the Ampeer

January The EFO Officers 2004

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The Next Meeting:
Date: Thursday, January 08 **Time:** 7:30 p.m.
Place: Ken Myers's House (see address above)

What's In This Issue:

Upcoming January 2004 EFO Meeting

The January EFO Meeting will be held at 7:30 p.m. on Thursday, January 8, 2004 at Ken's house in Walled Lake, MI.

If the weather is okay, and enough members are present, we will have nominations for officers, with a vote following at the February meeting.

Everyone is invited to join us. Members' planes, systems and new goodies will be discussed and refreshments will be served.

See you inside in January.

varioProp Revisited

From: James Frolik jdfrolik@freenet.de

I told James that I was putting his question in the December Ampeer, and hopefully, I'll have some responses from some of you to include in this issue! KM

Ken,

Frankly, I'm sure many readers will say a 5-blade prop is...well, senseless. Wasting lots of efficiency for appearance, particularly with electric propulsion. Well, that's partially true.

What many modelers haven't experienced is how efficient a varioPROP really is, or can be. I'm simply gambling that the 5-blade will perform well, or at least as well, at lower RPMs compared to, say, a 2- or 3-blade version (at a different pitch and, likely, a different diameter too). One modeler at Aspach 2003 had a huge Lazy Bee and got better performance with a 4-blade varioPROP over a 3-blade version of the same diameter and set at the same pitch. Of course this has lots to do with the model's top flying speed, it's slow. And, as another modelers informed me, prop pitch speed is also an important consideration in relation to the model's speed envelope.

Also, another modeler in Germany has been experimenting with a 5-blade varioPROP on his flying boat. Apparently it's more efficient that the 4-blade one he first used, more thrust, slightly lower RPM, and barely noticeable amp increase. Go figure.

I once had the same experience with a 3-blade (direct-drive) version over a 2-

blade, both at the same pitch setting.

So, given all the variables for such an efficient and, shall we say, versatile prop that on top of good performance often performs unexpectedly for the better, I think my 5-blade gambling has very favorable odds.

The biggest problem is probably to fashion a nice spinner to fit the blades.

Regards,
James Frolik

Ampeer Newsletter Opinion
From: Bart bartenational@yahoo.com

I am blown away by the amount of information packed into each issue. I like the magazine review - reviews. So many times I read a magazine review and they leave out a major piece of info, like motor brand type, or servo and battery size. The way a model flies is absolutely based on these pieces. I imagine they are responsible to their advertisers, and they would bicker if their servo was not featured in every article, but that creates tons of confusion for the consumer.

I am somewhat new to this hobby, so an unbiased opinion is super valuable, especially one with experience. My local shops can be somewhat helpful but are not always tuned into what I want.

I also read an article discounting the cheap ARF models of foreign manufacture. Sure they perform crappy, are ugly and support foreigners but for someone who is not even sure they like this hobby, vs. watching TV, etc., it is a low risk, easy way to try it out, without a big undertaking or wife approval.

I think the future is electric. It is way less expensive, easier to keep clean, easier to store, more scale looking, you don't have to put your fingers near a spinning prop to pull off the glow starter, you don't need a fuel pump, or starter, starts every time, turns off when you want it to. I could go on and on.

Thanks for the magazine,
Bart

Thanks for the kind words. I'm glad to see that you can see the very positive side of electrically powered models. I still have to disagree with you about the "cheap" R/C models. You can get absolutely no money back from one of these poorly designed, poor excuses for an R/C model, and the beginner will probably never get it to fly on their own. I still believe that investing in good equipment and a good instructor is the most positive way to enter the hobby. KM

Comment On Your Open Letter to SIG Mfg
From: Bob Ferrante robertf@autopkg.com

Ken,

Regarding your Open Letter to SIG Manufacturing Co.

I couldn't agree more with your opinion of the marketing term that SIG Mfg. has given to the Nitro Rascal as being a "Parkflyer." Glow power in a park or schoolyard is recipe for problems. The letter should not just be intended for SIG Mfg. however.

