



Generating Cash from Unreliable Energy

Power spikes, surges, and appliance damage from low voltage are common electrical problems at RV parks nationwide. Three moonlighting executives are looking to profit by answering those challenges in a way that can boost bottom lines for RV dealers and retailers, too.

By John Ghrist

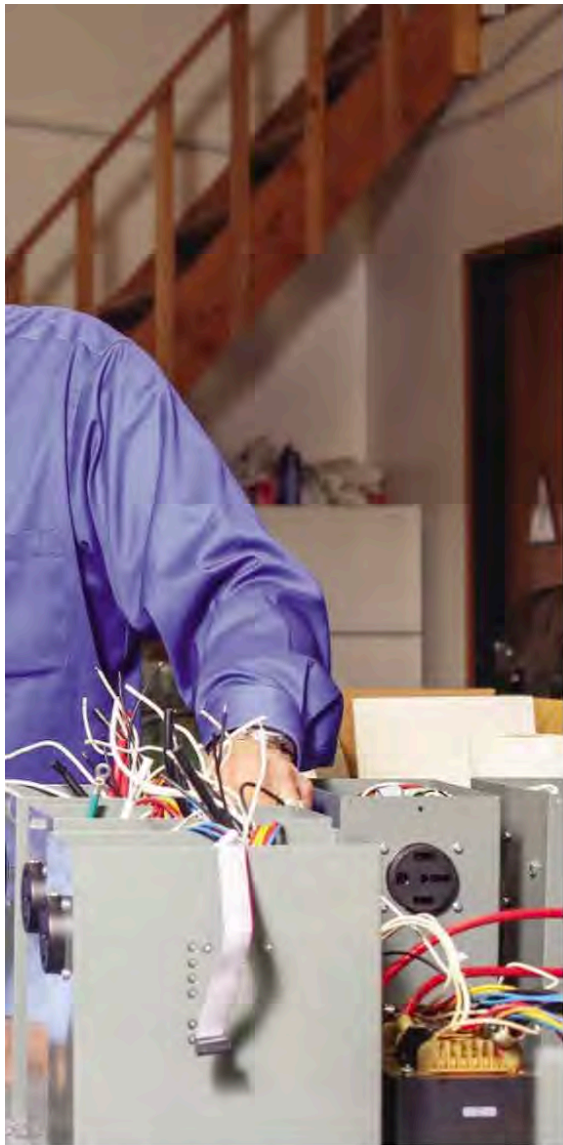
Although it is not widely known, there is a small company in Anaheim, California, that is making money from RV power problems—and is looking for RV dealerships and service centers that might want to join it in doing so.

Hughes Autoformers has been around since the '90s but fell on hard times

about five years ago. Purchased by three executives from another power-related company, Hughes Autoformers has undergone a transformation in the past three years. Its revitalization, centered around fairly simple yet ingenious products, also heralds a cure for a fairly common problem that plagues RVs at parks nationwide—spotty power.

Photos by Edna Eudave

At the helm of Hughes are Patrick Thomas, David Zomorrodian and Alex Moreno, all employees at Pacific Transformer, a company that builds custom power transformers of various sizes for customers such as NASA and the U.S. military. Thomas is 50 percent owner of Pacific Transformer, Zomorrodian is chief engineer, and Moreno is sales manager, but those are just their day jobs.



(L. to R.) Patrick Thomas, David Zomorrodian and Alex Moreno, owners of Hughes Autoformers, are transforming the company that offers a solution for a prevalent problem—spotty power in RV parks.

newer products that act as surge protectors and power monitors.

Autoformers have been around for years but were not adequately marketed by former Hughes management, which might seem odd because they solve a big problem.

The RV Park Power Challenge

Most RV parks have power pedestals that provide 120-volt power to RVs. However, as more RVs plug into a park's power system, voltage can get leeched away and transient surges can be introduced. Before long, all the RVs in the park can have a power problem, which potentially threatens their wiring and accessories. According to the Institute of Electrical and Electronics Engineers, when voltage drops below 108 volts it can damage the appliances it powers, Thomas says.

"As people turn on their air conditioners and their TVs, the voltage drops. Once it gets to about 104 volts, most people have some form of surge protection that shuts off the coach," Thomas says.

For RVers camped in a park, that means going dark because rules prohibit generator use, he says. For RVers using Autoformers, the outcome is different.

