FLYING TIMES

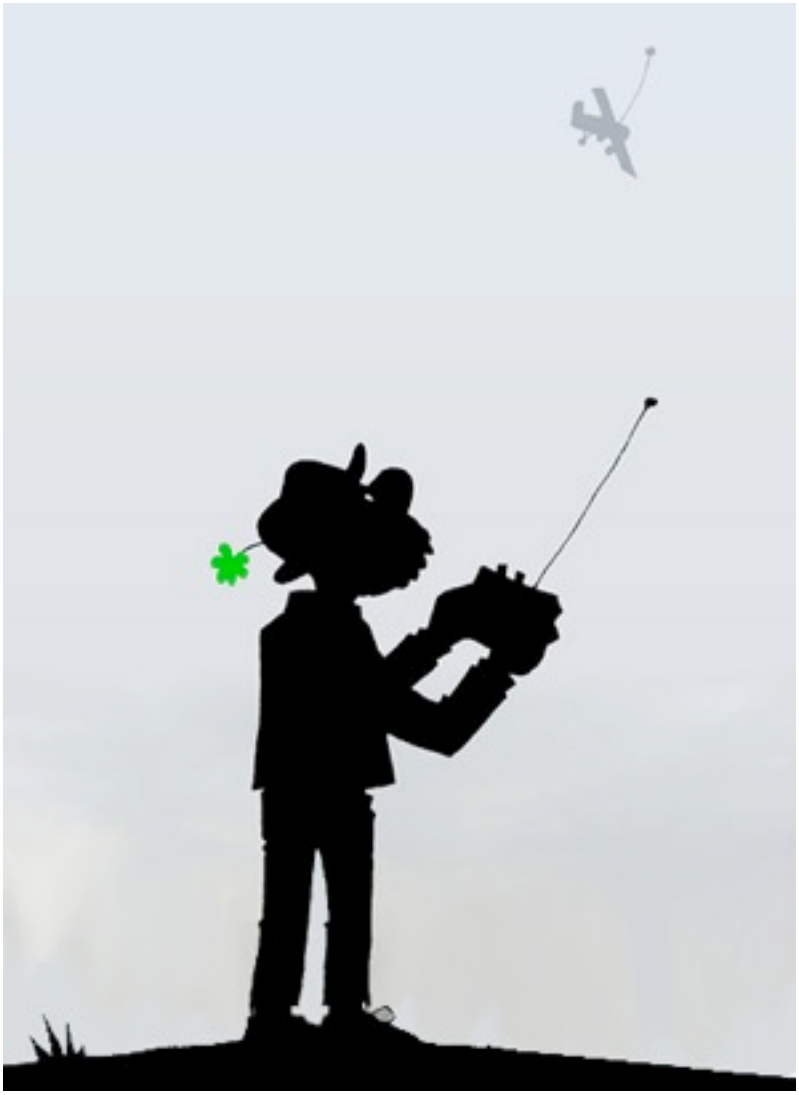
The Official Newsletter of the Valley RC Flying Club

PRESIDENTS CORNER

by Chester Williams

Item 1: The 2008 Swap Meet was a huge success! I'd like to congratulate Jim Stogdale for the job he did heading it up. I'd also like to thank everyone who pitched in to help "git 'er done".

Item 2: I would like to see more of your smiling faces at the monthly meetings. I know that some of you have good reasons for not being there such as work, school, church, and other such activities, but we usually only have enough attendees to meet the quorum. This has been going on for a long time and I'm not sure why. If any of you have suggestions for improving this situation please let me know. It would really be cool to see (at least) a third of the members at the meetings.



