering of the stepper support designed with Fusion 360. The stepper motor will be fixed to the base of the internal side of the radio using two identical supports shown in the image. The height of the supports has been calculated so that the tooth pulley fixed to the shaft of the stepper motor is at the same height of the tuner pulley (the one I have added to drive the tuner)



Rendering and simulation of the 3D model of the second pulley driven by the stepper motor. This second pulley, moved by the stepper motor through a toothed belt, will be glued on top of the tuner pulley connected to the tuner knob mechanism



The tuner driving pulley and the two-stepper motor supports that were 3D printed with the Elegoo Saturn LCD 3D printer

Tuner actuator — parts and assembly

After removing the internal speaker I checked the available space and designed two parts with Fusion 360:

- a 6mm high ring pulley of the same diameter as the tuner capacitor pulley to glue on top of it
- the support for a small stepper motor (I have used a 28BYJ-48 5V geared stepper motor).

On the geared stepper motor I fixed a 20-tooth pulley to drive a 6mm toothed belt. I was able to fix the belt to the tuner pulley in an appropriate

Searching for a good way to connect the radio to the synth platform ... I decided to use an RJ45 connector

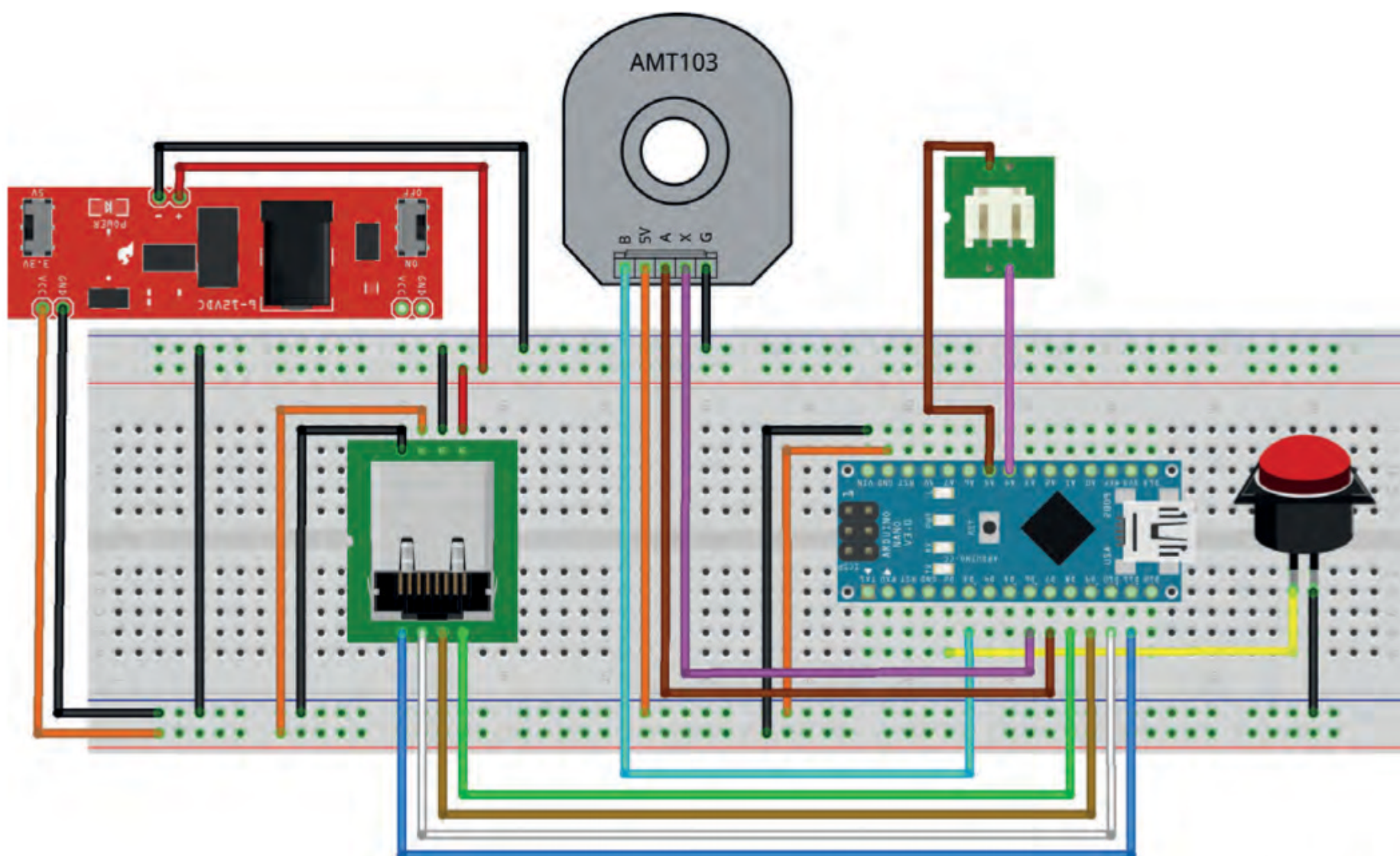
position as the tuner doesn't cover a full rotation.

Searching for a good way to connect the radio to the synth platform (which includes the microcontroller to manage the stepper motor logic) I decided to

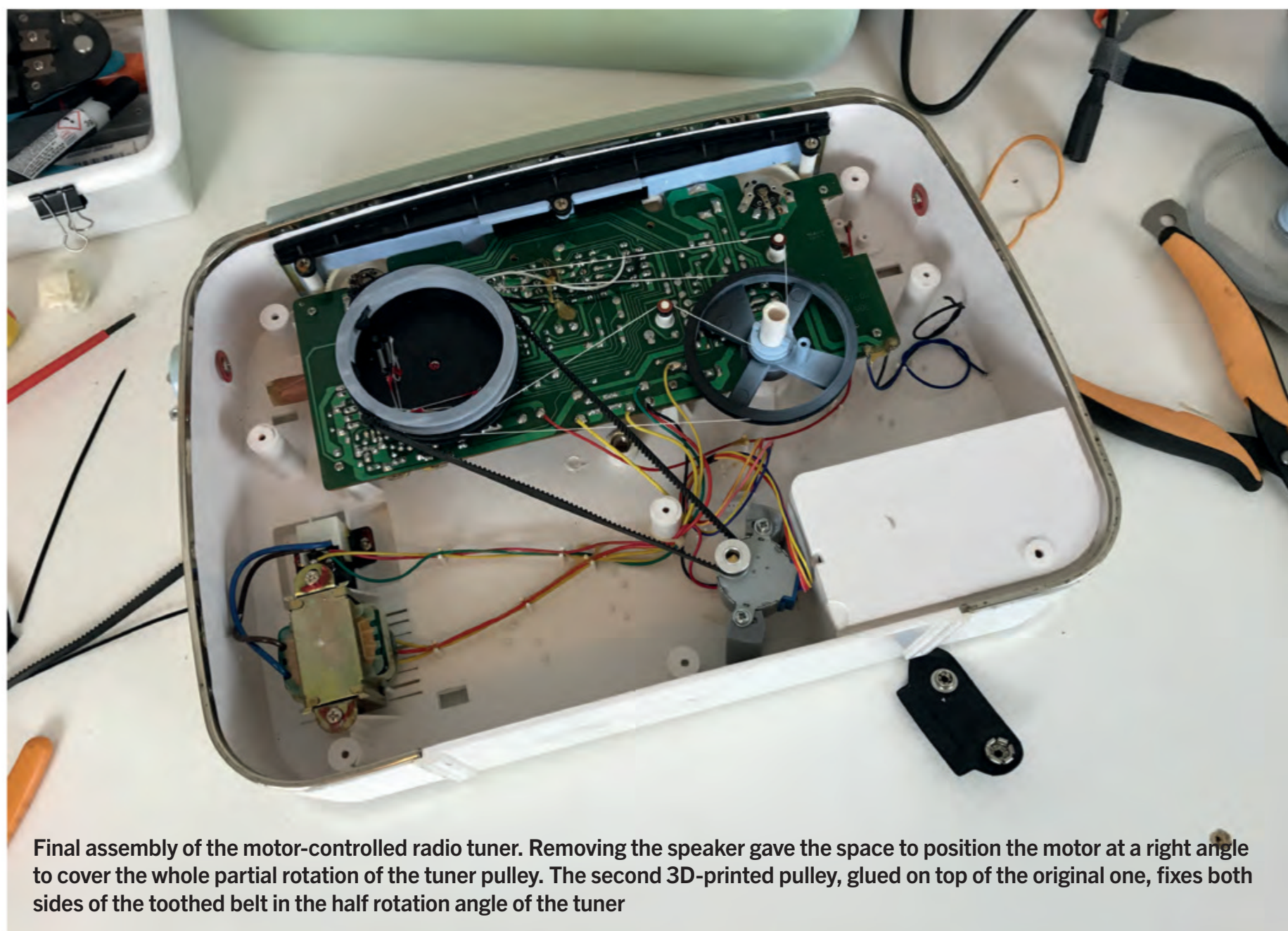
use an RJ45 connector (the one used for the network cables).