Other manufacturers do the same kind of marketing. Look at Thunder Tiger, and Ace RC. http://www.acehobby.com/acehobby/products/airplane/schoolyardflyers/index.html The Thunder Tiger Scooter is marketed as a glow powered Schoolyard flyer. The Scooter is much like the glow powered Rascal with the same type of flying characteristics as the Rascal. The Ace RC Simple Ultimate is something that truly should not be classified as a Schoolyard flyer like the Scooter. The Simple Ultimate is powered by a .10 to .20-glow engine. This size of motor could really bring the authorities down on model airplanes at public parks.

What I would be afraid of is these are being advertised in publicly available magazines. So John Q. Public could without hesitation, and worse yet any model flying experience, purchasing these glow powered models, then try to fly them in the park or schoolyard setting. They are led to believe they can be flown in the confined areas of a park or schoolyard. Due to lack of model experience they will inevitably crash those models, and possibly hurt the reputation of model aircraft overall.

Bob Ferrante

And from Scott Schroeder sschroeder@sbcglobal.net

Ken,

After looking at letter to SIG in the *Ampeer* I was reminded of the widespread abuse of the "parkflyer" term. Are you planning to right letters to the other folks abusing this term?

This comes to mind

http://www.hobby-lobby.com/monocoupe.htm
This thing is 10 lbs!!!!

After seeing it at a recent fly-in, it does fly slowly, but I can't think of anyway this a parkflyer.

I'm sure there are many other examples that can be found.

Scott Schroeder

And…

Ken,

Excellent letter to SIG, and well thought out as well. Most of us go into action only once a crisis occurs, and only a few of us (unfortunately) are able to see a crises coming and attempt preemptive action. Good work, Ken!

Grant Calkins
GrantCalkins@att.net

LiPo Blow Torch?
From Steve SKE@mx.aniton.com

Hi All,

After reading this in the EFO *Ampeer* this month (November 2003), I am going to make (or buy) myself a small aluminum box to put my LiPo packs in when I charge them. I knew that Li-Ion could blow up easily, but I hadn't heard that with respect to Li-Po cells. I too accidentally bloated a 2-cell pack of E-Tec 1200's having set the voltage for 3-cells (8.4v vs. 12.6v) but it did this rather uneventfully. With my new Shulze charger being able to pump out 5A into Li-Po packs, I guess I could create a really bad situation if I screwed up the settings and the charger didn't catch the incorrect - unlikely but possible with the Shulze.

Good luck & Safe Charging,
Steve

The Astro Flight 109 LiPo Charger
Information and photo from the Astro Flight Web site
http://www.astroflight.com

LiPo cells are becoming more and more popular with e-flight enthusiasts. They seem to offer a weight reduction of about a 1/3 over a similar NiCad battery while maintaining the same power level and increasing the flight time dramatically. At this writing, the jury is still out on how well they will hold up over time, compared to a NiCad cell. There continues to be safety concerns when charging them, but they do seem to be becoming more and more popular over the whole spectrum of electric powered flight.

I was very happy to see Astro Flight produce a dedicated LiPo Charger in 2003. Here's the data from the AF Web site:

Astro model 109 Lithium Charger/Discharger
Charges from one to nine cell Lithium Poly Battery Packs. Charge rate 50 ma to 8 amps.

Cell Types - Lithium Polymer
Minimum Cells - One cell
Maximum Cells - Nine cells
Maximum Charge rate - 8 amps
Minimum Charge rate - 50 ma
Charge Time cut off - 1 hour
Discharge Rate - 1.25 amps
Discharge cut off - 3 volts per cell
Current Display - 50 ma to 8 amps
Voltage Display - 0 volt to 40 volts
Charge time Display - hours, minutes and seconds
Milliamp hour Display - 0 to 9.999 milliamp hours
Supply Voltage - 12 to 15 volts
Supply Current - 0.1 to 12 amps

The available instructions indicate the following: "The Astro #109 Lithium is specially designed to charge and discharge Lithium Polymer battery packs. This charger can handle any pack containing from one cell up to nine cells (4.2 volts to 37.2 volts). Cell sizes can range from 140 mahr to 8000 mahr. All cells

in a single battery pack must be of the same capacity and in the same state of charge."

After carefully reading and rereading the instructions for the charger, I was still left with a question. I decided to go to the source for an answer. Doug Ingraham is the developer of the software used in this charger, so I emailed him.

