

## How To Wire Up Multi Motored Brushless Aircraft

You need one brushless ESC (Electronic Speed Controller) for every brushless motor.

Both brushless ESC's should be from the same manufacturer and the exact same size and preferably purchased at the same time. This is because the throttle curve varies from manufacturer to manufacturer and from size to size and slightly from batch to batch. Any difference in the throttle curve will make the motors run at different speeds which will cause a yawing effect. In the very worst cases it could cause your model to spin, in most cases it will make your model horrible to fly.

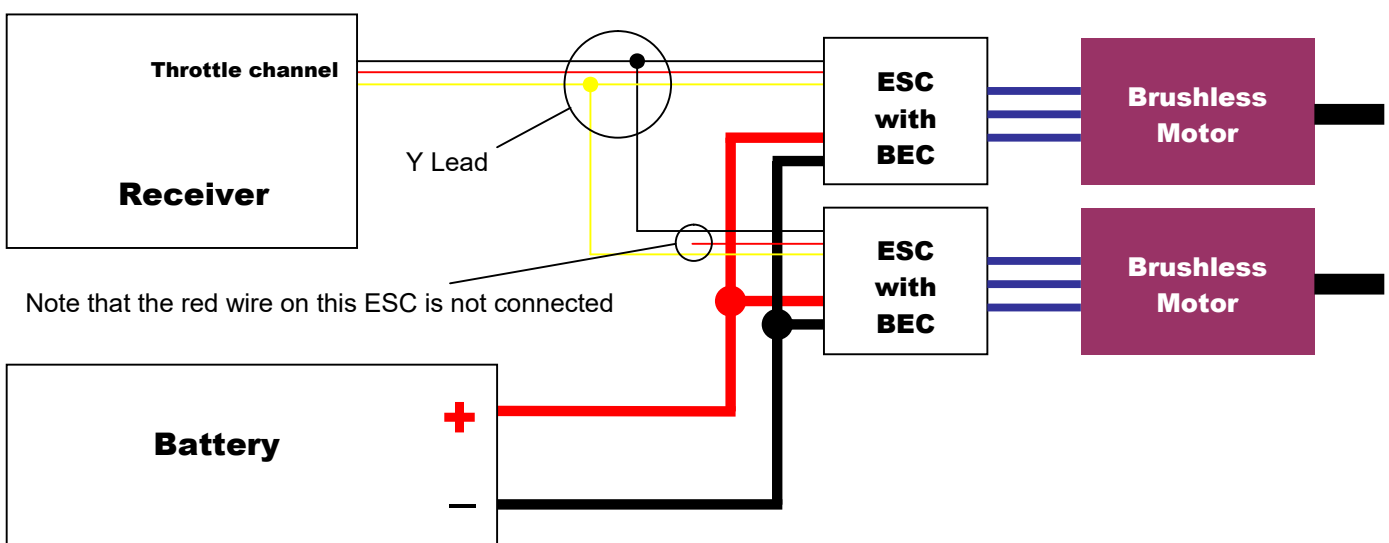
For safety reasons we **HIGHLY** recommend using a separate UBEC (Universal Battery Eliminator Circuit) to power your receiver and servos.

A UBEC is a small electronic circuit that can accept a wide range of voltage input and output a steady lower voltage suitable for your receiver and servos.

If using a low voltage system for example 2S, 3S, 4S, 5S and 6S LiPo then you will need to disable the BEC (Battery Eliminator Circuit) in both of the ESC's. "Why?" I hear you ask. Well... if you don't, the BEC's within the ESC's will both try to supply power. Output voltages are never exactly the same and the higher Voltage output one will always try to supply power to the other ones. This is not a good situation as one/all ESC's or the UBEC will eventually overheat and possibly burn out causing complete loss of control of your model. Therefore you need to disable the in-built BEC's in all ESC's. This is easily done by removing the centre red wire from the servo type plug on all ESC's. If you use the tip of a sharp knife to gently lift up the plastic restraining tab in the connector then the whole contact can be removed from the back of the plastic housing. Then just tape it back on itself and out of the way.

Most high voltage ESC's are OPTO (Optical Isolated) ESC's, this means that there are no in-built BEC's within the speed controllers. A separate power source will needed to power the receiver and servos. This power source can be either a separate 4 or 5 cell NiMh receiver battery pack as used in traditional I.C. powered aircraft, or a separate UBEC. If using an OPTO ESC then the centre red wire in the servo type plug should be left in place as it is needed for the ESC to work.