Happy St. Patrick's Day

Item 3: Now that temperatures are beginning to climb again as spring approaches, I want to remind everyone to be mindful of the condition of the flying field and surrounding areas. I'm particularly concerned about wet weather and soft ground. If you encounter such conditions when going to the field please do not drive through the creek to get to the shelter. Doing so will turn the area near the creek into a rutted mud bog. In the old days we used to park at the bridge and carry our equipment to the pit area. Yes, I know that is a pain in the butt to do but we have a contractual and ethical obligation to take care of the premises. Taking care of the place reflects well on us in the eyes of the landowners and it also tells them that we respect them and their property.

Item 4: It's still not too late to renew your membership by paying your 2008 dues, but since it's now past the February meeting you'll need to include the $5 late fee. Better late than never!

Item 5: Have a good March!

See you at the meeting.

Flying Season is Coming...

...and so is "Crashing Season"...if you're not prepared.

Although the flying season doesn't end with the onset of cold weather for some brave souls, for those of us who hibernate or do other things over winter, it's time to drag out the flying machines and prepare for Spring and flying weather.

I have not been in this hobby as long as some folks, but I've been it long enough to have seen some very nice planes get re-kitted on their first flight out following winter storage. Yes, it can and does happen. Model planes need annual inspections just like their full size brothers do. Take the time to do a thorough inspection. Below are some of the things I do/have done over the years. And a good time to do this is while you're waiting on decent flying weather.

Don't let this...happen to you!

Batteries don't last forever, regardless of what the manufacturers might like you to believe. Batteries that sit around can and do develop problems. I'm not a battery technician, but I do know that it happens. Checking for battery voltage after a charge doesn't really tell you what the condition of the battery is. Case in point, over the winter I did some battery cycling. My giant Telemaster has two separate flight systems on board, each powered by a 6v 3800mah battery pack. (Probably over kill on the size, but I needed the weight!) After cycling one battery, it checked out well, showing that it still retained about 3400mah of power. Not so for the second one. After repeated checking and cycling, it would only show a capacity of 547mah. It did however, show proper voltage. I don't think that would have lasted very long moving 1/4 scale servos! A battery cycler can be money well spent. Think of it as an insurance policy.

Another thing to look at very closely is all control linkages and connections, and look at them closely. One area to inspect is the nylon clevises. Believe it or not, these dudes vibrate in the control horns, and will wear completely through the clevis pin. (don't ask me how I know that!) Don't need to tell you what the result will probably be if that happens in flight.

Remove the clevis from the control horn and inspect it very carefully for wear. As cheap as they are, why not just replace them all, along with the fuel tubing you put on them to insure they stay closed and locked. (you do use that, don't you!)

Along the same lines, pull-pull cables should be inspected for wear, tight crimp connections, etc.

Other things to check: Servos for proper operation and centering. If you are using servo extensions, pull them apart and put them back together a couple times just to make a good connection, then secure them again. I have read that despite being gold plated, they can corrode just sitting there together. A few times pulling apart and putting back together may make a better connection.

Check the airframe closely for any possible areas that may be weak and need repairing. On one piece wings, check to see that they are still worthy of withstanding the amount of G-force you intend to in flick upon it.

Look closely at landing gear areas for breakage, damage, etc.

Inspect all hinges, especially the CA type. they can and do break.

If you have a plane that takes considerable effort to put together at the field, or has a lot of nuts, bolts and stuff to do, MAKE A CHECKLIST!! It's not a bad idea for any plane for that matter. I made one for my Giant Telemaster when I built it.I did it for several reasons.

One, I wouldn't care to see a 12' plane come down for an oversight on my part. It also requires 16 bolts/screws to be installed, things to be checked, plugged in, turned, twisted, etc. so far, the checklist has saved that plane at least 3 times. Before I even consider starting the engine, I go through every step to make sure I haven't overlooked something-and on 3 occasions, I had!

In conclusion, check your stuff out.

As Murphy's Law says, "If all else fails, READ THE DIRECTIONS!! -- If that fails, FOLLOW THE DIRECTIONS!

