

more information modelers can contact me by e-mail at cardinal.eng@grics.net or by mail at Roland Friestad - 1640 N Kellogg Street, Galesburg, IL 61401

Keep 'em Flying,
Roland Friestad, Editor
RC Micro World

An A123 Story

From Bob Kopski kopskib@gmail.com

Hi Ken,

I read with interest your story of the "over-voltaged" A123 pack and recent reader follow-up and I don't have any profound (or other!) thoughts to offer on this. I do however have a different A123 story that may be of interest to you and your readers.

A few years ago I built four 4-cell packs with cells derived from DEWALT packs. While these packs don't get much use, they do work quite satisfactorily when called upon. Further, over time, they have "held up" uniformly well as I periodically run 15 amp discharges on my CBA-Power Amp setup; the discharge data remains "overlaid" over all packs over time. By this I mean the four packs are essentially indistinguishable in discharge.

However, of the four packs, there is one "sport" in the group. While this pack discharges indistinguishably from the others, charging is another story. I have two FMA 4S chargers that I use on these (and other LiPo packs as well) and the chargers appear to work well. Except on this one particular A123 pack.

Specifically, for some unknown reason, this one pack seems to "confuse" these chargers. Almost immediately upon connection the charger will switch to "safety charge" and the reported cell voltages will be "all over the place". According to the 4S readout, the cells are nowhere near balanced. The other three A123 packs are not like this at all.

More than once, having become frustrated with the slow "safety charge" condition (it never seems to complete), I chose to charge the 4 cells individually using a lab supply set up in CC/CV mode. This works well and while it is also time consuming and tedious it results in all cells being charged and equalized. If I then put the pack on the

4S, it quickly goes into "balancing" and soon shuts down.

At this point all appears well - until next time I use the pack - which typically may be several weeks later. Any such flight is just like that with any of the other packs but the recharge experience is as above.

On one hand I can't justify scrapping the pack because under discharge (in the air or on the bench) it is perfectly fine. But then on recharge, well, it and the 4S just do not get along! It's a strange story for sure and I'm wondering if you or any of your readers may have had a similar experience with this pack/charger (or any other charger) combination?

In the meantime I've decided to exercise this pack more frequently with bench discharges / 4S recharges in an attempt to determine if "rest time" may be a contributor to this unusual behavior. I'm not holding my breath on the outcome of this experiment, but whatever it may turn out to be I'll share the result with you, though I'm not sure how long it may take to get some meaningful result.

BTW, these packs are used in a plane outfitted with a BDM and I KNOW none of the four have ever been deep discharged!

Cordially,
Bob Kopski

Looks like another one of those puzzling things about these cells. I've not seen that with any of my packs (3, 4 or 6 cells). Readers, any input? KM

Li-Poly Charging Question

From Sherwin Stielow Russell, KS

Still trying to get this E-thing correct. I'm new and trying to learn.

Question

For my Turnigy, Li-poly, 4s, 14.8V, 3.3Ah/3300 mAh, battery

Q1 What is my high charge showing? I think it is 16.7V

Q2 More importantly, what is my low V prior to cut off? For testing in the field with a V meter.

My Response

Hi Sherwin,

A fully charged 4S Li-Poly battery, in a resting state, will read between 16.4v (4.1v per cell) to

16.8v (4.2v per cell) depending on the charger. You are seeing a normal charge voltage at rest. The designation 14.8v is the nominal voltage of 3.7v times 4 cells. Why they even mention that, I honestly don't know. After a flight with most of the capacity used, the resting voltage should be about 3.7v per cell. There is room for fudging either way.

The voltage prior to the ESC cutoff may be as low as 3.3v per cell or even 3.5v per cell. There is no way for you to measure that, as it is under load.

As soon as the load is removed from the battery, the voltage will rebound.

It is best to use only 80% of a Li-Poly battery's capacity for long battery life. In your case, that would be 3,300mAh times 0.80 or 2,640mAh.

If your charger shows that you are putting in more than about that 2,640mAh, then you are flying your pack too low for long battery life. If you do not have some way of measuring how many mAh you are returning to a pack when you are charging it, you should get something. It could be a charger that shows the mAh returned on the display or a power meter (aka wattmeter) that you can put in line with the battery while it is charging to show the return mAh of the charge.

