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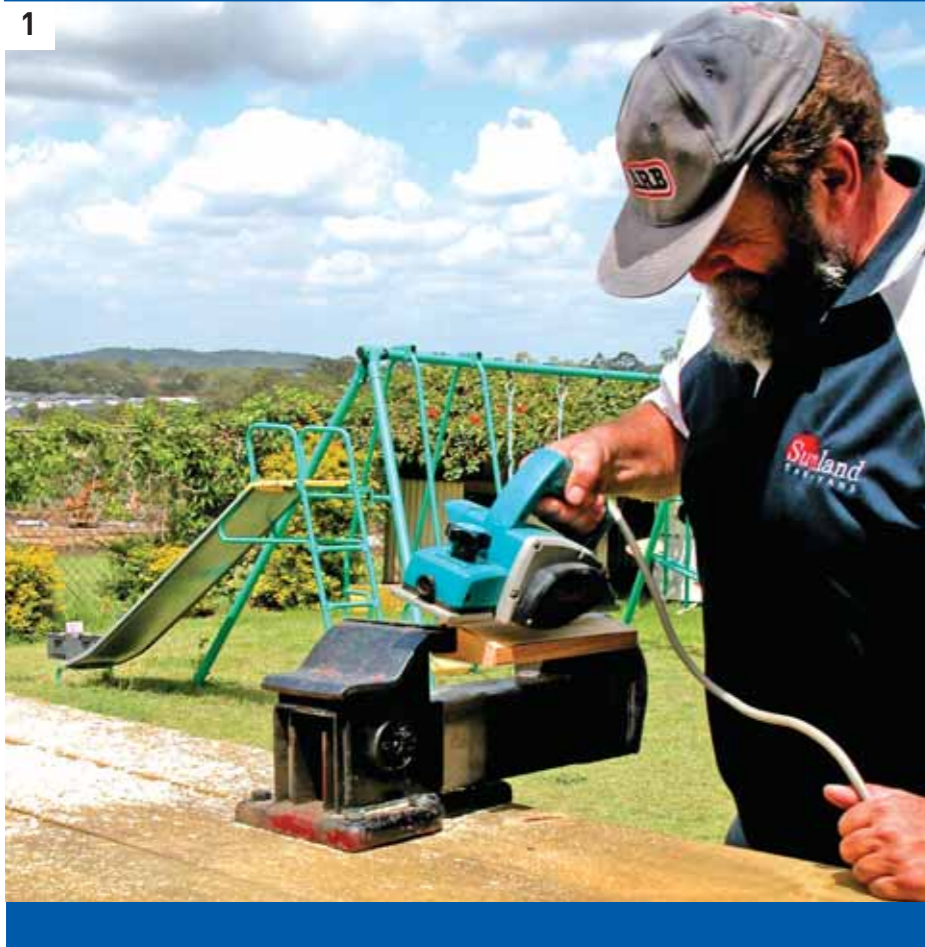
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Last month I finally took the solar plunge with Vicki and got that Two Faced 90/60 panel wired up to the Prostar regulator. That'd been planned since the inception of the project, but like family planning in the Rooth household, it took a while to get around to it!

Right now is probably a good time to explain my philosophy with Project Vicki apart from it being a great excuse to get out of the house without getting away from a fridge.

As you've probably noticed – certainly my little Handbrake has – there have been several times when I've let loose with an almost 'spare no expense' regime, which might seem right out of keeping considering the original price for our van was only \$500!

However, we all have our priorities in life, and it's been a dream of mine ever since those six years plugging camp lights into a truck battery and shaking the bejesus out of a kero fridge every month to get serious with 12V mobile

power. It has been a dream to build a caravan capable of doing all the things I want, and doing them well.

So, that's why I spent almost \$5K sorting out the chassis and suspension – 10 times the original price. It is also why I wasn't frightened to fit those Camec wind-out windows, the Smev stovetop, Camec sink, get Golf to do the upholstery and Boroma to do the flooring and all the other good stuff, too.