Only six wires are needed to control the stepper motor using a half-bridge L298 motor controller, so the eight wires of the RJ45 network cable are more than sufficient. To use the remaining two cables of the connector I also wired the RJ45 to an optional 9V battery connector inside the radio.

Batteries of this kind and size are no longer available, so I removed the original battery holder and directly soldered the power cables to the remaining two wires. ►



On the right side of the breadboard, the Arduino Nano connected to the button and the mechanical rotary encoder. On the left, the RJ45 connector with the power lines and the stepper motor control signals. To control the stepper motor only six of the eight wires of the connector are needed. I have used the remaining two wires to power the radio connecting the original battery holder of the device to the 9V power supply of the controller board



Final assembly of the motor-controlled radio tuner. Removing the speaker gave the space to position the motor at a right angle to cover the whole partial rotation of the tuner pulley. The second 3D-printed pulley, glued on top of the original one, fixes both sides of the toothed belt in the half rotation angle of the tuner



Arduino Nano digital controller

To control the radio tuner with a knob I used a rotary encoder (with button) to move the tuner stepper motor.

Using an Arduino Nano and an extra button I got a very good performing digital controller. The usage sequence will be:

- rotate the knob in one direction until you find the initial band of the tuner
- press the knob (the button on the rotary encoder). At this point, the software starts counting the number of rotations until the knob button is pressed again
- That's all!

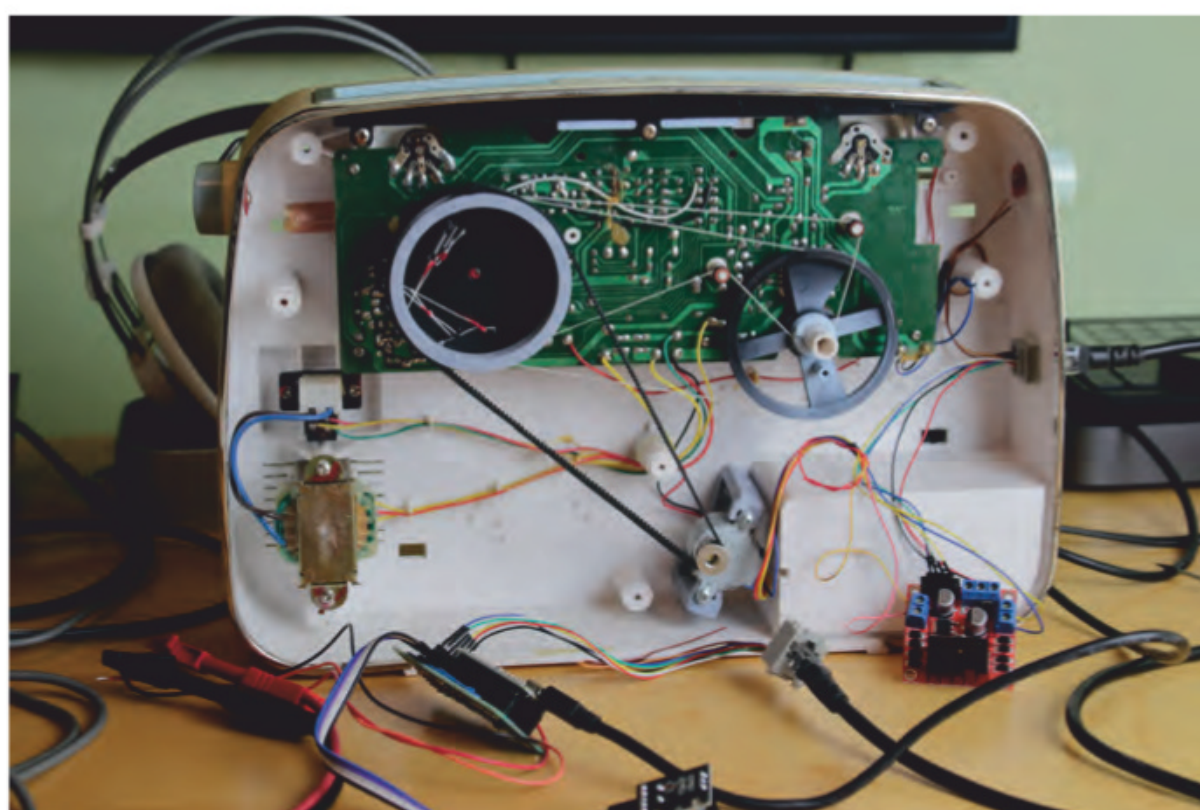
Batteries of this kind ... are no longer available, so I ... directly soldered the power cables to the remaining two wires

After the two limits have been set, by pressing the external button the radio tuner controlled by the stepper motor starts looping in both directions between the two preset limits.

