Please read this to learn more about BEC currents before purchasing this ESC

ESC's and BEC's

Why the battery eliminator circuit in your electronic speed control may not be up to the task.

Many electronic speed controllers (ESC's) have built in battery eliminator circuits (BEC's). The manufacturers provide this as a convenience to end users and in certain applications they do work well.

However, many BEC's are under rated (output current wise) for the tasks we are asking.

So be careful if you are thinking of using the BEC build into your ESC. Carefully check its maximum continuous and peak current ratings, and compare this to what you expect your servos and receiver actually will draw in flight. Typically a BEC built into an ESC may only be capable of delivering 3-4 amps. Even if it is a 120 amp ESC – which you are going to use on a 600 size electric helicopter – you may expect the BEC output will be okay, but often it wont be – this class of model with high end servos may draw 6-8 amps or more! Of course, this same ESC used in an aircraft with 'sport' servos may work just fine with the low current built in BEC.

So the Solution:
In most medium or larger models the ESC's BEC current rating is likely to be inadequate. Furthermore, for the sake of reliability, a separate BEC / regulator should normally be used in medium size or bigger models – perhaps even using its own dedicated battery.

Picking a Separate BEC
There are many options for separate BEC's / regulators. They have different output voltages, different basic design (switch mode or linear) and different current ratings. We suggest you pay careful consideration to picking one you are sure will work with your equipment.

Some Background:
All radio control models have (by definition) a receiver, which typically requires a '4.8 volt nominal' power supply (I say 4.8 volt to refer to the traditional 4 cell nicad pack – in fact most receivers are happy with a 5-6 volt input, and some even higher – for example the Spektrum 2.4g receivers). This same supply driving the receiver (again, there are exceptions) drives the servos. Most servos are rated for '4.8 volts nominal', some are compatible with 6 volts, and some even 2S lithium (7.4V nominal).
Again, without introducing undue complication, most current helicopter tail rotor (TR) servos are only rated to 4.8 volts nominal, so some sort of additional voltage reduction is needed for the TR servo if the receiver supply is greater than this (perhaps by way of diodes if the receiver is getting a regulated supply, or by a small voltage regulator if the receiver is running on an unregulated higher voltage).

On a glow (nitro) model, one would have a battery pack specifically designated to drive the receiver and servos. There are many possibilities – 4 or 5 cell nicad/NiMH, 2 cell lithium, etc with or without voltage regulation to the receiver and all servos, or just some servos (eg TR).

On an electric model, we have the option of powering the receiver and servos in the same manner as described above for a nitro model, or using the (typically larger) electric motor battery to power everything. The voltage can be regulated to the required (lower) voltage using either the BEC built into many ESC's, or a separate regulator/BEC still using the main motor battery.

Advantages of a totally independant receiver/servo power supply in an electric model:

The receiver power supply is totally independent of that for the electric motor.

The motor battery / ESC BEC has a certain failure rate (in part due to high voltages and currents involved). If the battery / ESC BEC fails, the model typically crashes.

Disadvantages a separate receiver/servo power supply include:

Added weight

Added space usage with more components to mount.

So Typically:

With smaller models (where weight and space are at a premium), the receiver/servos would be normally be run using the main motor battery and using the BEC built into the motor ESC.

With medium sized models often you may use the main motor battery, but use a separate regulator/BEC rather than the one built into the ESC.

With larger models, most would recommend a separate battery (and separate regulator /BEC if required).

The definition of model size is rather arbitrary. But as a guide a small model may typically be a 250-450 size helicopter. A medium model a 500 size helicopter, and a large model a 600 size helicopter or bigger.

So at Last, We Arrive at the Question:

Why the battery eliminator circuit in your electronic speed control may not be up to the task?

Carefully check the specifications of your BEC (whether it is built into the ESC or not)

You of course need to know the expected current draw of receiver, all the servos, gyro, governor, etc in your model. Calculating this figure is difficult, and deciding on a conservative (or otherwise) total current draw to plan your installation is not simple. You need a device to measure current draw, and look at dynamic and stalled current draw of all your servos, etc.

To give you some idea, the stalled current of a Futaba 9256 TR servo is in the order of 1.5 amps. The stalled current draw of a JR 8717 is in the order of 3 amps or so. Of course, we should not stall our servos should we?

Just the on bench 'wiggling of sticks' moving 3 x 8717's (unloaded – ie no flight loads) can cause current draws of 4-6amps continuous.

So you can quickly see if you are running modern high speed high torque servos in a '600' size or larger model, you need a very robust receiver / servo power supply!

And I Will Repeat Myself……

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