Similarly, the Vitrifrigo remote compressor fridge – possibly the world's best travelling fridge – cost almost four times as much as Vicki did originally, but what price do you put on a lifetime of cold beer? Even the 90/60 Two Faced solar panel fitted last month cost nearly twice as much as the original van.

But when you add it all up and compare it to the price of a new caravan with similar equipment, we'd have been lucky to spend a third as much as most people are paying. That doesn't include labour, of course, but then my Handbrake would argue that my labour's worthless unless

I'm helping her with the windows.

So I guess I'm happy to plough along, putting good money into the van knowing full well it's a bargain.

I also know that by choosing the right gear in the first place that if anything happens to the van itself – bar total immolation, of course! – that I've still got a stack of good gear I can pluck and put into something else. There are some products out there you wouldn't even bother rescuing...

More and more that's the case these days as the market is flooded with cheap rubbish that looks and makes claims that seem spot-on – until they cook themselves a few months later and you can't get parts!

There's the occasional bargain out there for sure, but mostly the oldest rule in the book still holds – you get what you pay for. But with so much to choose from, it's no wonder some people get dizzy and blow their money on rubbish.

Yep, it's all about research, so when it came to getting Vicki powered up, I've

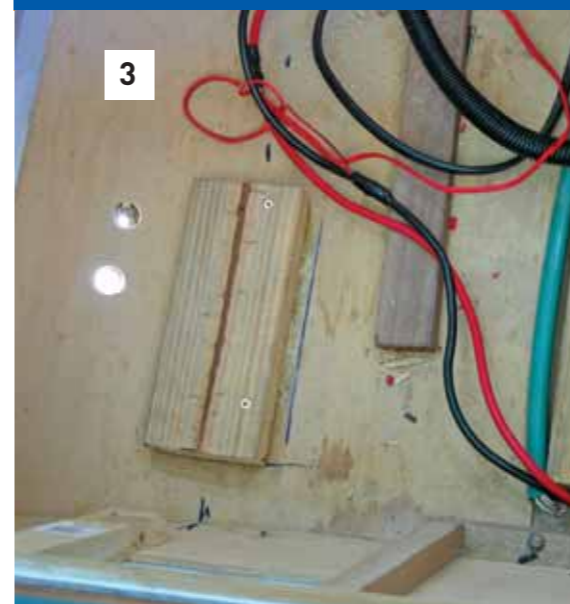
- 1 The first step was to shape a wooden block to fit the curved floor under the front seat. A couple of these blocks form the mount for the Victron, keeping it out of the dust and allowing air to circulate
- 2 How brave am I then? Not that brave. I'd already drilled a couple of pilot holes from the inside before opening them up with the hole saw! The Victron comes with 1.4m of heavy-duty welding-style cable, so I'm working around using that without cutting or adding to it
- 3 Wow, how complicated is that? About as high-tech as a shovel, eh? Slowly all Vicki's electrics have converged into this one compartment under the front seat, which certainly makes access easy
- 4 I've used a couple of short lengths of split tube (taped up to make it solid) poked through the holes as 'sleeves' for the cables, with silicone to hold them in place. The cables will be fed through later



Words and photography by John Rooth

The Victron— DUCK'S Guts! Part 1

Roothy installs a little blue box by the name of Victron Phoenix into Vicki. Well, this issue he talks about it – next issue he'll get around to it!



Vitrifrigo remote compressor fridge – possibly the world’s best travelling fridge – cost almost four times as much as Vicki did originally, but what price do you put on a lifetime of cold beer?

been doing my homework for years. I’ve looked at everything on the market while testing vans and visiting manufacturers, but I kept coming back to the Victron energy units.

Sure, I know that Paradise Motorhomes’s Colin McLean has been fitting Victrons into his top-of-the-line products for over 18 months, and Col never compromises on product choice.

That alone should have been enough, but I asked around the serious chaps in the trade, including the people at Battery World and Solar Panel Xpress, who are both leaders in their respective fields with big ranges to choose from, and guess what? Victrons are the Rolls-Royce of multiple-function power-control units.

