the Ampeer

November The EFO Officers 2011

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Mailed Ampeer Subscriptions are no Longer Available

The Next Flying Meeting:
Saturday, Nov. 5, 10:30 a.m.
Place: Midwest RC Society 7 Mile Rd. Flying Field

What's In This Issue:

Correction to: Sending in Chargers to FMAdirect for Service
Phone conversation with Joe Hass

Joe called me on September 23 about an unrelated matter. I asked him if I'd gotten the information correct. I HAD NOT.

The important difference was that the charger did have a problem that was fixed by FMAdirect. The adapter problem arose AFTER the repaired charger was returned. I've reprinted the article below, so that you don't have to look it up.

The recommendation still stands; be sure to have them check out everything you send in!

Here's the original article from the October 2011 Ampeer.

Joe had a problem with his CellPro 10S. It was giving an error message that he could not figure out. He packed up the unit and the adapter board(s) and sent it ALL in for service.

When he received it back, he was told that there was nothing wrong with the unit. He hooked it up, and it still would not charge. He changed the adapter board to a spare that he had. It worked.

He found out that they do not automatically check the adapter board when the unit is sent in for service.

He ordered a new adapter board and also found out that they now have a new design that makes it much harder for the adapter board to short via protruding pins through the shrink-wrap around the circuit board. Reference to this adapter board problem can be found in the article "**A Problem with FMAdirect Adapter Boards Discovered**" in the October 2010 *Ampeer*.

It is our recommendation that you include a note to FMAdirect, when service is required, to check out EVERYTHING you have returned to them. Not doing so left Joe without a charger for quite a long time.

An Odd Occurrence with My FMAdirect CellPro 10S

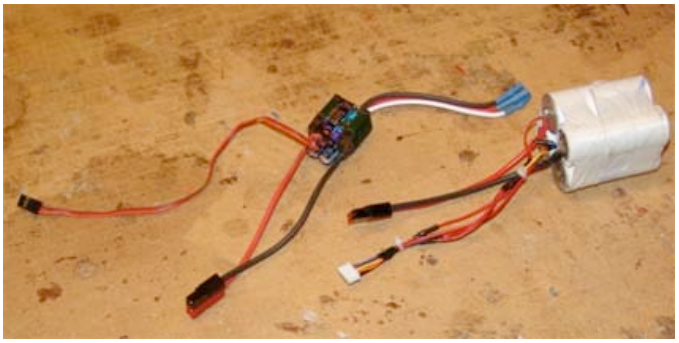
By Ken Myers

On September 8, I was ready to do some motor/battery/prop testing on my new O.S. Motor OMA 3825-750. It had

been raining for several days, and was continuing all that day.

Through the flying season, I store my CellPro 10S on the cement floor in its original box near my Marine/RV battery and its charger in my attached garage.

I had just completed making up a 4S "A123" 2300mAh pack for my new club trainer, the Thunder Tiger Lazy Tiger Cub. The pack required a long balance/node connector to reach the hatch on the bottom of the plane for charging. The new pack, including the balance connector, had checked out just fine on the bench.



The photo shows the pack, with its long leads, on the bench with a Castle Creations Phoenix Ice 50-amp ESC.

I hooked everything up to charge in the garage, on this rainy day.

My CellPro 10S charger kept telling me the cell count was wrong on the new 4S "A123" 2300mAh pack. I thought that maybe one of the wire extensions I made came loose. I checked out that pack with a meter that reads all of the cell voltages and NO, all of the cells were reading just fine.

I tried another 4S "A123" 2300mAh pack from the Super Stearman. The charger said the same thing.

I tried the 3S "A123" 2300mAh pack from the Son of Swallow. No luck, the charger gave the same message.

I thought I had a bad adapter board for the charger. I had a brand-new, spare adapter. It was tried with the same result.

I decided to start the motor testing with the batteries charged as they were.

Later, after the testing, when I tried to charge the packs, the CellPro 10S continued to give the 'bad cell count' error message.

I started thinking about the fact that it had been raining for two days. I brought the charger in from the garage and used a covering heat gun on air to dry the connections on the charger and adapter. It worked.

On September 11, it finally stopped raining here after four days. I arrived alone at the field at about 9:45 a.m. I wanted to give the pack a 'top charge' before the first flight. The day started off foggy, but then cleared with bright sunshine. I hooked everything up and once again got the error message of bad cell count.

