

New Battery Charging Products

by Garth Cane

Modern charging methods improve the life of your batteries.

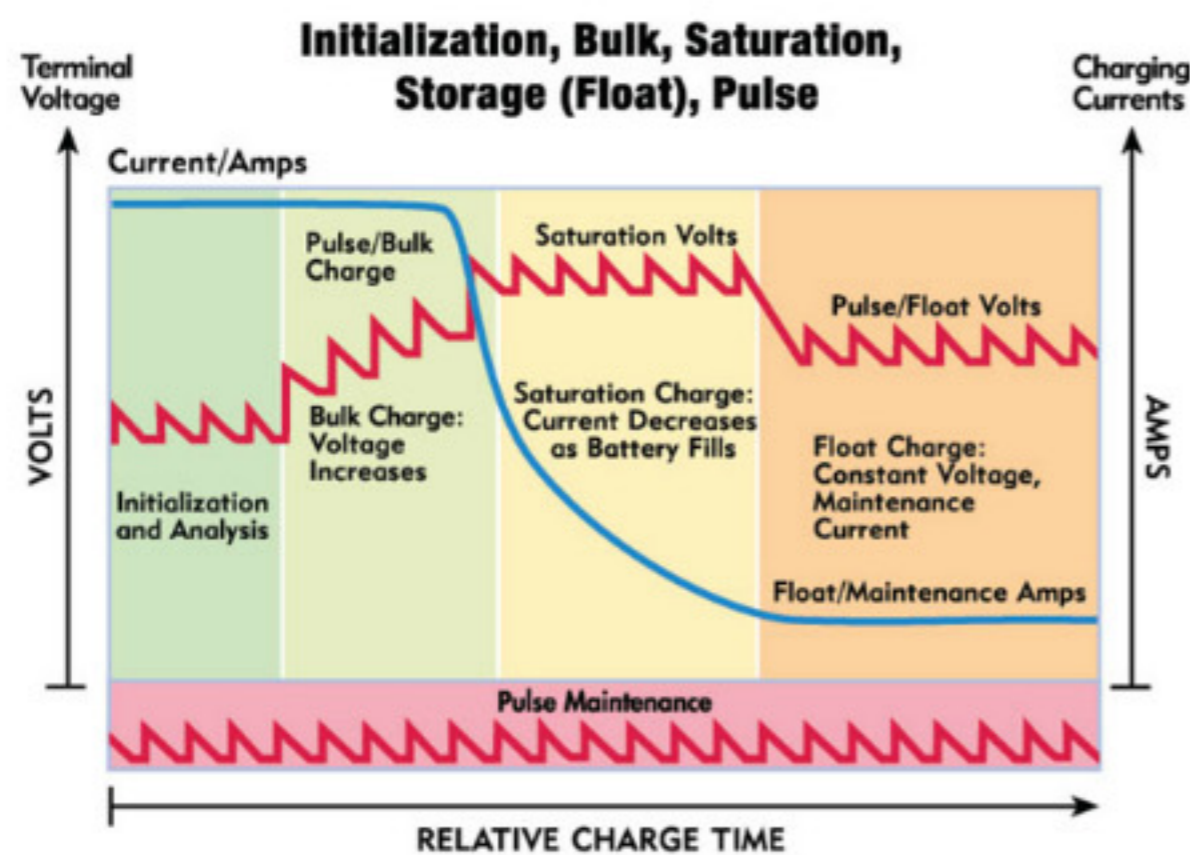
Many people use their RV's for weekends and short holidays, and some are fortunate to have a place on their own property to park between their trips. These people are able to take their time packing and unpacking, and they can usually plug in the power cord to keep their batteries fully charged between trips. Many towns and cities, however, have bylaws that restrict RVs from being parked on the street or in the driveway beside the house. Parking bylaws are usually passed by a town council as a result of complaints from neighbors who do not want to see an RV sitting on the road in front of their house, or their neighbour's. So after the RV is unpacked, it is often driven to a remote location and put into storage until the next trip. Most of these storage areas do not have electrical outlets that can be used to trickle charge the batteries for the next trip. Unless the batteries are maintained with a boost of energy, they can deteriorate quickly.