Beauty you say, but what the hell does that mean? Okay, it’s going to take a cou-



- 5 Wiring the Victron was dead easy. The two super-heavy cables go to the batteries, there’s a 240V ‘in’ plug – which I’m wiring to Vicki’s external power flap here – and a 240V ‘out’ plug that powers the van’s sockets. Oh, and there’s an earth and a battery heat sensor, but that’s about it
- 6 And this is why it’s easy. This is one of the unit’s power plugs, and with marked screw fittings, it’s hard to get it wrong! Plus one plug is male and the other female – even I’d have trouble getting them mixed up. But even though it’s self-policing, I’ll get the job checked over by a licensed electrician before hitting the road
- 7 The best possible mounting for the Victron is vertically to allow cooling air circulation, but they can be mounted horizontally too, especially if you pay a bit more attention to airflow. I’ve screwed down the slider plate, so all that’s left is to pop a couple of screws in the other end
- 8 Having fed the two leads through – along with the heat sensor’s wires – it’s just a question of plugging in the 240 leads and fitting an earth. At least I thought that’s all I had to do. Looks like finishing up might take longer than I figured

ple of issues to get this blue box fitted properly, so I’ll try and describe in layman’s terms (mostly because I don’t understand the ‘techno’ speak...) what this unit does.

For the last year, Vicki’s ‘power supply’ has been a CTEK battery charger. These units – the best available smart chargers on the market – are incredible in that they massage the batteries to

keep them in peak condition and give you the potential to run a 12V van off the CTEK in its ‘power’ mode and plugged into shore power.

But what I really wanted in the system was an inverter – a device to transform the batteries’ 12V output into 240V. No, not just so the Handbrake could plug in her hairdryer, but because we – like most people these



days – have a plethora of 240V equipment we’d like to take bush.

For the most part, that includes chargers for cameras and laptops and the like, but given the increasingly cheap nature of appliances and their compactness these days, to have portable 240V power is a genuine asset.

Inverters can be cheap, but the cheap ones don’t make computer-friendly

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- 9 With the Victron's cables, the heat sensor (top) and the connecting leads to the other battery, this terminal is starting to get a bit crowded! I'll swap it for a bolt-type terminal later, but for now it's a case of cinching everything tight and keeping the terminals free of corrosion with some Lanotec lanolin oil
- 10 There's nothing too complicated about these controls, is there? Switched 'on', it's a charger/inverter with full functions, or there's an option for charger only – or off. The lights tell the story – and I'll have the rest of this story ready by next month once I've had a little nap...



power (true sine-wave output), have a habit of overheating and don't handle vibration. So I went straight to the top of the class and invested a tad over \$1700 in a Victron Phoenix Multi Compact unit.

It's the bottom-of-the-range 800/35 unit, which means it's capable of pumping around 700W, but that should be more than enough given our needs, and when you consider everything else, they're excellent value.

Victron earned its stripes in the marine world, where its products are recognised as the most reliable and long-lasting available. Apart from producing true sine-wave 240V power from 12V batteries, this unit takes over from the CTEK by providing the ultimate in battery charging when plugged into shore power.

It's actually better described as an intelligent 'adaptive' battery management system, because the charging cycle is controlled by a microprocessor that takes battery condition and temperature into account.

This is invaluable for caravans and motorhomes, because our type of lifestyle often means long periods with little use followed by plenty of hectic holidaying demands!

The Victron's brain works all this out, charging flat batteries as quickly as possible – while not over-cooking them – or maintaining them with a storage mode that minimises gassing and corrosion by floating the voltage at 13.2V.

It does this while giving the batteries a weekly 'hit' at absorption level to prevent stratification of the electrolyte and sulphation.

In other words, it's virtually a 'fit and forget' battery maintenance and 240V inverter all in one. Plugged in line

between the 240V inlet and the van's 240V outlets, it means looking after the batteries is as simple as leaving the van hooked up to shore power when you're not travelling.

On the road, you've got the convenience of 240V whenever it's needed. The Victron's automatic activation (in less than 20 milliseconds) means that should you be plugged into shore power, any appliance running off 240V won't shut down in the event of a power disruption.