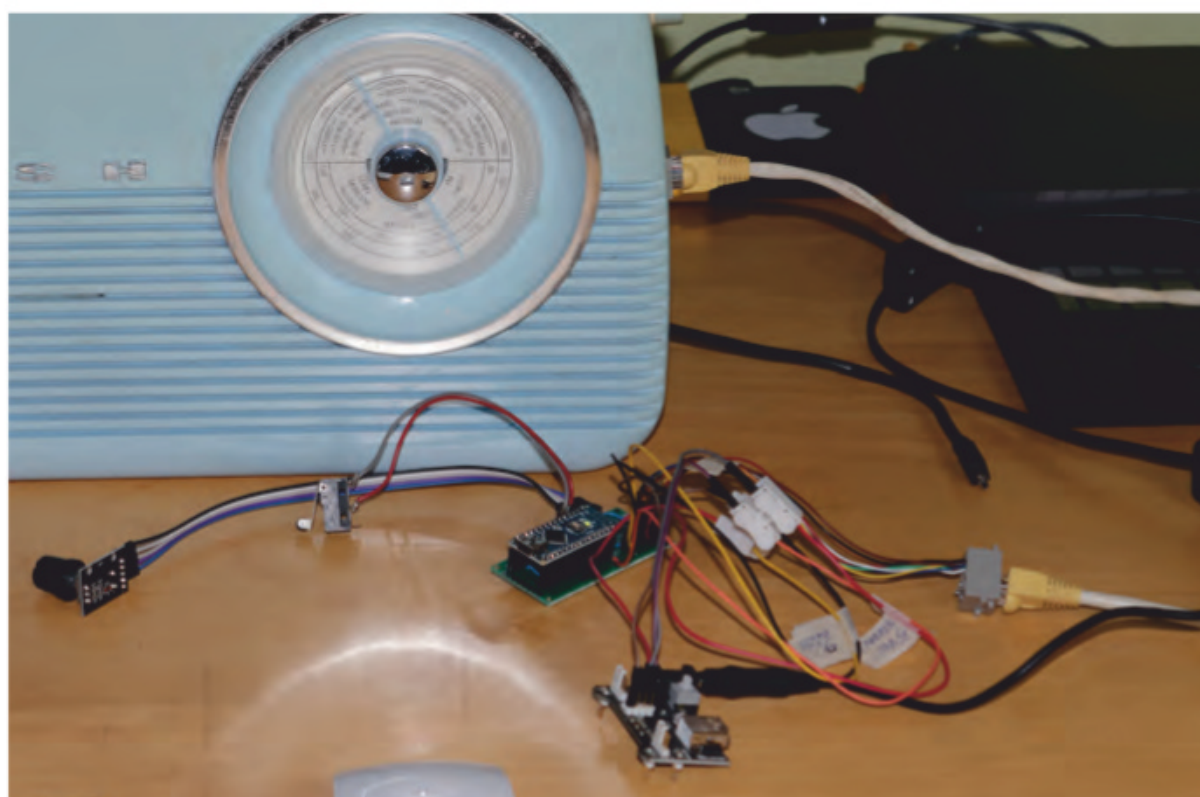
If the user manually moves the rotary encoder, the settings are removed to avoid hitting the physical limits of the tuner.

Now you can make a proper case for the digital controller, or wait for the next *Shed* and the second part of the Radio Magic project. Stay tuned! 📖

Detail of the RJ45 female connector fixed to the right side of the radio. This is the only visible aesthetic modification of the original design. It seems more than acceptable, don't you think?



Last test and fine-tuning of the radio before fixing the wires with hot glue and closing the upcycle device and the final assembly with the prototype controller. At first power-on, everything worked well



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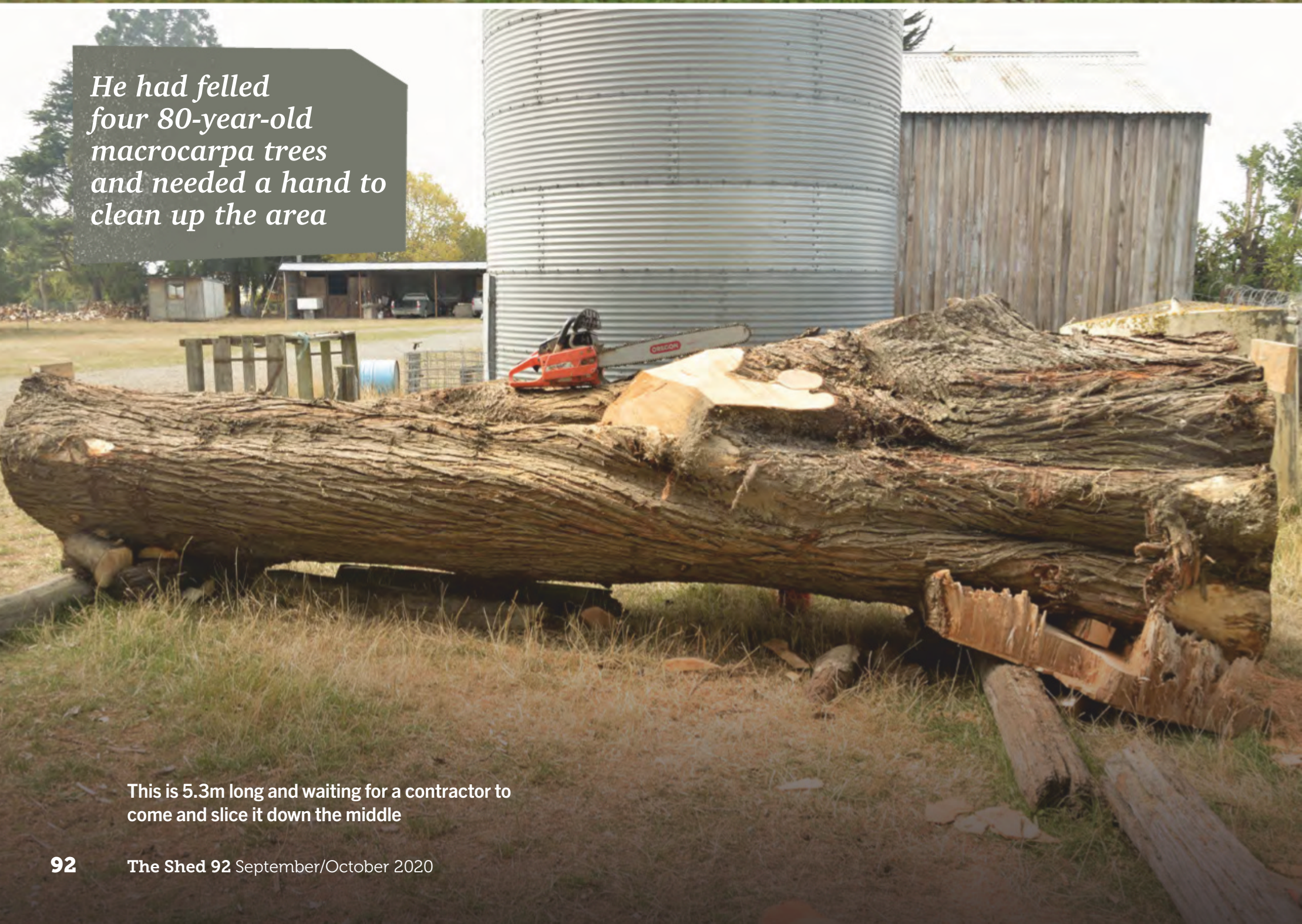
LINBIDE

Milling an outdoor table



The old table in January 2009 — looks perfect

*He had felled
four 80-year-old
macrocarpa trees
and needed a hand to
clean up the area*



This is 5.3m long and waiting for a contractor to come and slice it down the middle

MISSION IMPOSSIBLE OR JUST DIFFICULT

LATERAL THINKING AND SOME GRUNT RESCUE TIMBER FROM THE FIREWOOD PILE

By Mark Beckett Photographs: Mark Beckett

Back in 2005 a friend in Kaikoura felled two very large pine trees and had them milled on-site for timber. The remaining slabs were destined to be firewood until someone suggested they would make a great outdoor table.

One slab became the table and what remained of the other was shaped for legs. It sat on our patio providing an excellent outdoor table and was certainly unique.

Despite the odd lick of protective sealer, eventually the ravages of time and rot took over and it needed to go.

We'd been on the lookout for a replacement for some time and had reconciled ourselves to the fact that we'd have to make do with something much more modest, when I got a phone call from the farmer across the road. He had felled four 80-year-old macrocarpa trees and needed a hand to clean up the area.

One of the trees looked just right for our new table, so after dealing to the other trees and removing all the limbs

and other material we were left with a number of logs, some that would suit milling, and one that would be perfect for a replacement table.

I did come across a device that you fitted to the chainsaw bar ... that acted as a support and guide and gave a straight cut

What we need is a plan

Enquiries with the local saw mill led to five logs heading off to be turned into flitches and 100x200 timber, but the log that was going to be the new table was far too big for them to handle.

