

the

Ampeer

April The EFO Officers 2006

Table with 3 columns: President (Ken Myers), Vice-President (Richard Utkan), Secretary/Treasurer (Rick Sawicki), Board of Director (David Stacer), Board of Director (Jack Lemon), Ampeer Editor (Ken Myers).

Ampeer subscriptions are \$10 a year US & Canada and \$17 a year worldwide. The Next Meeting: Date: Saturday, April 15 Time: 10:00 a.m. Place: Midwest RC 5 Mi. Rd. Flying Field, Northville Twp. MI

What's In This Issue: A Couple of Observations - Ampeer Reader Feedback Wanted - Feedback from Adding a Balance Connector - Upcoming Battle Creek E-Fly Info - Some "Real World" Li-Po Experience - Keith Shaw's Birthday Electric Fly Info - Chispas Li-Po Beeper - Student Flyers e-Books & Mini Review - More on the "Best Wire Bender" - Multipurpose Tiger Moth and More - Low Cell Detect Circuit (LCDC) For Li-Poly Batteries - Upcoming April EFO Flying Meeting - Drive Calculator 3.0 Beta 4 Released - Upcoming Events

A Couple of Observations and Questions From Ken Myers

The February 2006 Model Aviation had a couple of articles that I found "interesting". I gave the guys attending the February meeting a homework assignment. I asked them to read through the article "Fiberglassing the Wing Center-Section", p.41 - p.43 and then read "Plane Talk: Great Planes Matt Chapman CAP 580 46 ARF", p.66 - p.74, paying particular attention to what it says about the wing assembly of the CAP in the second column near the top of p.71. Never having put together an ARF, I was at a loss to explain why the wing on such an over-weight plane (my opinion) would be assembled in such a way. I still don't understand it.

I also could not understand why the CAP's completed airframe weighs so much. It is said to have 562 sq.in. of wing area. I have this review and another review of this same plane, and back-figuring the airframe weight from the two articles, I come up with a completed airframe weight of about 75

ounces from both examples. That is more than twice as heavy as my slightly larger (569 sq.in.) Fusion. The Fusion's completed airframe weighs about 33 ounces.

I know that glow airframes tend to come out heavy, but not usually more than twice as heavy as one designed for electric propulsion. No wonder the author of the MA review said, "It excels at snap and tumbling maneuvers."

As an afterthought, I checked out the Stevens AeroModel CAP 232 (.40e). It is just a little smaller (550 sq.in.) and has a ready to fly weight of 45 ounces. Doing a very quick and dirty back-figure on this plane gives a completed airframe weight of about 22 - 25 ounces.

I am wondering outloud if any of the Ampeer readers might have some idea why the wing construction on the Matt Chapman CAP ARF is acceptable, and what is making the completed airframe weight of the Matt Chapman CAP so heavy, in my opinion?

Ampeer Reader Feedback Wanted

There are a couple of topics that I

would like to get some feedback from *Ampeer* readers about.

The first topic is vendor service. I would like your input about vendor service, good, bad and thoughts. I want to put together an article on this topic. I will keep your name anonymous, but I would like some honest feedback. This idea comes from several emails that I have received recently about some "big name" vendors that seem to be having some problems with shipping out what is supposedly in stock.

Secondly, I just read a review of a highly advertised "primary trainer" with the following specs:
Wing area: 627 sq.in.
Reviewed weight: 7 lbs. (112 oz.)
Wing loading: 25.7 oz./sq.ft.
Cubic wing loading: 12.3 oz./cu.ft.
Stall speed: 18.8 mph

According to my CWL chart, this type of plane would be an advanced trainer bordering on expert, not a primary trainer type. What do you think? Would you want to train a new RC pilot with it?

Feedback from last month's: Adding a Balance Connector to a Li-Poly Battery Pack
From Camille Goudeseune cog@uiuc.edu

Great article on adding taps to packs! (*Our thanks go to Jim Yuzwalk for providing that for us. KM*)

One more warning for soldering: besides "sharp" and "hot" objects being dangerous, so are conductive objects. Keep things like knife blades and soldering irons away from the contacts or bare wires. Don't short-circuit a cell with your knife! (Stripping only one wire at a time as the article suggests reduces this risk, of course.)

I'm happy to hear of the winter fun this ship's (*Air Hog Bipe KM*) providing to so many "advanced" modelers! (*Um, advanced? How? ☺ KM*)

I won't criticize your diving out of the way of this harmless airplane. (*Saw the video huh? KM*) Keep the instinct sharp, flying models are dangerous!