That's not such a worry, unless you're on a respirator or you're a journo with 2500 words of a 3000-word yarn tapped into his computer...

They've got a lot more features – most of which I'm yet to understand – so I wasn't surprised to find that these units can be programmed with a laptop to suit an individual fitment.

This is the sort of thing Colin does with the Victron units he fits, computer customising them to suit whatever generator/battery storage system his customers have in mind so that battery and inverter performance is maximised.

But that's all a bit too technical for me. I just wanted the best I could find, and it had to be simple enough to fit myself – though, like anything to do with 240V power, I got my installation

checked out by a licensed electrician when I'd finished. No, that's not him you can hear laughing.

Which won't be until next month now, because we've run out of space. Whoops, talking space, I'd better mention one of the other features of the Victron units – they're light-weight and space efficient, especially when compared to anything with similar outputs.

Yet while space and weight are always priorities with us vanners, I've got a more immediate concern.

Yep, explaining a little \$1700 glitch on the credit card to 'She who Checks Everything'. Constant cold beer won't wash. I'd better try the hairdryer angle... *C&M*

AD

CONTACTS

Victron Phoenix units are distributed by
Bainbridge Technologies Pty Ltd
Tel: (07) 3821 3333.
Web: www.baintech.com.au

Stockists include:
Battery World outlets
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Words and photography by John Rooth

The Victron— DUCK'S Guts! Part 2

After last month's deliberation, Vicki now has a bright blue box called Victron Phoenix tucked away in her tummy

Having spent most of last month's column justifying fitting the Victron inverter/charger multi-function unit into Vicki – and most of the month since justifying the cost to the Handbrake – I figured we'd better take a look at the fitting of the unit itself.

It was one of those jobs that I've been putting off, mostly because the technology involved had me thinking that it'd demand some incredible feat of the do-it-yourself kind.

In fact, I'd set aside a couple of days to get that blue box in and wired, and

even had the telephone number of an electrician mate handy at all times in case he was required.

He wasn't – not until it was time to check out my work anyway. The thing is that while the Victron Phoenix Multi Compact – to give its full title – is an incredibly high-tech device, the actual fitting rates up there with wiring up the solar. Dead easy, as long as you've got a few basic techniques sussed anyway.

I've found this more than once during Project Vicki. I dread starting something because it looks complex, only to bowl it over easily once the first step has been taken.

Wiring up the solar regulator and fitting the panel was one example. In the end, it was accomplished in a couple of hours!

Similarly, fitting the Vitrifrigo remote compressor fridge – with its plethora of gas and electrical fittings and the certain knowledge that I knew absolutely nothing about refrigeration other than that it makes beer cold – was almost daunting.

Yet once mounted, it only required a couple of tubes to be connected so they could self-gas and a wire connected to the power. The Atkinson hot-water unit looked like the big-time too, especially

The first step in fitting the Victron was to physically mount the blue box – something that’s not that hard given that for its performance, it’s one of the smallest and lightest units available

with its remote start and the need to plumb to suit hot water. In the end, it was a doddle!

Why is this? I guess it’s the nature of good product these days. The manufacturers – at the top end at least – seem to consider that making the fitting operation as simple as possible is very much to their advantage in the marketplace.

Most caravans and motorhomes aren’t

built by tradesmen; they’re put together by ‘jack of all trades’-type people whose work is then checked by experts. Make fitting simple and you’re taking less of that expensive time on the assembly line and running far less risk that the product will malfunction because somebody stuffed up!

The first step in fitting the Victron was to physically mount the blue box – some-

thing that’s not that hard given that for its performance, it’s one of the smallest and lightest units available.

Being space conscious really helps, especially given that when Vicki was born in 1962, man was yet to land on the moon, let alone build technology like this!

So the decision to place the Victron under the front seat – where the solar

regulator was placed – was pretty easily made.

After all, this compartment is on the route of the main power leads from the batteries to the power board, is physically close to the batteries themselves and already carries the 240V inlet wiring. Everything it needs is already there!