Most mills have a large saw that slices pieces off a log. The saw has physical limits on the size, and some mechanically deal with the cut piece, but the local mill has to manhandle theirs.

A horizontal mill involves setting up over a log and slicing horizontally, but at 5.3m long and 1.2m at its widest, it was too big, let alone taking into account the estimated four-ton weight.

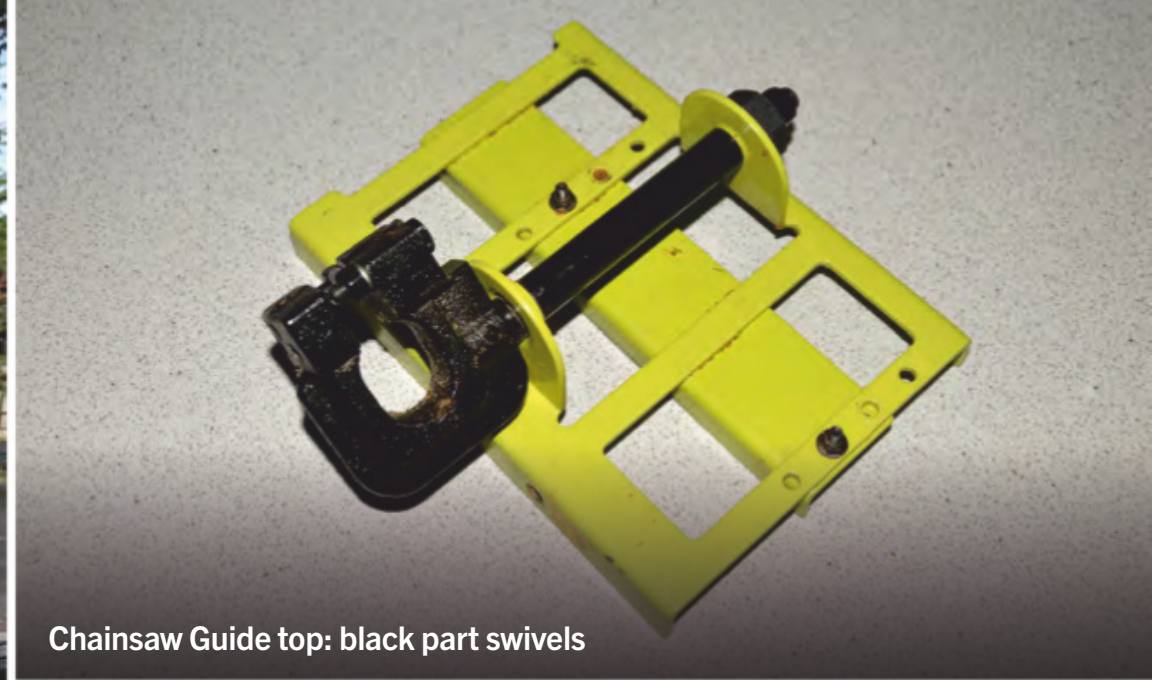
Plan B was to cut it down the middle on-site, which would provide the new table and a spare. It required the expertise of a third person skilled in the use of a 36-inch bar on a chainsaw and unfortunately my timescale didn't match theirs.

So Plan C was put into effect. I'd been looking online about how to slice large logs and found some very interesting videos and some very talented people expertly wielding large chainsaws ... which excluded me!

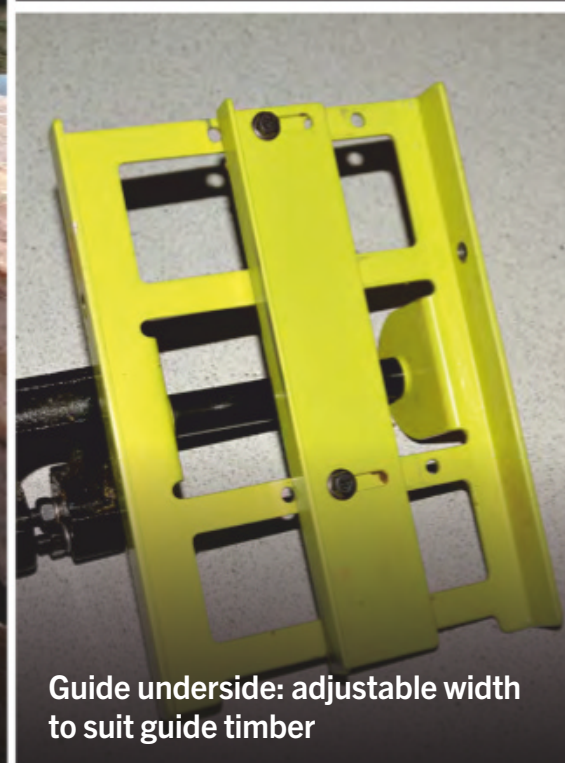
But I did come across a device that you fitted to the chainsaw bar. This ran along a piece of timber that acted as a support and guide and gave a straight cut. It was cheap enough at US\$35 from several sources, but I chose this one due to the quick freight: treestuff.com/timber-tuff-lumber-cutting-guide/. ►



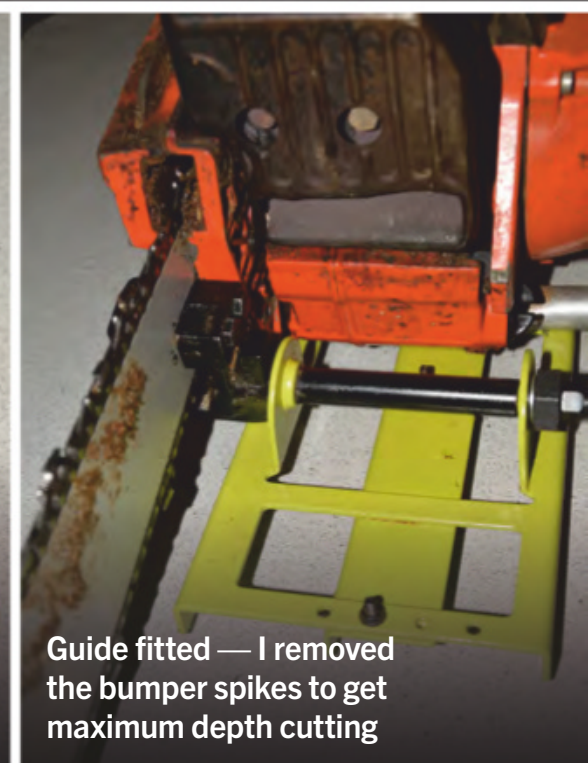
The guide bolts to the chain bar and runs along the guide board



Chainsaw Guide top: black part swivels



Guide underside: adjustable width to suit guide timber



Guide fitted — I removed the bumper spikes to get maximum depth cutting

How to cut it

My chainsaw was limited to a 24-inch bar ... they just don't make anything bigger for that model, so it meant it would have to be cut twice — once from each side. The log was manoeuvred onto two round poles and there was room to roll it, so it was simply a matter of deciding where it was the widest and marking it.

I attached a vertical strip of plywood as a guide and used a digital level to ensure that both ends were the same alignment.

The log was rotated so that these were vertical, and with chocks and the jack in place to stop it moving, two flat boards were screwed on each end that would support a plank that the cutting guide could run on. Once everything was lined up, the plank was screwed to the flat boards so that nothing moved. A 60x60mm length was clamped onto the plank, and the cutting guide ran along this.

First cut

I removed the bumper spikes on the chainsaw and positioned the guide

on the bar so I had maximum cutting length. Initially, I had the guide fitted to the bar using the three grub screws, but I found they loosened and fell out, and then the clamp moved. So I drilled the bar and bolted it on using spring washers.

