



Electric Power Systems Workshop #3

Putting it all together

Choosing the best battery

Let's say you have a 2200MAH 20C 3S lipo. 2200MAH means that it will put out 2200MA (or 2.2Amps) for one hour. This means that, if you average 22 amps in flight (or 10 times 2.2Amps) you can expect 6 minutes of flying from that battery (1/10 of an hour)

3S is the number of cells in series, which will give you the voltage you need (see the chart in the first workshop notes).

Make sure your battery can handle the required current. To do this, take the C rating, and multiply it by the capacity (in MAH, Milli Amp-Hours). Then, take away the Hours and move the decimal point three places to the left to get straight amps.

As long as the capacity multiplied by the C rating gives you the required current, you can choose whatever size battery will give you the best flying time and least weight. Remember, this is always a tradeoff.

The Electronic Speed Controller (ESC)

The ESC is a device that takes the direct current from the battery and splits it up into 3-phase AC for use in your brushless motor. Here's some things to consider when selecting an ESC.

- Maximum current rating (Amps)
- Maximum voltage that can be put in to the ESC. This usually is measured in the number of Lithium-Polymer (Lipo) cells, and will be indicated by the manufacturer).
- Whether or not the ESC has a BEC (see next paragraph).

To BEC or not to BEC

Most ESC's for smaller aircraft (such as park flyers) will have a BEC built-in. BEC stands for "Battery Eliminator Circuit." This means that it eliminates the need for a separate receiver battery, which is especially useful for smaller models. If your ESC does not come with a BEC built-in, do not worry! You can purchase a separate BEC and install it later, or just use a separate receiver battery as you would in a gas airplane.

The 4-step electric power system selection:

- 1: Decide what type of flying you want to do with the airplane, and use the watts/pound chart to decide how much power you will need.

- 2: Search around for brushless motors that can handle this much power, then use your desired pitch speed and thrust (there will always be a tradeoff) to find the best motor.
- 3: Using the recommend voltage for your motor, and the number of amps required to give you that many watts, select a battery that can meet these requirements.
- 4: find an ESC that can meet the voltage and current requirements.