While I did the first test flight on the charge in the pack, I set the charger and adapter in the sun on one of the plane workbenches.

One of the Midwest RC Society members, who lives almost right across the street from the flying field, just happened to come over. I told him what was going on with my charger. He said that he had a CellPro 10S that I could borrow, if I needed it.

Several other members arrived at the field. After chatting with them a bit about the less than satisfactory maiden, I decided to charge the pack.

The charger and adapter had been sitting in the sun for about an hour. Everything worked! It had 'dried out' once again.

The following weekend, Keith and I went flying. I told him about the 'problem'. He told me that the circuit is pretty sensitive and that moisture could affect it. He suggested that I keep my charger in a coffee can with rice in it to draw the moisture.

I found only one mention of this 'problem' on RC Groups. It was in a post by Howard Matos. http://www.rcgroups.com/forums/showpost.php?p=12280803&postcount=2 "The calibration values could become compromised during periods of say, high humidity which could collect on sensitive, high impedance circuitry within residual solder flux."

I've not gotten hold of a coffee can yet. I've kept the charger in its box on my workbench in the basement. It rained all day yesterday and is foggy this morning, September 24. I'm heading for the flying field in about an hour and a half. I'm figuring that you might know what my last little task will be before heading out, right? Hint: my covering heat gun is still on my workbench.

Has anyone had a similar experience with this or any other chargers? It is the first time I've ever heard about it.

MIDWEST R/C SOCIETY
22nd annual

R/C SWAP MEET
Sunday, November 6th, 2011
9:00 am to 12:00 pm

Location
Northville Senior Community Center
Northville, Michigan

Admission Charge
$5.00 per person
(active duty military, kids under 12, and women are FREE)

Vendor Table Cost
$20.00-$25.00 per table, depending on location
The vendor table cost includes one admission.
Vendor set up time is 8:00am.
Advance table reservations are highly recommended, last year all table were sold in advance!

For information, call Rudi Reinhard
at 248.631.8205 or e-mail: wwtbi@comcast.net

Directions
Take the 8 Mile Road exit off of I-275 and go west for 2.5 miles on 8 Mile to Center Street.
Go south (left) on Center Street for .5 miles and then west (right) on Main Street.
The Northville Senior Community Center is located at 303 West Main Street in downtown Northville.
There is free parking in the back of the building, off of Cady Street.

This is the BEST & LARGEST swap meet in southeastern Michigan!

New Online RC 'Magazine'
From Ken Myers

I received the following email from Michael Kranitz at michael@rcpilot.com. It might be a good idea to check it out. KM

Hi,

I am Michael Kranitz, former CEO and co-founder of RCUniverse. In the next few months, my company will launch RC Pilot Magazine for the iPad.

The magazine is gorgeous and interesting to read. It's about pilots, not products. I won't use space in this email telling you about it -- there is a link to our website below and it contains a short video explaining why we are different from anything you have seen in print or on the web.

The purpose of my note is to announce a "Club Grant" that RC Pilot will be making to three clubs in early 2012. We will award cash and cool prizes to the top three clubs in our contest! We will send a video crew out to visit and film the top club for our "Club Spotlight" section.

Here's how it works:
1. We want pilots to read the premiere issue of RC Pilot FREE.
2. On our website, we have a form that allows pilots to sign up to receive a notice
3. when we release our first issue. (www.rcpilot.com)
4. The three clubs with the most referrals (that is, individuals signing up who write
5. either the club's name in the "Flying Club" box or a club member's name in the
6. "Referred By" box, will win. In order to qualify, the club must have at least
7. 35 referrals credited to it or its members ("Minimum Referral Amount").*

PRIZES:
First Prize is $1,000 and 2 E-flite Apprentice RTF trainers for the club!
Second Prize is $750 and 1 E-flite Apprentice RTF trainer for the club!
Third Prize is $500 for the club

THE CONTEST IS ON NOW! THE DEADLINE IS JANUARY 20, 2012 AT MIDNIGHT.
GOOD LUCK!

If you have any questions, please email contest@rcpilot.com. Otherwise, hop over to http://www.rcpilot.com and watch the video!

THE FINE PRINT:
*If no club reaches the Minimum Referral Amount by the contest deadline, we will extend the contest until at least one club reaches the Minimum Referral Amount.

If fewer than 3 clubs reach the Minimum Referral Amount, by the time the contest ends for any reason, we will only award prizes to the clubs that did reach the Minimum Referral Amount.