I found it kept trying to twist and veer to one side, so I'm glad I didn't try cutting it freehand

The first cut went well with the line straight and at 89 degrees. Once the plank was removed, I took the guide off the chainsaw and did a few passes to deepen the cut. I found it kept trying to twist and veer to one side, so I'm glad I didn't try cutting it freehand.

With the cutting guide fitted, you can't access the chain-tightening screw, so if you're using a new chain, be prepared to unbolt it, tighten, and reassemble it.

Second cut

They say "the first cut is the deepest", but the second cut was much more important in this situation. This involved rolling the log 180 degrees and lining everything back up. The cut at the small end was a few degrees off vertical, which turned out to be a slight twist in the plank, so the plank was adjusted and we lined up the cut as best we could.

I decided to change where the chainsaw sat relative to the guide, and rotated the guide 180 degrees so the body of the chainsaw was over the plank (and the cutting guide). This made it easier to handle and gave me better footing on the log.

The second cut was far quicker than the first, and I was very pleased when I could see daylight through the cut at the thinner end, and even happier when it looked like it was exactly in line.

Sadly the thicker end was out by 5 or 6mm but considering what it could have been without a guide, I put it down to our alignment rather than the tools. ►



One of four large macrocarpa trees that were felled at a neighbour's farm



Looks like I found my new table. That's a five-litre oil pack!



Log is jacked down to flat



The thick end was out by a chain width, while the smaller end was spot on. Stops stopped it splitting while the remainder was removed



Cuts were pretty close, with some minor tidying required at one end

There was some cleaning up required but overall it was better than I hoped for



Two potential tables laid ready to transport



Of the four trees dropped, one yielded some nice straight pieces that were trucked to the mill. Some were converted to 200x100, and two others were flitched at 75mm and 50mm to be used for tables and bench seats. The 200x100 timber — these are 6m long from two branches of the fourth tree



The 4.3m at 75mm timber for tables. The surprise was how nice the inside was

I'm fairly sure OSH might have had a few words to say



The 2.4m at 50mm timber for bench seats and table legs. No rot or knots and, more importantly, no metal objects



Surprisingly, my small tractor handled it well



Another part of the tree to be used as legs/support



March 2020 — well past its best-before date and time to get the patio recoated



The end had started to rot and I made the mistake of telling the original supplier ...



It was far worse than we imagined ... now just waiting for the fire ban to end

The final cuts

At this point we had a very large log that was cut down the middle, and only one side was properly supported. I wanted to make sure it didn't split and rip out a piece of timber as, knowing my luck, it wouldn't be on the spare side. So to stop it splitting apart, two tie-down straps were looped around each end.

I'd cleaned out the gap at the thinner end and wedged it apart to get some idea of what needed cutting, but we weren't sure how far the chainsaw had reached on the first cut and, with no way of rolling it back over, we retrieved an old pit saw from the rafters, just in case.

After a few cuts at the thicker end with the chainsaw there was a small jump as both halves came apart without any extra coaxing. The two halves were jacked down and I was amazed at how close the cuts were. There was some cleaning up required but overall it was better than I hoped for.

Shift the logs

Since the log and the other offcuts had been occupying space for far too long,

it was decided to move them that day. Luckily the farmer has a front-end loader on his tractor and a very heavy-duty trailer.

We loaded both halves onto his trailer and between us we got them to my place and unloaded them. I'm fairly sure OSH might have had a few words to say since we had no-one with a clipboard in a high-vis jacket making sure we'd had a safety briefing before tackling it, but both of us have been around machinery for longer than we care to admit, and safety wasn't compromised.

Trucking timber to the local mill and the milling cost could be more than the timber is worth

What's next?

Part of the area clean-up involved removing a few other parts of the felled trees. These were saved to be used for legs, and some other

furniture options.

Fitting legs requires the slab to be laid flat and then the legs sculpted to match the contour and trimmed to height. I've seen a few videos and pictures involving guides screwed onto the side, and I'm sure these will be part of the solution. The alternative is to fit adjustable feet but that would be cheating.

The intention is to add some plastic under the legs to keep the wood off the concrete patio so it will last longer. Once that is done it can be craned into place and assembled, then the final sanding and sealed with CD50 Extreme ready for the next party.

The intention is to turn a couple of the flitches from one of the milled logs into bench seats that match the table, but for now the table is the primary focus.

The intention of this article was to show there are some alternative options to milling, and those nights spent searching the internet weren't wasted.

Trucking timber to the local mill and the milling cost could be more than the timber is worth, but using this technique you may be able to convert some excellent timber into something other than firewood. 📦

Ab 699 in all her glory pulling the passenger carriage fleet: 1st, a converted UG wagon, originally used to carry four horses was refurbished about 20 years ago; 2nd, a New Zealand Railways works carriage, which was subsequently converted to a schools carriage — boys in one half and girls in the other, with a partition down the middle to prevent any monkey business; 3rd sat in a paddock near Geraldine for 40 years and needed a major overhaul. And the guard's van at the rear

PLEASANT POINT RAILWAY

ENTHUSIASTS ENABLE A PEEK INTO A MORE ROMANTIC PAST

By Nathalie Brown Photographs: Brian High

They're a dedicated lot, these steam railway enthusiasts. More often than not, they're blokes past retirement age who are happy to spend two days or so each week restoring late 19th- and early 20th-century railway carriages, stripping down locomotives, laying tracks, and the like. They bring a lifetime's worth of skills and the willingness to learn something new.

There are around 60 rail societies throughout New Zealand and each one is distinctive.

The Pleasant Point Railway and Historical Society Inc. in South Canterbury will celebrate its 50th anniversary on 20 September by offering steam train rides from 10.30am until 9pm.

Half a century of restoring steam locomotives

Over the past 50 years the society's volunteers have restored a fleet headed by

"It took a major restoration job to get that operating"

two steam locomotives: Ab 699, built in 1922 by A&G Price Ltd, Thames, and one of New Zealand Railways' early steam locomotives, D16, built in 1878 by Neilson & Company, Glasgow, Scotland — it took a major restoration job to get that operating. Then there are two diesel locomotives, a small Ruston and Hornsby built in the UK in 1955, and former New Zealand Railways shunter Tr18, built in the UK in 1938.

The society's rolling stock includes New Zealand's only restored half-birdcage carriage, built in 1895 and at present being given its second complete restoration job, and a 1925 Model T Ford railcar, the only one of its type in the Southern Hemisphere.

An impressive operation

In all, four carriages and two guard's vans run on 2km of meticulously maintained railway tracks between the restored former Pleasant Point Railway Station and the Keane's Crossing complex.

This building is impressive by most steam rail society standards. The volunteers assembled and built it with the help of their supplier, Calder Stewart from Milton. It houses a workshop, where the volunteers set to with lathes, grinding wheels, drill presses, and the woodworking gear needed to make the shapes and moulding. There's a locomotive turntable, a meeting room, a model railway operating room, a museum, and an archive of more than 3000 pieces of information relating to the society and the local district. Then there's a printing room, a souvenir shop, a vintage movie theatre, and a kitchen. ►



Young volunteers



Most of the volunteers are well past retirement age, but there are several younger volunteers and all of them are enthusiastic railway evangelists.

The future for Nicholas Trounson-Harris was mapped out when he asked for an ultimate Thomas the Tank Engine railway set as a wee boy. Now aged 18, he is the youngest member of the crew but started volunteering at the Pleasant Point Railway when he was 10.