Battery problems and failures have plagued RV owners for years. In most cases, they are replaced long before their anticipated expiry date. The average battery often lasts only 6 to 48 months and is thrown away, or recycled at a smelter to try to recover some of the metals inside.

All batteries are built with two different metal plates immersed in a liquid called an electrolyte. One of these plates is called the negative and the other is the positive. The electrolyte is composed of 63% water and 37% sulfuric acid. Whether the battery is supplying current or just sitting there doing nothing, the acid is continually reacting with the chemical coating on the negative plate. When the battery is delivering current to operate your furnace, water pump, or lights, the acid in the electrolyte is breaking down into hydrogen bubbles at the positive plate and forming a black material called lead sulfate covering the negative plate.

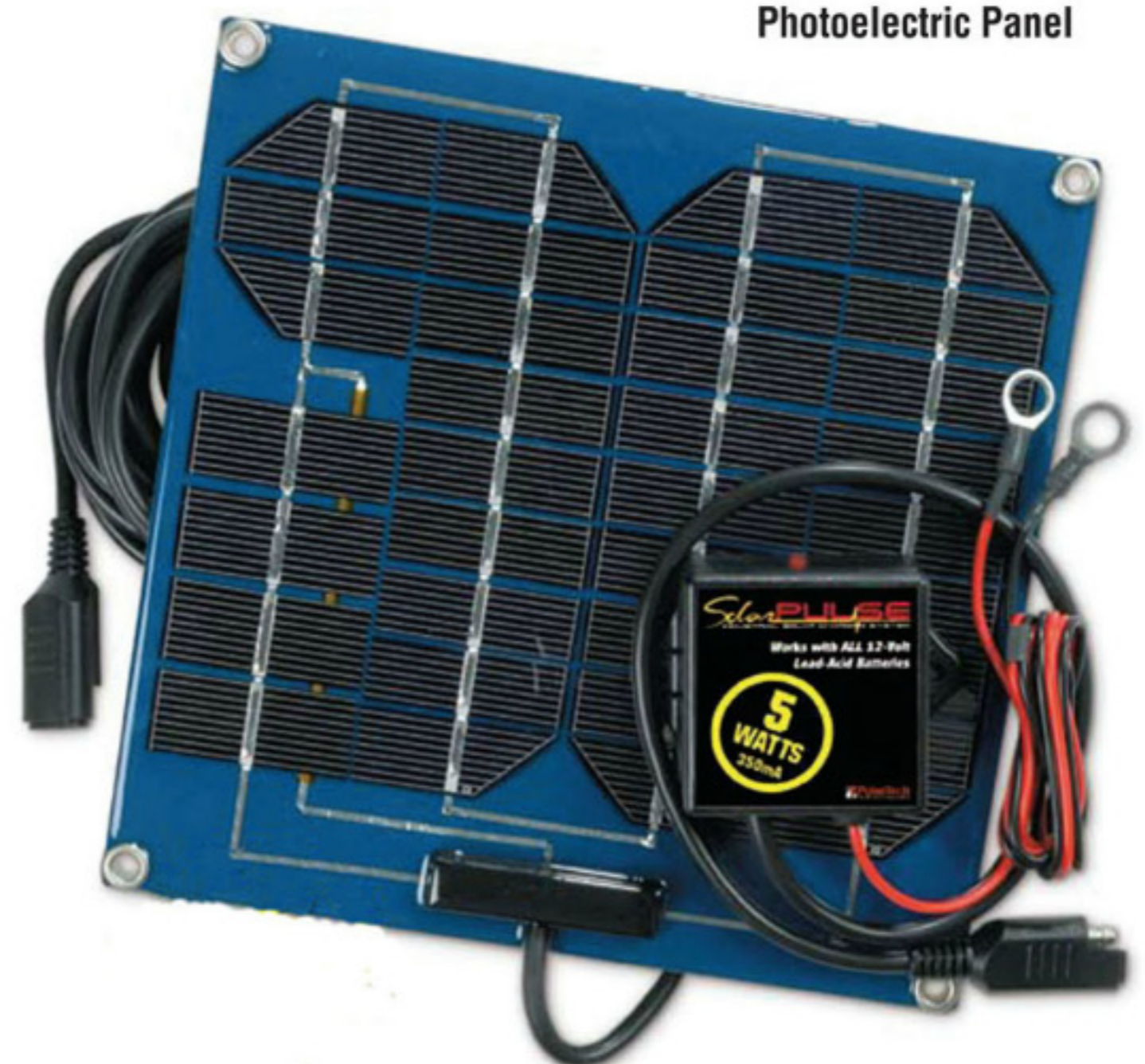
If the battery is completely discharged after a trip, the sulfuric acid

