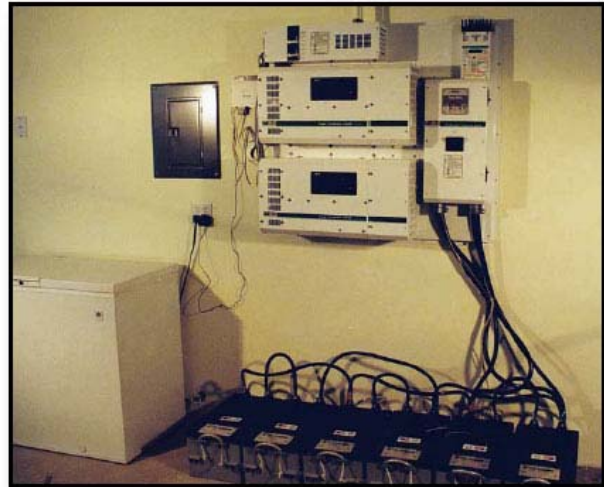


## Robin's System

By Robin Gudgel  
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My wife is threatening to write into Home Power magazine if my power back up system isn't working this winter. I barely escaped last winter as we didn't have any power outages. The generator was broken, the batteries were toast and one of the inverters was dead. We live on grid and I have a pretty nice grid tied battery backup system (when it is working).

The original system now sits in a corner of the garage. It was a stacked pair of Trace SW4024's with a C-40 and DC250. It has the distinction of having the only split back plate in existence. I made a split in half back plate that would have been UPS able, but that product was shot down. The marketing guy at Trace decided that he wanted dealers to buy the Trace manufactured Power panel rather than supplying parts so they could build their own. I still think they made the wrong decision, but then I am usually on the side of installers and do it yourselfers. It is too heavy to move and has been sitting against the wall for about 9 years now.



The system that has been in place for 9 years has dead batteries. Three years ago I had decided that the GVFX inverters had to go in favor of a Xantrex XW. (More on that later). The OutBack's work fine, but they have only one AC input and they cannot charge batteries from my Kohler generator. The intent of the backup system was to automatically back up the furnace and fridge for an extended length of time. I had bad memories of replacing all the water pipes in my old garage in the summer of 1995 after having a three day power outage when I was in Hawaii. The temperature was below zero for those three days and everything froze, so I was determined to create an automatic back up system in the new house under construction. The Trace inverters did that very well. The system had a propane generator that is hooked up to a 500 gallon tank. I was able to liberate eight solar panels from the engineering department at Trace so the SW's slowed down the utility meter during the day.

Unfortunately the Trace SW's bought power at night. They continuously held the battery bank at 27.4 volts or something like that. That voltage was held constant 24/7. We did not understand that doing this would wear out the batteries! Fast forward a couple of years. Trace had merged with Xantrex and Xantrex "eliminated my position". The next day I founded OutBack Power Systems and never looked back. One thing I wanted to do was to improve on things we had done at Trace. That is what good engineers do, they improve upon what is presently state of the art. The OutBack FX series of inverters was a great step forward. The FX's had many features that improved on the Trace/Xantrex inverters although they did not have all of the features of the SW. Some of those missing features would later on give me grief. One of our friends at Concorde Battery Company gave us a clue as to how to make a better battery charger. They had done research that showed you need to give the batteries a rest. No problem, we just shut off the charger after a while and this allowed the batteries to last longer.



In 2003 I replaced my SW's with shiny new GVFX inverters. After all I was no longer at Trace/Xantrex and as the president of Outback, it made sense to be using OutBack inverters. That was all fine and good until I had an extended power outage a few years back.

