Solar Power Generator

Crazy boy



calibre 1.26.0

Solar Power Generator?
Crazy boy
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posted February 14, 2004 09:15 PM

I'm thinking about building this one http://www.rain.org/~philfear/how2solar.html anyone ever build it before? Any ideas or help are greatly appreciated!

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he has the basics right... look on ebay for solar cells. I got a 10 watt/12 volt unit for $30. Not mounted, but that isn't a big deal.

This is just a bit too simple, it needs a blocking diode to prevent back flow of voltage into the cells when it's dark..... and such a small panel will take days to rechage as lead acid battery that is drained.

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true, delectric, unless you remember to disconnect the cells... and my memory isn't all there any more

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Dielectric:

Right on the money as usual!

That panel is WAY too small for that battery.

A 60 watt panel would be better.

For a more portable system, check into "thin film" panels - they can be made foldable, and work in less than ideal sun conditions. The old glass panels only worked in bright full sun. Now the newer panels will produce some power from dawn to dusk, even on cloudy days.

The blocking diode is a good idea. A charge controller is even better, but raises cost considerably.

Also you really want a AGM or Gel cell battery for portable usage, if you tip a liquid electrolyte battery on it's side, it could leak with disasterous results. Optima AGM batteries will run upside down!

Make sure you buy a True Deep Cycle Battery - not all batteries marked "Marine" are true deep cycles.

An Auto parts store inverter?

Give me a Break!

Even the lousy inverters Sportsman's Guide sells are better that those!

Fleataxi

>All Unisolar flexible panels have a 3-year >warranty, and blocking diodes are built into the >units.

lotsa small panels come this way guys.
good point though DE for the uneducated.

the setup as shown is a tinkertoy. Not worth the $$$ as quoted.

grinch

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let's turn this into something useful. How about we take the basic idea and turn it into a practical set of instructions...

So, the boat battery / box combo isn't bad, gives a place to mount components too.

We need a specific controller and solar panel as well as generic specs for what we might find on ebay or somewhere like that.

What is it supposed to do? For how long? This will set the basic design parameters.

NB: Your average PV panel 2'x3' (approximate) puts out 45-60 watts in full sun at 14vdc using a good controller. If you have 2 Optima Group 24 deep cycle AGM batteries in parallel - each rated at about 60Ah, the total Ah available is 120Ah. I would never subject it to a greater load that 15A. At that rate, it would totally discharge in 8 hours, and reach 50% charge in 4-6 hours of continuous use.

The safe recharge rate is 10% of Capacity in Amp-hour, abbreviated C10. So your 120Ah battery bank should be charged at 12Ah for maximum battery life. A 60 watt panel equals 4-5A each. You'd need 3 panels to charge the battery at 12Ah, and it would take 10 hours to recharge.

These are all ballpark figures, but it gives you some ideas. Gel Cells are an odd duck, and don't like to be overcharged at all, and usually need a special charge controller, or a very good conventional charge controller that does multi-stage charging, with pulse and trickle charging to maintain full charge.

To do this right, you need a good set of panels, a good charge controller, at least 120Ah of batteries -AGM or Gel type, a good battery box, and a good inverter.

The inverter is optional, since converting 12vdc to 110vac cuts the Ah rating of the battery by a factor of 10. In other words, your 120Ah 12vdc
battery when the voltage is stepped up to 110vac, becomes a 12Ah source!

FT, I'm a curious novice. Any specific examples of a "good" set of panels, a "good" charge controller, and a "good" inverter? Any specific recommendations for the batteries? How practical would such a setup be for either power outages or BO time? Have you ever made/used one?

Snakebite: I talked to my friend in San Diego, and evidently my supplier has gotten a whole new generation of new stuff that is better and cheaper than last years model.

I'm going to send him an e-mail to request brochures, and then I'll be able to give you current information.

If you want to contact him directly, his webpage is http://www.solarelectricinc.com

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Like any generator before picking one you need to know your load. How much power will you be using and how much can you put back into the system with your charging device. Until you know these requirements, links to solar chargers are worthless.

To determine load, the decision path needs to answer the following questions:
a) Which items do I HAVE TO HAVE and supply power to?
b) What is the power demand of those items?

The first question is different from:
c) What additional items would it be "nice" to have.
and
d) What is the power demand of those items.

Once you figure out these questions, then you have the information you need to go power generation system hunting.

