LEAD Batteries Part III of III

As radio operators we often go to the field where we power our equipment with lead or gel batteries. This is the last article in this series. Some of the important things we learned from Part II are:

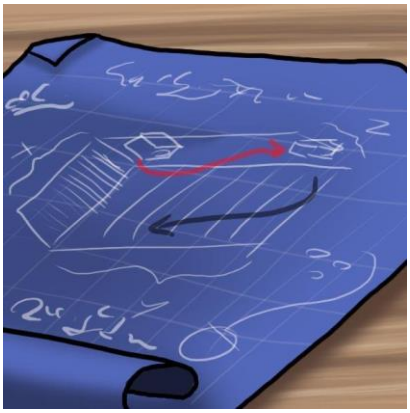
1. Deep discharging is a battery killer.

2. Overcharging is another insidious killer; its effects often aren't apparent to the innocent purchaser of the ten-dollar trickle charger who leaves it hooked to the battery for extended periods.

3. Whether using a trickle or maintain charger, it is recommended to unplug the charger at least once every 60 days during storage and allow the battery to rest for a couple of days, and then plug the charger back in.

Here we go with part III.

—Andy KE5KOF



By Stu Oltman - Technical Editor, *Wing World Magazine*
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Continued from part II

Testing the battery

Unless you own a battery tester as pictured above, here is one way to test your battery:

The first thing to do is to get a pen, a notebook, a voltmeter, and a charger. For this test we will assume that the batteries in question are 12v.

Step # 1

Disconnect the battery from the system, remove cables and connectors, and clean off the terminals. Take a voltage reading for reference and make sure to write it down.

Step # 2

Try to charge the battery with the 12-volt charger. Hook it up to the charger and let it charge for a full cycle.

Note: If you are using a smart or automatic charger and your Step # 1 voltage reading is below about 6.5 volts, then you will need to hook up the battery in parallel with another battery to charge it. You can do this with any other 12-volt battery, including a car battery, using jumper cables, but DO NOT start the engine of the car if you are using one. You don't need the charger complete its full cycle hooked up to the battery in testing, just give it enough time to add some voltage, usually 10-20 minutes. Then disconnect the second battery, and let the charger charge the battery in question

Step # 3

After the charger indicates that the battery is fully charged, or if it has charged for more than 8 hours, disconnect the charger from the battery. Let it sit for 30 minutes and then take another voltage reading.

Step # 4

Let the battery sit for 12 hours with no load, DO NOT load test at this time. After the 12 hours take another volt reading. You should be recording the results of each of these readings as you go.

Step # 5

Hook the battery back up to the bike, or RV, or whatever you took it out of (go-box). If you are testing a starting battery, hold the volt meter on the battery while you attempt to start the motor. Record what the voltage drops to. If you are testing a RV battery, turn on as many electrical devices as you can while the voltmeter is on the battery.

Do you need a 12-volt battery for your application but don't know what size? This calculator is designed to help you find a deep cycle battery when a continuous load is applied, not for cranking or starting purposes. If you know how much power your application takes to run, and the time you would like to run it, we'll recommend a 12-volt battery with a safe amount of AH (Amp Hours) that will give you the runtime you need. Use the following link:

https://www.batterystuff.com/kb/tools/calculator-sizing-a-battery-to-a-load.html

Building your own Fast /Trickle charger

If you have a DC power supply that can be adjusted to 13.8 volts, here is a way to build a simple “not so smart charger.” Connections: Always connect the TCP negative wire to point 3. For faster charging connect the TCP positive wire to point 2. For maintenance charging connect the TCP positive wire to point 2.

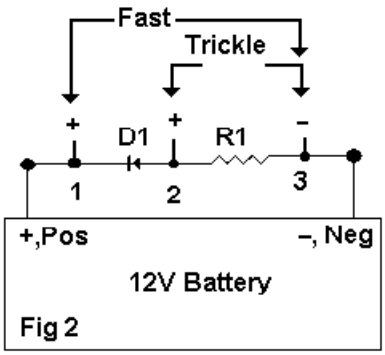
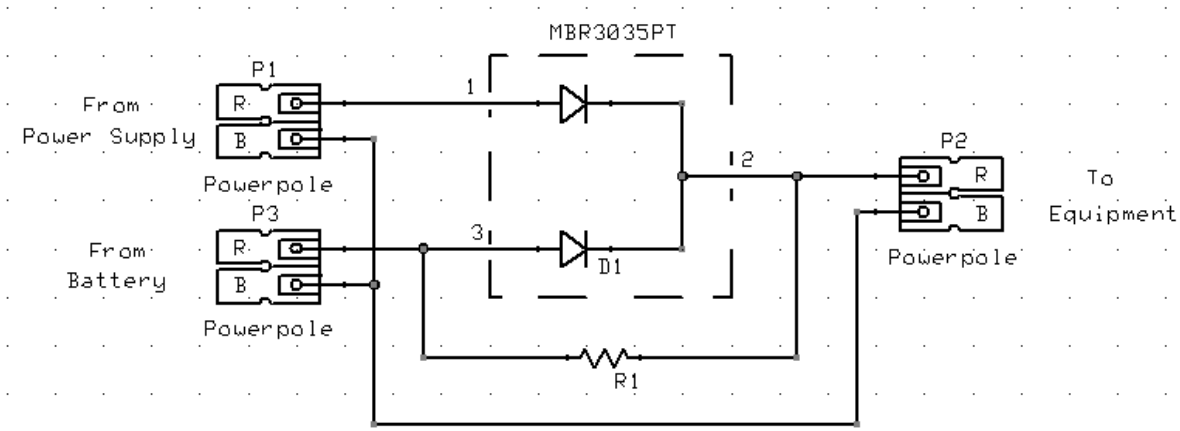


Fig 2

I recommend starting with a 100-ohm five or 10-watt resistor and the diode (For D1 I use a 1N4001 diode, for higher power application, in a pinch use two or more 1N4001 in a parallel). This should get you close (about 13.0 to 13.3 volts) then add resistance until the battery is fully charged and continue to measure the voltage for a few days to be sure it doesn't over charge (do not let it go above 13.80 Volts when in trickle mode). I have noticed that in this arrangement even adding a volt meter affects the voltage reading when the battery is close to full charge. You will probably need to adjust R1 for each battery you charge.

Ok folks we are almost done with this series. We have one last item for you. The circuit shown below was provided to us by Jon Galvin (N5TIM). It is a useful item to add to your GO BOX. Should your 12-volt power supply fail (do to power outage, or other reason), it will automatically switch to your backup battery. It will also help keep your equipment at the nominal 12-volts during peak load demand (depending on the load and the capacity of your battery, power supply). Finally, it will trickle charge your battery through R1. As discussed earlier, you can adjust R1 for the size of your battery, but in any case, do not trickle charge your batteries for an extended amount of time. Have fun with this circuit. Provide us any feedback on this circuit and the three articles we presented. Thank you.



R1 - 0.75 Ohm, 25 Watt

D1 - 25 - 30 Amp, 35 Amp surge

D1 - Mounted on heatsink