Michael Kranitz
Publisher & CEO,
RC Pilot Magazine
www.rcpilot.com
720.838.0700

Skymasters' Indoor Flying Season
From Greg Cardillo indoor@skymasters.org

Skymasters R/C of Michigan would like to welcome your club to join us when the Winter Indoor Flying returns on Tuesdays starting November 1st!
Gold Card Season passes are on sale now, at our Skymasters' meetings, or on the Web via Paypal (http://www.skymastersrc.org).

The price remains at $100 this for the season, but now includes the 2 four hour Holiday Sessions - for 25 sessions - 54 hours of flying! Hope to see you at the arena.

Click here to signup now!
http://www.skymasters.org/events/indoor/register.php

5 session punch cards remain $30 and will be on sale at the arena on event days. Each 2-hour session is one punch. (Punch cards may also be used for the holiday flying sessions this season - 2 punches for each 4-hour session.)

The sessions are at 11:00 a.m. to 1 p.m. on Tuesdays through the winter at the Ultimate Soccer Arena, 867 South Blvd, Pontiac, MI. The Ultimate Soccer Arena is located just west of Opdyke, on the north side of South Blvd. The flying area is 365 ft. by 260 ft. with ceilings from 45 to 75 ft. The facility is temperature controlled and well lit.

Remember that the season starts on Tuesday, November 1st! Buy your season pass now via Paypal!!
Event Flyer:
http://www.skymasters.org/events/flyers/ultimateindoor.pdf

An E-powered Magic
From Willie McMath via email

My Hano Prettner – Magic was scratched built and had its maiden flight in 1983. It was first flown using a Super Tiger 60 with a tuned pipe exhaust system and retractable landing gear.

I converted it to electric power. It flew well with the repaired Turnigy motor. I glued the loose magnets with thin CA. The motor ran well, except when turning the motor over I could feel all the magnets and hear a noise. I have to figure out why.

The motor is a Turnigy 5065-350Kv. The prop is an APC 17x10E. The rest of the power system includes a Turnigy nano-tech-5000mAh Li-poly battery and 70-amp Suppo ESC.

Carl Goldberg Eaglet
From Rob McLeod via email

Dear Ken,

Hi! My name is Rob McLeod. I live in Ottawa, ON and I am also a Media / Technology and several other things Teacher, though in high school and sadly not retired. You can understand how this really cuts into my flying time.

I am a member of Rideau Flyers (http://rideauflyers.com) where you might find our club's solar powered charging system of interest.

I have followed your *Ampeer* newsletters, both current and online back issues for several years now on the advice of my Dad (The Old Guy or OG) who has been in the hobby 30+ years, is a long time electric flyer and who is trying to help pound some electric power systems basics into my head.

Constant repetition seems to be helping and I am reading as much as my brain can take with many small but filling trips to the all you can read knowledge buffet.

Every month Dad sends me the new link to the *Ampeer* newsletter. I can't count how many times I have told him "Yes, the *Ampeer* is great isn't it, I subscribed a long time ago when you first told me about it". Now that's love. So I really have no excuse for missing an issue.

A couple of years ago I got my MAAC Wings training on an Alpha 61. I then obtained a beautiful, blue and white Carl Goldberg Eaglet.

I am wondering if you have ever run the Electric Conversion numbers for a Carl Goldberg Eaglet 50 Trainer. I did not see them in are referenced articles in the *Ampeer*.

It would save me a ton of time to get some basic power system recommendations if this has already been done before, as it seems a fairly standard long time production nitro plane that is prime for conversion.

All basic specs are available in a chart at this link:

http://carlgoldbergproducts.com/airplanes/gpma0961.html

I am dismounting the engine so that I can get the basic reference weights minus the engine power system and start the conversion process.

My Dad fixed the mild warp and perfect the washout, while happily giving me another wing building and airfoil theory lesson, for which I am eternally grateful as always. Hey, it's handy having an OG around to help with the finer points of aviation theory. We then bench tested the engine, which runs beautifully.

However, I live in an apartment and have some nitro plane experience. The mess is not something I want to keep around my apartment and the OG already has a house and a half full of planes.

While I am very enthusiastic to see this beautiful model fly again, I want it to fly electric. In particular, I am interested in setting up a power system with A123 batteries so I can try implementing the ZIP charge method I have read so much about.

All of my current models are electric and I am familiar with the basics of electric power systems.

