Basics for Electric RC Planes

MOTOR RATINGS

A motor's KV rating identifies its "no-load" rpm rating or the amount of rpm the motor will produce for each volt of current. For example, a motor with a KV rating of 860 when supplied with 11.1 volts will produce 9,546 rpm under a no-load condition (running without a propeller attached). Any load placed on the motor from spinning a prop will reduce the rpm. These KV rating numbers can be used as a guide when selecting a motor. As a rule, high KV values mean the motor is best for spinning smaller props at higher rpm. Low KV values are better suited for larger props turning a lower rpm. (great for larger scale models)

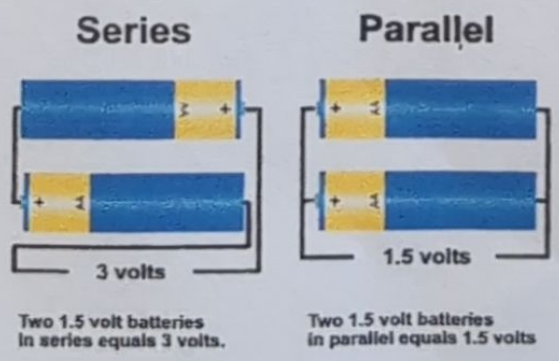
BATTERY TERMINOLOGY

Capacity: This is the amount of energy a battery can store and it's measured in milliamp hours (mAh). Milliamp hours give a basic run-time for a power system's given amp draw. For example, 5000 mAh battery pack can sustain a load of 5000 milliamp (or 5 amps) for one hour. If you double the amp draw to 10 amps, the battery will then last only half as long. These numbers are only guidelines, other factors can also decrease or increase a power system's estimated run time.

C-Ratings: This term is used to identify a battery pack's charge and discharge requirements. Being tough is very important for Lipo batterie and the ratings do apply for all types of battery packs. The term "1C" describes the amperage a battery can supply for one hour, and most of the time, this is also the charge rate for many Lipo packs. The simplest way to determine the amp charge rate at 1C is to look at the batteries mAh. Put a decimal point at the end and move it over 3 digits. Example (4500mAh 1C charge rate would be 4.5 amps). Most batteries will give you the charge rate on the label.

Wired in Series: When cells are wired in series, they combine their voltage but the capacity remains the same. Example: two one cell 3.7V wired in a series, they will deliver 7.4V. But, the mAh will still be the same.

Wired Parallel: Wired cells to parallel combines their capacities but not their voltage. Example: Two 3200 mAh 11.1V batteries will produce 6400mAh at 11.1V.



ELECTRONIC SPEED CONTROLS TERMINOLOGY

Electronic speed controllers (ESC): Regulate the speed of the motor. The ESC is plugged into the receiver's throttle channel and connected between the motor and the battery pack power leads.

Amp ratings: ESCs are rated by the maximum amount of current (measured in amps) that can pull through them when the motor is running. As a safety margin, use an ESC that has a maximum amp rating about 20% higher than the expected current of your power system.

Cell count: The label on the ESC will tell you the number of cells it is rated for example (2-6 cells).

Most ESCs labels have all of the pertinent information on them.

Battery Eliminator Circuit (BEC): Most ESCs come with a built in BEC. But there are some with external BECs. The BEC is a feature that allows the ESC to power both the motor and the radio's receiver with the same battery pack. When the voltage gets too low, the BEC circuit cuts motor power and keeps the receiver operating properly so the pilot can land the plane.

Determine a Model's Power Requirements

You can determine the power requirements of a model based on the input watts per pound found below, using the flying weight of the model (with battery):

50-70 watts per pound; Minimum level of power for lightly loaded slow flyers.

70-90 watts per pound; Trainer and slow flying scale models.

90-110 watts per pound; Sports aerobatic and fast flying scale models.

110-130 watts per pound; Advanced aerobatic and high speed models.

130-150 watts per pound; Lightly loaded 3D models

150-200 watts per pound; Unlimited performance 3D models.

Note: Most modelers use the rule of thumb, 100 watts per pound for most models.

Example:

Flying weight is 6.0 lbs. x 100 watts per pound = 600 input watts of total power required to achieve the desired performance.