"The people that run our product, whenever it gets down to 104 volts, they (might not) even know there's a problem in the park because they're sitting at a hard 114 volts, which is a perfectly acceptable voltage. Not ideal, but it's comfortable," Thomas says.

An Autoformer, unlike just shutting off a coach, can actually solve the problem, he says.

"It's like saying 'my foot itches,' so you're going to chop it off. When your foot itches, you scratch it. Our product offers you a way to do that," Thomas says. "It boosts the voltage. It's the only one that does it. It's a simple solution to a big problem that occurs in RV parks."

Power Watchdog Keeps Users in the Know

Hughes' other main product line is the Power Watchdog, a surge protector and power monitor that comes in 30- and 50-amp models. It provides a shutoff to protect RV wiring and appliances, and it does diagnostics on RV power use. What is more unusual (and now patented by Hughes) is it reports its findings to RV users on their smartphones in text messages via Bluetooth, even as users might be sitting around a campfire or are out for a walk, and it also includes a replaceable surge-protection board.

"That readout on your phone tells you how many amps you're drawing from the park, how many volts the park is supplying you with, it gives you how many watts you're using, and it also tracks your kilowatt hours," says Thomas. "A lot of parks are starting to put in watt meters or electric meters like on your home, so you can track that on your phone as well. It also gives you the ability to set parameters as far as your power usage, like 'I don't want to see the coach drop below 108 volts, I don't want to see my coach go over 128 volts.'"

"Watchdog will text you, 'You've gone above or below your voltage limit.' You can set your amp limit, and it'll text you and say, 'you've exceeded 40 amps' on one leg of your circuit," he says. "You may have one leg that's at 45 amps, one leg that's at 15 amps, and you can do something about that, because you don't want to wear out one side. You want to keep that balance if you can."

Legs are the halves of a circuit that enter an electrical service panel. Balancing the load between both legs is recommended so the power being drawn is roughly the same on both sides. Doing so avoids overheating electrical components and lessens the chances of causing the panel to overload.

The trio are 100 percent owners of Hughes and have similar roles there: Thomas does marketing, Zomorrodian is in charge of operations and manufacturing, and Moreno handles sales. It is a little like having a skunk-works project in the shed out back, because Hughes' modest 5,000-square-foot manufacturing facility is just 500 yards from Pacific Transformer's headquarters. However, other than the personal interests of Thomas, Zomorrodian and Moreno, there is no connection between Hughes and Pacific.

What these three and their seven employees are cooking up at Hughes could come to have a major impact on RV users, and by extension, those who sell vehicles and aftermarket accessories to those users.

Hughes has two main product lines (not counting its sales of voltage meters for RV users who want to test park power before plugging in): Autoformers, which are long-standing Hughes products that can drop amperage being fed into a coach and use that to boost voltage; and Power Watchdogs,



(L. to R.) Tim Grove, Ian Thomas and Tommy Just are the technicians who assemble Hughes Autoformers products at the company's 5,000-square-foot facility in California.

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Technician Tim Grove assembles Hughes Autoformers products.

you out of trouble in these parks with marginal power, or these private parks where the voltage drops due to a lot of use.' You can sell this thing on the service call."

There also is potential for revenue to be made via the install, because the Autoformer line comes with a kit for installing the product inside an RV.

This option has additional benefits for the users: Mainly, it is not in plain sight.

"Just from talking to our customers, (it seems) theft is an issue in most RV parks," Thomas says. "It's a big concern of our customers. Putting (the Autoformer) inside protects it from being stolen. We do supply a lock that'll lock it to the park power pole pedestal, but people like to put it inside for security reasons."

If users are handy they can install kits themselves. If not, "any dealer that sells the product and has a service center will put it inside" for the user, Thomas says.

Weight is another convenience consideration. "If you put it inside, you don't have to lift it to hang it on to the park power post," he says. (The 50-amp Autoformer weighs 35 pounds and the 30-amp unit weighs 22 pounds.)

The Fallacy of Electricity Theft

Another out-of-sight benefit stems from the erroneous perception that Autoformers somehow are stealing power. When one RV is running lights, TV, and an air conditioner while the unit next to it is dark, some park owners who don't understand how an Autoformer works can persuade themselves something shady is going on.

"Some park owners, if they walk around and see this, they (can) threaten the users. 'If you don't disconnect your machine you've got to leave the park.' By (users) putting it in a compartment, nobody knows about it, so everybody's happy," Zomorrodian says.