What I am finding in the learning curve process here is that the theory can quickly muddy the process making it a little daunting and I tend to get lost in the spreadsheet.

While I am technically capable in a technology sense I do not have a strong electricity / electronics background and am learning on the fly and back filling as I have taken an interest in this later in life (45). I am used to being on the user side of the wires and buttons. This could explain why I go off course on a tangent so easily when learning about this topic.

I could really use some Step by Step / Paint by the Numbers pointers that are pared down to "need to know" essentials or a link to such a source(s).

Of course, I also have a very experienced OG to help me but I know for a fact he would be very interested in your comments about an A123 system for this plane.

I hope see many back to back Trainer electric flights from this planes in the not too distant future.

Thanks so much for any comments or input you might have.

Rob McLeod
Robert.d.McLeod@Rogers.com

And

Hi again,

Well 20 seconds after hitting the send button I find a) your reference to having a Eaglet in your fleet and b) the extensive thread on RC Groups on conversion of this long time model. I was basically not using the search tools well and looking in wrong area.

Rob

My Replies:

I imagine that NONE of the info in Eaglet 50 thread uses 3S "A123" for zip charging.

The quick and dirty answer to your power system question is that you need an outrunner of about 1200Kv (RPM/v) to 1250Kv weighing about 250 grams. While a lighter motor can be used (as low as 110g), you'll need the 'nose' weight. A 10x7 or 10x8 prop would be appropriate. Check RC Groups and the EFO site for info on the power systems I used in my Son of Swallow and Fusion 380, and you'll see what I used.

And then a follow-up

Here's a bit more info for using an outrunner with a 3S "A123" pack. The weight I noted for you yesterday was incorrect due to a severe brain-fade on my part.

Ideal: APC 11x7E prop, outrunner weight range 100g - 200g*, Kv (RPM/v) range 1075 - 1190. A Kv of 1130ish should be very good.

Here is an example for a motor like this:
http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_122&products_id=839&osCsid=eca77353696e29143de4641b89b5001f
Kv = 1130, wt. = 171g
comparable motors by outside diameter (mm) body length (mm) dash Kv, wt. would be 3546-1130, 171g
I gave you that info as some suppliers use that type of description. For Example: the Turnigy TR 35-48-A 1100Kv
http://www.hobbyking.com/hobbyking/store/uh_viewItem.asp?idProduct=4910
generic name as described above: 3548-1100, 163g

You can see that this motor has similar external dimensions, a bit lower Kv and 8g less weight, so they are somewhat equivalent.

Photo of Ken's 1998 Conversion

The following would be okay if you need the prop clearance: APC 10x8E prop, outrunner weight range 100g - 200g*, Kv range 1170 - 1295. A Kv of 1230ish should be very good.

Here is an example for a motor like this:
http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_123&products_id=842&osCsid=eca77353696e29143de4641b89b5001f
Kv = 1200, wt. = 141g
comparable motors by outside diameter (mm) body length (mm) dash Kv, wt. would be 4336-1200, 141g

Here is a motor from Hobby King that might work as well with the 10x8.
http://www.hobbyking.com/hobbyking/store/uh_viewItem.asp?idProduct=4656
generic name: 3742-1185, 152g

Motors weighing between 175g and 200ish grams will make balancing easier. Yes, a motor weighing just slightly more than 200g would be okay. Something like 210g to 220g would be fine. Be careful of getting too light of a motor.

A Couple of Twins

From Victor Madison via email

Ken,

I have been following the *Ampeer* for quite a long time now since I switched to all electric powered planes. We exchanged emails a few times when I had questions about electric models. I have been flying since 1982 and have chosen General Aviation planes as my favorites. I am the Web Master for my club located near Baltimore MD. I sometimes find time to keep the site updated (http://wrightflyers.org/). You do a great job with the *Ampeer*.

I have several stock electric ARFs and a couple of nitro-to-electric conversions (NitroPlanes B-25). The B-25 conversion details are on our Web site.

My latest build is the TT-62 Alekto from Nitro Planes.

I wondered if you would like some information on my electrics for your *Ampeer*?

Thanks for the photos Victor. I'd love to share more information with the Ampeer readers. KM

A Note from Australia

From Robert Comerford via email

Hi Ken,

It has been a while since I last corresponded. I have been out of flying for several years while working away from home.

