

LiPO Batteries

(Lithium Polymer Battery)

This is the details of how I run my LiPO batteries. I have been using the same LiPOs for almost 5 years now and the only issues have been of my own doing. LiPO batteries CAN be extremely dangerous, so I'm probably more cautious than most in there use.

If you want more information on LiPO's, Google it.

This is only a rough guide, and I take no responsibility for any consequences with using this advice. Its entirely up to you

The “Cell”

A LiPO cell is a single battery of 3.7v Nominal

To get more voltage, you connect multiple 3.7v Cells together in Series, you get:-

1S - 3.7v

2S - 7.4v

3S - 11.1v (I use for RC transmitter & dome lights)

4S - 14.8v (I use for main motor drive battery)

and so-on.....

Capacity

Like all batteries, there are different “Capacities” (big or small fuel tank)

On the Hobbyking site, this is typically expressed as mAh, or “Mili-Amp Hours”

The larger the number, the bigger the fuel tank !

I use:-

2,500 for RC Transmitter

5,000 for Dome Lights (and back-up drive battery)

10,000 for main drive

C Rating

This is the “Discharge Rating”, or how fast it can SAFELY discharge without damage.

A heavy unit with big motors would require a bigger “C” rating than a lighter unit.

If like this battery, is 25-35C, the higher numbers is maximum “burst” rate (nominal <10 sec)

To work our what this actually means is simple

C Rating x Capacity = Max Mili-Amps

25 x 5000 = 125000 Mili-Amps = 125 Amps (Max)

More than enough for most normal styrene units, that typically draw around 8-12 Amps when running everything at full speed.



Battery Connectors

Make sure when you buy your battery, you get connectors to suite your charger (typically plugs both ends) and another with only the battery plug for you unit. Spares of each is good too !

All these plugs are matched Male & Female, so make sure you get the right ones !

Hobbyking seems to be standardising on the XT60 & XT90 plugs, but there are hundreds of options, so your on your own here (sorry)

Charging

!! Warning !!

You hear stories and YouTube videos showing LiPO batteries catching fire or exploding. Now the majority of these are because the owner is being an idiot on YouTube, but be mindful that it can still happen

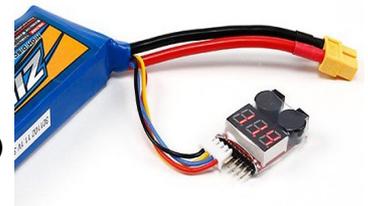
Simple safety steps:-

- Use a fireproof bag (available at Hobbyking)
- Do not charge unsupervised
- Do not charge in flammable areas or surfaces
- Check and re-check the charger setting before charging (most new chargers have in-built system to help)
- Do not overcharge individual cell
- Use a Balance Charger ONLY
- ALWAYS remove battery from unit to charge

And the list goes on, so Google it for more information

NEVER DO

- Discharge below 3v per cell (I set-up a voltage alarm at 3.5v)
- Charge above 4.2v per cell (most Balance charger manage this)



Setting up the Charger

For Charging, ALWAYS use “Balance Charge” setting with the balance plug connected to your charger

While you can charge the batteries at high rates, I only use a charge Rate of 1 to 2A MAX. Rapid charging will reduce the life of the battery.

Also, while many chargers claim they can charge at 5A and more, you will find you will fry the chargers power-supply if you do high rate charging regularly (they get too hot).

Only fully charge the battery to 4.2v per cell prior to use, say the day before at the most.

Storing the Battery

If your not using it for a week or more, Ideally, charge or discharge the battery so that it is 3.7v per cell. While you can store at higher or lower voltage, this may reduce the life of the battery (slightly)

Most chargers have a “storage” setting. However not all charges will check that the batteries are balanced, so use something like “Hobbyking Battery Medic System” to check out each cells condition when the charging has finished, and use it's Balance function if needed (it is slow, about 100mA)



If you need to discharge the battery farther, a 12v low watt automotive light globe can be useful (I use a 12v 24watt globe, which is a discharge rate of about 1.6A)

1 or more cells below 3v.

!! DO the following at your own risk. !!

I have successfully recovered low voltage batteries using the following
Use *EXTREEM* caution, and stop if the battery feels warm

- Set your charger to NiCD or NiMH battery setting
- Set charge rate to 0.1A
- Plug in Battery
- Connect a “Hobbyking Battery Medic System” to the balance leads of the battery
- Set the “Hobbyking Battery Medic System” to Balance (this will discharge the higher voltage cells to match the lowest voltage cell)
- Start the charge process on your charger
- Check cell voltages regularly. The “dead” cell should/may slowly rise in voltage. STOP IF NOTHING HAPPENING over 30min
- Monitor temperature, STOP IF BATTERY WARM
- Continue until all cells are greater than 3.2v per cell
- Stop charging, and setup charger to LiPO, Balance @ 0.1A charging and start charge.

When Charged to 4.2v per cell, leave for 1 day to see if the battery maintains charge.

You can SOMETIMES recover the battery to original condition, but usually the damaged cell will discharge faster than the other cells, and wont hold charge as well during storage.

Cycling, or Charging / Discharging / Charging etc. can SOMETIMES bring them back to life too.

Storage and Using a Recovered Battery

Until they behave like a normal battery, I only use on low power items such as lights or emergency/backup battery.

And ALWAYS use with Battery Voltage Alarm that checks each cell's voltage, and not just the pack voltage. It is advisable to use a Voltage Alarm all the time anyway.



Be aware that the damaged cell may loose charge during storage, regularly check the balance of the battery, and top-up as needed.