Test post……

When you're calculating power needs for your electronic devices, you not only have look at how much power you need from your battery but also how much power you're going to have to generate to recharge the battery. I'll go over those numbers and also how to calculate solar power output if you're using solar panels to recharge the battery.

The battery's capacity is measured in amp hours, abbreviated Ah. (For the smaller portable lithium-ion battery chargers the power capacity is expressed in milliamps or 1/1000th of an amp, abbreviated mAh.) This measure tells you how many amps or electrical current the battery can deliver in one hour. The greater the amp hours the longer you'll be able to run your electronic devices. However, when it comes to deep cycle lead acid batteries, you have to keep in mind not to go below the 50 percent discharge level. So if you have a battery rated at 24 Ah, realistically you're only going to get 12 Ah. What does 12 Ah get you? For this we'll have to do a bit of math.

Electricity is the flow of electrons in a circuit through a wire, creating an electrical current. If we use the analogy of water being pumped through a hose, the pump is the battery, the hose is the electric wire and the water flowing through the hose is the current. The force with which the pump pushes the water is the voltage, the speed at which the water is flowing is the amperage and the total power of the water coming out of the hose is the wattage. The electrical system in your house is 110 volts, which is like a fire hose, while the van's 12 volt battery is more like a small garden hose by comparison.

If we take the example of a 60 watt lightbulb, whether you're using the house's electrical system (firehose) or the 12 volt battery (garden hose),

the amount of power coming out of either hose has to be 60 watts for that lightbulb to work. For the garden hose to have the same amount of power (water pressure) coming out of it as the firehose, the water going through it has to be flowing a lot faster. So if we translate that into electrical terms, for a given amount of watts, the number of amps required by a 12 volt battery to operate the lightbulb is going to be greater than that needed by the household system. This relationship is reflected in the formula:

Watts = Amps x Volts

The number of amps multiplied by volts gives you the total power in watts. If you want to know how many amps an electric device will draw or use, then divide watts by volts:

Amps = Watts / Volts

Let’s take the 60 watt lightbulb again. Your household electrical system is 110 volts. So the amount of amps that lightbulb will draw is 60/110 = 0.5 amps. But if you use that same lightbulb in your van with a 12 volt battery, the calculation is 60/12 = 5 amps.

To determine how long the 12 volt battery will operate the 60 watt lightbulb, you have to take the battery’s rated amp hours and divide that in half because of the 50 percent discharge limit. And you then take that amount and divide it by the number of amps that the electrical device draws:

12v Usage Hours = (Rated Ah x 0.5) / Amps

For our 60 watt lightbulb drawing 5 amps and a 12 volt battery rated at 24 Ah, the calculation is 24 x 0.5 = 12 / 5 = 2.4 hours. So the battery will give you enough power to use that lightbulb for just under two and a half hours.

But it’s not as straightforward as that. One important factor when using household items with your 12 volt battery is that you’ll need an adapter called an inverter. The 110 volt household device uses alternating current (AC), so named because the current switches direction 50 to 60 times each second.