Timing your flight and noticing the charge returned is a far better way to manage your batteries than with a voltmeter. Also, the older Li-Poly batteries could drop to 3.3v per cell in a resting state after using the battery, but that will ruin the newer, high C batteries. They shouldn't be much under 3.7v per cell resting. Again, that is why I say measuring what you put back in is better, as it shows you what you've "taken out".

Hope this helps,
Ken

Discharging Li-Poly Batteries to Put a Storage Change on Them

From Ben Rufli Traverse City Area

Ken,

I'm Ben Rufli of the TRAMPS of Traverse City, MI. I started flying models in 1955 and have been in and out over the years, raising family, other interests and full scale flying. I got back into models full time about 8 years ago, and when I saw how far electric has come, I dove in feet first. Best decision I ever made.

I was one of the founding members of the TRAMPS in '76. Having retired out of Motorola after 32 years as a service tech, electronics really seemed a no brainer.

My reason for writing to you is to find out what you recommend for charging on the Li-poly batteries? I really don't need anything for Nicads any more. I presently am using a FMA CellPro 8 which works well. What I need is something to discharge batteries down to a storage voltage w/out having to schedule my flying to coincide w/winter weather to get them all to a discharge state and then charge them back up to storage voltage.

Any suggestion will be greatly appreciated.

Thank you for your time.
Ben Rufli

My Response

Hi Ben,

I believe you may have meant a FMA direct CellPro 10S, as it does not have a discharge feature. The FMA direct PowerLab 8 does discharge.

A simple solution to discharging would be to find a NiCad/NiMH charger with a discharge function. My SR Batteries Smart charger has one, and I'm sure others do as well. It is swap shop season, so you just might find one at a good price. Also, the Astro Flight 109 Li-Poly Charger has a discharge feature. You might be able to find one for a good price. You can also use a tail light bulb or bulbs to discharge.

Here is a link to a helpful page. The author uses Anderson Power Poles, but whatever type you use can be used. APPs do make series connections easier but Deans, or whatever, can be used.
<http://www.slkelectronics.com/lipodapter/storage.htm>

Hope this is helpful,
Ken

Voltage Drop in Charge Leads

From Cedric Longman daddioo@longmanhouse.ca

Just a quick comment about Dave Thacker's "A Charger Voltage Test" in the December *Ampeer*, he was certainly right on when he commented on the voltage drop in charging leads!

I just checked mine, and using well-made, short charging leads, there was an unbelievable 250mV or more drop at 100 Ma charge current! I thought I

was making a mistake there, but sure enough, that is what it was!

Quite an eye-opener I can tell you! Just thought I'd tell you about my findings.

Another Possible Indoor Site in the Detroit-Metro Area

From Mike Ashley Great Lakes Golf Center
info@greatlakesgolfcenter.com
248.332.4653

Our dome has over 90' of overhead clearance and has a flying area that is 310' x 300' x 220'. It is the largest golf dome in North America. Pilots can stand on the 2nd or 3rd level while flying.

Rent the dome for \$200/hr after 9 p.m. Monday-Saturday and after 8 p.m. on Sundays during December. New hours and rates for 2011 are coming soon. Morning rentals are also available from 6 a.m. to 10 a.m. M-F and 6 a.m. – 9 a.m. Sat/Sun.

All inquires should be directed to:
info@greatlakesgolfcenter.com

Best regards,
Mike Ashley
Great Lakes Golf Center –
Located at I-75 and Joslyn
248.332.4653

What's On Your Building Board?

I received the following photo and email from Don Belfort, electric columnist for Flying Models. We'd all love to know what's on your building board for this 'building season.' Share it with us, please. KM



Hi Ken,
Hope all is going well for you!

It has been cold weather flying lately but I'm sure you have the same!

My 2011 project is the Nesmith Cougar in 1/4-scale. It is very similar to a Whitman Tailwind. Both are speedy home built designs.

Take care,
Don

December EFO Meeting

The December meeting was held on December 8 at Ken Myers's house. The meeting was well attended, and filled with all different kinds of electric talk and sharing.

