Mid Hudson Radio Control Society

Pilot Briefing

Volume 6 Issue 11 November 2014

President's Corner

Hi members,
Another year is almost come and gone and it is that time of year to pack away all our flying equipment. With the first major snow of the season a few days away I hope everyone is settling into the building season. I don't really have any major project planned but rather to do some much needed repairs and maintenance on my regular flying stock.

I usually have the seasons flying stock stored away for the winter by November. I drain all fuel tanks and remove all onboard flight batteries to charge and monitor them during the winter season. For my large planes using A123 packs I just leave them in the plane. After 8 years of use I have come to the conclusion that the self discharge is so low in these batteries that I do not bother to charge them through the winter like NiCad or Nimah packs. My blue cub has over 600 flight on the original pack and still is working fine.

Do not forget to empty the carburetor on gas engines by running the engine till it runs out the fuel in the carburetor. Should there be any moisture in the carburetor bowl it could pit the metering needle and cause you grief in the spring. If you have a glow engine I usually will squirt a little Marvel Mystery Oil or After Run Oil into the carb and work it into the crankcase and bearings.

These few practices have served me well for winter storage for many years.

Wishing a Happy Thanksgiving to everyone and their family. Hope to see you at the meeting or Holiday Dinner.

Warren Batson
MHRCS President

Tom Smith and his Aeronca C3 Collegiate at the Jamboree in front of familiar hangars.

Last month you met Mr. Simon Ohm, Monsieur Andre Ampere and Mr.Alessandro Volta. This month, we talk about about batteries.

If you like your airplane....you better **LOVE** your batteries.

Batteries

The cell is the most basic battery. Its electrical symbol is

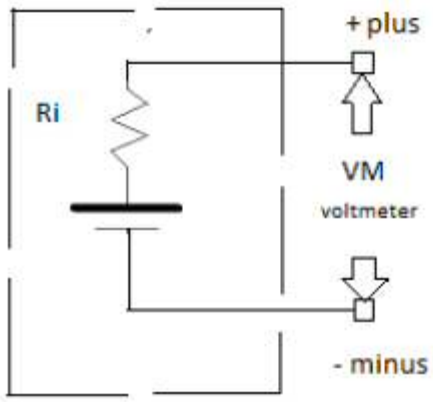
+ plus (red)

- minus (black)

All cells have polarity and its very important. I've shown it above with + plus (red) and - minus (black). The red and black refer to the wire colors used. The + plus refers to the positive side of the cell and - minus the negativeside. +, plus, positive and red are interchangeable when speaking about batteries as are -, minus, negative and black.

Cells and batteries are spec'ed by voltage, capacity and INTERNAL RESISTANCE. You know from last month's article that voltage is the electro-motive force, EMF, that causes current, amperes, to flow. Capacity refers to the amount of current that the cell can provide for a period of time before its depleted and is given as amphours or for small batteries as milliamphours, mah. Your car's battery is rated by CCA, cold cranking amps is derived from capacity.

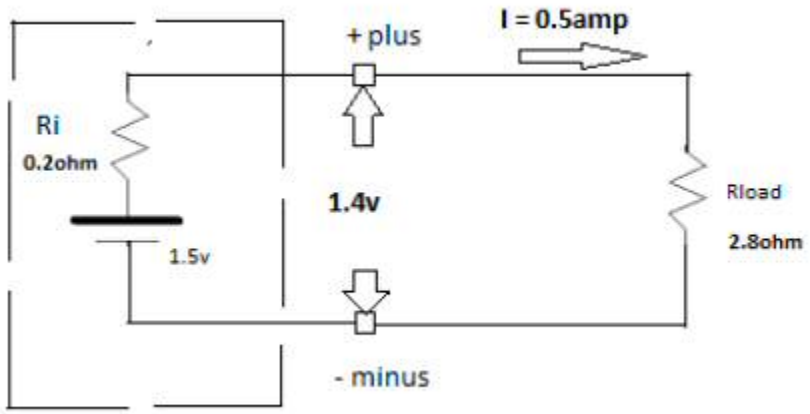
INTERNAL RESISTANCE, like any electrical resistance, impedes current flow. It's an important parameter because it determines the cell's quality. The lower the INTERNAL RESISTANCE the higher the quality AND higher the cost of the battery. The following diagram shows a cell with its INTERNAL RESISTANCE symbolized by the jagged line. The C rating of a battery is related to its INTERNAL RESISTANCE. The higher the C rating the lower the INTERNAL RESISTANCE.



Blackbox of Cell showing INTERNAL RESISTANCE

Notice the voltmeter across the plus-minus output terminals AND the fact that there is no other connections. If the Vm has infinite resistance, and that is important!, NO current flows and the measured voltage will be that of the cell. This voltage is called E Open Circuit; it is the cell voltage with NO LOAD.

Now place a 2.8ohm load across the output as shown below.



That 2.8ohm load resistor is in series with the INTERNAL RESISTANCE, Ri, of the cell. The total resistance is equal to the sum of all series resistance. Simply add Ri + Rl, 0.2+2.8 = 3.0ohms total. Now go back to Ohm's Law, using the form I = E/R, and you get 1.5v divided by 3.0ohms = 0.5amp. Its that 0.2ohm INTERNAL RESISTANCE that causes the output voltage to drop down to 1.4v. Look

inside the blackbox and notice the cell voltage = 1.5v but when you draw 0.5amp from it the voltage available at the output is only 1.4v.

Let's increase the load to 1.5amp by decreasing Rl to 0.8ohm. Now the total resistance is 0.2+0.8 = 1.0ohm. The current is 1.5v divided by 1ohm = 1.5amp, our desired load. Here's the rub, the voltage at the output is no longer 1.4v, its 1.2v!! We dropped 0.3v INSIDE the cell because of its INTERNAL RESISTANCE. E = IR = 1.5amp times 0.2ohm = 0.3v.

Now you see why INTERNAL RESISTANCE is so important in battery selection. You pay a premium price to get a small amount. Its a case of BIG is BAD. As a battery ages, the INTERNAL RESISTANCE increases which is the reason its performance goes down. Temperature is another factor that changes INTERNAL RESISTANCE but for a LiPo the INTERNAL RESISTANCE decreases as temperature increases and the battery performs better for a short time before the inevitable downward trend kicks in.

You now have enough knowledge for some homework. Read the forum at

http://www.rcgroups.com/forums/showthread.php?t=1323465

Its heavy reading, take your time and spend that snowy evening on it. DON'T hit the sauce until after your done.

Browsing enjoyment

If you like seeing & reading how fellow modelers construct their models try:

http://www.flyinggiants.com/forums/showthread.php?t=87621

Henry cores a foam wing in a geodesic pattern to replace the manufactured one in a $5,800 airframe. That's five thousand eight hundred.

Then there is his 126" Carden build at

http://www.flyinggiants.com/forums/showthread.php?t=71449

And don't forget

Upcoming events:
Regular club meeting Dec 1st at 7pm

Club Holiday dinner, Friday Dec 5 . At Copolla's in Highland.
Information is on our forum web site and everyone should have received a letter.
If you have not received info on the Club dinner please contact any board member