I resolved to make use of the latest technology when I returned after my self-enforced abstinence. 2.4G radios, brushless motors, lithium batteries and RTF foamies seemed like a pleasant change from the technology I had been using since I started in electric flight many years ago.

The susceptibility of the Li-poly batteries used in electric flight to fail violently caused me some concern. I fly in paddocks that have dry grass everywhere in summer and the thought of a mechanical/electrical failure or 'dumb thumb' breaking one of these battery packs and starting a bush fire lead me to consider staying with Nixx cells for anything I would fly in those places.

My interest was sparked when I looked further into the new type of batteries being supplied for some of the power tool ranges. Research showed them to have some more valuable characteristics (for me) than the Li-poly batteries.

When I finally moved back home and started to look for supplies I was pleasantly surprised to find this battery technology was now more readily available. I purchased some 1100 and 2300 cells. I then decided to go to your website and catch up on what you have been up to; and what did I find? From around the other side of the planet, you have once again mirrored my thoughts and have taken the LiFe path. If I had any doubts about the suitability of these cells they were dispelled after reading your experiences. The 2300 cells I use in 4s packs to replace my former 10 cell Nixx packs and the 1100 are used in 3 cell packs to replace my 8/10 cell packs of small Nixx cells for S400 size models.

I rarely run WOT so I did not re-prop the larger planes, just used the throttle as appropriate. Longer flights and slower landings were the main differences I noted due to the weight reduction on my 2 remaining sport planes (both powered by geared brushed motors; Astropower-Australia Neo motors, one ND05 and one ND10).

I had donated or scrapped all my S400 planes during my layoff so I looked at foamie options available on the web. I settled on a Wilga 2000 from Hobby King. While the kit has a few minor issues that needed work it went together fairly quickly and I test flew it yesterday. Apart from removing the supplied 'scale' wheels and spats and replacing with some homemade wheels of larger diameter the plane is currently pretty much as supplied. Also on test was a new Spektrum DX5e transmitter, Orange receiver, 3S 1100 A123 pack and Turnigy Accucell 6 charger. All performed their duties very well.

I took an educated guess at where the balance point should be and was happy with it as it stood.

Watch for an article in an upcoming Ampeer on how to select the initial safe CG point. KM

The plane rose off rough ground and flew away without any trim required. I cut the first flight short to test the results as the battery ran down. The supplied ESC did not appear to have an auto-cut but the servos worked long after I would have turned the motor off due to lack of power.

I decided to have a second flight and time the result. Conditions were a light breeze, temperature about 20-deg C (68 in old money) and flying at about 1130M (3600ft). An approaching thunderstorm looked likely to prevent me finishing the flight.

As it turned out a bunch of cattle arrived before the storm front looking no doubt for a late afternoon handout from me. Unfortunately for them I was not their owner and did not have a bunch of hay bales hidden in the boot of my Corolla. As they were threatening to take over the strip I decided to land. Flight time was 17 minutes and I returned 850mAh to the pack the next morning when I recharged it. I'll set the timer for 18 minutes to start with. I don't think I will miss the old technology.

The intended use of this model was to have something that would shoot touch and goes, do nice low fly-pasts and would be gentle enough to buddy box with a beginner. I must say, I am very happy with the performance so far.

Regards
Bob Comerford
Glen Innes NSW
Australia

p.s. As I write this, 3 ultra lights just passed overhead. That's very unusual. I occasionally see one come from the south, do a loop around the top of the hill I am on and head back home just south of town, Usually this happens in the afternoon when there is a high pressure center sitting above us. This is just on dusk and it is breezy outside.

Hi Robert,

I really enjoyed hearing about your reentry into the hobby and 'finding' the A123 batteries. Since I've been using them, Keith Shaw has switched over almost all of his planes to them. For those of us who cut our teeth on NiCads and high discharge NiMH cells, they are a ton lighter. For the guys who fly 10 oz. 3D planes, the A123s are 'too heavy'. Duh!

Thanks again for sharing,
Ken

New Format for Some 'Books' on the EFO Site
From Patrick Surry via email

Ed Anderson's EVERYTHING YOU WANTED TO KNOW ABOUT ELECTRIC POWERED FLIGHT and Ken Myers' Electric Power Basics now have a new format available on the EFO site. KM

I read about Ed's book in this month's *Model Aviation*, and found a copy on your website. I downloaded it along with your book.

In case you're interested, I used a little script of mine to convert them to a PDF that's easier to read on small-screen devices (like my Kindle). Results attached - essentially converts to four pages per page and strips most margins to maximize use of the screen.

