

Electrical Grid

How we power our camp (and some neighboring camps, too!)

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On Playa Electrical Grid

On playa we rent a large 56 kW (70 kVA) generator that has ample power for our needs and all the camps in our hub. In 2024 we received a Multiquip DCA-70SSIU4F generator:



Expand to learn more about big generators at Burning Man

[Brad Templeton's Guide to Burning Man Power Grids with Big Generators](#)

[Electrical Systems training course at Burning Man Hive](#)

and join the [Burning Man Generators](#) group on Facebook.

The generator outputs **three phase power**. The three phases are called U, V, and W. Any one of its phases can be combined with Neutral, also called \emptyset , to get 120 Volts AC. You can also combine any two phases together, say U and V, to get 207 Volts AC. (We need this in the kitchen fort for the compressor that runs the walk-in refrigerator).

Coming out of the generator, we use five banded cables to distribute the three phases to **distribution boxes** around our camp. Those cables are U, V, W, \emptyset , and Ground. Neutral (\emptyset) is always color-coded white and Ground is always Green. The others are Red, Black, and Blue, but the order doesn't matter. Here is what a banded cable looks like:



In 2024, we had three distribution boxes around our camp, and provided one to 8-bit Bunny and one to Gender Blender, for a total of five. The distribution box's job is to take that three-phase power - all five cables - as input, and break it down into **50 Amp L14-30 California Twist Lock** (also known as CS63xx) outputs. The twist lock cables look like this:



Those only have four conductors, not five. They only carry two of the three phases. The distribution box splits up the phases so that some outputs get UV, others get VW, and others get UW.

It is critical to keeping the generator running well that we maintain approximately equal loads on each of the three phases U, V, and W. This is called *load balancing*. During the burn week, we monitor the load (in amps) on each of the three phases. If one phase is overloaded, we will move some of the load over to an underloaded phase by changing which 50 amp plug is plugged into which outlet on the distribution box.

A very simple distribution box has one three phase input, six 50 amp outputs, and some breaker switches to turn on and off the outputs and prevent fires if someone draws more than 50 amps. However, in 2024, Generator World, our generator vendor, brought us, at no extra charge, some amazingly incredible distribution boxes that had 12 outputs instead of 6, a dozen regular 120V household plugs for convenience, and built-in digital meters on the back that made it really easy to do load balancing.



Each of the 50 amp outputs from the distribution box can be fed, via a single 50-amp cable, into a **Spider Box**. A spider box takes the 50 amp cable as input, and contains a whole bunch of household-style electrical outlets that can be plugged into.

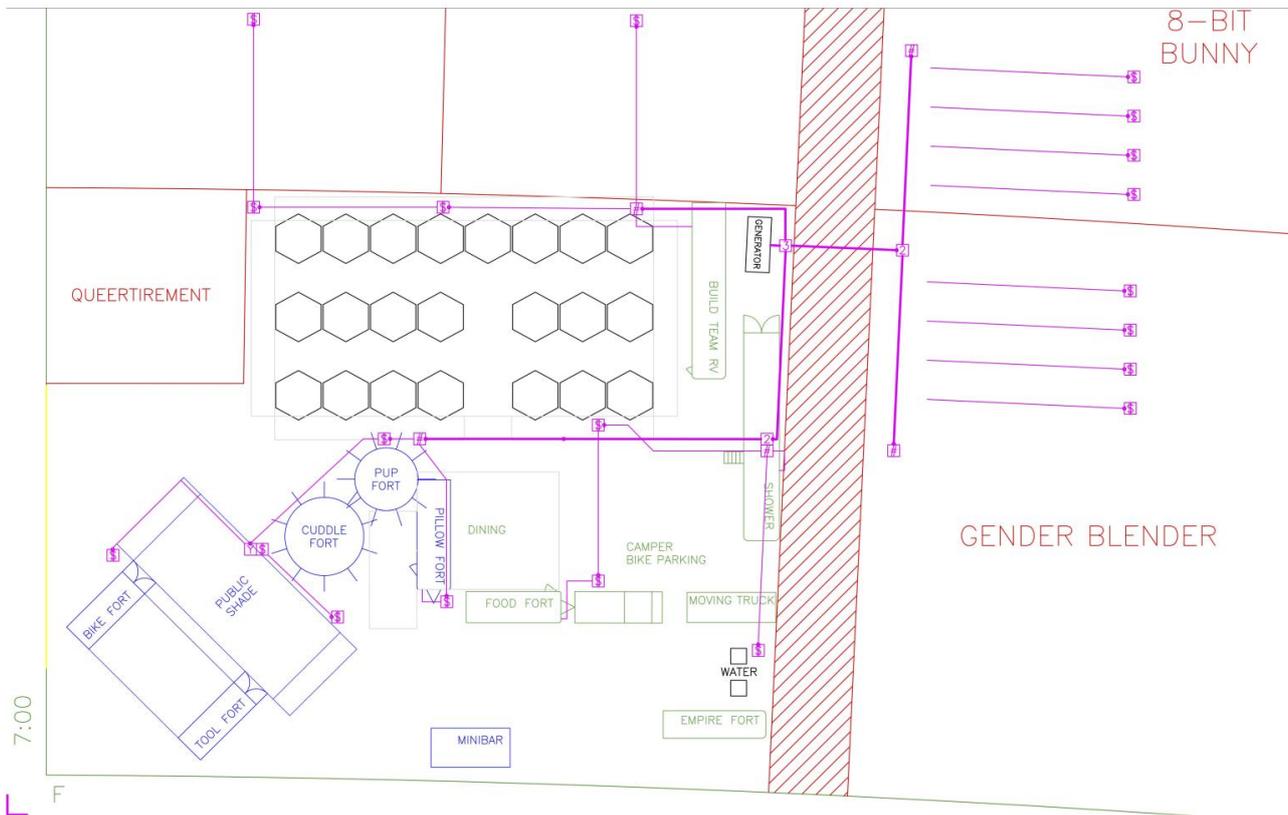


Spider Box

Our camp owns 20 RhinoBox RB-300AE Spider Boxes ([TurtleBox Manual.pdf](#)), so we place these near where a lot of power is needed. In many cases, instead of plugging appliances directly into the spider box, we end up using some outdoor-rated extension cords and power strips to further distribute power.