Hi Doug,

I have a question about the AF109 charger. Does it charge packs only in series? I assume that, but nowhere on the Astro Flight site or in the instructions does it say it. It says 9 cells, but I don't believe it could charge a 3S3P pack, as parallel charging is a no-no as far as I've been told. Am I correct? If I am correct, shouldn't that be noted in the charger literature?

As it turned out, I was WRONG!

Ken,

If all the cells are the same capacity, there is nothing at all wrong with charging Li-Poly in parallel. The 9 refers to 9S (*series*). In parallel your effective limit is that you must get to about a 70% charge in less than one hour or the charger will timeout and you will have to manually restart the charge to finish it. This means effectively about 7-8AH total capacity of the paralleled component (on 9 cells) and maybe 10AH on 5 or less.

I've been cycling a 3S2P Kokam 1020 pack I made for a couple of months now. It has about 25 cycles on it so far. I did match the cells to within 1%, which I think is a really good idea.

There are three problems with Li-Poly packs that are going to bite people.

1) Unbalanced cells in a series chain which causes the high cell to be overcharged.
2) The low cell being damaged when the pack is discharged.
3) Discharging at too high of a rate.

The overcharge is the immediate problem because the cell will puff and eventually catch fire with no real good way for the charger to tell this is happening. It is expensive to fix because you would need some active electronics on EVERY cell in a pack to prevent a single cell overcharge condition. If the cells are within a percent they will eventually self balance. I am seeing this with my long term testing. However over discharging or discharging at too high a rate will tend to unbalance the cells.

Over discharging (below 2 volts) is only a problem because it tends to unbalance a pack causing a failure on the next charge cycle. To damage the cell you have to actually reverse the polarity or hold the voltage below 2 volts for a long time. Shorting the terminals of a cell for a month will ruin it.

Discharging at too high a rate appears to cause hot spots on the cell material which tends to be localized damage but reduces the capacity of that particular cell thus unbalancing the pack and causing problems the next time you charge. Of course, if it gets hot enough it will probably go into thermal runaway and you will have a fire that way.

All of that make sense? I've been thinking about how to tell people this stuff and I wonder if I have made it simple enough.

Doug Ingraham
Rapid City, SD USA

Well Doug, I believe have told us! Thanks so very much. I would like to see some specific information in the 109 instructions about parallel charging. KM

A-26 Power

From: Nick Spagnuolo Nspag@aol.com

Hi Ken,

I'm responding to the question from Larry Lewis of Florida regarding powering his new Wing Manufacturing A26. I have the same model on my building board and wanted to offer some advice. The power system for this plane is to be the same as I have in my B25 from Royal plans - twin Astro 05G on 16 RC2400s turning 11x10 APC props. The B25 has about the same wing area. AUW (all up weight) is just less than 10 lb. It has B&D air retracts (great BTW) covered in flat olive Monokote. There is plenty of power and 6-8 minutes of flight duration with a combination of strafing runs and slow passes for the gas guys (got to rub it in). I'd like to exchange my email with Lewis so please feel free to send it along to him. Thanks for the great newsletter.

Regards,
Nick Spagnuolo
Wellington Florida

I then received the following from Larry Lewis

lslewis@florida-showcase.com
Dear Ken,

The combination of an Endoplasma car motor, $19.99 and Great Planes gear box $12.99 is a popular propulsion system here in southwest Florida. I put the numbers in MotoCalc for my A-26 and was surprised to get a positive answer. The configuration has been popularized by Gary Wright http://www.gwmp.net/ a Melbourne Florida electric flyer.

I subsequently posted the following thread in RC Groups:
MotoCalc seems to think that 2 Gary Wright Endoplasma systems and 20 cells (motors in series 1/2 voltage on each motor) running just under 40amps will fly my 7 lb A-26, 750 sq in wing. Have I given MotoCalc bad info and thus received bad info? Opinions, experience and guesses welcome.

****
Gary Wright's reply:
Works well, lots of power for very little money, but there are some caveats. Two endos in series on a 20-cell pack doesn't work. Simple solution though, just costs you another ESC. Run each motor from it's own 10 cell pack and ESC. Even works when the motors are ganged together to a common shaft, like the innerdeamon gearbox. Not very efficient, but is a fraction of the cost of brushless.

==========
The system requires the gearbox to run at 4.6:1 and it is necessary to purchase the gear $4 from Gary.