"I really enjoy being with the other members. I don't think of them as grandad age," he says. "I've always liked trains. I started out nipping the tickets. By age 16 I had more responsibility and these days I most enjoy firing up the steam locomotive."

Nicholas works in the railway yards and station every Wednesday and Saturday, wood splitting, driving the shunter, cleaning the carriages and locos, going out to farms to get wood, splitting it up, and bringing it back. At present he's looking for employment and has his heart set on working for KiwiRail.

Thomas Kissell is 19 and a second-

year student nurse at Timaru Hospital. He has a family history with railways. He's been doing railway modelling for a few years and started volunteering at the Pleasant Point Railway over new year 2020.

"I'm keen to gather the oral histories of the older members on video, but I mostly enjoy working with something that's not theoretical. It's good to learn hands-on stuff. Steam trains are cool. I'd recommend younger men and women to get into it. If you can lift a shovel, you're fine," he tells us.

Josh Granger, aged 28, has been a volunteer for 10 years: "My gran's square-dancing partner got me into it," he says. "I learnt to drive the shunter and carried on to get my steam ticket in 2016. Before that I got my Model T and diesel driving

ticket. I'm happy to do any role here. We're looking for younger people to get into it. Once the kids have left the nest and you're bored, come on out!"



(Clockwise from top) Nicholas Harris; Daniel Smith and Josh Granger are engineers by trade who work at Parr & Co. in Timaru



(From left) founding member Bryan Blanchard, Stewart Frew, Bill Noble, Nicholas Harris, Lloyd Robertson (guard) and Dowall McLeod, who travels from Christchurch most weekends and is in charge of the steam locos



In all, four carriages and two guard's vans run on 2km of meticulously maintained railway

The replica Model Ford railcar is unique to the Pleasant Point Railway and Historical Society



Steam up. New insignia. Flags a-flying. Ab 699 dressed up as Ab 718 in all her glory in 2018 when the Pleasant Point Railway and Historical Society celebrated the golden anniversary of the last run on the Fairlie Branch line



The volunteers built the Keanes Crossing Station using parts from the old Temuka Railway Station

All of this is maintained by some 15 volunteers, most aged over 70 and four in their late teens to 20s. Several women volunteers tend the administrative and catering jobs, taking bookings and providing refreshments for the tour groups that, until Covid-19 took hold, provided much of the income to fund the enterprise.

A local identity, Terry Broughton, is writing a book about the 50-year history of the society.

Why do it?

Ask the volunteers why they spend their time here and they'll talk about the romance of the steam locomotive era and the need to preserve its history. They especially value the camaraderie they find here.

"I missed it in lockdown," says Stewart Frew. "The social contact is a

big part of it — pot-luck dinners and a meeting two or three times a year. Last year we did two day trips to other railways around the South Island."

Stewart owns a 1913 Ford Model T hand-cranked car and is a local vintage car club member.

They especially value the camaraderie they find here

The bulk of the repair and maintenance equipment, from spare railway lines to buckets of bolts and nuts, is meticulously catalogued and stored in the shed in the adjoining paddock.

The society sometimes borrows specialist equipment and can call on the skills and services of people

who help as and where they can, not necessarily on the regular Wednesdays and Saturdays. Many of the volunteer sheddies bring tools from their home workshops — drills, welders, log splitters. Bill Noble, assistant general manager and yard boss responsible for allocating jobs to others, brings his own Hough front-end loader and the Isuzu truck that goes with it to do jobs around the railway.

"Keeping the locomotives, carriages, and tracks in good order is a big part of the job," says the society's president, Bryan Blanchard. "Because they're old, they can break down and you've got to make parts using a lathe, a drill press, all sorts of welders, and woodworking equipment. However, the larger engineering and upholstery projects are farmed out to local businesses." ►

Fairlie Branch line



New Zealand Railways announced the closure of the Fairlie Branch line in 1967.

The line had run through Pleasant Point for 93 years and was steam operated all that time, but, like many others throughout the country, it could no longer compete with road transport.

After nearly a century of service to Pleasant Point and 84 years of service to the Mackenzie Country, the Fairlie Flyer blew its whistle for the last time on 2 March 1968. A special excursion train ran from Timaru to Fairlie and back, hauled by two Ab-class locomotives — 718 and 798 — plus 18 passenger carriages.

Shortly afterwards, local identity Bill Timmings approached the Pleasant Point businessmen's association

with a proposal to erect a memorial to the line. An incorporated society was formed and it was decided to secure the former railway station, restore it, and find money to pay for one of the locomotives that were being sold for scrap.

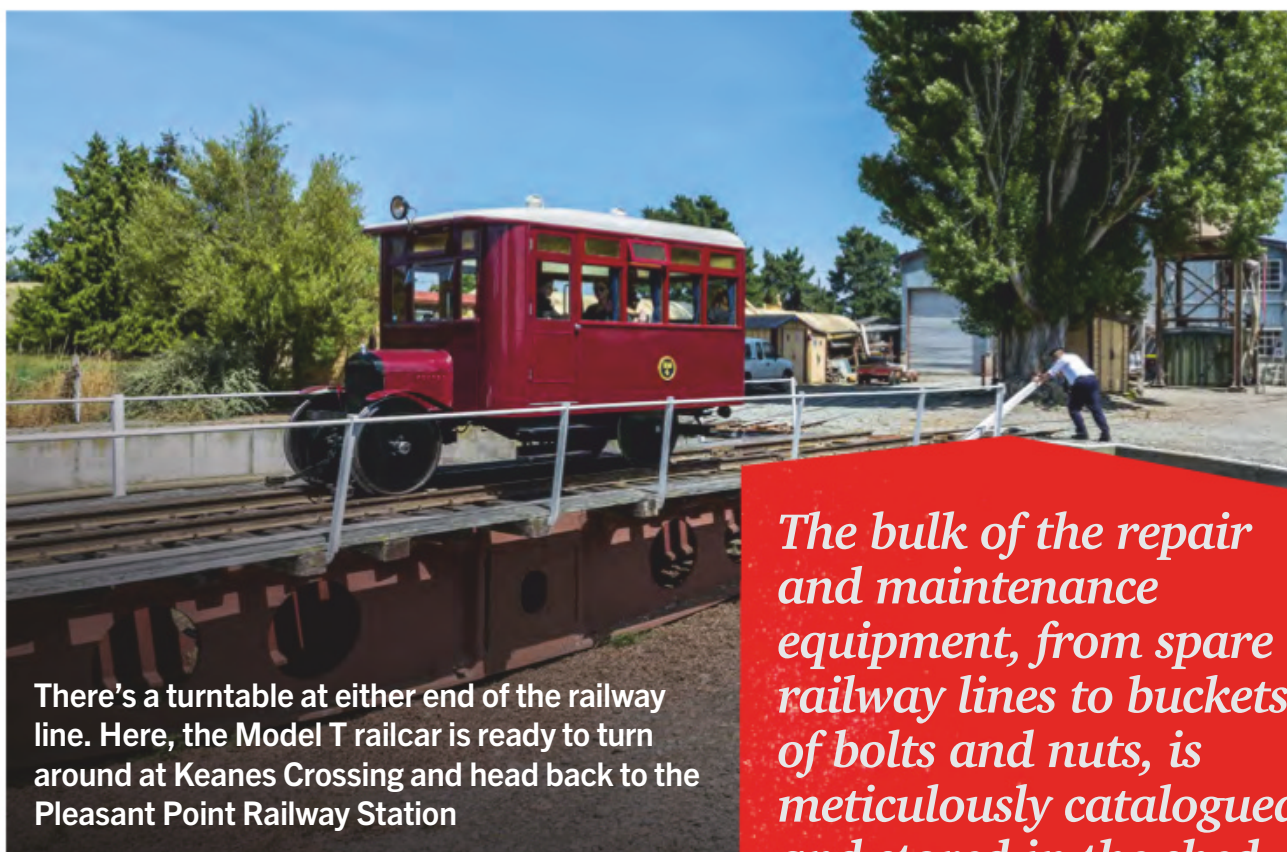
Before long, two members of the newly formed society had bought a 46-year-old locomotive, Ab 699, for \$600. It was one of many of that class that once operated on that branch line. On 28 November 1970, a diesel shunting locomotive pushed Ab 699 into place in front of the derelict Pleasant Point Railway Station.

