The Dead Stick Flyer

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Tech Corner: Parallel LIPO Battery Balance Charging

by Ron Lazzeri

As part of the continuing series of articles on battery charging, I am writing this article on "Parallel LIPO Battery Balance Charging" to introduce the concept, provide a good article on the topic, and neither suggest that you (do) or (do not) follow this method of charging LIPO batteries. I currently do not charge LIPO batteries using this method but I have seen it done and have read many articles on the topic. This charging method seems simple to follow but can be a bit risky if the process is not fully understood or applied correctly. Hopefully, this article can help shed some light on the charging methodology and help you decide if it is right for your type of flying.

First off, from many articles I have found and read on the internet, I am providing an article from "RC Helicopter Fun" https://www.rchelicopterfun.com/parallel-lipo-charging.html. This article will provide some good and useful information to help you better understand what Parallel LIPO Charging is all about. The article will cover the following topics:

- *What is "Parallel LIPO Charging" and how you do it.*
  - *Words of caution regarding this advanced method of charging.*
- *How safe is "Parallel LIPO Charging".*
  - *Having good & appropriately sized equipment, healthy batteries, and the proper know how.*
- *How Parallel Charging works.*
- *What you need to Parallel Charge LIPO batteries.*
- *How to build a simple Parallel Charging Board or Plug-in Cables.*
  - *Building a simple Parallel Balance Board.*

- *Building a simple Parallel Balance Harness.*
- *How to calculate the charging current when parallel balance charging.*
- *Very important battery connection warning tip!*

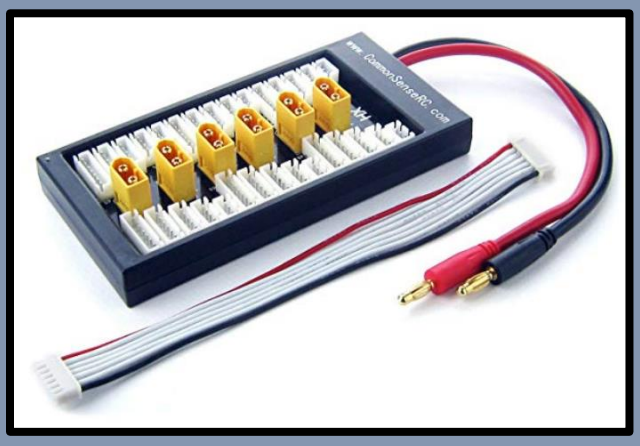
Here are some key points regarding Parallel Balance Charging LIPO Batteries:

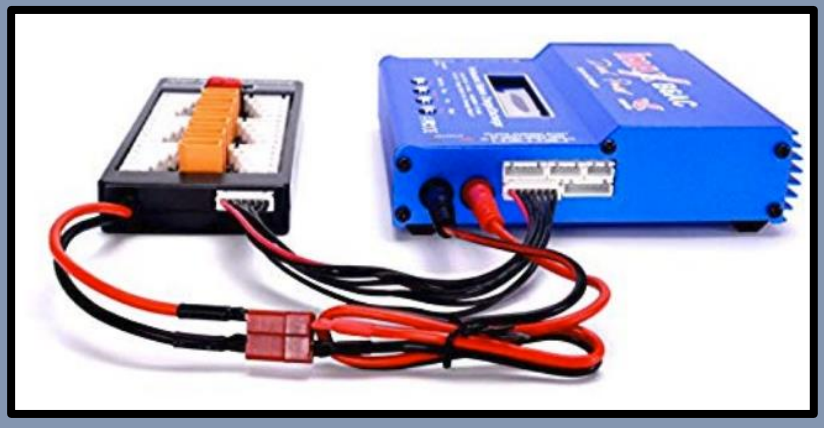
- ***Carefully read and follow all of the charging process instructions.***
- ***Parallel charging allows you to charge more than one LIPO battery at a time from a single port battery charger using a Parallel Balance Charging Board.***
- ***Parallel charging requires that all batteries be of the same <u>Cell Count</u> and <u>Voltage</u> but can have different <u>MAH Capacities</u> within reason like 2200mah, 1800mah, 1500mah. The batteries can also be in different states of charge like 80%, 75%, 60%.***
  - ***Do not Parallel Charge batteries of different cell counts like 6S, 4S, and 3S.***
  - ***Do not Parallel Charge batteries of different voltages like 14.8v, 11.1v, and 7.4v.***
- ***Be sure connections are made in this order:***
  - ***1 - connect parallel balance board to battery charger***
  - ***2 – connect LIPO battery power leads to parallel balance board***
  - ***3 – connect battery balance leads to parallel balance board***
    - ***Note: if you connect the battery balance leads before the power leads, the smaller gauge balance lead wires <u>may not</u> be able to handle the initial high current exchange and cause a problem.***
- ***It is very important to set your charger up to "Balance Charge" the batteries during the parallel balance sequence. Same procedure as for individual batteries.***
- ***It is important to understand how to calculate the appropriate charging rate based on the batteries you intend to parallel charge. It is always safer to parallel charge at the lower 0.5C versus 1.0C rate. The calculation would be the sum of all battery capacities multiplied by the charging rate as follows:***
  - ***4S-1500mah + 4S-2800mah + 4S-4000mah = 4S-8300mah***
  - ***Battery sum equals an equivalent total value of a 4S-8300mah battery***
  - ***Charging Rate examples:***
    - ***At 0.5C Rate = 8300mah x 0.5C = 8300mah / 2000 = 4.15mah***
    - ***At 1.0C Rate = 8300mah x1.0C = 8300mah / 1000 = 8.3mah***

Hopefully, this helps explain <u>Parallel LIPO Battery Balance Charging</u> and provides you some useful information to decide if you want to pursue this method of charging. I know it sounds a bit complicated but with a little research effort, the right equipment, and finding someone who already uses this method to help you out will make it easier and safer.

<u>Remember, always error on the side of caution when charging these high capacity batteries</u>!

<u>Example</u>: Parallel Balance Charging Board for 6 battery packs 2S to 6S configured with XT-60 connectors. There are many varieties and configurations being sold, this is just an example version.





Example: Single Port battery charger with a 6 Port XT-60 Parallel Balance Port Charging board connected. Batteries will connect to the Parallel Charging Board.