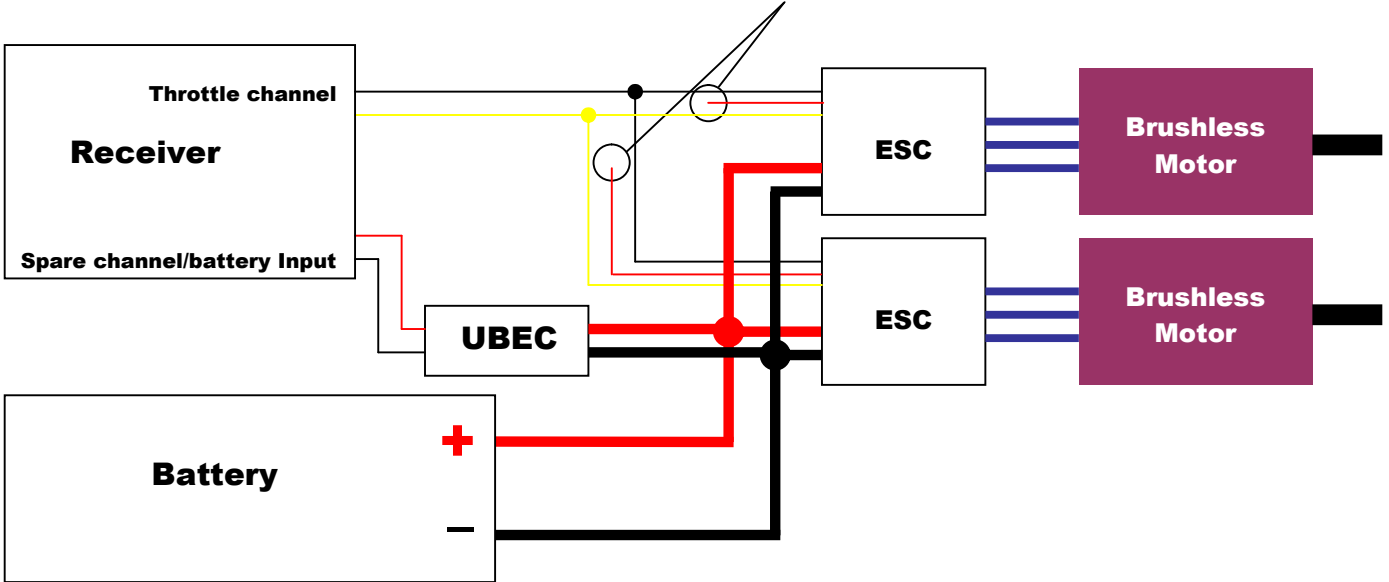
### Option 1 – Low Voltage System Using the BEC in one of the ESC's only.



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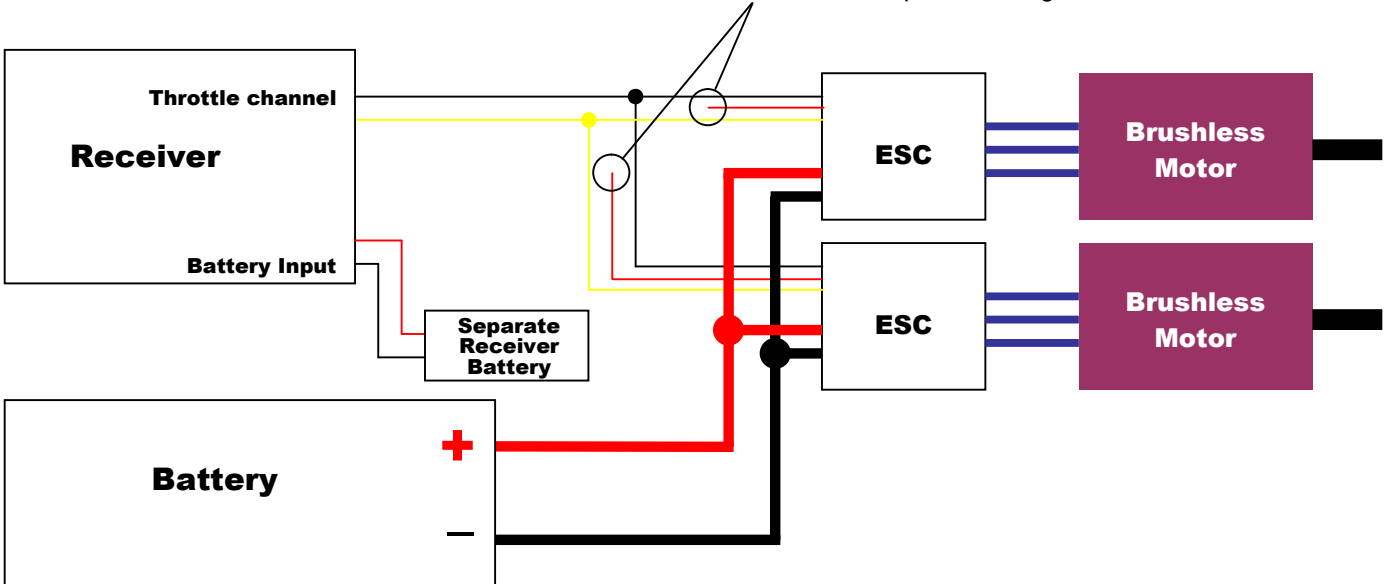
Option 2 – High Voltage System Using a Separate UBEC.