Luckily I was not in Hawaii this time and was able to keep the heat on. The inverters were pretty much worthless

because the outage lasted for four days. The OutBack GVFX inverters do not charge off of a generator, so I just ran the generator the whole time. My wife let me know just how humiliating this experience was. I'm an inverter guy who can't use his inverters during a power outage! That did it, I had to make a change. I wasn't going to put the SW's back on the wall. They were too heavy and I was getting old. I was familiar with the new Xantrex inverter. It had the same features of the old SW, and much newer technology. I had left OutBack a few years before so I had no issues with using a Xantrex product in my home. Just about then, I was coerced into getting back involved with Outback management. Crap, there go my plans to get my own system fixed. Once I got back involved in OutBack it became obvious that we needed to create something to compete with the XW inverter. It was kicking OutBack's butt. We knew how to design inverters so we began the XWK project. This was about three years ago. The project was later renamed the Beast and later the Radian. MidNite Solar had more engineering resources so it was decided MidNite would design and manufacture the circuit breaker box to go with the Radian. To make sure the MidNite Solar circuit breaker box was going to mate up with the OutBack inverter, we also designed the original sheet metal enclosure for the Radian. The inverter took so long to come to market those plans changed after we sold the company to Alpha. OutBack decided to make their own breaker box to go with their inverter. I fully expected this to happen so I wasn't too upset even though we had a deal.

Fast forward three more years to the present. I did not purchase an XW. I did buy a Radian since we had such a hand in the development of it. I did have a problem with using an OutBack breaker box though so we resurrected the design we had done years before. The MidNite breaker box has some nice features that the OutBack boys didn't think of. We do plan on putting it in production in the not too distant future. Ah, there is nothing like experience when it comes to getting things right.

That's it on the left next to the new SMA Sunny Island E-Panel. OK, now I have a new inverter that will do all that is necessary to make an automatic back up. The Radian has 2 AC inputs, is grid tied and can automatically start my generator if required. Hmm, back to those worn out batteries again. The 24 group 31 batteries were housed in two OutBack PSR battery cabinets. I designed these cabinets about ten years ago. I had certain cosmetic goals for the design back then and was very happy with the outcome. After having put together numerous PSR cabinets back then,



it became obvious that these enclosures had other issues. They had too many screws, took too long to put together, were inflexible as far as battery types allowed and cost too much. Now that MidNite Solar is heavily into battery box manufacturing, it just makes sense to replace the PSR's with a more modern MidNite Solar battery box. The MidNite MNBE-D was selected and eight Concorde PVX3050T batteries were purchased. They have now been sitting in my garage for over a year. I know you aren't supposed to do that, but I am good at procrastinating. Today I went out to the garage to start dismantling the battery box cabinets. I took the time to clean the dust off of the OutBack system and took a picture of it. I do not normally mess with the system. I design and manufacture the gear, but actually have very little interface with it.

As I was messing with all the parts it brought back good memories of past accomplishments. Even though all the gear in my garage is now about 9 years old, it is really good stuff. The PSR battery boxes are nothing short of a class act. The Starbucks green OutBack equipment was pure class back in its day and is still great gear. The MidNite MNBE-D solved all the negative issues that I had created regarding the PSR, but the MidNite battery boxes just don't have the class of those old PSR's. The MidNite boxes are less expensive, stronger, more versatile and far quicker to assemble. Still, I am going to miss my PSR's. The next thing to go will be the PS2 system on the wall. It too had some

great construction and features. The Flexware replacement that OutBack makes today is missing some of these subtle features. Professional installers know this and that is probably why MidNite sells so many E-Panels.

It will take some getting used to looking at stainless steel and gray rather than Starbucks green. I guess if it bothers me too much I can always go back to the drawing board. I have a feeling there might just be a new inverter going up on that wall in the future. I don't know what color it will be yet.

On another note, have you ever heard this phrase "The shoe maker's son has no shoes."

Well, one other thing that needs attention regarding my system. My combiner consists of wire nuts in a plastic box on the ground. MidNite Solar makes more PV combiner boxes than any other manufacturer in North America. I did not understand what a combiner box was when I liberated those panels from Trace. I suppose it is time to upgrade that a bit also.

The last thing to be upgraded will be the addition of lightning arrestors. My house has been struck by lightning and a fair amount of crispy critters was the result. The main service entrance and inverter/solar system will be getting some liberated MNSPD's. Pictures of the finished upgrade will follow.

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