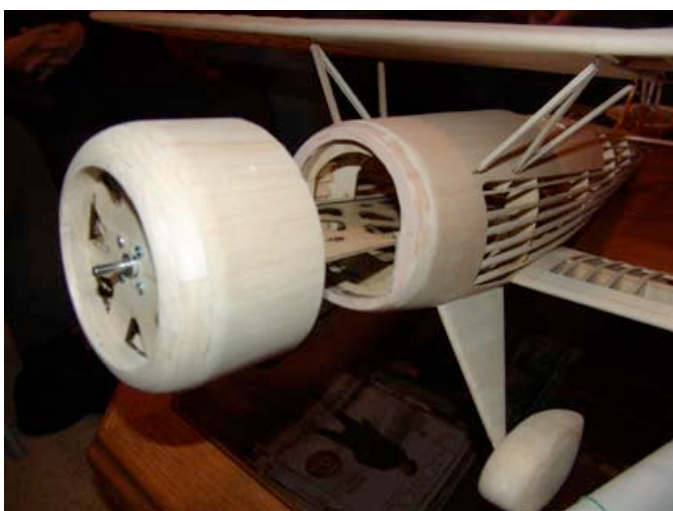


Hank Wildman shared an HET F/A-18 Hornet Blue Angels ARF for a 70mm fan. He pointed out many problems, and/or potential problems, including the landing gear plates, wing attachment, horizontal stabilizer attachment and vertical fin attachment. He also shared his 'fixes' with us. While he likes the plane and will finish it up, he noted that it is NOT a plane for someone with very little modeling experience.



Richard Utkan, EFO vice-president, brought along two new projects. He's completed a combat Zero from plans available on the Internet. He painted it with house paint and an inexpensive spray gun that he picked up at Harbor Freight. There was quite a bit of discussion about the Harbor Freight paint sprayers and several members said they use them and like them for relatively inexpensive spray units.

Richard also shared and flew in the living room his latest purchase. It is the Horizon Hobby Force RC ultramicro coaxial RTF helicopter. It maneuvered very nicely around the living room and Richard was able to move it and hover it for good photos. Now he's waiting on some of us to get another one to do battle. The December issue of *Model Aviation* has more info on this neat coax.

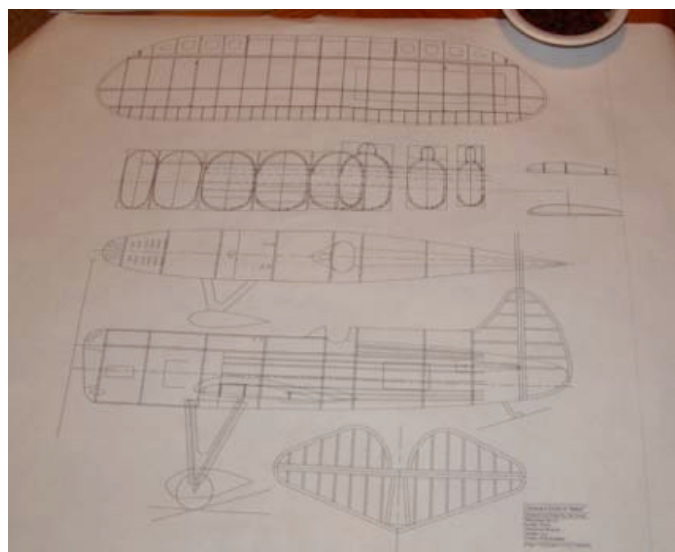


Jim Young shared the 2nd prototype of his 1/8-scale WACO YMF-5. Mark Woods built and flew the first one this past summer. It is coming along nicely and he's thinking about using a 3S "A123"

2300mAh pack in this project. The plans and kits for the WACO are available from Jim at <http://www.tnjmodels.rchomepage.com/>