The only problem is that in the fitting instructions – which are excel-



- 1 I fitted another vent to the under-seat area so it’s cross-vented. To encourage airflow, this vent’s higher than the other. Electrical units develop heat – you need to be aware of that, especially up here in Queensland! Victorians take note and locate yours under the bed...
- 2 Mmm, tidy. The whole trick to efficient low-voltage power is to keep the cables thick and short, and they don’t come much thicker than the Victron’s welding cables. They were supplied at 1.3m, which was perfect for this application.
- 3 The Victron Multi Compact is the Rolls Royce of power supply/delivery systems



lent, by the way – the preferred option for mounting is vertically to allow an easier passage for the cooling air required when big coils are doing their thing.

But that wasn’t possible, and given that Vicki’s demands won’t be that huge and there are buckets of capacity virtually unused, I mounted it the only way it’d fit – flat on the floor.

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Not quite flat, of course. I used a couple of blocks to lift it an inch or so up. Two reasons – to keep any dust at a distance and to allow air to circulate around the box. Thanks to the supplied mounting plate, this job was a doddle, too!

As was fitting another air vent to the under-seat compartment. I still had one left from a past buy-up at Camec RV, so I fitted this extra one under the seat, directly across from the exterior vent.

If you remember, I'd already fitted a vent to the outside, so with the two vents facing each other there's plenty of cross-flow ventilation around the unit – exactly what any heat-producing electrical apparatus likes!

By now you're all aware of the importance of thick leads and short distances whenever 12V current has to be conveyed. In keeping with this, the Victron came with two welding-type leads with thick multi-strand copper wire that measured about a metre and a bit.

The most direct route for these leads, given the position of the chassis rails

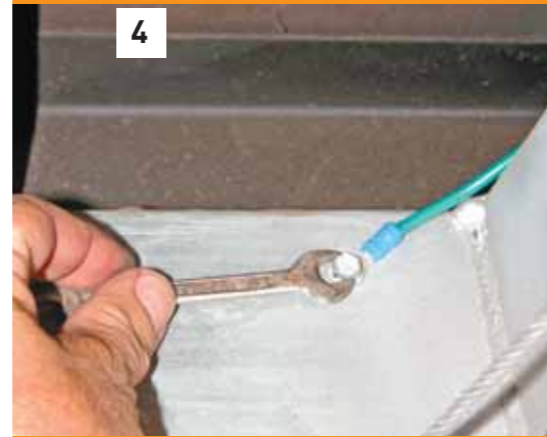
under the van, was to go straight out through the front and direct to the batteries. I could have lengthened the leads and taken another route, but simple is as simple does – and the wife's always saying I'm simple.

Hooking up leads to a battery isn't rocket science, especially when they're colour-coded red and black! The only thing that confused me was another lead made up of two smaller red and black wires that seemed to converge to one terminal point.

The instructions mentioned a temperature sensor, and sure enough, after a call to my expert, that's exactly what this was. I tucked it alongside the positive lead and bolted it to the terminal, too.

The Victron unit uses this sensor to monitor battery temperature, which helps make decisions about charging rates and voltage inversion accordingly. Phew, pretty clever stuff but simply installed – even if not fully understood!

With the 12V leads and sensor hooked up, it was time to tackle the 240V side of things, but once again the



4



5

Victron's advanced design made this part simple, too.

The unit's 'AC in' input plug is wired directly to the van's 240V inlet plug and has directions for placement of the wires. If you can fit a plug to an appliance lead, you can wire it.

Similarly, the 'AC out' plug is wired back to wherever the power went from your van's 240V inlet originally – in

Vicki's case, back to the power points. If you've got an RCD unit, the Victron goes in line before that.

Now here's where clever design really takes over. The Victron is now wired in line with the 240V power, sitting in the circuit after the AC inlet but before any AC devices.

In the incredibly unlikely event of the unit failing – I've been told only swapping the battery leads can cause that



6



7

4 Last but not least – the earth cable from the Victron to the van's chassis gets bolted down. The unit is earthed for safety reasons, but I'm still not sure how the earth goes to ground when you've got rubber tyres. I'll look into it some more.

