

Solar Power

By Joe Bryan K5BRY

Advantages To Solar Power

There are four main advantages to using solar power for emergency response applications.

- 1) You can be completely off the power grid for extended periods of time.
- 2) DC power does not introduce line noise or 60-cycle hum to your radio.
- 3) You will be immune from grid power surges, which may hit in times of emergency.
- 4) During a lengthy, multi-day emergency response, finding an outlet for recharging batteries, even when there is power, can be a real challenge.

Solar for Go-Kits

Solar for your go-kit can be classified as a small-scale setup, but can still be valuable. This setup allows you to charge handhelds, batteries for low-power QRP radios and to recharge laptops.

For this type of setup, a solar panel rated at 10 - 15 watts is ideal. These panels are very portable. Some are the size of a notebook. Others roll-up. You can get roughly 750ma in full sun. With the right adapters connected to your solar panel, you can charge your handheld and your laptop and your cell phone. All directly.

If you have a low power radio other than a handheld (e.g., QRP rig), I suggest a small sealed lead acid battery, or lithium ion battery or the lithium iron phosphate battery. By low power radio, I mean a rig that runs about 5 watts. 2.4AH to 8AH of battery storage capacity is good for a few hours, but you should increase to fit the application. These smaller batteries are small and light weight.

Solar For Your Home Station

So, what kind of installation will you need to power your home amateur radio station using solar?

When I say a home station, I'm talking about a station that may have a 40 watt VHF rig and perhaps a 100 watt HF rig. The answer depends on a lot of factors, including not only how much gear you have, but also duty cycles, and the load you intend to support. Generally speaking, a solar installation with around 200 watts of panels and 300 to 500 Amp-hours of battery capacity is a good start, but your mileage may vary.

Trying to figure out how much you need in the way of solar panels and battery capacity for a permanent ham station is tricky. You have to consider the load you will support and the number of hours of sunlight you will have, among other things. Gene Hinkle's website provides a spreadsheet to do the calculations for you. Go to

<http://k5pa.com/Ham%20Radio/Portable%20with%20Solar.htm> .

All you have to do is enter the details on your station in the spreadsheet and it can simplify the process of calculating what you will need in the way of solar panels and battery capacity.

Batteries

I recommend you use 12 volt 100 AH or larger AGM deep cycle batteries. Don't use car-starting batteries. They are not deep cycle. Car batteries are built to deliver short bursts of power. Deep cycle batteries are constructed differently to deliver power over long periods of time.

Remember, connecting two batteries in parallel gives you the same voltage, but doubles the capacity, or amp hours. So, if you wire two 100 AH AGM deep cycle batteries together in parallel, you get 200 AM of capacity. Another consideration is that if you have a solar panel that is rated at over five watts, it's a good idea to use a charge controller.

Charge Controller

A charge controller is recommended to make sure you don't over charge batteries. Some charge controllers can generate RF noise when charging. Sometimes this can be controlled with shielding or DC filtering or grounding. It's something to watch out for.

Next, it's a good idea to have a diode in the circuit to keep your solar panel from draining your battery at night.

Other Considerations

I recommend Anderson PowerPole connectors for connecting gear, and heavy gauge wiring. Also, grounding and fuse considerations must be taken into account.

Summary

Is this something you can do yourself? Definitely! With some research and an eye on safety.