

# "TURBULATOR"

Newsletter

of the Rio Rancho  
Radio Control  
Flying Club

AMA Club #2770

WATERMAN FIELD

ELEVATION 5840 FEET

35° 17.2'N 106° 44.8'W

Christmas Party  
2017



## PRESIDENT'S CORNER

**"Da Prez Sez"**

*Guest Hosted by our VP Reggie Card.*

G"Day members. December was a really good month for flying. There were many days in a row that were unseasonably warm and calm. If you missed the Christmas party you missed a good one. Good times were had by all. With the new year, I would like to take this opportunity to welcome the new members. Hope to see you at the field, and monthly meetings.

Speaking of the field, In the coming months(after it warms a bit) We will be doing our spring field cleaning and repair. More bodies, and tools(tampers) would be welcome.We will be flying indoors on January 15th at the Star Center. We will meet at 08:45 at the V.I.P. entrance. Be there.

### Coming Events

1. Indoor at the Star Center January 15th 0900-Noon
2. January Meeting on 8 January, 7:00pm at Wallen Clubhouse. 5545 Lilac Pl
3. Its cold out there if going to the field Layer Up!!!

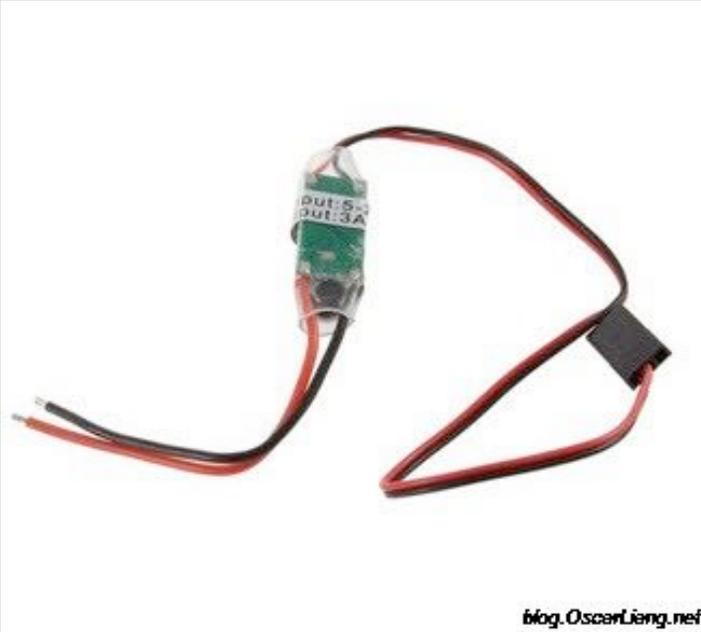
## Christmas Party

The Club's Annual Christmas Party was held on the 3rd of December with 36 members and guests attending. There was plenty of food for everyone. The club provided Rudy's Turkey, Brisket, and Corn with many of the members providing very good side dishes and desserts. The start of the evening was a short meeting to elect and install the Club officers for 2018 then the festivities began with a hearty attempt at consuming all the great food. Which I must say we put a pretty good dent in. The club held the annual plane raffle with Glen Nesbitt taking the top prize of an E-flite Taylorcraft 450 ARF, Steve Bailey won the UMX Radian, Tom Maier won a pair of Dueling Drones, and Robin Tuchler won a stand alone drone and controller. Doug Williams' wife Jan made and donated a Wives/Girlfriends Christmas Basket with a Sparkling beverage, coffee, tea and other goodies which was won by Ruth McClelland. Garry Wallen, MC'd the White Elephant Gift Exchange. Many really nice gifts were passed around. The most traded gift was a box of Dog Treats, which reached the limit for "Stealing". The Party wrapped up around 9:00pm. In talking to people post party every said they enjoyed the party and had a really good time. Good job and Thanks to the Party Committee(Bill Ryan, Ken French, Don McClelland) for getting things together for the club! Thanks to Jan and Doug Williams for making and donating the Wives/girlfriend Gift Basked. Thanks to Garry Wallen for running the White elephant gift exchange. And thanks to all the members and wives who attended and brought the great tasting side dishes and desserts ! ! ! !



## What are ESC, BEC, UBEC?

ESC stands for Electronic Speed Controller. It converts the PWM signal from the flight controller or radio receiver, and drives the brushless motor by providing the appropriate level of electrical power.



BEC stands for Battery Elimination Circuit. It's just a fancy name for voltage regulator, which converts main LiPo battery pack voltage to a lower voltage (e.g. 2S 7.4V, 3S 11.1V or 4S 14.8V to 5V). BEC is usually built into ESC, and as the name suggests, it eliminates the need for a separate battery to power the 5V electronic devices.

UBEC stands for universal BEC or sometimes ultimate BEC. It's used when ESC doesn't have built-in BEC, or standalone power system is required. They generally are more efficient, more reliable and able to provide more current than BEC. The UBEC is connected directly to the main battery of the aircraft, the same way as an ESC.

You might sometimes also see "LBEC" and "SBEC". LBEC stands for Linear BEC, and SBEC stands for Switching BEC. I will explain what they are in the last section in this article.

### Why Use UBEC over ESC BEC?

In layman's terms, UBEC has the following advantages over ESC built-in BEC:

UBEC are more power efficient and are normally used when a 2nd power source is used for the Radio Equipment or High current draw servos are used (ie Digital).