To those who don't understand much about power, an Autoformer can look like it is stealing electricity.

"It's been an issue we've always had to address (with Autoformer)," Thomas says. "On the basic level, you're paying for 50 amps at 120 volts on either side of the circuit, or with a 30 amp, you're paying for 120 volts at 30 amps. You can't get more than that. You go beyond that, you're going to pop a breaker, so you're not stealing anything."

The problem lies in perception, he says: When other RVers in a park are suffering low voltage or have had their coaches shut off, they are suspicious of a unit that still has full power.

In reality, an RV with an Autoformer might be doing more to prevent a parkwide power drain. The Autoformer changes amps into volts and draws fewer amps from the park and converts those amps into more volts inside the RV.

"If the park power gives you 50 amps available, you only end up having to use about 45 amps at your coach at higher voltage," Zomorrodian says. "That's the way to look at it. You cannot exceed the park amperage. A lot of people are now leaning more into installing (Autoformer) inside of their coach because of that reason."

Innovating to Stand Out

The Bluetooth connectivity, the voltage boosting and other features, such as a 4800-joule absorption limit for Power Watchdog models, are all intended to make Hughes' products stand out from the competition, particularly when the aftermarket has plenty of competing power-management products. The 4800-joule feature, for example, is the amount of joules the surge protector can absorb in power spikes before failing, and Power Watchdog currently has the highest capacity in the industry for a basic surge protector, Thomas says.

"We have to be innovative, and that's why we came up with Watchdog with the Bluetooth and the replaceable surge board, two things no one else has, and it comes at basically the same price range with all these innovations," Thomas says. "That's what you have to do. What we hope to continue to do is to innovate and bring out new products and we're constantly working on new things. That's our approach."

Even with just seven employees, Hughes is producing 25 to 35 units a day. Although output varies from month to month, in the spring and summer Hughes can't keep up with demand for Autoformers and is thinking of expanding beyond its current

facility. (The Power Watchdogs are manufactured by a partner company in China.)

"Manufacturing is a hand-assembled process," Thomas says. "You take the components, you have to put them all together with the connectors and the nuts and bolts. It's that type of assembly job, you know. Straight-up electrical."

Building Reliability in From the Start
Innovation isn't Hughes' only concern. It also planned its products to be durable.

"Every unit is inspected in a couple of stages. At the stage of component level, we do some testing. Halfway through the assembly we have an inspection of all the connections, and then we do the



final inspection under the load conditions to make sure that the units are up to expectations,"

Zomorrodian says. "Our boards are designed to the point that we can calibrate them. Because of the variation in components, sometimes it's necessary to adjust the calibration. The board is designed in such a way that it can be calibrated at any time that it's needed. We do calibrate each individual unit to meet the requirements. From that point on, it basically ships to the customers."

Product testing is equally careful.

"We test them under the load conditions. The high-current unit of 50 amps proves

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Ian Thomas moves a pallet of Hughes Autoformers.



Technician Tommy Just assembles Hughes Autoformers products at the company's Anaheim, California, headquarters.

about 12,000 watts and the 30-amp unit proves about 3,600 watts. In order to make sure that the joints are made correctly, they have to test them under full load conditions," Zomorrodian says.

Units returned under Hughes' two-year warranty are handled in stride.

"We do have, probably every few weeks, one or two units coming back. The thing is, the technology that we use for changing the voltages is drawing on a relay and these relays have a lifecycle of, in most cases, 100,000 (uses)," Zomorrodian says. "If the relay already has its life done, like a timing chain on a car, eventually the contact wears out and it needs to be replaced. On average, (Autoformers) should have at least four to five years of continuous service if they are not in severe conditions."

The Hughes execs are excited about the future for their rejuvenated company.

"At first, we had a company that was almost down to nothing, maybe \$12,000 a month in sales," Thomas says. "Now we're doing \$120,000 to \$150,000 a month, and next year we'll probably be doing \$200,000 to \$300,000 a month."

"We're constantly working on new stuff and it's just a matter of making decisions this year (about) what we're going to bring out," he says. "The Power Watchdog will probably remain the same for the near future, and then a higher-end Autoformer will come out. That'll have more features, and it will also have Bluetooth. That's towards the end of the year. We're working on it right now, so yeah, we have a lot of irons in the fire." RVN



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