Randy

TREASURER REPORT

As of February 25 we have 67 paid members in 2008 Valley R/C. That is nearly 80% renewal. Some of the 19 that have not renewed will be lost by natural attrition. A 20% attrition rate for a fun club is very acceptable. We can count on one hand the number of members that were marked as not a member of Valley R/C in the AMA rechartering process and later paid the $5.00 fine for being after the Feb. meeting.

We have some interesting new members joining this year. Come to the club meetings and the flying field to meet them.
Soft landings,

Dan Myers, Your 2008 Treasurer

MESSAGE FROM THE FIELD MARSHAL

Just a couple of items this month:

Military term: FOD walk down: All pilots and crew start at one end of the runway..form a line and look for any object that might cause damage to an aircraft on taxi, departure, or landing. Foreign Object Damage

A note to (smokers) at the field: Please be sure to (field strip) your cigarettes when you finish and place the butts in a trash can or coffee can. If you use a coffee can you can dump the butts into the burn barrel periodically.

We will be fixing the (fencing) come this spring. It has already been discussed at the last meeting. The creek crossing has already been discussed and is on the list of things to do.

Mandatory safety practices while starting glow and smaller gas engines:

You must use one of three methods, (chicken stick), a (heavy glove) or

a (powered starter assist). Face aircraft towards fence; keep spectators back behind the line of the prop. While flying keep your aircraft pointed away from the pit area as much as possible.

Aaron Swindle
Field Marshal

BROKEN PROP AWARD

Hands down, Fred Foster is this months winner of the "Broken Prop" award! He had a servo foul up during a turn. Fred did his best to save the aircraft but it just refused to cooperate. Do to the newness of the aircraft and apparent cause, he may qualify for a freebie from the manufacturer. This crash was not pilot error. We hate to see this happen, but Fred will be back in the skies very soon, just in time for spring!

MEET JOSH PHILLIPS

You are ten years old, it's Sunday afternoon and you can't seem to find anything to do with your time, not if you are Josh Phillips. If you are Josh, I would imagine your Sunday's and many summer days are filled with some pretty fun stuff. It might be a typical Sunday, you look down the road about noon and here comes your grandfather in his old pickup truck. You load up your gear and you head out to go where? Well, the Village Inn Flying Field

Of course. We started noticing Josh around the field about 2 years ago. He's a great kid who always seems to have a smile on his face and most days an interesting question about flying for you.

Most kids Josh's age you come across at a flying field might be flying a small electric or just kicking dirt around, not Josh. I was walking the flight line this last summer and noticed Josh and Howard had a buddy cord hooked between two radios. Josh was at the controls of a 1/3 scale Piper Cub! That has to be a thrill if you are ten years old and just learning to fly. The airplane is literally bigger than Josh. Looking at the accompanying photo you can tell Josh is having a great time flying around the pattern. Besides the Piper Cub I am told the Taylor craft is one of Josh's favorite aircraft. Who doesn't love a Taylor craft? Josh, you have good taste in airplanes.

Quote from Fred Foster:

"Yeah, I know Josh. He's the little guy always running around asking questions. What amazes me is that he always asks very intelligent questions for his age. It's fun having him around because of his energy and enthusiasm. I've watched him fly his grand-dads Cub and he has all the instincts an RC pilot needs. He's pretty darn good!"

When he's not looking cool behind his pilot shades, Josh is also very helpful at the field. Fred Foster had some debris stuck behind his pull out tray in his truck. We lifted out the tray and without hesitation Josh jumps in the back and low crawls like a trusty old marine and removes the obstruction for us.

A good pilot, a constant smile, and always helping people...holy smokes we are lucky to have him around folks. Well Josh, the summer of 2008 is on the way; are we going to see you (solo)? I hope so, that would be very cool!

