

Mid Hudson Radio Control Society

Pilot Briefing

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President's Corner

Hi members,

Well the year end Holidays' are fast approaching us or may have passed by the time you read this. I would like to say it has had been another wonderful year being a member of MHRCS. As president I get to talk with many of you and I am happy to pass along the wonderful comments about the great flying sites we have and the camaraderie that is felt my members. Especially as new members join our organization. It is also nice to see everyone helping to work on member's aircraft problems, so that member might be able to get some air time. This was another stellar year for MHRCS.

About 9 members and 5 spouses attended the MHRCS Holiday Party at Coppola's of Highland in early December. We had a small private room and it was really nice to just relax and visit. There were many comments about how relaxed the dinner was. I would like to thank Rob VanDerMeulen and his wife for setting up this event. If you did not make it I hope you can make it next year. This was a very nice evening for everyone.

At our last club meeting there was much talk and concern about all the recent news publicity on "Drones" . Of course most of this is evolving around what is commonly called Multi-rotor aircraft and "First Person View" aircraft. Members relayed examples about recent conversation about how they fly RC models and the general public saying "OH, so you fly those "Drones".

I had a recent phone discussion with AMA District 2 Vice President Eric Williams and he informed me that Amazon .com is selling 17,000 Multi-rotor aircraft a month. Anything from micro mini for \$20.00 to sophisticated camera mounted platforms selling up to \$4,000.00.

This technology is here to stay and the FAA is getting ready to make some announcements for new regulations on RC Drones. Many of the members were concerned that these new regulations will have an adverse impact the RC modeling community. I have heard all the speculation and rumors of what these regulations might include but no one really will know till they are announced.

The members at the Dec meeting expressed concern that MHRCS club be proactive and keep a close watch in the coming months as this evolves. Most concerning is the regulation that may affect all RC clubs operating within 5 miles of a Full scale airport. The other main concern was the potential or FPV aircraft flying over neighboring property at our fields. We already had a problem at Red wing a few years ago. Hopefully the FAA will make some announcements in the coming months.

Hope everyone has a Happy Holidays.

Warren Batson
MHRCS president

A Revolution in the Soaring World

Looking for something a little different? Something that really tests your true ability to “fly” as well as your knowledge and awareness of the weather in which we operate. Then, take a look at Altitude Limited Electric Soaring (ALES). It is a new event that has gained significant interest over the past two years to the extent that it had the highest number of participants in a single event at this year’s Nats. While winch launched and electric powered soaring has been around for a while, the playing field has been completely leveled by the introduction of a solid state barometric altimeter known as a CAM* unit (Competition Altimeter for Models). The CAM unit costs less than \$45, weighs only a few grams, is the size of one dime, and is easily programmed for altitude set points. “Foamies” such as the three channel Park Zone Radian and the stereotypical “gasbags” such as the Bubble Dancer have been successfully flown to the top three positions in many National and Regional events. .

So how is all of this possible? Until approximately two years ago, all soaring events were conducted using a winch to launch the Sailplane. For those not familiar with the winch type launch, the winch is powered by a Ford long shaft starter motor and a 12V battery. The winch line is set out 900 feet ideally and develops enough power to break a 250lb. test line. Why use such a device...? The answer was quite simple. It enabled the sailplane to reach an initial

altitude of approximately 750 feet consistently and facilitated a method of allowing almost all skilled participants to attain the same starting altitude. The major downside to this launch scheme is that it drove the Sailplane design to very sophisticated composite material construction using Carbon and Kevlar in order to survive the tremendous aerodynamic load applied during the launch. The requirement for structural sophistication slowly reduced the number of individuals participating in the event to those very skilled scratch builders or those with sufficient disposable income to afford \$1.5 to \$2K molded ARFs from Eastern Europe. Definitely not a situation for growing the Sport.

With the development of light weight and efficient electric power, the Soaring community was quick to adapt it to the Sailplane and competition rules were generated to require a limited or timed motor run similar to free flight events. The downside of this path is that it led to seriously over-powered composite airplanes that could attain extreme altitude far in excess of that attainable by the so called run-of-the-mill sailplanes. This discouraged many from attempting to participate in the event and again, led to a major decline in activity.

The CAM unit introduced two years ago has completely revolutionized the Soaring event and competition rules have been re-written to eliminate all of the problems of the past. First, the CAM unit is an incredibly accurate altimeter and is inserted electrically between your receiver and the motor control unit (ESC). It is readily programmable to cut off the motor at either 100, 150 or 200 meters altitude or 30 seconds elapsed time. This guarantees a consistent launch height for all participants. The rules have been written such that the pilot has 30 seconds to reach the preset altitude. If your motor is capable of hauling your sailplane up to 200 meters in 18 seconds, then the altimeter kicks in to shut off the motor regardless of the time. If the altitude is not reached in 30 seconds then the timer in the CAM unit shuts off the motor regardless of the altitude. It has been my experience and observation that almost every type of sailplane can reach 200 meters in under 30 seconds and I have seen no instances where the motor shut off prior to making the preset altitude. The rules state that there can be no zoom at the top of the launch. The flight attitude at the motor cut off point must be relatively flat. From 200 meters, it is all about soaring which is 90% piloting skills. This series of developments has allowed almost all of the Sailplane types to be competitive. Foamies as I mentioned above, the built up balsa and film covered ships of years back as well as the composite sailplanes of recent years. The requirement for sophisticated composite construction is not necessarily a must.