5-Stage Charging



- Stage 1** Charge Evaluation/Test and Initialization
- Stage 2** Bulk Charges at 0.5-2.5A (5 A Effective*)
- Stage 3** Absorption and Saturation Charge
- Stage 4** Infinitely Variable Float Maintenance
- Stage 5** Continually PULSE Charges to Mini Size of Lead Sulfate Crystals

Solar Pulse Photoelectric Panel



in the electrolyte has been converted to lead sulfate on the negative plate leaving only water to cover the plates. During recharging, an electrical current is forced through the electrolyte, reversing the chemical changes at the negative plate, and returning the sulfate into solution to form acid again. The water in the electrolyte eventually evaporates as the hydrogen gas bubbles off, causing the sulfate on the plates to dry out and making the battery difficult to recharge.

Deep Cycle batteries are expensive to replace in an RV. Millions of dollars are spent each year replacing batteries that could have been saved if they had received proper care and maintenance. In most cases, batteries that are considered "dead" are replaced long before their potential life has been completed. The biggest killer of batteries is lack of exercise. They need to be regularly recharged after each use. Vehicles like RVs, boats, motorcycles, and snowmobiles, often are not used for a portion of the year so the batteries sit idle,

shortening their life. The longer the battery stays in a discharged situation, the harder it is to recharge. The sulfate on the negative plate of the battery becomes hard and almost impossible to convert back to acid in the electrolyte. These lead sulfate crystals enlarge and can build up "excessively" to the point where they create a physical barrier across the plate. Before long, this buildup can become so dense that a battery will no longer accept or release energy.

Studies were done at the Oakland University in Rochester, Michigan and at Ohio State University in Columbus, to conduct separate evaluations of the sulfate crystals. During these studies, the crystalline buildups were regularly

investigated by X-ray diffraction methods. The X-ray diffraction data confirmed the positive effects on the battery plate of the application of a new charging technology using pulses of voltage and current.

Large solar panel installations are often used by people who spend a great deal of time in areas like National Parks and use an inverter to convert

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120 volt
Maintenance
Charger

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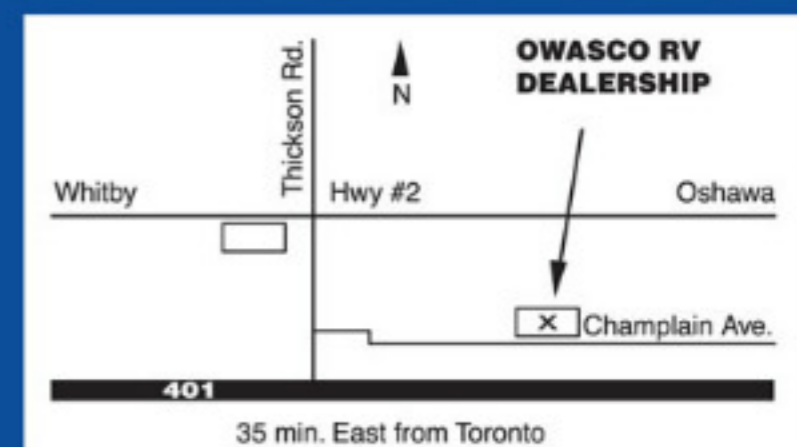
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their battery power into 120-volt alternating current required to operate appliances like satellite receivers, TVs, VCRs, and coffee makers. These large panels must be connected through a charge controller to prevent damaging the batteries. If you are not using the RV, the large panels are overkill and smaller solar panels are more than adequate to keep the batteries up to full charge. What can you do if your storage facility is just a field with no electrical power available? Some RVers have installed smaller solar cells on the roof of the RV to provide the current necessary to maintain the charge in their batteries when the sun is out.