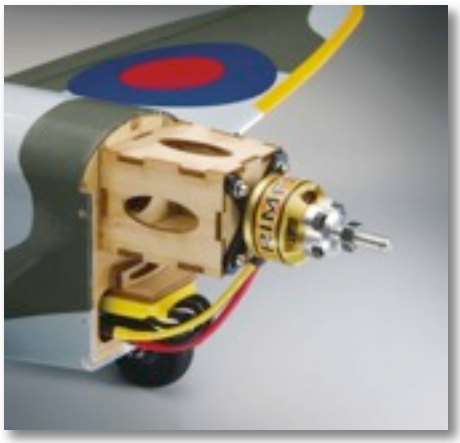
I asked Josh what he enjoyed doing the most and he said "Just hanging out with my grandpa and flying airplanes" Nuff said!

Aaron****

Photo by Fred Foster

Flying Li-Po Electric Airplanes

For the first time in RC History, ARF trainers are available with Li-Po batteries and electric motors already installed! I believe, due to the noise restraints placed on so many areas of the country, that this will become a very popular option in the near future. Although there are some minor problems with the first generation of electric trainers, this will soon be modified and corrected. Many new improvements have been made and by the time the flying season arrives in 2008 these should be corrected. So with that in mind I wanted to spend some time talking about some basics that you will want to know.



There area four basic principals that you need to know about electric flight: Voltage, Current, Power, and Capacity. Most of are familiar with these terms but just in case you are a little rusty I have defined the terms. The easiest way to think about all these things is to imagine electricity as water. Voltage is electrical "pressure". It is measured in volts (v). Thinking of it like water, voltage is the number of pounds of pressure you have - so if the reservoir has 50 vertical inches above you, you have 50 pounds of pressure.

Current is electrical "flow". It is measured in amps (A). Thinking of it like water we would measure it in something like the flow in gallons per minute. Power is the combination of voltage and current (power = volts x current). We measure it in Watts (w). Capacity is a measure of how long you can draw a specified current from a battery. It is measure in Amp Hours (Ah), or more commonly for the scale of equipment used for electric flight, mill-Amp Hours (mAh). Using the water analogy this is simply how many gallons you have in your reservoir. It is a little more complicated for electrical power and we will talk about it a bit later.

Power Needs

To figure out the power you need to fly a model depends on the weight of the model, and the type of model it is, as well as what you want from it. The chart on the right is a table that I put together that will help you determine which type of aircraft you want to fly and how to power it appropriately.

Note - You must include the weight of all the plane's components in your calculations - anything that leaves the ground with the plane needs to be included - batteries, the engine, speed controller, etc.

So, using the chart, if you have a Herr model Little Something Extra (6.5 pounds) that you want a 2:1 ratio to achieve sports aerobatic, then you are going to have to try and generate 1,560w (6.5 x 120 = 780 ; 780 X 2 = 1560). If you have a slow flying trainer that weights 4.5 pound then you need to try and generate a minimum of 473 watts (4.5 x 70 = 315 ; 315 X 1.5 = 473). Most electrical equipment will have limits on the amount of current it can handle, as well as sometimes the number of volts it can handle. Some equipment also states a power limit as well.

Batteries, and particularly the Lithium Polymer type, are rated in C for the amount of current they can discharge. So, if you have an 3 cell 1800mAh 20C battery the maximum current you can draw from it is 36A (20 x 1.8=36). With that example the maximum power this battery can provide would be 400 w (36A x 11.1v = 400watts.) Batteries may have a burst rate, and a continuous rate - so 15C at burst, 10C continuous. Using the 1800mAh battery again you might be able to draw 36A in burst, but only 20A continuously.

Speed Controllers are often rated by the amount of voltage, and current they can handle. The amount of current that is drawn through the speed controller depends on the engine. In general you need to make sure your speed controller can handle at least as much and ideally a little more current and power than the engine. Obviously your speed controller needs to be rated at the voltage for the battery - it will not reduce voltage either (there isn't room for a transformer there).

