



# ***Lighter and stronger – a 5th wheeler mantra***

**It took a year to design and research, and another two to build, but Paul Lindsay (#17854) couldn't be happier with his 5th wheeler.**

**JUDE AND I** have been NZMCA members since February 2002. The idea of a motorhome first took root on 4th January 2001, my birthday, when a summer holiday in a tent turned rainy and snowy. Meanwhile, our friends in a bus were warm and dry. That's when I made the decision – no more tents. We later bought, stripped out, and rebuilt two nine-metre buses, which we loved.

Then came the Covid lockdowns, and with them the first taste of what retirement might look like. Jude and I began discussing extended travel and she pointed out we'd need more space if we planned on being away from home for longer stretches.

I've always liked the 5th wheeler concept which offered a spacious interior, excellent towing combination, and an independent tow vehicle when parked.

We looked into the market in New Zealand

and Australia, including a visit to the Melbourne Caravan Show. Most 5th wheelers on offer were US imports that didn't tick any of my boxes. Their design, layout and construction quality didn't suit the New Zealand travelling lifestyle nor meet my personal expectations.

On the plane home from Melbourne, I announced to Jude, "I'm going to build our own 5th wheel caravan." As an amateur engineer I underestimated what I was getting into with that statement. It turned into a year of design and research, followed by over two years of construction.

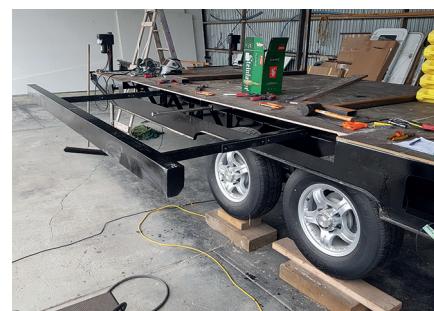
From the outset my mantra was lighter and stronger. The design brief: 9 metres long, three full-sized slide-outs, and a gross weight around 3,500 – 4,000kg so I could tow with a medium pickup (on WOF) with the 5th wheel on COF, providing flexibilities like towing a small vehicle.

For the concept drawings I called my friend Sam – an outstanding engineering draughtsman. I handed over reams of scribbled ideas. He took my vision and began turning it into a viable CAD design. It was amazing to see the stuff that had been in my head morphing into a design that could work.

Everything had to match the mantra of weight and strength. The key weight savings had to come from the chassis and the walls and roof. Unlike the US builds, I wanted to develop a space frame chassis that guaranteed strength, rigidity, and weight savings. After some design iterations, we were happy.

For the walls and roof, I needed a one-piece panel – light, strong, self-supporting, and maintenance-free. It needed to carry an R-rating for insulation and sustain its own strength whilst bonding only to the chassis.

A lot of homework led me to Composite



It was a slow process that involved lots of research and sourcing components from both here and overseas, but Paul learned to celebrate the wins along the way as the project began to take shape.

Group in Christchurch. They normally build fibreglass swimming pools and refrigerated truck bodies. I must have tested Andrew's patience describing the project in detail, but he was incredibly helpful. After sharing many ideas backwards and forwards, we landed on a high-density urethane sandwich panel, weighing just under 8kg/m<sup>2</sup>, which was then engineered into the CAD drawings by Sam.

Next came the slide-outs. Most off-the-shelf mechanisms were 'clunky' and poorly engineered. Instead, we opted for linear actuators – lighter, fewer moving parts, and compact. We even designed our own slide-out system, which has worked brilliantly.

With the construction design in CAD, Sam supplied the chassis drawings. Steel was ordered, pre-cut and folded, and a truck delivered a "jigsaw puzzle" to my workshop. In just a week, the main chassis was tacked together. At about this time reality struck with the magnitude and the scale of this

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project. No going back though – it took four to five months to complete the chassis with slide-out assemblies. Total weight: 722kg. A personal milestone moment.