A company called PulseTech (pulsetech.net) in Texas has developed a system for the military to keep batteries up to charge in vehicles that are not used regularly. Rather than a constant source of current that can cook the battery, their system uses a series of high frequency pulses that will often reverse the process of sulfation. This waveform has a strictly controlled rise time, pulse

width, frequency, and amplitude of current and voltage pulse. The efficient charging system converts the sulfates to active electrolytes. Not only does SolarPulse provide clean quiet energy, it helps keep sulfates from building up on the lead plates so that the batteries stay strong. With clean plates, batteries charge faster, accepting a full charge and they will be able to release all the stored energy, providing maximum power from the battery.

The SolarPulse offsets energy robbing parasitic loads even when the ignition key is off, such as currents required by dashboard clocks, radio memory, and computers. A 6-watt unit has proven to be ideal for police cars and emergency vehicles. When mounted on the rooftop lightbar, it helps the battery provide energy for the communications and computing systems necessary for our emergency response teams.

When the RV is connected to a source of 120-volts in a campground or storage facility, the "XtremeCharge" is a unit that will charge any 12-volt lead

acid battery, safely and simply, through the application of the patented PULSE Technology, and it will increase average battery life by 2-5 times. A unique charge algorithm built into the XtremeCharge, coupled with advanced battery evaluation capabilities eliminates the need for users to identify battery type or chemistry, to select and set any specific charge criteria prior to charging or worry about charging in an improper or potentially unsafe manner. "The idea was to make a charger so simple to use, that it actually does get used regularly. You don't even have to turn it on, just connect it to the battery, plug it in and your battery is charging" says Pete Smith, President of PulseTech of Southlake, Texas.

PulseTech also makes a product called QuadLink that can be used to charge multiple batteries from one charging system. The QuadLink automatically splits the output of the charger's capabilities into 10-minute sequenced charging segments. Since