Motors are usually rated at the maximum current draw they can handle. They will be either brushed or brushless. They will often have a burst and continuous rating. Sometimes engines are also rated for the maximum power they can handle. For example, and engine might say 18A or 200watts. This engine could handle a

Watts	Thrust to Weight Ratio	Performance
6-15 Watts per lb	.25:1	Indoor flight
15-50 Watts per lb	.5:1	Slow flyers (no wind)
50-70 Watts per lb	1:1	Park flyers
70-90 Watts per lb	1.5:1	Trainers and pattern
90-120 Watts per lb	2:1	Sports aerobatic and scale models.
120-150 Watts per lb	2.5:1	Advanced aerobatic and Ducted Fan
150 + Watts per lb	3:1	3-D with Unlimited Vertical Performance.

three cell LiPo (11.1v) @ 18 A = 199.8 watts, but couldn't handle a 4 cell LiPo (14.8v) @ 18A (266.4 watts). However, if you restricted the throttle so that the current never got above 13.5 A (199.8 Watts) you could use a 14.8 volt battery with the motor (provided the motor can handle 4 cell LiPos).

Current Draw

The current an engine draws depends on the propeller it spins and gearing. Generally if you buy a new engine there will be information on what propeller combinations, and how much current they draw will be included. If not there is a software package that you can buy called MotorCalc that will determine this for you. Also, if you want to experiment with a different propeller then you really need a way to measure the current flow to make sure the engine is not drawing too much current for either the battery, the speed controller, or the motor. This can be accomplished by using a device called a WattsUp Meter. It has a LED with 2 line screen that will store all the vital information on watts, amps, volts that the particular set up used.

Remember what I said last month about Propellers. Larger diameter propellers will draw more amps because they are moving more air. Propellers with a more aggressive pitch will draw more amps to a point, although the best pitch for a propeller is normally determined by how fast the engine spins (the kv rating for brushless engines - 1000 of rpm per volt). There are two ways to reduce the amps a system draws - reduce the prop size, or limit the throttle throw if you have a computer radio.

A few more thoughts on batteries

Do not fast charge your Li-Po batteries. Use an approved Li-Po charging device and battery charging box like a ammunition box or Li-po sack. There are numerous stories about fires that have been cause by modelers who were ignorant to the proper use of Li-Po batteries. Try to use a battery balancer if at all possible when using Li-Po batteries. Never discharge Li-po batteries. Always supervise your charging of Li-po's and never leave them unsupervised. Make sure that you charge using the proper connectors and set the correct number of cells.

If you know how many amps your model draws while "cruising at half throttle" it is pretty easy to estimate an approximate flight time. For example, if you have an 2400mAh, which draws 8A while cruising you will have an approximate flight time of 18 minutes (2400/8000[8Amps])=0.3 of an hour, or 18 minutes).

To make sure you are still with me, work the following problem. Li-Po batteries are 3.7 volts per cell. Given two batteries - a 2 cell 1200mAh LiPo, or a 3 cell 800mAh LiPo on a park flyer using 30 watts of power, which would provide the longest flight time? The answer is perhaps not as simple as you might think. Because the 3 cell has higher voltage you do not need to draw as much current to achieve the same power.

For the 3 cell: power = volts x current therefore 30 = 11.1 x A, A =30/11.1, A=2.7
For the 2 cell: power = volts x current therefore 30=7.4 x A, A=30/7.4, A=4.1

So, flight durations are as follows:

3s 800mAh: (800/2700=0.3 of an hour, or about 18 minutes)
2s 1200mAh: (1200/4100=0.3 of an hours, or about 18 minutes)

So, even though the 2 cell has higher capacity, because the current draw is so much higher to provide the same power, it ends up both these batteries have about the same flight time.