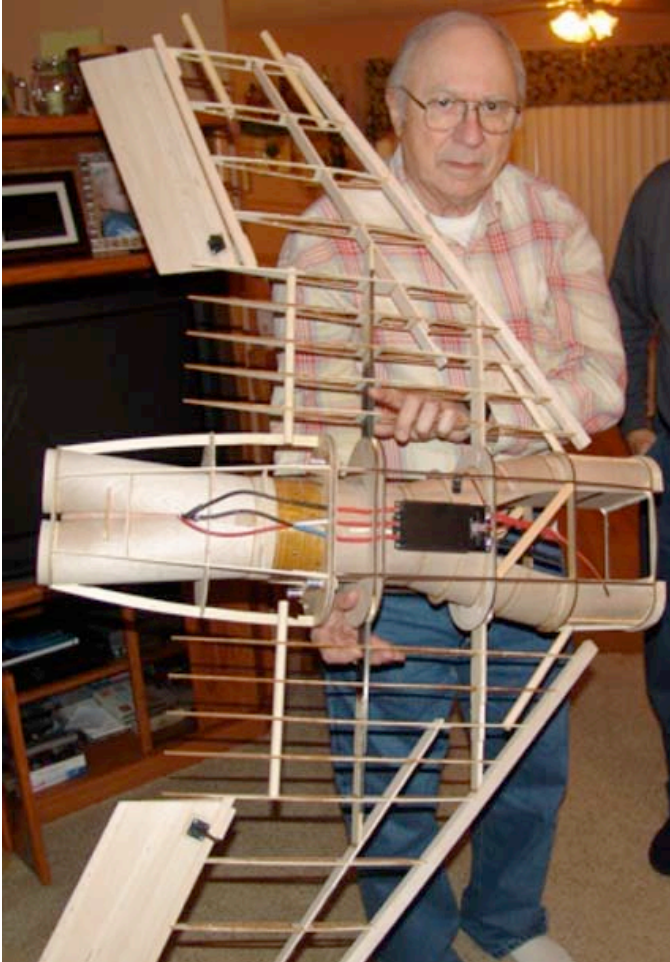
He also brought along plans for a new micro racer to use the AR6400 system from Spektrum. It should be a fun indoor and outdoor flier.



Gotta love Jim's plans!

Tom Bacsanyi has his Cutlass well underway. Note the 200 amp ESC! He shared the motor, ductwork and fan with us, as well as construction to this point. It is going to be a MONSTER with monster power. It uses a Neu motor with homemade fan and ducting. The work is brilliant.

Because the plane sets at such a high angle of attack, Tom is also designing a two-position nose gear. In the takeoff stance, it will be in the 'high' position, and to help keep it on the ground when landing, the nose gear will be in the 'low' position.



Full size Cutlass so you can see where Tom is headed!

Ken Myers shared a very, very rough version of a Power Point presentation on the basics of electric powered flying today. He was preparing the presentation for a Monroe Cloudbusters meeting. The members gave him excellent feedback and input to make it much better.

Ken finally broke out the chips, dips and cookies and the usual, and best part of the meeting, got started, BSing in groups. Everyone learns a lot as very informal discussion groups form and reform through the rest of the evening.

The EFO would like to invite anyone in the area to come and visit our meetings. The next one is on Wednesday, January 12, 7:30 p.m. at Ken Myers's house. Ya'all come now.

More Photos from the EFO Spring and Summer Flying Meetings

The weather for the 2010 RC flying season in southeastern Michigan was not good. We were plagued with high winds, rain and scorching summer heat, but we still had a great time.

The May flying meeting was held at the Midwest RC Society field on the 10th. The weather cooperated nicely. Ah, to have that weather again, tomorrow!



It was the 27th of June before we could meet at the field for the June meeting.



Denny Sumner has out his new Spitfire. It is a fantastic flier.



Paul Sockow's 1/4-scale Clipped wing Cub got a lot of airtime this year. This was one of its first visits to the field.



We took full advantage of the nice day.

With the 2010 Mid-Am fast approaching, many of us took advantage of the nice weather again on the evening of July 2.



Jim Young's Gloster Meteor Ready for Maiden



Keith and Jim prep the plane for its initial flight



We had several unexpected visitors that evening. Yep, that's one of three hot air balloons that landed there that evening.

Jim's maiden was very successful. We all had a great time, and it was a wonderful summer evening in Michigan!

This is the link to the maiden takeoff:
<http://homepage.mac.com/kmyersefo/ampjan11/Gloster Meteor Maiden.MPG>

The June Keith Shaw Birthday Fly-IN

The Balsa Butchers of Coldwater, Mi, with Dave Grife as the CD, hold this fly-in every year near the beginning of June to celebrate Keith's Birthday and electric flight!

Michigan's weather was not very cooperative for this year's event. While it was overcast all day

on Saturday, the winds cooperated and there was a lot of flying until about 2:00. Then the rains came!

Sunday was very windy. But it was all worth it. It is always a great event with great, great people and planes.



The Subaru outback is loaded with planes and all our gear for the weekend. Chris and I LOVE this event! Note the two-tier storage.