A note to Robert who commented on his Air Hog bipe in the last issue: Robert, don't bother sanding off the raised bumps. They don't add noticeable drag at such slow airspeeds. From my upcoming May 2006 *Quiet Flyer* column you might even extrapolate that turbulence from the bumps makes it "easier" to fly.

I still maintain that if you're going to improve its performance, the smallest worthwhile step is replacing the entire airframe.

Aeroacemods.com actually contacted me about their wheels and lights. I'm knee-deep in projects, so I didn't splurge on them yet. But I did offer to write them up and shoot good photos if he sent me some.

Camille

Thanks for expanding on the safety issues involved in adding the TP connector taps.

Keith Shaw has replaced the AeroAce bipe airframe with that of an airfoiled flying wing with just the right amount of reflex. He says that it flies well, and thinks very highly of the engineering or the electronics. KM

**BATTLE CREEK BALSA BEES
3RD ANNUAL
OPEN ELECTRIC FLY**

Saturday, AUGUST 26th, 2006

Pilot's Fee \$5.00 INCLUDES Hot Dog Lunch
Proof of AMA Membership is required for pilots

Pilots briefing 9:00 a.m.

Tx impound w/controlled flying until 5 p.m.

Spectators are welcome and entry to the field is free.

The BALSA BEES flying site is located SOUTH OF I-94 EXIT 100 (Beadle Lake Road) approx. 5 1/2 miles to D Drive South, then WEST approx. 3/4 mile. Follow Beadle Lake Road past Beadle Lake, Harper Creek High School, Binder Park Zoo. WATCH FOR THE SIGNS!!! Cell phone help will be 269-275-9272.

Modern Porta-Potti available, no running water.
Cold soft drinks and water will be available.

Contact Event Chair at 269-979-9272,
or email at NSCALENUTS@AOL.COM

More on the "New" Charger Supplied With the EasyStar

From Dave Petre djpetre@comcast.net

I redid my review of the great electric trainer, the Multiplex EasyStar, in the February 2006 issue of the Ampeer and noted that it is now supplied with a much better charger. Dave sent me an email with more information about the "new" charger. KM

I have the exact same charger that you picture as the supplied charger for the EasyStar RTF. Here is what I can tell you about it.

There is no on/off switch. It has a 10 amp automotive fuse to protect the charger from being connected to the battery with reversed polarity. It is pretty goof proof with automatic peak detection.

I've had mine for about four years and it still is working fine. I've abused it by charging 8 cell, 1700mAh NiCads most all the time, even though it's only recommended for up to seven cells. That is the charger that I got for my first electric; a Zagi 400X. I flew with three battery packs and that was my only charger for over two years. The only thing that has gone wrong with the charger is one of the three LEDs has quit working. The three LEDs are labeled power, tric, and quick. The power LED has quit working. It's not a big problem since as soon as you connect a battery, the tric LED comes on. It will trickle charge like that for as long as you leave it. You have to set the slide switch to your selected charge rate and push the start button to start the fast (quick LED) charge. It peak detects and drops back to trickle when it reaches full charge.

I think that Multiplex has chosen a charger that will work well for a beginner and still be used when they are more experienced.

Thanks Dave. I talked with Keith Shaw recently and he had purchased the EasyStar RTF for his nephew. He told me that his nephew learned to fly the EasyStar very easily and that he has now recommended the Hitec Space Scooter for his nephew's second plane. This is an absolutely excellent way for anyone to get into this great hobby. KM

Some "Real World" Li-Po Experience

From Dick Corby info@altacom.us

Hi Ken:

Just read the latest Ampeer (*January 2006 issue KM*) and the Li-Po thing was interesting and surprising to me.

I have 4 Li-Po packs - Kokam 3S-1P 2000 mAh packs that I have been flying for nearly 2 years now, and they fly my planes for the same amount of time as when new. I use them on my Viking, my EP Superstar, my Aero Princes, my (Ex) Mini Funtana and a couple of other planes that have bitten the dust.

To be honest, I couldn't estimate the number of flights on these packs, but I have done a lot of flying the last 2 years and these 4 packs are usually all used every flying day, sometimes more than once. They always charge right up to the same voltage after being used. They hold their charge from one flying session and are ready the next time. I usually bring them home run down and charge at home then store them till next flying day.

My son-in-law, on the other hand, had 3 of the same packs he bought a little over a year ago. One of them just died (1 cell became a sausage) while he was charging last week, and the other 2 are really weak, and will only fly a plane for about half the time as my packs. He has used them in only 2 aircraft, his mini-Funtana and Mini Edge for maybe a total of 50-60 flights per pack.

The same manufacturer produces them, same rated cells, and pretty much same usage, there must be something different.