Gearing your Motor

Let say that you have a Motor that states it is rated at 5400Kv and you want to use a 3 cell Li-po. You take the Kv x Volts and that will give you the RPM's. (ie: 5400Kv x 10V = 54,000 rpms) Now, most of us know that you can't turn 54,000 rpms on an airplane or it would tear the airframe apart. So in order to use this energy to our advantage, we convert it by using a gear box. For example, on a slow flyer, we want to keep the rpm's below 8,000. So in order to achieve that we have to reduce 54,000 to 8,000 to give us a ratio of 6.75:1 (5400 / 8000 = 6.75)

There may not be a commercial gear box that is available to meet that specific need. So you have to find one that is close. In our example Cobri makes a 6.6:1 gearbox that would give us 8,181 rpm's.

Let's use another example. We want to buy a ducted fan model from Hobby Lobby but we want to see how many watts if it needs maintain 10volts and the motor and battery are capable of 15A. We take the 10Volts @ 15 Amps and we get 150 Watts of power. We now know that the Hobby Lobby Ducted Fan model will fly using our chart above.

I hope you have found this info to be helpful. Most of the information about calculations can be use regardless of which type of batteries you are using. I hope to spend some time in a future issue talking about Battery Charging and another one on engine break-in. If you have any questions about batteries or if there is a particular article you would like to see me write about, let me know.

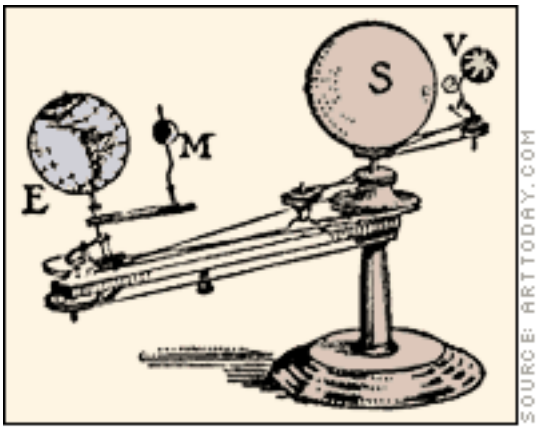
Thanks for listening,

Tim Blankenship
Flight Training Officer

year	Equinox Mar	
	day	time
2002	20	19:16
2003	21	01:00
2004	20	06:49
2005	20	12:33
2006	20	18:26
2007	21	00:07
2008	20	05:48
2009	20	11:44
2010	20	17:32
2011	20	23:21
2012	20	05:14
2013	20	11:02
2014	20	16:57

March means Spring!

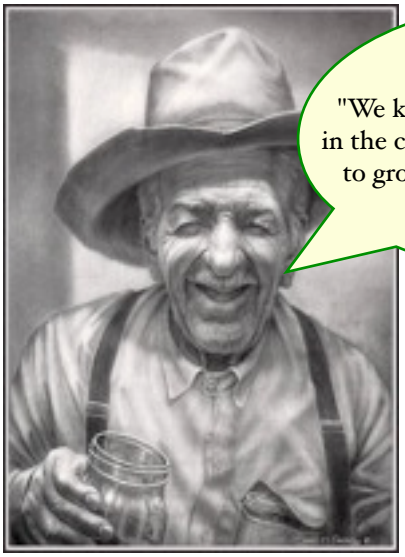
What Happens at the Vernal Equinox? Far from being an arbitrary indicator of the changing seasons, March 20 (March 21 in some years) is significant for astronomical reasons. On March 20, 2008, at precisely 5:48 A.M. EDT, the Sun will cross directly over the Earth's equator. This moment is known as the vernal equinox in the Northern Hemisphere. For the Southern Hemisphere, this is the moment of the autumnal equinox.



Equinox Means "Equal Night"

Translated literally, equinox means "equal night." Because the sun is positioned above the equator, day and night are about equal in length all over the world during the equinoxes.
For those who flying...spring means warm weather, longer days...more flying.

Welcome Spring!!!



Quotable Quote

"We keep planting planes out here in the corn field, but they just refuse to grow"!

-- Dan Myers

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