Ken, I plan to try the system and will keep you posted. If it does not work I will do the Astro 05 and have two Endoplasma systems for my smaller planes!

Larry Lewis
Cape Coral, Florida

Finding a Starting CG
From Sam Kilgore sk-pcs@mindspring.com

Ken,

My name is Sam Kilgore and I am wondering if you know of anyone that has built a Midwest AT-6. I am looking for some technical advice on the CG of the airplane. If you know of anyone, could you please point me in there direction?

Thanks,
Sam Kilgore

It just happened that I had read an article in the September 2003 AMA National Newsletter on this topic. It appeared in The Beacon of the Miramar Radio Control Flyers of San Diego edited by Dick Doucet. It is presented here in its entirety.

DETERMINING CENTER OF GRAVITY ON YOUR AIRCRAFT
By JERRY NEUBERGER

A number of important factors, such as wing area, wing loading, and tail volume percentage, make an airplane fly well; however, most airplanes can fly with many of these parameters out of norms.

The center of gravity (CG), on the other hand, is critical. If the CG is too far forward, the airplane will be very stable while flying, but as it slows down to land, more up elevator is required to hold the excess nose weight up until the elevator either runs out of travel or stalls. If the CG is too far aft, the airplane will be unstable and uncontrollable.

Figure 1

So, how do you figure out the CG? It's pretty easy, actually. Acceptable CG ranges for almost all airplanes is between 25-33% of the Mean Airfoil Chord (MAC) so the hardest part of figuring CG is the "mean" part. On an airplane with a constant chord wing, such as a Cub (see **Figure 1**), the MAC is easy to figure since the chord of the wing is constant. Just measure the back 25-33% of the chord from the leading edge and that is where the airplane should balance. If the chord is 10 inches, the airplane will be in balance if the CG is between 2.5 and 3.3 inches back from the leading edge.

Not all wings have constant chords and that is where the "mean" part starts to get complicated.

Figure 2 shows a wing with a leading edge taper so the chord at the root is considerably larger than the chord at the tip, causing the "mean" chord to be somewhere in between the two. To figure the MAC, measure back 25-33% at the root and mark it. Then measure 25-33% at the tip and mark that. Connect the two marks with a dotted line. Now, measure the wingspan from the center of the wing to the tip (include the part of the wing that is covered by the fuselage). Go half that distance to get the mean point on the wing. Do the same for the other side of the wing and draw a line between the two points. Now you have the balance point of the airplane. Notice that the balance point at the tip is nearly at the leading edge of the wing so it is critical that you mark where the balance point is. If you just measure back 25% from the leading edge at the tip, the airplane will be nose-heavy. Although **Figure 2** only shows a tapered leading edge, this method also works with trailing edge taper and even wings with both leading and trailing edge taper.

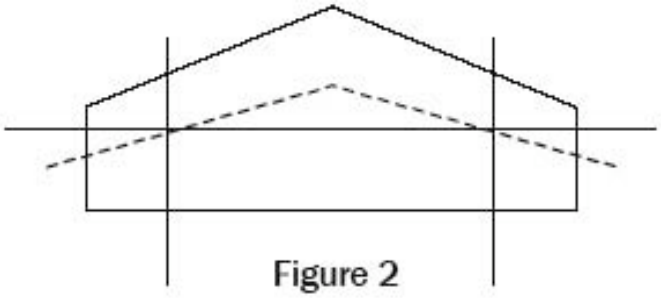


Figure 2

Figure 3 shows a wing with sweep, and once again, figuring the CG is a simple matter of finding the 25-33% point at the root and tip, then finding the point at half span and drawing a line between the two. Notice that the CG is well ahead of the tip leading edge and with more sweep, can actually be behind the root trailing edge. Once again, it is important that you know where on the wing you are going to balance the airplane.