BEC tends to overheat with large input/output voltage difference, or large load; UBEC doesn't have this problem and thus more reliable

UBEC generally can provide more current safely

The reason behind these are due to the way how voltage is regulated. Most BEC are linear type, and UBEC are switching type. For a more technical insight, please carry on to the next section: Linear BEC VS Switching BEC.

If your ESC don't have BEC, you can use an external UBEC to power your FC and RX. The UBEC's input cable should be connected to the LiPo battery, and the output cable to the RX and FC. No change is required in the ESC connection.

But if you want to power your FC and RX with an UBEC, while your ESCs have built-in BECs, those BECs first needs to be disabled/disconnected from your system. Simply remove the red wire (5V) from the output servo lead of the ESC.

### Linear BEC vs Switching BEC

There are two types of BEC; linear and switching. They are basically the two type of voltage regulators: linear and switching voltage regulators , which have been covered before, but here is the summary of differences.

They are sometimes also referred to as LBEC and SBEC.

### Linear BEC

Most ESC's built-in BECs are Linear type.

Linear BEC reduces the voltage from the main Lipo to 5V by converting the excess voltage into heat. This is not a very efficient way of voltage converting as you can imagine.

As input voltage gets higher, or current draw gets larger, more power will be wasted and converted into heat. That's why this type of voltage regulator is not ideal for high input/output voltage difference or high current application.

Overheated BEC will enter thermal-shutdown, and cause loss of power to the flight controller and radio receiver, and eventually a crash.

When the main battery pack is fairly low (e.g. 7.4v 2S), wasted power is relatively small because there is not much voltage difference, so efficiency is better. But as you use higher cell count lipo efficiency

drops right down. Lots of power is wasted and converted into heat.

This is something you should bear in mind, but I just want to assure you that I have been running 4S on my Blue series ESC (rated 2S to 4S by manufacturer), and using the built-in BEC to power my FC and RX, I have not had a single problem with it. Although it gets a bit warm, it still runs reliably with good good amount of air flow. This leads to another argument, where to mount your ESC on quadcopter frame?

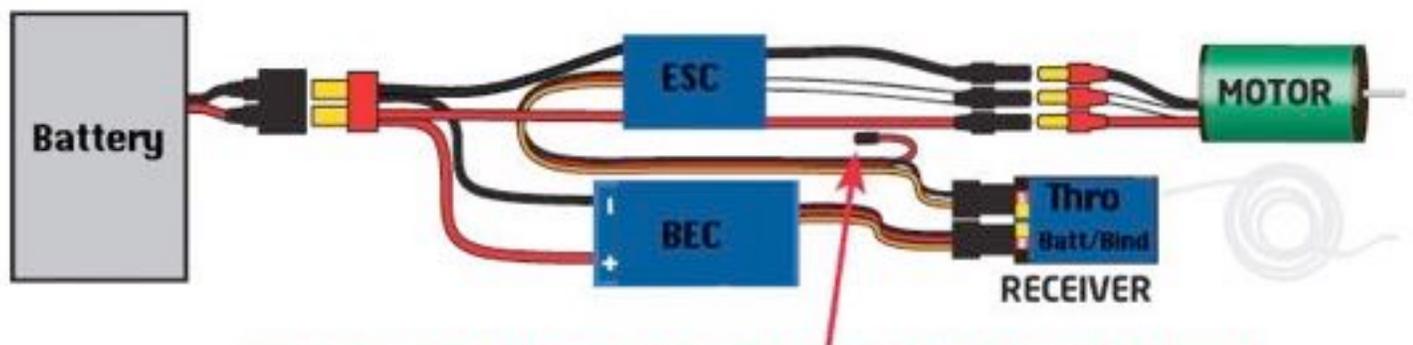
### Switching BEC

Switching BECs reduce the output voltage by switching the supply on and off several thousand times per second. They don't heat up like linear BEC, and they generally handle higher input voltages and higher current much better.

They have a very consistent efficiency across a wide range of input/output voltages, which is around 85%. This is also the choice for running on all systems if you are after reliability.

One drawback with switching regulators is the noise they produce due to the nature of voltage regulation, which has been overcome by putting a Capacitive filter on the output of the Switching BEC. Switching BEC Cost about \$1-\$2 more.

BELOW: Wiring diagram for a ESC and BEC when used together



**Disconnect the RED wire from the ESC to the Throttle channel.**  
**The ESC will plug into the Throttle channel of the receiver**  
**The BEC will plug into the Battery and/or Bind channel (BATT/BIND)**

# MEETING MINUTES

## Minutes from the December 2017 Club Meeting

The December meeting was held at the Clubs Annual Christmas Party and started at 6:00pm. There was one item of business; Election of Club Officers. In a unanimous decision the following officers were elected:

President - Ken French

Vice-President - Reggie Card

Treasurer - Bill Ryan

Secretary-Don McClelland

The meeting was concluded and the Christmas Party Commenced at 6:10pm.



### **Turbulator:**

Editor Don McClelland

We are always looking for articles, pictures and your input!

For comments, or suggestions

Please Email Don at

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AMA Charter #2770

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### **Next Club Meeting**

January 8th 7:00pm at the Wallen Club House. 5545 Lilac Pl.