Lithium Polymer (LiPo) Battery Usage

Lithium polymer batteries are now being widely used in hobby and UAV applications. They work well because they can hold a large amount of current and are lighter than nickel metal and ni-cad batteries. But with this increase in battery life come potential hazards.

Use only LiPo Chargers with Error Detection - It is always recommended that you charge your lithium polymer batteries with a battery charger specifically designed for lithium polymer batteries. As an example, you would charge 3 cell Kokam lipoly batteries (11.1 volts) at 1.5 amps. This type of charger will have automatic shutoff capabilities that will protect the batteries from over charging or charging a damaged battery. If you attempt to charge a damaged battery with a non-safe charger the battery could catch fire or burst.

Limit LiPo Discharge to Rate - Another potential hazard happens when lithium polymer batteries are discharged too fast. If they do so they could potentially catch fire and burst. LiPo batteries are rated with a continuous and max discharge rating. For example a 1500mAh LiPo may be rated at 10C continuous current should not be discharged at more than 15A (1.5A * 10C = 15A) of current.

LiPo Maximum Temperature - Lithium polymer batteries should not be operated in temperatures exceeding 140 degrees Fahrenheit. In the event of a crash, lithium polymer batteries should be carefully inspected for any punctures, puffiness of the batteries, or short circuits. If any of exists, do not use the batteries. Dispose of them properly.

LiPo Minimum Voltage - A very important consideration is to NOT allow the battery voltage to drop too low. The amount that the battery voltage can drop is dependent on your system. If you are using a 3-cell lithium polymer pack, we recommend you land the UAV when the battery voltage drops under 9 volts. If the battery voltage drops below 8 volts the batteries could become permanently damaged. Follow manufacturers recommended guidelines.

Damaged LiPo Symptoms:

- Charger does not allow the battery to charge
- Batteries are puffy to the touch (do not use!)
- Punctures in the battery cell
- Short circuits

Never plug batteries into each other..!!

Properly LiPo Dispose Procedure:

- Discharge all cells to the recommend cut off voltage of 3 Volts per cell
- Place in salt water for several hours
- Apply tape to one of the terminals and dispose of in the trash.
- DO NOT INCINERATE

Parallel Battery Configuration

Use Equally Charged LiPo's in Parallel Configurations - Some UAV battery configurations require the parallel connection of two or more Lithium Polymer (LiPo) batteries. In this case, LiPo batteries must have the same or very similar output voltage. Parallel connection of two batteries of significantly different output voltage (one is more fully charged than the other) will cause one battery to discharge into the other battery at a high current rate. This may cause damage to either of the batteries and potentially cause fire or the battery to burst. It is strongly recommended that in applications requiring parallel connection of LiPo batteries, only batteries of equivalent technology, capacity, cell count, and output voltage be used. A good assumption is that fully charged LiPo batteries of the same type are safe to connect in parallel.

Environmental Conditions

Avoid Flying in Wet Conditions - UAVs will fly in somewhat adverse conditions. We, however, do not recommend flying in falling precipitation. Flying with snow on the ground, planes & components will get wet (thus affecting performance) and must be dried prior to subsequent flights.