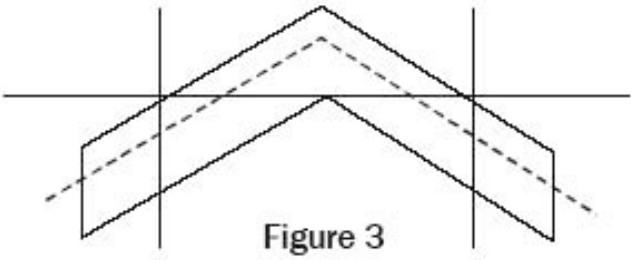


Figure 3

The most complex wing design you will encounter is shown in the next diagram (**Figure 4**). This wing has a constant chord section, a tapered section, and sweep, so how do you figure the MAC? Interestingly enough, it is just as simple as any of the other types of wings. You find the MAC of the constant chord section and the MAC of the swept and tapered section. Then you find the mean point on the wing. The only thing that could get you in trouble here is forgetting to include the part of the wing covered by the fuselage. The sweep angle in Figures 3 and 4 is exactly the same, but you will notice the CG line is further forward on the wing with a constant chord section. This is the effect of the constant chord area reducing the total area of the swept section.

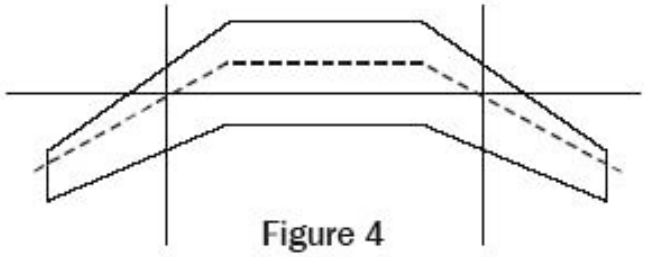


Figure 4

How does this work with a biplane and two wings? Once again, the answer is simple. **Figure 5** shows the wings of a biplane (bottom and middle ovals) looking from the tips of the wings. To figure the MAC on a biplane, just consider both wings as a single wing for CG purposes and measure from the leading edge of the forward wing (usually the tip wing) to the leading edge of the aft wing. Consider the span to be a single wing (shown by the top oval in Figure 5. Then, use the 25-33% of that total as the CG location. Notice that the balance line is well aft of the 25% of the top wing and well forward of the 25% of the bottom wing.

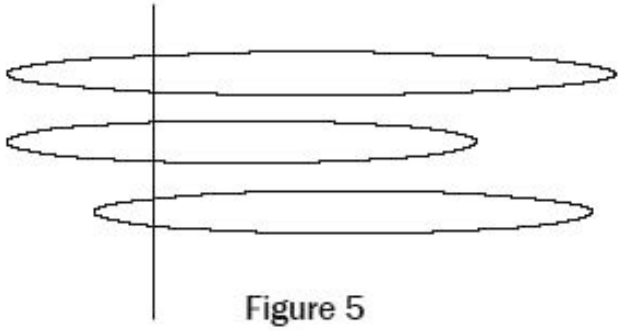


Figure 5

Only one wing type will not work with this system - a delta wing. This type of wing has considerable aft shift of the center of pressure so using this method will result in the CG being much too far forward. There must be some chord at the tip for this to work.

That's Not the Whole Story!

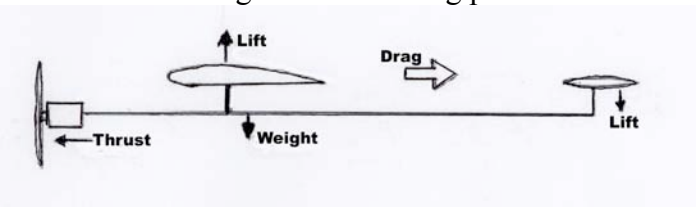
While the information presented gets you close in most cases, there is still fine-tuning to do. The following is from Keith Shaw's Talk to the EMFSO, as transcribed by Martin Irvine. The whole talk is available on the EFO site. KM

Fine-Tuning the CG

By Keith Shaw

As the airplane gets close to its perfect center of gravity, the drag of the airplane drops dramatically, which means it takes less power to fly. Flying an abnormally nose heavy airplane, burns an extra 20% power just to counteract the nose heaviness.

It's the old weigh/lift/thrust/drag problem.



Normally, an airfoil creates drag, which we can't get away from, but it also creates a pitching movement, which, with most airfoils, tires to push the nose down. In a glide, a typical flat-bottomed wing will try to do a half outside loop. Symmetrical airfoils glide beautifully. For flat-bottomed wings, something is usually done with the horizontal stabilizer. A lot of gliders get carried away and stick the stabilizer on at a drastic leading edge down attitude. This acts like up elevator, which lifts the nose.