I built a very simular power system in 1999. I have used it around the farm and at work. It is ok within it's limits.The battery is a group 27 marine deep cycle. I installed 3 fused auto lighter sockets and a set of 12 volt outlet terminals fused at 15 amps for my scanner and 2-meter radio. The 300 watt inverter is ok to run the blowers on my propane heater and some lighting , during power failures . It did not do to well powering a 3/8 drill,it went into overcurrent often. I recently purchased a 500 watt inverter it does much better.
The battery box is wider that the battery
and has room for some spare fuses and a set of side terminal adapters to allow use of a G.M. style auto battery if needed.
My solar panel is rated 15 watt it takes several days of full sun to recharge the battery.
It came with a charge controller.I built a wooden box from 2x2s and plywood that opens like a book to hold the solar panel and charge controller. The box is designed to hold two 15 watt panels.
Look around the net for plans to drive an
auto alternator from a lawmower or tiller engine to recharge the battery .

BB: I'd get at least a 45 watt panel - a 60 watt would be better, and 2 70+ Amp-Hour Gel Cell Deep Cycle batteries. The 12vdc lighter taps are a good idea. A 500watt inverter draws about 4A at 110VAC, and 2 80Ah gel cells = 16Ah @110VAC, or about 4 hours of operation. A 60 watt solar panel puts out about 5 amps, it would take almost 20 hours to recharge the 2 gel cells! Not a good trade-off.

A far better "lawnmower" design drives 2 100Amp GM internally regulated alternators, better utilizing the power of the lawnmower engine. Problem is you need a bank that can handle a 200A charge @ C10 - that means a 2000Ah battery pack, or over 20 of those batteries! Even a single alternator needs 10 batteries in parallel to absorb the charge!

lawnmower designs don't last long - make sure you can rebuild the lawnmower engine, and the alternators, since automotive alternators aren't designed for a 100% duty cycle.

Marine alternators, on the other hand ARE, but they are $$$!

If you want to use the lawnmower as a generator for AC power, connect it to a suitable inverter, and use it to cool your freezer and fridge for an hour or two, or run your well pump to refill your cistern.

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flea : you can adjust the output amperage
on a lawnmower genny. yes it is kind of a waste
since it uses the same amount of fuel but you can achieve C10 charging rate.

Grinch, Be carefull with lawnmower gens using a car altinator. They put out 60+ amps and will harm your deep cycle batteries, as deep cycles are designed to be recharged at 10amps. If you devide the number of amps by 10 and charge a battery bank with that many deep cylces in it at one time, I don't think you'd have a problem, but charging one battery at a time you will fry the battery and cook off the water. Watch water level either way as deep cycles vent a lot.

Eagle : thanks bro. I'm fully aware of C/10
charging rates vs those of an auto type battery.

Part of the reason I did my mods on one of my
lawnmower genny was to be able to charge smaller
banks of batts at proper amp rate.

DC ammeter as well as reduction capability
So I control the amps ... something none of the lawnmower genny folks even discuss....
Not cheap to do, but it's not a bank breaker either. about $70 total.

4 different battery banks for me. VRLA for the most part now.

Yes you can easily cook down any setup with 1-2-4
batts.

Grinch, just wanted to give a heads up, I learned the hard way! I recharge my 4 battery bank with a basic 10 amp charger and let it float while on the grid (it has a setting to allow this). I would just leave it plugged in and let it charge off the generator during a blackout. Yeah it's not the most energy eificiant way to do it, but it works and was cheap. Diesel gen doesn't seem to know weather I'm pulling 5kw or maxing it out, gets about 4 hrs per gallon no matter the load. It runs at a constant speed, no idle down like most gas gens.

Grinch: how are you controlling amperage - an external regulator basically controls voltage, not amperage?

Flea : It's all about controlling the connections to the alternator. That's what tells the alternator what to do. Rheostat will do it.

long & short it's not hard to do.

Yes windfarme they give some of the details

there. My rheostat is a GM headlight/dimmer switch (scrounged free).

DC ammeter was $35 off of ebay and it is a slide thru connection. 0-80 amps. Tested well at 2-10-15 & 50 amp ranges.

only one gripe about it : No better "MPG" charging at 5 amps than 60 amps...

a portable clip on type of DC ammeter is on my
desired list (similar to the AC type) however
they are not cheap like the AC ones are.

grinch