5 After looking around the house for something to wrap those cables up with, I finally found a length of heavy-duty plastic hose, err, somewhere behind the wife's washing machine and split it to suit. No worries – at least there won't be if I'm down at the pub when the laundry floods...

6 The old style diamond pattern aluminium is thicker and stronger than its modern equivalent but it's also getting hard to find.

7 Yep, you can tell that as far as sheet-metal work goes, I'm a great carpenter! The diamond-pattern alloy is easy to cut and bend, yet strong enough to take a good belting from flying rocks. I've riveted it in place and used silicone to fill the rivets and seal everything.

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8 Any job involving 240V should be handled by a licensed electrician or at least checked out thoroughly by one. Rob's 'the man' when it comes to anything tricky – in-car computers and DVD players, rear-view screens, antennas and communications – so this was a doddle for him.



sort of drama – all you have to do is pull the two AC plugs out of the unit.

Because one's male and the other's female, they can be plugged together, and it's back to life as usual without the inverter/charger! That's brilliant!

Gee, that was about it. It's a good thing I had to make up, drill and bolt down an earth wire for safety (from the pack to the van's chassis), or I'd have been sitting in the pub well before lunch!

In which case I might not have noticed how vulnerable the battery leads were looking as they popped out of Vicki's front panel.

Making a protector plate and insulating the leads with some heavy tube took longer than wiring it up, but it was time well spent – and as usual with small fabrication jobs, was damned enjoyable, too.

The final step was to take Vicki along to another mate, Rob from Rob's Bayside Electronics. Being a whiz at all things electrical, I got him to check my work, because we are talking 240V here.

Sure, I have this primitive urge to fit things myself, and certainly it's helped build a better, more practical understanding of all things caravan during the Vicki build-up. However, I'd suggest most people would be better off getting someone like the experts at Solar Panel Xpress to do the fitting for them.

So now the Victron's in. How is it in practice? Bloody awesome, that's how.

We took Vicki away for a four-day weekend last month. The first two days and nights were spent 'free camping'. yet not once did we miss out on 240V power. Whether it was charging the camera batteries, thawing dinner in the small microwave or the wife drying her hair, life was as simple as plugging into the wall.

With only one Two Faced solar panel, I wasn't surprised that when we

plugged in to shore power on night three, the Victron went to charging cycle and topped our two Century deep-cycle batteries up even though we were using 240 inside the van at the time!

Then, just for the sake of trying out Victron's 'rapid switch' claims, on the fourth morning I hooked up my laptop to Vicki's 240 outlet and asked the Handbrake to switch off the shore power at the pole.

My laptop is an older one and its own battery won't sustain life unless it's plugged to the wall. It was a perfect test.

I didn't even get a flicker from the screen – just seamless power transition as the Victron computed the sudden lack of 240V input and switched to inverter mode, going from charging the batteries to using their power to make 240V in the instant!

Amazing technology, eh? I did nothing except switch the Victron off when we got home, and even that's not necessary.

Once plugged to shore power (and switched on again!) the batteries are kept in peak condition and massaged to ensure longest possible life. On the road you've got 700W or more of 240V whenever it's required with the only limitation being battery capacity.

I guess in the long run this is what clever technology is all about – making life as simple as possible without the

need for constant human attention.

Time on the road should be about maximising enjoyment, not fiddling with settings or plugging and unplugging things accordingly. The Victron units are built to be operated by people with absolutely no knowledge of the technology itself.

Yep, there's only one little hassle on the horizon.

Having realised that she can plug anything into the wall and it'll work, no matter where we are, my little Handbrake is making all sorts of Vicki travel plans that don't include Chooka Morris, Fat Kevvy, fishing by the sea and a pallet of XXXX. Maybe I should have stuck with the swag... **C&M**

CONTACTS

Victron Phoenix units are distributed by **Bainbridge Technologies Pty Ltd**
Tel: (07) 3821 3333
Web: www.baintech.com.au

Battery World
Tel: 131 760

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