That's all well and good, but in order to get that to work, the center of gravity is fairly far forward, so that the airplane has a chance of flying. It becomes like a beam balance. The wing is creating lift and drag. The tail is also creating lift and drag but the lift is all down.

That's the wrong way. The wing is lifting the whole airplane, so that if there is a pound of lift pulling the tail down, the wing needs to lift an extra pound, which increases its drag. Reducing the downward lift at the tail to just a little downward lift, which you need to counteract the wing pitching moment, can get the center of gravity back further on the wing and get the beam balance equation to work more efficiently. The tail is creating less downward lift, therefore less drag. The wing doesn't have to lift as much, so its drag drops. The drag of the airplane becomes reasonable.

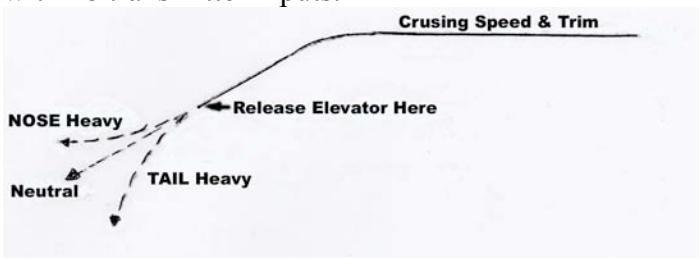
An airplane with a lot of negative tail incidence, and the CG well forward, will glide at only one speed. If it goes any faster, it will try to loop. When the plane comes out of a stall, it will drop quite a ways before it recovers.

Where should the CG be? First, set up the CG according to your plans. Then, there are several tests you can make, aerodynamically, to find out what your CG is like. These tests are based on the idea that the angle between the wing and the tail is reasonable. You rarely need more than 2 degrees.

It sounds funny, but almost no matter what you do, the airplane will try to fly with the stab level. There are a few exceptions like biplanes.

A plane flying in the 30 to 50 mph range probably needs 2 degrees difference between the wing and the tail. For a plane in the 20 mph range, it could be 3 degrees. At 100 mph, you only need 1/2 degree or even none at all. I've seen gliders with 5 to 7 degrees. Why they have it, I have no idea.

Assuming even semi-good wing and tail angles, a quick way of finding the optimal CG is to pull back to 1/2 throttle at altitude. Fly well above the minimum glide speed - cruising speed. Make several passes up and down the field, at several hundred feet, playing with the elevator trim until the airplane flies level with no transmitter inputs.



Leave the throttle alone, but force a 30 to 40 degree dive. When the plane has gained a 20% to 30% increase in speed, (say 50 ft. or so), so that it's accelerating, take your thumb off the stick. If the airplane continues on straight, (hopefully not for very long!), it's at the lateral perfect center of gravity. It is neutrally stable. The airplane doesn't change direction. It just keeps on going.

Ideally, I shoot for something that is just slightly trying to pull up, slightly positively stable.

If the stick is released, and the airplane tries to do a half loop, the airplane is very NOSE HEAVY. When the airplane picks up speed, the negative

incidence, (or slight up elevator trim), acts like up elevator and will try to make the plane loop. (The increased speed makes the trim have more effect.) As the CG is moved back, there is less of a downward load on the tail, so speed has little or no effect.

On the other hand, if the airplane dives steeply, it is TAIL HEAVY. If the CG is well back, the tail actually has to provide positive lift to balance. When the airplane flies faster, the tail lifts more and the dive is increased.

If the airplane always does a loop on the test, or has a 6 or 7 degree differential, put the CG further back, and reduce the difference to 3 to 4 degrees. That should add quite a bit of duration to the flight because of the reduced drag on the airplane.

Old timers, with lifting stabs, often have the CG around 70%. My Zomby trims out at almost 70% of the cord from the leading edge. It's way back!

Often, many of the old designers didn't mark the CG on their plans, simply because they didn't know either!

They would say, "Balance to suit and get a good glide."

("When you've got it, call us and let us know!")

Old timers are very draggy airplanes. There is nothing that can be done to clean them up. Unfortunately, many had a tremendously bad force layout because the designers didn't know a whole lot about aerodynamics. Whether it worked or didn't work depended on which guy stumbled into a thermal. Then, if his plane was green, everyone went off building green airplanes because it took a green airplane to thermal!