Thanks very much for sharing!

Cheers,
Patrick

Thank you Patrick for sharing them with us! KM

Glow to Electric Follow-up Questions

Ken,

Could you give me a brief/quick/down n dirty explanation as to why when the number of cells goes up, the amp rate of the ESC goes down?

Also, I have a Sig Kadet LT-40 with an OS 52 4 stroke. Same thing with it, would it be a good candidate for conversion? And it is setup as a tricycle gear.

Again Ken, I appreciate your time & effort to help me.

Adam

There are a lot of variables when selecting a successful power system for a glow to electric conversion. Some decisions need to be made to limit the number of variables.

Tom Hunt, in his Electro-Active column starting on page 52 of the August 2011 *Fly RC*, noted some very important considerations in his article titled "Glow to electric conversion tips – Part 1, Theory". He lays out a ten-step method, which is very similar to what I've used over the years.

He put a very important concept into a few words that I'd not been able to do, up until now.

p. 54 "**ASK YOURSELF THESE THREE QUESTIONS**
The next step is all up to you. I cannot help you with answers. How was the model intended to be flown? How do I want to fly it? What is my skill level? Answering these questions (honestly) will help us choose an "appropriate" power system for the model."

You'll note that I set a target power in for the Venus at about 660 watts in using the glow to electric spreadsheet as a 'guide'.

http://homepage.mac.com/kmyersefo/Glow2Electric/2011-glow2electric.xls

That input power could be higher or lower and the plane still considered a successful conversion, as demonstrated by Tom's questions. To make it easier for most folks interested in this type of conversion, I just let the formulas on the spreadsheet do their work.

For this explanation, we will assume that a Li-Poly cell can supply approximately 3.7v under load at some point in time when we might be measuring it with a power meter. This is only done to make comparing what is going on with the different number of cells easier. It absolutely does not happen in 'real life' for many various factors. Using 3.7v per cell –
4S 14.8v
5S 18.5v
6S 22.2v

660 watts in / 14.8v = about 45 amps required
660 watts in / 18.5v = about 36 amps required
660 watts in / 22.5v = about 30 amps required

The 80% 'Rule'

See this post by Lucien Miller. The 80% 'Rule' is discussed as the second item in his reply. http://www.rcgroups.com/forums/showpost.php?p=18761206&postcount=40

Some folks, including myself, use this 'RULE', while others don't. Like all rules of thumb, only the user can determine if it is useful for their purposes.

The inverse of 80% (0.80) is 1/0.8 or 1.25. That means that if you multiply a number by 1.25, 80% of the new number will give you the original number.

4S 45 amps * 1.25 = 56.25 amps (56.25 * 0.8 [80%] = [tah dah] 45) A 55 amp or greater ESC would be appropriate, if you want to follow the 80% 'rule'.
5S 36 amps * 1.25 = 45 amps or greater for the ESC
6S 30 amps * 1.25 = 37.5 amps or greater for the ESC

Keep in mind that the 'target' power in is ALWAYS 660 watts in for this example.

Selecting the battery. I use a simple method of multiplying the 'target' amp draw by 100.

4S 45 amps x 100 = 4500mAh or slightly greater or less to get a real world capacity
5S 36 amps x 100 = 3600mAh or slightly greater or less to get a real world capacity
6S 30 amps x 100 = 3000mAh or slightly greater or less to get a real world capacity

As I previously noted, the weights of similar cells in the given packs will be very close to the same, even though the cell count changes. As the cell count goes up, the capacity, and therefore the weight goes down.

Flight times will all be relatively the same. Again using the 80% 'RULE', 80% of a 4500mAh pack (4.5Ah) is 3600mAh (3.6Ah). 3.6Ah * 60 minutes = 216 amp minutes. 216 amp minutes / 45 amps = 4.8 minutes of wide open throttle flying, which generally translates to 7.5 to 9 minutes of flight time depending on the airframe, pilot's throttle management ability and how 'aggressive' the pilot chooses to be during the flight.