Bryan Blanchard remembers the original plan to keep it as a static display: "It stood in the centre of the town under a new veranda that had been constructed and attached to the former railway

station to protect it from the weather. In 1970 no one actually believed Ab 699 would ever be steamed again but in order to prevent the locomotive from rusting out, as was generally feared it might, members preserved it by pouring barrels of used oil into the boiler. It was a day to be remembered when a small team put the first fire in."

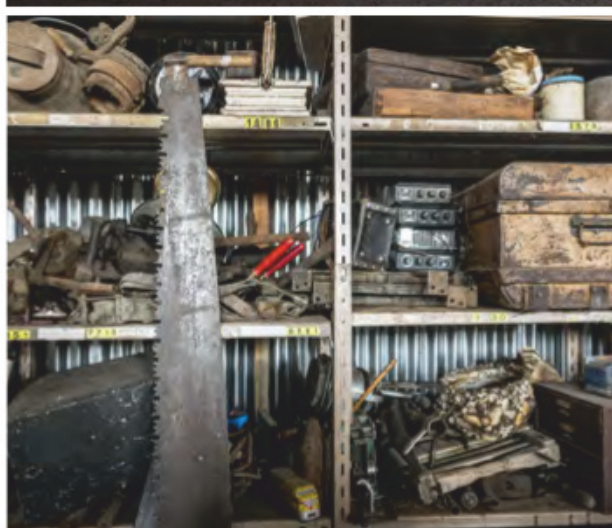
Over the next few years, the small society started relaying track and the first steaming day took place at Labour Day weekend in 1975.

The line may be only 1.5 miles (2.4km) relaid from the original 38 miles (61km) of the former Fairlie railway branch line, but each year it draws more than 10,000 people to the small town of 1200 people.



There's a turntable at either end of the railway line. Here, the Model T railcar is ready to turn around at Keanes Crossing and head back to the Pleasant Point Railway Station

The bulk of the repair and maintenance equipment, from spare railway lines to buckets of bolts and nuts, is meticulously catalogued and stored in the shed



The railway workshop is a sheddie's dream

Movie nights



The original Pleasant Point Railway Station of 1875 houses a community and railway museum. Adjoining the railway station is the restored former Washdyke Railway Station signal box. At the Keanes Crossing complex is a fully restored locomotive turntable originally used at Cromwell, plus a vintage movie theatre.

Notices for any given night's programme run something like this one from 19 February 2020:

"Another of our popular Saturday night movie nights. Starting at 7.30pm — \$2 entry fee and a plate for supper. Everyone welcome — spread the word.

"The usual first half [a selection of vintage cartoons and black and white newsreels] with the main movie, this week, from 1946: 'The king of the cowboys', Roy Rogers, in *My Pal Trigger* [his famous horse]. Also starring George 'Gabby' Hayes, Dale Evans [Rogers' wife], Bob Nolan, and The Sons of the Pioneers."



(Clockwise from top) Established in 1991, the vintage cinema is unique to the Pleasant Point Museum and Railway; a vintage Dictaphone is one of the many superannuated machines to be found in the Hall of Technology; Hall of Technology



“We’ve won a number of awards for the condition of the carriages and locos”

The facades on the left offer window displays, a model railway room, and a printing room with restored printing presses. This shed also houses the locos and carriages when they are not in use



The D16, which originated in 1878 in Glasgow, Scotland



Jono Welsh (in uniform) is a former member of the Pleasant Point society, seen here on a day when the place is thronging with visitors

Annual safety certificates

Every year each of the locos gets a warrant of fitness, being brought up to a safety standard that complies with NZ Transport Agency and SGS specifications. General manager and safety officer, Leon James, and another member, Jeff Tollan, take on much of the paperwork.

Safety is the highest priority at the museum and railway. No shortcuts are taken. No one is expected to take on heavy work alone.

"We make sure the yards are well maintained. There's a lot of mowing and weed spraying on the job sheets. We keep the gear looking top notch. We've won a number of awards for the condition of the carriages and locos," says Bryan.

Every project must be properly funded and approved by the executive, and they

"It takes up so much of our time that we couldn't do it unless the women were happy for us to be out of the house so often"

try to attract people who bring a bit of structure and business acumen.

The volunteers have just finished rebuilding the carriage of the Model T railcar, which had suffered water damage round the side windows.

"The Model T is unique," says Bryan. "It was the brainwave of one of our foundation members, the late Russell Paul, who supervised its construction from old New Zealand Railways plans. Until the recent lockdown,

we had people coming from all over the world to ride in it and visit our railway museum."

Still loving it

The Pleasant Point Railway and Museum has ruled the lives of Bryan and his wife Marian since they attended the foundation meeting in February 1970. Bryan has been president since the early 1990s and Marian holds the positions of membership secretary and charter booking secretary.

Bryan makes a point of saying that the men couldn't do the work without the support of their wives.

"It takes up so much of our time that we couldn't do it unless the women were happy for us to be out of the house so often," he says. 📺



A vintage drill press



A view of the storage shed



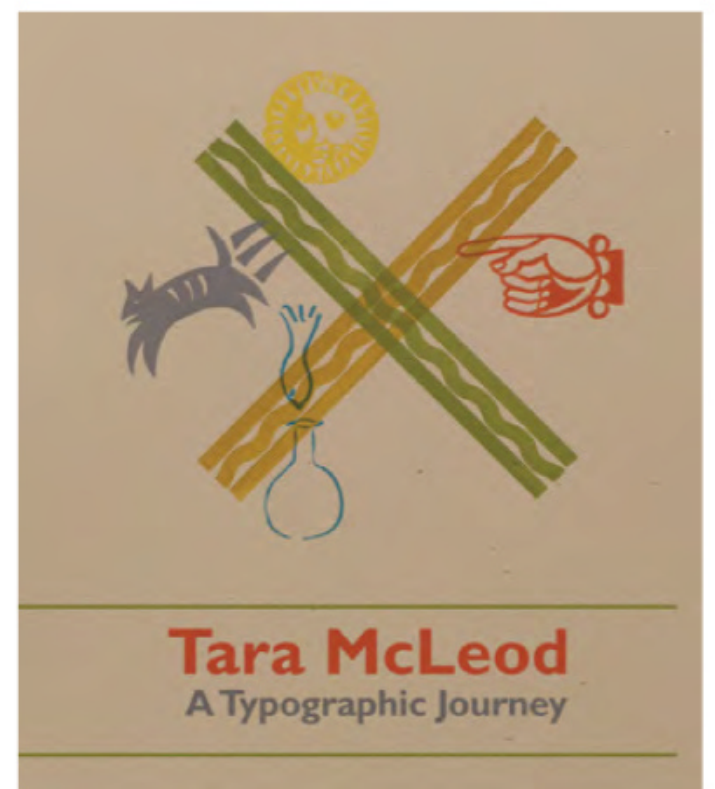
When the train and the railcar are running simultaneously, the pointsman changes the points and waves a green flag to let them know when it is safe to come in. When he's not changing the points, he takes shelter in the pointsman's hut

TARA MCLEOD: A TYPOGRAPHIC JOURNEY

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Review by Sarah Beresford

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It is one of life's ironies that as we are increasingly bombarded with modern missives in the form of emails, texts, and Tweets, and are surrounded by billboards showcasing towering exhortations, that knowledge of how to creatively and effectively display the written word has become more and more predictable.

