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Catching the breeze – the Marlec Rutland 504 Wind generator in use

Wind-powered CARAVANNING

Off-grid caravanners, Mike Kingdon and Alan Ross, fit a wind-powered electricity generator to a tourer for supplementary charging. Here's how



Mike Kingdon



Alan Ross
Photos Mike Smith

» As members of the Camping & Caravanning Clubs' Folk Dance and Song Group, we regularly pitch up without mains electricity. New touring caravans make ever-greater demands on their 12V leisure batteries, so, if we wish to enjoy the facilities that modern caravans provide, and camp regularly without electric hook-ups, 12V power management becomes a challenge. Fitting a high-capacity solar panel and low-power LED lights helps, but when the sun doesn't shine and meets extend to five nights, caravanners can experience 12V power shortages. After several meets when the weather didn't cooperate, we decided to take a look at wind generation and focused on a company called Marlec with its Rutland range.

Main pic: Marlec loaned us a Rutland 504 wind generator, land tower, rigging kits and HRDi charge controller. The box for the wind generator measures 54 x 54 x 25cm, and all the rigging attachments – apart from the poles – can be transported in the lid.



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2: Components to rig the Rutland 504 wind generator.



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3: Close-up of the middle of the improvised connector. Note the channel for the power cable comes well below the shoulder

to support the upper set of stays. (See also 11, which shows the cable and lower stays in place.)

The Land Tower Kit contains:

- Two 2m stainless-steel poles, which we reduced to 1.6m each.
- Ground plate and spike to support the lower pole, including power cable exit.
- An aluminium connector to join the tubes. This has a central hole for the power cable to pass through, and also supports the bracket for the lower stays. We decided to replace this with a longer connector, which provided greater rigidity and allowed the cable to exit between the poles. Our connector has a groove for the cable and a shoulder to support the lower stay bracket.

The Tower Rigging Kit contains:

- Two sets of three-wire stays with ground anchors and adjusters.
 - Essential nuts and bolts.
- For several reasons we rejected the idea of a freestanding wind generator anchored to the ground with guy lines only. Using the awning channel to support the pole became over-complicated. Instead, we decided to anchor the land tower poles that would support the turbine using the jockey wheel clamp on Mike's Sprite Finesse 2 caravan. To facilitate this, we added the following items to the Land Tower and Rigging Kits:
- A nylon bush (from Marlec) to hold the lower pole in the jockey wheel clamp.
 - Four plastic-coated (Bradcot) awning clamps to attach two pairs of stays to the caravan grab handles.
 - Four cable clamps (from a chandlery) to adjust the length of the stays.



4: Mike prefers to have a charge controller with a digital display mounted inside the caravan so he can monitor the charge rate and battery condition. Marlec's HRDi Charge Controller has separate inputs for wind turbine and solar panel plus outlets to a main and secondary battery. When the battery is nearing its maximum charge the HRDi slows the speed of rotation of the turbine to prevent overcharging. An additional safety feature is a temperature probe (black wire on left) to check for battery overheating.

Converting the caravan to take wind-generator power



5: The Finesse 2 is fitted with an internal pre-wired connection to the battery, so the biggest electrical change we had to make to fit the wind turbine was to take its power cables into the caravan using an additional 12V auto socket located in the side of the battery box. Note: on the left is the pre-existing plug and socket for the solar panel.



6: We fitted a switch to disconnect the HRDi from the battery when turbine or solar panel power are not in use. While the HRDi has a switch to isolate it from both inputs, we might want to use one but not the other source, which implied the need for separate switches. As solar is likely to be the main source of 12V power, we used a double-pole switch on the battery line, so that the panel (smaller black switch) couldn't be switched on before the HRDi and battery connection had been made.



7: We were able to fit all three switches into the sides of a project box which we mounted in a bracket below the HRDi. None of the system is visible when the caravan's cushions are in place.



8: For safety, we fitted fuses to the + lines of the battery, turbine and panel. As we aren't using the controller on the back of the 90W panel, Marlec advised us to fit an 8A diode to the panel line. ($90W \div 12V = 7.5A$). The fuses and diode cable blocks all fit in the second box.

Assembling the wind generator on site

We found it easiest to assemble the wind generator and its poles on the ground and then swing it up into its vertical position.



9: Fit the awning clamps and adjusters on the grab handles ready to take the stays.



10: Fit the nylon bush to the base of lower pole, ready for clamping.



11: Slide the lower set of guylines onto the upper pole. Feed the wind generator power cable through the upper pole. Join the two poles together using the connector. Position the lower set of stays, taking care not to pinch or damage the turbine power cable.



12: Slide upper set of stays onto upper pole and secure with a bolt.

Assembling the wind generator on site

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13: Insert the turbine power cable into the upper tube. Connect the wind generator to the power cable using the terminal block and check the polarity.

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14: Slide the wind generator mount into end of upper pole and secure it in place with a bolt.

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15: Level the caravan and put the steadies down, then remove the jockey wheel and position the ground spike and plate directly below the jockey wheel clamp. Swing the turbine pole with wind generator into

vertical position, and slide it through the jockey wheel clamp and into the ground spike. Adjust the nylon bush and tighten the jockey wheel clamp.

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16: Fit two upper lines to grab handles and adjust until pole is vertical. Fix remaining upper stay forward using a ground anchor. Tension using the adjusters. Fix lower stays if needed.

Fire it up!

Plug the turbine power lead into the 12V auto socket. Inside the van, turn on the HRDi connection to the leisure battery, scroll through the screens to find the wind generator menu, switch on power input on the HRDi, and switch on the power from the solar and wind generator as required.

We encountered several minor issues when using the grab handles to secure the stays. Firstly, using the jockey wheel clamp meant that when the guylines were shortened, they all became different lengths. As a result it became important to have the bracket that held the guylines to the poles the right way up, so we colour-coded some of the lines. On some caravans the lower guylines might prevent the opening of the gas locker. The upper guylines provide adequate rigidity on their own for most occasions. However, we fit the others at night, when the caravan is unattended and when the wind gets up.

First real test

We experienced 36 continuous hours without sufficient sunlight to generate adequate solar power. The wind generator did all we could have expected of it. We had power to spare and could have charged an additional battery. The HRDi showed that it was generating between 0.5

and 2 amps – depending on the wind speed – and it was structurally stable. It could just be heard in the caravan at the height of the storm, but only when we listened for it. Otherwise, its noise was obscured by other sounds. The next morning was dark and dismal. When we asked neighbours about the noise levels, none had even been aware of the turbine.

Evaluation

We have tried out the wind generator on several subsequent events and our evaluation is ongoing. Our judgement so far is that, although the Rutland 504 wind generator doesn't provide large quantities of power when compared with contemporary solar panels, it will provide a valuable supplement during the autumn and spring, when hours of daylight are limited, and on longer meets during the season, when the sun can't be guaranteed to shine every day.

In our view, it's a more sociable/less polluting alternative to petrol generators.

We are content with our method of mounting the turbine and the jury is still out on whether the lower set of stays are needed all the time. The one thing we haven't yet tried is charging a second battery. All-in-all, we have found it to be a positive result. <<

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17 Our first opportunity for an extended trial was C&CC Folk Dance and Song Group's five-night Easter Meet at Uttoxeter Race Course. The weather on arrival was fine and the wind generator was set up. Towards evening Storm Katia blew in. Twelve hours of heavy rain plus high winds followed.