5S 3600mAh (3.6Ah) @ 36 amps – 3.6Ah * 0.8 = 2.88Ah * 60 minutes = 172.8 amp minutes / 36 amps = 4.8 minutes

6S 3000mAh (3.0Ah) @ 30 amps – 3.0Ah * 0.8 = 2.4Ah * 60 minutes = 144 amp minutes / 30 amps = 4.8 minutes

The original calculation for the Venus 40 and recommendations were based on using an APC 14x10E prop. Prop selection is a key to all electric power system's success, as well as for glow to electric conversions. Tom Hunt explains why on page 52 of his article and notes, "The biggest advantage to electric flight is to choose a motor/prop combination that swings a large prop that better matches not only the way you want to fly, but the ability of the model to fly in the manner intended." That is why I chose to do the original calculations with a 14x10 prop.

Tom's first step, as well is mine, is to get an approximate required power in. The spreadsheet does that using several formulas or the simple watts in per pound can be used with experience. The second step for both of us is to select the prop. He says to use the largest diameter possible based on the pilot's experience.

After leveling the plane on a flat surface and measuring from the flat surface that the airframe is sitting on to the center of the glow prop shaft the beginning prop radius can be determined. p. 53 "A "skilled" pilot can subtract one inch or so. A less skilled pilot might subtract 1.5-2 inches. If you fly off a very rough field, even a skilled pilot may choose a higher number to avoid prop breakage." Once that number is determined, multiply it by 2 for the largest diameter prop.

The spreadsheet uses a slightly different method, but pretty much ends up with the same results.

The "How to Guide" explains my method. http://homepage.mac.com/kmyersefo/Glow2Electric/2011-Glow2Electric.htm

If the actual measurements for the Venus and your experience indicate that a 15" diameter is appropriate, the spreadsheet allows for this. Note that **the only** numbers that change are the motor Kv (RPM/v) numbers. Even the recommended motor weights remain the same. A 12" pitch, as suggested by the pitch area of the spreadsheet, would be good. New possible motors would need to be chosen based on the new Kv numbers for a 15x12.

Conversely, if a 13" diameter is more appropriate to the real world measurements and your ability, new motors, based on the new recommended Kv would need to be considered.

Appropriate pitches are noted on the spreadsheet as well.

The use of RC Book is a great resource for finding the data on a lot of motors without having to go to the suppliers' sites and look up each motor. http://www.rc-book.com/en/parts_accessories/engine

If you have downloaded the spreadsheet, fill in this data for the Sig Kadet Senior from the Sig Web site: http://www.sigmfg.com/cgi-bin/dpsmart.exe/ProductsV6.html?L+Sig+kzxj5221+_Ddp_5fSearch1_02a01RCSigKadetSenior_01Search_02Index_01Menu_02CatProd_01Thumb_02Kits_20_2d_20Trainers_01

Upcoming E-vents

Nov. 5 EFO flying meeting, 10:30 a.m., Midwest RC Society 7 Mile Rd. Flying field. All electric fliers welcome with current AMA membership card to fly. Everyone welcome to come.

(continued from page 9)

2-stroke 0.40
4-stroke 0.45 (even though you are using a 0.52)
Weight 6 lb.
Wing area 1150 sq.in.

The spreadsheet has been updated and the numbers for the average and median watts-in per the cubic wing loading are automatically displayed.

You will note that everything concerning the power system recommendations comes out about the same as for the Venus 40 when using the 14x10. Of course the two planes, even with identical power systems, will fly extremely differently, as they have very different 'missions'.

If a 15" diameter prop is appropriate for the Senior Kadet and your flying ability, it might be a better choice to haul the 1150 sq.in. 'trainer' around. An APC 15x10E might just be a tad more 'appropriate' to the mission, yet the APC 14x10E would certainly work.

Again, if the 15x10 could be used, then an outrunner with the appropriate Kv for the number cells chosen would need to be located.

And from Adam:

I have been using the "magic spreadsheet" to gather parts for my Sig LT40 conversion from fuel to electric. I have a 710kv Scorpion motor. The battery comes out to be a 4 cell, 4500maAh that I have not purchased yet. My question today is, can I use a 5 cell, or even 6 cells with similar/more/less capacity? My speed controller is in the 65-amp range. I'm using the 13x8 prop.

Learn More About This Conversion:

Adam's build thread with the maiden info on RC Groups:
http://www.rcgroups.com/forums/showthread.php?t=1482085

The Ampeer/Ken Myers
1911 Bradshaw Ct.
Commerce Twp., MI 48390

http://homepage.mac.com/kmyersefo

The Next Monthly Meeting:
Date: November 5, 2011 **Time:** 10:30 a.m.
Place: Midwest RC Society 7 Mile Rd. Field