A Spider Box has numerous safety features including breakers that flip in case you draw too much power or a short is detected, and GFI switches that flip if current leaves the box and doesn't return because it went elsewhere to shock someone. This makes them completely safe to use outside, in the rain, and with faulty equipment without risk of shock or fire.

The following figure shows our 2024 electrical layout in purple. Thick lines show five banded cables leading to # distribution boxes. Thin lines show 50-amp cables leading to \$ spider boxes. 2 and 3 designate "hard twofers" and "hard threefers" used to split five banded cables. Y indicates a 50-amp y-splitter. We always let 8-bit Bunny and Gender Blender lay out their own cable inside their camp however they see fit so those cables are not shown connected.



FUTURE TURTLES 2024 ELECTRICAL GRID

Important Links

- Google Sheets: [Future Turtles Generator Usage in Amps](#) *Historical data on how much power we draw*
- Google Sheets: [AC Distribution Equipment Schedule](#) *Detailed list of distribution equipment that we own and rent*
- Google Sheets: [Fuel Consumption](#) *How much fuel we've consumed per day on the big generator*

Backup Plans

In three years running big generators we have had outages and they were always caused by one of two things:

- Air filter clogged after dust storms. Blowing out the air filter with a leaf blower, or replacing it with a new one, fixed it right up.
- Fuel running out. This was a big problem in 2022 when BRC Petrol skipped many days of fuel delivery. We also "ran out" of fuel once in 2024 because the fuel level indicator showed empty even though there was still plenty of fuel tricking the generator into shutting down when it didn't have to.

In 2022 we had paid for a backup generator to be on playa that could be swapped in in an emergency, but realized that the truth was it would take so long to get it, it just wasn't worth it to pay for this.

Meanwhile we have the following plan for emergencies to keep a few things going in case of a problem:

- We can plug the kitchen into the generator that it used to get to playa to keep the refrigerators going
- If we need to host a party or event, we can plug the public area lights and sound system into a single spider box and plug that into the RV's generator
- We have two Honda eu-2200 small generators which can be moved around to provide a little bit of emergency backup power at spot locations

Solar and Renewables

We often get asked when we're moving to solar power or why we insist on using a big smelly noisy generator when the sun is free, etc. etc.

Unfortunately right now there is very little solar equipment available to rent, and what is available to rent, would be far away. For the amount of power we use, it might take an extra truck from, say, Los Angeles, to bring in all that equipment. That truck alone would consume more fuel than we expect to consume with our generator over the course of a week. That doesn't help the environment. And buying new solar equipment just to use for one week a year would be both insanely expensive and equally bad for our carbon impact. The heavy batteries we would need to store power during the day and make it available at night only have a ten year lifespan and using them for 10 weeks total before sending them to a landfill is an environmental disaster.

Although the Burning Man organization has been encouraging camps to try small solar projects and thus incrementally move over, the truth is once we have a big generator in place, it is almost free to add a little bit more load to that generator, both from a carbon emissions perspective and from a financial perspective. For example, we considered investing in solar panels for the roof of our kitchen trailer, but whatever we spent on that, the net result would be just reducing the load on our generator by a tiny fraction and saving a few dollars in diesel fuel, while the cost and effort of getting those solar panels would be significant.

In short, solar power is great if you can use the panels, batteries, and inverters year-round, say, at your house in Las Vegas, but not so great in the remote playa conditions where it continues to be very very carbon-efficient to use diesel fuel. If you are tempted to spend money on solar infrastructure that will only get used once a year at Burning Man, it would be far far better for the environment to use that money for solar infrastructure in houses and permanent locations where it can work all 52 weeks a year. As we continue to grow our HUB on playa to include more and more camps, who all benefit from a single large efficient generator, we are actually reducing emissions and noise on playa, but we do not believe that the technology is there yet to minimize carbon emissions through solar at Burning Man. That said, we recognize that many small camps with low power needs can make solar work for them, we applaud camps that are experimenting with this technology and figuring out ways to make it work, and we'll jump on the bandwagon as soon as it is carbon-effective.

Vendors

Generator World, Inc

Provides the rental generator along with distribution boxes and the banded cables connecting it all.

Email: generatorworldinc@gmail.com

Contact: Shaz Nawaz (307) 461-9318 or Krystal Nawaz (916) 668-0605

They have always provided excellent service and Shaz is a long time burner (worked on Entheos and Titanic's End) and genuinely nice fun guy.

BRC Fuel Program

We get fuel for our generators delivered (hopefully daily) by [BRC Petrol](#) during the event. They charge about \$7 per gallon.

- [Customer portal for BRC Petrol](#)

The generators use dyed diesel. For 2025 we have already applied for fuel delivery. [Fuel Consumption Logs](#)

Small Generator Repair

We received a recommendation for [RepairIT](#) for small generator repair and maintenance (e.g. for our Honda's) but have not tried them.