Few people knew what they were doing back then, so a lot of the old timers had strange force arrangements.

Each individual old timer needs its own evaluation and set up, and then it's almost cheating, because the original airplane wasn't built that way, so it's no longer really the old timer.

It's always best to get the stab incidence right rather than fiddle with the wing. There are many kits on the market that have the center of gravity in ridiculous spots and have incredible angles of attack. To them, if the plane flies, it's a good airplane. It really depends on what you want to do and what means something. If flying overhead with transparent covering is desired, then you can do anything. If super long flight times mean something, then that means efficiency.

Why I Haven't Jumped on the Brushless/Li-Po Bandwagon

By Ken Myers

If you read the modeling press today, you'll begin to believe that "everyone" is using brushless motors and Li-Po batteries. There are numerous photos of electrically powered planes hanging on the prop and statements about pulling vertical out of the hover or flying for 20+ minutes on a charge. This sounds great, and it is, if that is how you want to fly a model R/C plane. To be able to do this, there is only one magic formula, more power and less weight. Brushless motors are able to supply more power for a given weight than brushed motors of the same weight, and Li-Po batteries can provided the same power as a NiCad with about 1/3 less weight than the equivalent NiCad battery.

Why haven't I rushed to embrace these technologies? I wasn't sure until I read Bob Kopski's "Radio Control Electrics" column in the January 2004 *Model Aviation*. Here is his statement that got me thinking:

"Without planning as such, as I select airplanes for the day's flying, I'm finding that I'm routinely favoring those with the good, ol' Ni-Cd systems. It took some time for me to realize this, but it's clear now: I seem to be 'naturally selecting' Ni-Cd power from the 16 or so ready-to-go Electrics I have. As I've reflected, I've decided that the reason for this is the shorter charge time for Ni-Cd."

"Humm," I thought, "me too!"

When I go to the field just to fly for fun with my buddies, not to a meet, I just take my planes that use Ni-Cads.

First of all, the planes I choose to take to the field already fly like I want to fly. They are sport aerobatic with the occasional slower model for some relaxed flying while I "chit-chat". They fly as long as I want to fly; six to eight minutes for the aerobatic and about 8 to 10 minutes for my slower ones. I guess you can say they've been optimized for my flight regimen. All of them have brushed ferrite or cobalt motors and provide the power I've designed the plane's flight capabilities around.

I'll use my very good flying E-250 as an example. If I just changed the motor from the brushed AF035 direct, which draws about 28 amps, I could use an equivalent brushless to draw about the same amps. The brushless equivalent would weigh a little less and

its controller a little more. On this size plane, the weight difference of the motor/ESC would change the wing loading only slightly, so there would be no real advantage to just changing to a brushless motor.

Ken's E-250

There would be a slight disadvantage, as the brushless ESC (electronic speed control) would be slightly less efficient at partial throttle, where I spend a lot of time with this plane, compared to the brushed ESC. This could mean the possibility of a shorter flight time.

If I wanted to increase the "Wow" factor of this plane, I could put a brushless motor in it and draw 35 to 40 amps. If I did this, I'd have to increase the battery capacity to keep the flight time in the 6 to 8 minute range. I could use six Panasonic NiMH 3000 mAh batteries. They would weigh only a little more than the six-cell Sanyo RC-2000 pack I use. With the combined weight of the brushless motor and its controller weighing less than the brushed motor and its controller, and the larger pack a little more, the AUW (all up weight) could be about the same, but there would be a marked increase in performance. Why wouldn't I do that?

First, I'm extremely happy with the performance of this plane as it is. Second, my flying time at the field for this plane would go down when using the brushless motor and Panasonic NiMH cells! My SR Batteries Smart Charger has a maximum output of 5 amps. At 5 amps it takes about 120 amp minutes / 5 amps = 24 minutes to charge the RC-2000 pack. The Panasonic 3000 pack would take 180 amp minutes / 5 amps = 36 minutes to charge.

Using three packs charged at home and peaked about three minutes each at the field before use, the best possible scenario, with one pack flying, one charging, and later one cooling, over a three hour flying session (180 minutes), the RC-2000's yield 80 minutes of 8 minutes flights, while the Panasonic 3000's yield only 56 minutes of 8 minute flights. Of course the 56 minutes with the brushless pulling harder could be subjectively a lot more exciting, and to some, worth the difference. Charge times do make a big difference.