Even more pleasing was the rigidity, jack up one corner and two diagonally opposite corners would lift with less than 5mm flex. That stiffness would prevent stress on the bonded panels which was critical for long-term integrity.

During chassis construction, I researched the global market for components as many weren't available in New Zealand. Quentin from Trailer Parts Online was incredibly helpful and most of our parts came through him. I imported a Timbren Silent Ride suspension system from the US which is quiet, smooth, and highly recommended. The hitch also came from the States, allowing over 90° articulation in a double cab ute without touching the cab.

I sourced custom-built locker doors, windows, hatches, and steps internationally, as local options didn't meet my specs. Then came plumbing, wiring, and underbody fabrication. This involved a steep learning



The name Lindstoun Ritz II combines the couple's surname Lindsay with Jude's maiden name Cranstoun. The first trip away was a triumph.

curve, particularly in electrical prewiring and system integration.

Once that was completed it was on to the big task of cutting out the walls and roof from Composite Group. I tried to find a 10 metre CNC router bed in Christchurch to do all the cutting out, to no avail, so it took months to get these completed on my own. I also had to invent a jointing system for the panels, designing a custom router bit to create a four-edge bonding method that's incredibly strong. Thanks to my neighbour Stu and his tractor crane, the panels were lifted and bonded into place, though not without some heart-stopping moments.

With the walls up, I tackled the interior and slide-outs. After everything else, I thought these would be easy, but they turned out to be the biggest challenge. Every day I pleaded silently for someone to arrive with the skills to give me a hand. Working on a project like this on your own is a challenge and often frustrating.

The last external wall to consider was the nose cone. Composite Group had an old curtain sider nose cone beyond its commercial life, but on initial viewing it seemed too large. Later, I had an epiphany, could we flip it upside down? A quick plywood template proved the idea. Andrew's

team prepped it, and we had a perfect-fitting nose cone.

Next came endless hours of interior fabrication – from cutting, shaping, and mounting, to custom builds like the shower tray. I leaned heavily on Sam's design input and the engineering wisdom of my friend Dale, whose advice and assistance was invaluable throughout.

With bodywork nearly done it was back to electrical systems, and I spent hours learning systems and the nest product integration. I rejected the traditional 12V-only RV setup. Instead, I ran with 240VAC, 24VDC, and 12VDC. Where possible, 24VDC took precedence. I used Victron gear throughout.

This setup brought unexpected benefits. For example, a household 240V fridge (4.5-star rated, \$499) performs better than a \$4,000 RV compressor fridge. Same with TVs – mainstream 240V units are better and often come with satellite decoding built-in, making them ideal for RVs.

Once the wiring was in, I turned to joinery. I knew if I wasn't careful, the weight would get out of hand. That got me thinking about old style joinery with fabricated joinery fronts and frames for shelving and drawers. But finding a joiner with these skills was frustrating.

Eventually I found Brett, a marine cabinetmaker who'd just relocated to Rolleston. He visited, loved the project, and was on board with what I wanted.

After researching lightweight panel products for the joinery, I was close to importing from Australia. Then a staff member at Hamptons ITM put me in touch with Prime Panels who custom-made a 12mm laminated poplar ply (sold via Hamptons ITM). It's strong, straight, and just 15.7kg per sheet.

Brett did an amazing job with it. The entire interior joinery came in under 300kg – remarkable. If anyone needs cabinetry or RV work, I'd be happy to connect you with Brett.

With the final fit-outs complete, I designed and applied the Lindstoun II graphics. Final dry weight: just over 3,500kg, with 2,920kg on the axles and a roomy 34m<sup>2</sup> of floor space with the slides extended.

We've done a couple of trips and are extremely pleased with how she performs. She tows beautifully and is a breeze to set up, thanks to the 24V electric four-point levelling system I designed.

I'm on to the next project now, a folding boat trailer so that we can put our inflatable outboard jet boat in the locker and I can go fishing.