Note that the red wire on both ESC's are not connected. Leave the wire in place if using OPTO ESC's.

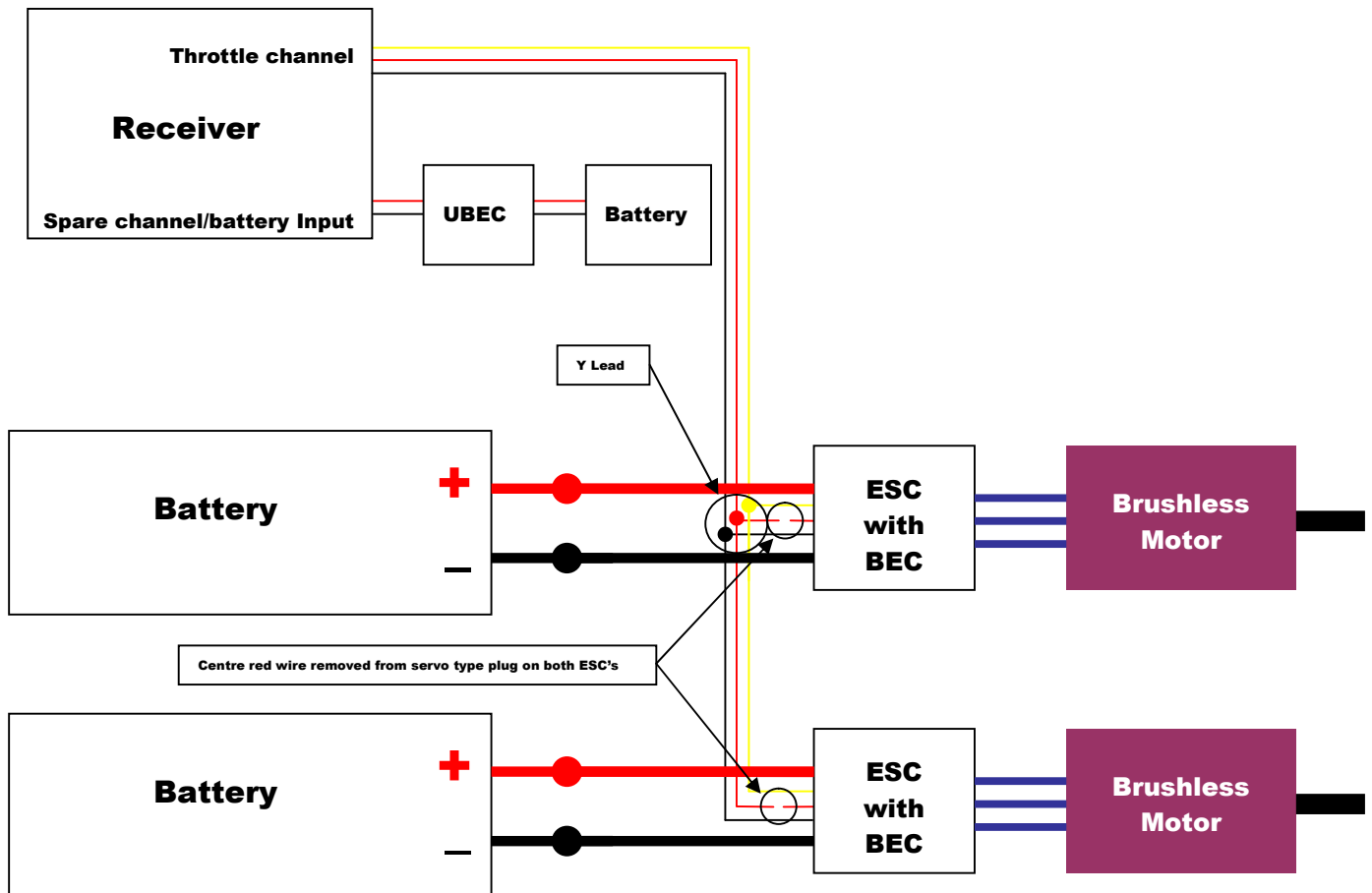


Option 3 – High Voltage System Using a Separate 4 or 5 Cell NiMh Receiver Battery.

Note that the red wire on both ESC's are not connected. Leave the wire in place if using OPTO ESC's.



**Option 4 – Low Voltage System Using 2 Separate Power Batteries And a Separate Battery and UBEC to Power The Receiver.**



Remove the centre red wire on the ESC's themselves and NOT on the Y lead.

If you do not do this then the 2 BEC's in the ESC's are still connected to each other which could cause overheating and one or both ESC's to shut down or even burn out.

The only voltage to reach the receiver/servos should be from the separate UBEC.