If I wanted to use Li-Po batteries and keep the AF035, a Thunder Power 2S3P at 6.3 Ah could be a decent choice with the AF035 direct setup. With a battery capacity of 6.3 Ah, that is 378 amp minutes. It might be possible for this battery to get three 8-minute flights on this plane. Using two of these packs and a 3-minute wait period between each flight would yield 88 minutes of flying time over a three-hour period, with the first pack doing a field charge at 1C. While the Li-Po battery might save about 3 oz. in weight, it probably wouldn't be noticeable in the flight performance. There is only one more flight available with Li-Po cells over Ni-Cad cells in this fictitious, idealized flying session.

Am I trying to say that brushed motors are "better" than brushless? No, but in some applications, brushed motors are better suited to the task. Am I trying to say that Ni-Cads are better than Li-Po batteries? No, but in some cases Ni-Cads are almost as good a choice for flying time at the field as Li-Po cells.

For now, I am staying with good quality Ni-Cads that can take a 4C charge rate. By investing in a good, new charger like a Schultz or Astro Flight that can charge at a rate higher than 5 amps, I can shorten my charge time on my larger capacity Ni-Cads, and increase my flying time at the field without having to go to Li-Po cells.

I've found that I do not like to use NiMH cells, even the good ones that can be charged at 2C, since the longer charge time at the field cuts into the flying time. I also don't like the higher resistance of the NiMH cells, as it cuts down on the available voltage, and many times forces the use of an "extra" cell in the NiMH pack to equal a Ni-Cad pack.

Given the way that I fly and design my planes to fly, and with the safety issues during charging and the fairly rapid loss of capacity of Li-Po cells reported so far, I'm not ready to make the switch to Li-Po cells. I feel that, for me, a better investment, to increase my flying time at the field, would be a new, more capable charger.

When the time comes that I need more power and a lower weight, I will certainly consider the use of brushless motors and Li-Po cells, but for now I'll just grab my brushed motor, NiCad powered, planes and keep having fun.

Putting Your Club Newsletter Online

From Merle Davies mp_davies@yahoo.com

Hi Ken,

President of our Marine City R.C. club is in process of programming a small club e-mail newsletter. Much has been discussed with our Club Guru Tom Darragh about procedure; however, my thought was your experience with " *La Ampeer* ".

Your Web program for the newsletter contains pictures and text, to be accessed by all. Will you pass constructive info onto the others on the above e-mail addresses?

Thanks,

Merle

Obviously, you'll need a place to park your newsletter on the Internet. Hopefully, someone in you club can provide that for you.

The *Ampeer* was originally written using Microsoft Publisher. That is a relatively inexpensive page layout program. Since I've switched to the Mac, I now use Microsoft Word. Publisher is not available for the Mac, and the page layout programs that are available are WAY out of my price range. It was not as easy to set up a newsletter using Word, but it is doable.

I use Adobe Acrobat 6.0 Standard for the Mac to create the .PDF file from the Word document. This program is expensive. The best way to purchase it is with a student or teacher discount, and then it becomes very reasonable. Check out places like diskovery.com for educational discounts. There has to be a student or educator in your club, or that you know, who can purchase at this discount.

I don't use a program for the HTML version. I just use HTML code and a text editor. You can use Notepad or Wordpad on a PC. I use BBEdit Lite on the Mac. It is very easy to learn enough HTML coding to do a simple text and photo layout. The text is copied from the "hard copy" and pasted with the appropriate tags. Then the photos are tagged. That's it!

Finally, everything is sent to the server where it is served to the world.

Upcoming E-vents

Mid-Winter Electrics 2004 - President's Day Weekend. The fun starts on Feb 14!

Tentative:

July 10 – 11, Mid-America Electric Flies (Mid-Am), Northville Twp., MI (southeastern Mi), CD's Ken Myers & Keith Shaw.

The Ampeer/Ken Myers
1911 Bradshaw Ct.
Walled Lake, MI 48390
http://members.aol.com/kmyersefo

The Next Meeting:

Date: Thursday, January 08 **Time:** 7:30 p.m.

Place: Ken Myers's House

Walled Lake, MI

Everyone interested is welcome