So it's refreshing to see a handsome book celebrating the considerable skill, finesse, and mastery of typography and the letterpress printing method that has defined the work of printer Tara McLeod.

He has made a significant contribution to the New Zealand literary scene over many years and his work is held in distinguished collections around the world. His knowledge and imagination has gifted many writers with the experience of seeing time-honoured printing techniques breathe special life into their work.

Remarkable content on show

Tara McLeod: A Typographic Journey is illustrated throughout with examples of McLeod's creative endeavours, from limited-edition books of poetry, to posters, flyers, and his remarkable three-dimensional handcrafted wooden pieces. This content alone provides readers with a wonderful meander through some thought-provoking literature, and also underlines McLeod's sensitive appreciation of how to use typography and printing techniques to emphasise layers of

meaning without overwhelming subject matter.

A series of essays by various contributors explores the trajectory of McLeod's early career in graphic design, his acquisition and restoration of a 1932 Albion Press, his establishment of Pear Tree Press in 1985, through to his tenure at The University of Auckland's Holloway Press from 2001 to 2013, and his work as Printer in Residence at the University of Otago.

The essays detailing his collaborations by poet Riemke Ensing, writer and printer Alan Loney, and curator and bookmaker Paul Thompson highlight McLeod's unique contribution to the written landscape. As well

He has made a significant contribution to the New Zealand literary scene over many years and his work is held in distinguished collections around the world

as his extensive knowledge of typography, control of inking, and print perfectionism, it is his ability to focus his imaginative eye and mastery of production techniques to highlight the essence of meaning that makes his work so special. Says Ensing: "When opened my poem *Being there* — which evokes Venice — seems to float on

water. Various water colours ... float up to enchant and intrigue."

There's stunning typography to enjoy

McLeod values the importance of mastering precepts before taking the plunge into new territory and breaking the rules. He is noted for the sense of witty playfulness that he brings to his work that makes it truly contemporary, despite using equipment and techniques from a bygone era. *Hot Acrobats Perform Cheese Fog Polka* is a case in point and illustrates how he is intuitively brave enough to mix up elements to create compelling interest without losing the discipline of structure.

The book invites readers along on a tour of McLeod's many strands of work, with incidental photographs by Shaun Shadbolt fleshing out the journey. Many examples include attributions of the fonts used, which will be appreciated by lovers of typography, but the book avoids getting bogged down in excessive technical detail.

A quote by Alan Loney became McLeod's mantra early on his typographic journey: "One chooses to simply muck about in the shed with an old printing press, or to acquire at considerable cost and some risk to one's emotional stability, standards of excellence comparable with the finest anywhere in the world."

McLeod made that decision and this book is a fascinating and inspiring testament to his endeavours. 📖

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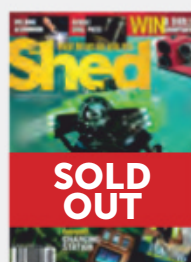
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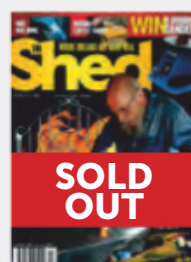
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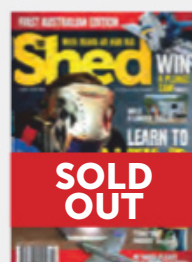
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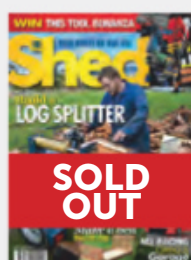
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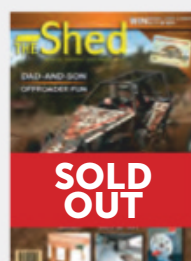
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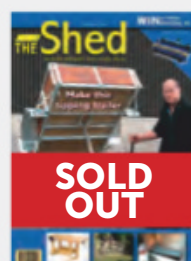
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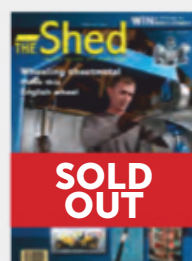
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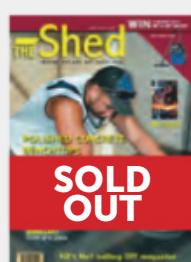
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THE FAB LAB VOLUNTEER

REINVENTING THE VITAL ROLE OF LIBRARIES AND LEARNING

By Jude Woodside

I volunteered at my local library recently. Actually, the library in my town has just adopted our Fab Lab, and having some involvement with the Fab Lab previously, I volunteered to help with the opening.

'Fab Lab' is a contraction of the term 'fabrication laboratory'. It was a concept developed by Massachusetts Institute of Technology (MIT) when they sought to spread knowledge of new technology like laser cutting and 3D printing throughout the world. The idea was that such a facility would help some small entrepreneurial businesses get off the ground and help to spread technology education.

Life after books

Libraries all over the world are suffering an identity crisis as more and more people dispense with the need to borrow books in favour of the internet or Google.

I know of some towns where councils are considering closing their libraries. My town is a little more enlightened and recently added a number of buildings to ours to house the Fab Lab among other things. Libraries all over the world are fighting the tech tide by adding access to online courses and resources and creating facilities that attract people for education or simply for curiosity.

Many of the more enlightened ones have moved to become hubs for this new technology. That's where the Fab Labs come in.

Our Fab Lab has a laser cutter, a CNC router, five 3D printers, a vinyl cutter, a hot press for transferring designs to fabric, a scanner for the 3D printer, and several computers. They teach basic electronics, design for 3D, and courses in how to use the laser cutter. As a means of engaging children, it is



Part of the Fab Lab at Masterton District Library

It is a hub for the community and a resource for young and old

second to none and it would be hard to dispute that being accomplished in these techniques does any young person any harm. The ability to use CAD software, even of the most basic kind, is a very useful skill. I don't think schools even teach paper-based technical drawing any more.

Membership benefits aplenty

Library membership gives me access to Linda.com (now bought by LinkedIn), a website of tutorials in all things online; Pressreader, an app to read newspapers and magazines from the world over for free; even a link to the online versions of Haynes repair manuals for the petrolhead in me. I can use all these resources at home through my membership of the library.

Now, with the addition of the Fab Lab, I also have access to all their tools and a source of tuition in it. In a way, it is still fulfilling the job of a library as

it is contributing to the dispensing of knowledge free to the community. It is a hub for the community and a resource for young and old.

Busy opening day

The opening was a bit low key but the weather was at least pleasant for a change. It was the first day of the school holidays, so it got a bit busy. In one room we had two 3D pancake-making machines running flat out making free pancakes in butterfly or skull designs — it was a gender thing. In another we had a banana piano and a VR system that proved enormously popular. We had the laser cutter printing small furniture items, and the 3D printers churning out all sorts of knick-knacks and gee-gaws. With my knowledge I was deemed only fit to run the 'Makey Makey', an electronic device that allows those bananas to operate as a piano. In my case I had various vegetables operating as a drum set.

I am looking forward to doing more in the new site. There is nothing better than seeing the joy of the young at new discoveries and watching the light bulbs go on in their eyes when they imagine what they could do. 📖



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