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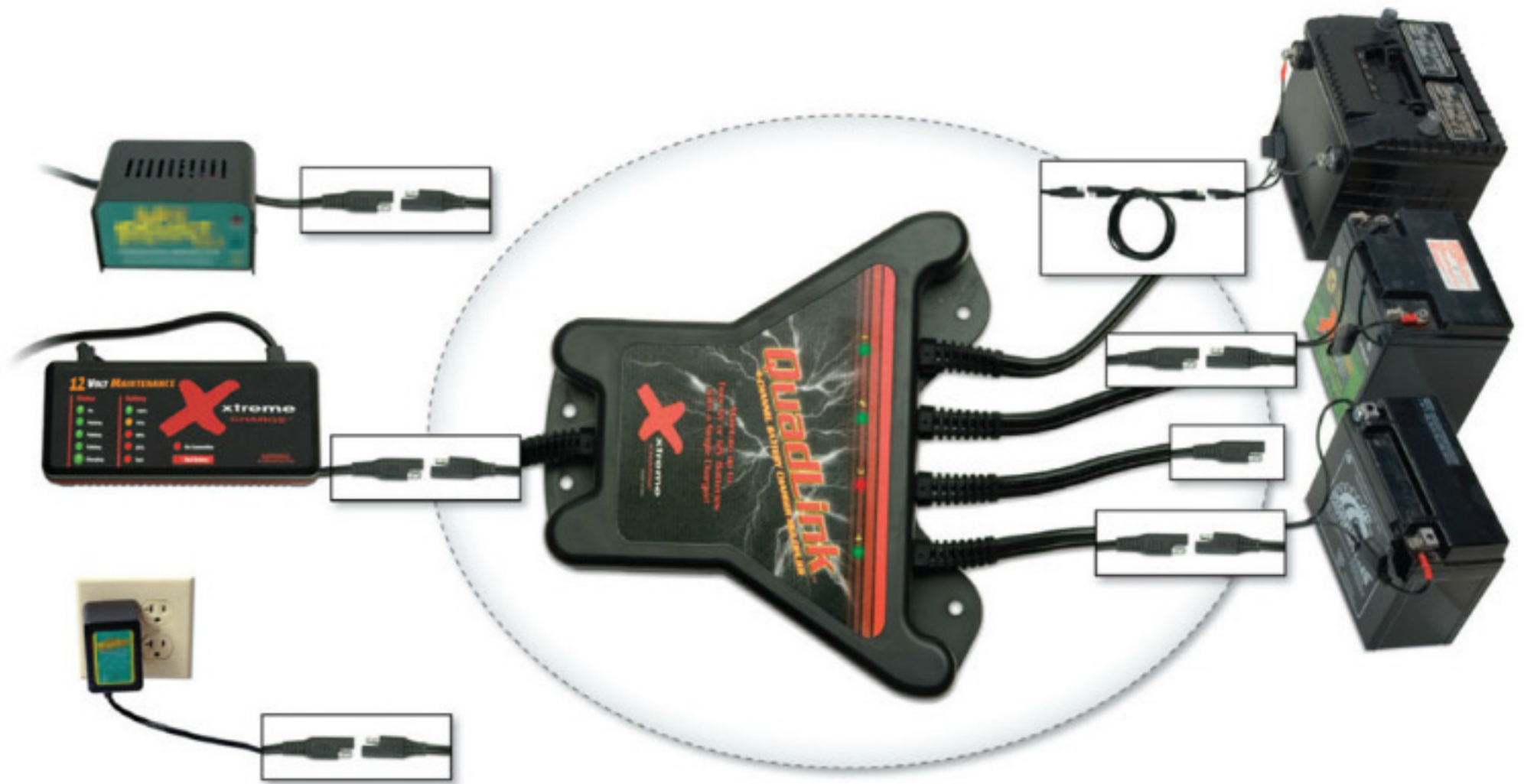


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each battery is being charged separately, there is no additional load on the charger. Depending on the charger's capabilities, the QuadLink can distribute charges to up to four AGM, gel-cell, VRLA deep cycle batteries used in RV's, boats, automobiles and trucks regardless of the difference in CCA rating of the batteries. Since the QuadLink is a switching device, it can be used with any 6, 12, 36, or 48 volt systems, whether the batteries are individually connected or connected as a group.

Pete Smith explains: "With the QuadLink there's no longer a reason to use multiple chargers on vehicles or batteries in storage. Since most maintenance chargers are in float mode 95% of the time, QuadLink's unique ability to switch back and forth between batteries allows a single maintenance charger the ability to charge and maintain up to four batteries."

It is a simple plug and play application with a microprocessor that automatically adapts to the number of batteries actually connected. Applications



The QuadLink can allow four separate batteries to be charged at the same time.

for the QuadLink include a wide variety of vehicles and equipment, including automobiles, light trucks, SUVs, ATVs, motorcycles, small boats and watercraft, lawn mowers, industrial and warehousing equipment and even golf carts. Almost transparent to the battery, the QuadLink does not add to the charging capabilities of the charger it is connected to, but simply multiplexes

the charger's application to up to four batteries at one time.

These products are designed to keep good, new batteries in peak condition for a longer period of time. Some batteries that will not accept and hold a charge can be brought back to a useful condition. If a battery has a short circuit or physical damage it is impossible to bring back to life. 🍁

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