Jim Young had his fleet of Golden Age planes there, including the newly completed prototype of his WACO YMF-5, which was built by Mark Woods.



I had my Stearman there, and Mark and I sat them side-by-side for some photos.



The maiden of the WACO went very well and Mark stated that it was a joy to fly.



We are already looking forward to the event this year! It should be the weekend of June 4th and 5th. Watch for the event notice in upcoming *Ampeers*.

I've finally caught up with our summer photos. It was a great year, in a lot of ways. This section of the hobby continued to grow, and it is still a lot of fun for us all.

Keith Shaw keeps me going and on my toes. He's a great friend and great person to spend a lot of time with! The following photo of us is one of my favorites from this past summer! That is us admiring Jim Young's Wedell-Williams.



The Power Meter

By Ken Myers

*When I previewed this information at the December EFO meeting, everyone one nodded and agreed that this is an **essential** first purchase. Get one ASAP if you don't have one! Learn how to use it. KM*

The very first item to purchase when getting into electric power should be a power meter. It is also known as a wattmeter and Whattmeter (Astro Flight brand and first in RC the market). It is connected between the battery pack and electronic speed control (ESC) and displays the volts at the input of the ESC, amps drawn by the power system, energy delivered over time (Ah - amp hour or mAh - milliamp hour) and the watts input at the ESC.

Watts equals volts times amps. $W=V*A$

The purpose of the power meter is to provide the actual information about the power system (battery, ESC, motor & prop). The information provided by the meter allows the user to adjust the prop (load) so that all parts of the power system are within a safe operating range.

The meter is ALWAYS used at full throttle. Partial throttle readings mean nothing. A power meter measures watts in (power in), not watts out (power out)!

The Power Meter by E-flite is NOT RECOMMENDED. It does not display all of the essential information on one screen.



Progressive RC PowerLog 6S

This meter also includes an optical tachometer and has the ability to log data to a file on a computer. It also has a 'Hold' button to keep the information onscreen.

Source:

http://www.progressiverc.com/index.php?page=shop.product_details&flypage=flypage.tpl&product_id=135&category_id=12&option=com_virtuemart&Itemid=1

Other Meters:

I high recommend the **Hyperion Emeter 2** even though it is quite expensive. Source:

<http://www.allerc.com/hyperion-emeter-version-2-and-rdu-set-p-4323.html>



Watt's Up Meter

A very popular power meter is the Watt's Up meter. It is available from Powerwerx and other online sources. <http://www.powerwerx.com/tools-meters/watts-up-meter-dc-inline.html>

Upcoming E-vents

December 27, Monday, Skymasters' Christmas Weekend Indoor Flying Session! Ultimate Soccer Arena, 867 South Blvd, Pontiac, MI. 4 p.m. to 8 p.m. \$15 for the day Spectators are free! Additional information is

<http://www.skymasters.org/events/indoor/>

January 12, Wednesday EFO monthly meeting at Ken Myers's house. 7:30 p.m. Everyone is welcome!

Power Meters (cont. from page 9)

The P1 and an identical meter from Hobby King have a handy 'hold' button: Sources:

<http://www.hobbypartz.com/88e-aepm300-p1-watt-meter.html>

and

http://www.hobbyking.com/hobbyking/store/uh_viewItem.asp?idProduct=10349

BP Hobbies has several choices:

<http://www.bphobbies.com/view.asp?id=A0320107>

Other power meters can be found online at Tower Hobbies and additional sources.

<http://www.towerhobbies.com>

How to use a power meter:

Manual for the Watts Up meter that may be applied to all types and is found on the PowerWerx site.

<http://www.powerwerx.com/techdata/Watts-UP-V2.pdf>

Power Meter Videos:

Video 1: Hobby King Meter – similar Watt's Up

<http://www.youtube.com/watch?v=kfs4Bs3H7gw>

Video 2: Watts' Up meter

http://www.youtube.com/watch?v=_tjEJmq1aB0

Video 3: TME Xtrema as wattmeter

<http://www.youtube.com/watch?v=PiCyDSMOySw>



The Ampeer/Ken Myers

1911 Bradshaw Ct.

Commerce Twp., MI 48390

<http://homepage.mac.com/kmyersefo>

The Next Monthly Meeting:

Date: Wednesday, January 12, 2010 **Time:** 7:30 p.m.

Place: Ken Myers's House (see above)