The other dreaded aspect of Sailplane events in former years was the so-called 'Dork' landing or spot landing. Landing bonus points were awarded based on how close to a specific spot on the field that you could land. No effort to reflect landing realism was considered. In the ALES world, the event has a thirty foot long landing tape and the pilot is awarded points based on how close to the center line of the tape he lands as long as it is somewhere within the thirty feet fostering a more scale like landing and again eliminating the need for robust construction techniques..

ALES is a great format for Fun Flys. Give it some thought and lets discuss it further perhaps at a club meeting this winter.

BOB MAGEE

*** CAM (Competition Altimeter for Models) manufactured by Soaring Circuits
www.soaringcircuits.com

More batteries

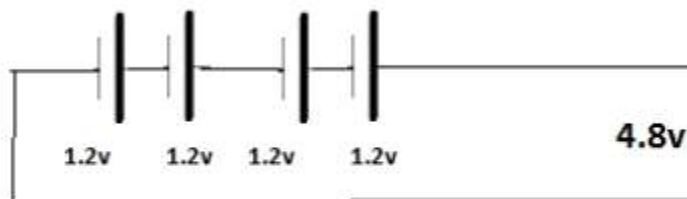
Cells come in a variety of voltages that is determined by their chemical composition.

| Chemistry | Abbrev | Voltage | Used in |
|---------------------|--------|---------|------------------------------------|
| Nickel- cadmium | NiCd | 1.2v | receiver & transmitter |
| Nickel - metal NiMh | | 1.2v | receiver & transmitter |
| Lithium- Iron LiFe | | 3.3v | receiver, transmitter, motor power |
| Lead- acid | Pb | 2.0v | car battery, your field starter |
| Lithium- polymer | LiPo | 3.7v | electric motor power |
| Zinc - carbon | | 1.5v | flashlight, low level systems |

You need to know the cell voltage when using a newer multichemistry charger and you will also have to know how many cells are connected in series. The charger that came with your system is NOT a multichemistry charger, it can only charge cells based on Nickel. A multichemistry charger can be used for Nickel, Lead and Lithium batteries because the user tells the charger the chemistry AND voltage of the pack being charged.

Battery packs are made by placing multiple individual cells in series to provide a higher voltage. When you place cells in series, you connect the plus side of the first to the minus side of the second, the plus of the second to minus of the third and continue this for the remaining cells.

Schematically, a four cell NiCad pack looks like this.



Notice the output is 4.8 volts. Connecting cells in series produces an output voltage that is equal to the sum of all the cells.

In this case it is $1.2 + 1.2 + 1.2 + 1.2 = 4.8v$.

So far we've only talked about the voltage of a battery pack. There is another attribute that is equally important and that is its capacity. The capacity of a pack is analagous to the size of a fuel tank. The tank in a 40 size glo is around 10 ounces, move up to a 60 and you'll need 12-14 ounces. Talk to a pilot flying a 50cc gasser and he'll tell you its anywhere from 20 to 30 ounces. Your car is about 20 gallons and don't forget your home oil tank that is hundreds of gallons. Battery packs are just as variable and we size their capacity to our application. Ideally you'd like to fly 4-6 times and have half the capacity left as insurance before having to recharge.

When proprotional radios first came out back in the 60's, Nicads were the batteries of choice. Remember back then we were using only 4 analog servos that produced about 30 oz/in

torque and were slow by today's standards. Today we use digital servos that are faster, have higher torque and more of them. That means we need MORE POWER.

To get the additional power the pack needs more capacity. To improve servo efficiency, the voltage was upped to 6v from 4.8v by using 5 cells in series rather than 4 (remember Watts = EI, up the voltage keeping everything else the same and you up the power and $E=IR$ when calculating the voltage drop in the servo wire). Higher capacity and higher voltage equals bigger batteries. And we haven't talked about ignition batteries yet. Tim the Toolman would be proud!

The move to NiMh was to overcome the "memory" effect of NiCd's, it wasn't until Lithium batteries appeared that power density improved dramatically. Power density can be measured as Amp hours per pound or Amp hours per cubic inch. Ever notice the weight of a car battery? There is no such thing as a free lunch, you want more power? Its going to cost you dollars, pounds and size. The holy grail of battery technology is trying to get them lighter and smaller. They are looking for the same thing Captain James T. Kirk was looking for, dilithium crystals. Chances are its not going to happen in my lifetime.

LiPo batteries are as close as we'll get to dilithium. They are also as dangerous. Crank up youtube and search on "LiPo Fire" or "Lithium battery fire" and you can view thousands of fires. Lithium is very reactive when it comes in contact with water.

DO NOT USE WATER TO PUT OUT A LITHIUM BATTERY FIRE

If you don't have a proper extinguisher use dry sand/dirt.

Its the lithium polymer battery that made electric powered flight possible.

A much safer but heavier lithium battery is the LiFe, also known as A123 that tool manufacturers use. This technology is very tough, it can survive over charging and not burn your house down. Its biggest drawback is it gives you no advance warning when it approaches being discharged. You can buy this technology for use as a flight pack and because its nominal cell voltage is 3.3v, you only need 2 in series for a flight pack IF you use 6v servos. You will kill 4.8v servos if you use a voltage in excess of 5.2v.

For info on LiFe batteries see:

<http://www.hangtimes.com/nobsbatteries.html>

<http://www.duraliteflightsystems.com/>

Be prepared for some serious reading, dig deep and look for the reasons they give. The more you know about batteries the more reliable your aircraft becomes and you will spend more time in the air.

Merry Christmas and Happy New Year

96 days until Wallkill opens as of December 25th.