The only difference is that I use the Astro Flight 109 Charger, and it is the only charger that has charged any of my packs. My son-in-law is using a \$49.00 charger that can charge NiCads, NIMH and Li-Po's using a switch on the box. I won't mention the brand name, but you see a lot of them at the flying field. He only flies electric as an aside to his big gas planes, so feels that he need not invest in a good charger.

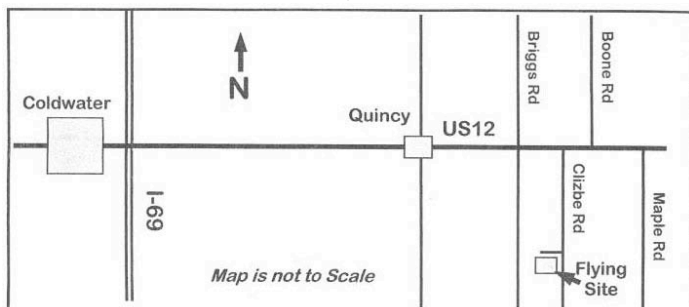
This may not even be relevant, but is my experience with Li-Po's so far. They have done for me what they say they will do, and I'm really happy with the results. I can fly more given Electric planes, get longer flight times and for me the batteries are paying their way, even with the higher initial cost.

Dick Corby

Check out this site for some lab reports on Li-Po brands: <http://www.trextuning.com/lipos.htm> KM

**The Keith Shaw's Birthday Electric Fly
June 3 - 4**

Quincey, MI near Coldwater, MI, see map.
Dave Grife CD, 517-279-8445.



Chispas Li-Po Beeper

From Paulo "Chispas" Faustino chispas@sapo.pt

Dear Ken,

I have been very busy with my Horten flying wing with motor and new projects, a Projeti, F-27 Stryker and a Piper Cub Clipped Wing. Along with this my almost 4 years old 3000 NiMH batteries are dying on me and I had to face the choice of purchasing new 3700 NiMH cells or Li-Po packs.

Along the purchase of Li-Po packs I purchased a fancy and smart, but not too expensive, charger for Li-Po batteries. As we all know the Li-Po batteries need to be dealt with with care. This led me to the point I bring to you; should change to new ESC's for Li-Pos, more than 10 for all my planes, or should I figure a way to make my old ESC's to work with Li-Pos?

As I don't want the ESC to stop the motor when the voltage of the Li-Po battery goes down to 3 Volts per cell, forcing me to land unexpectedly, I designed an Alarm for Low Voltage Li-Pos so that I have time to plan the landing with power to go around again if needed.

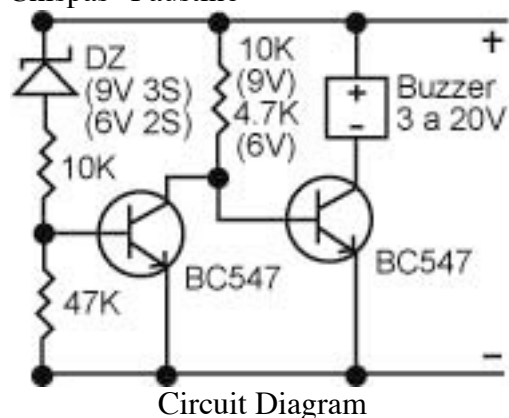
The unit is built with common components available at any electronic parts shop. The red dot is an LED to indicate "Power On" and the switch on the central position doesn't let the buzzer work. The switch also lets me chose between 2S and 3S batteries and if I use 4 or more cells in series, in my case 2x2S, I can put the alarm in any one of the batteries or use two alarms.

I am sending you the circuit diagram and photos in case you want to publish it on the EFO newsletter or build your own.

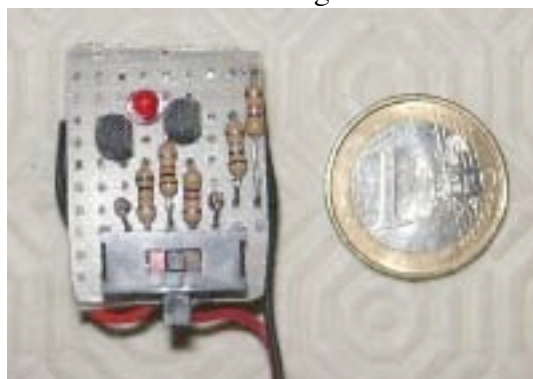
After I designed and tested my units I found similar ones at online shops.

Have good flights and smooth landings.

Paulo "Chispas" Faustino



Circuit Diagram



Circuit Board Bottom View



Circuit Board Top View - Buzzer

If any of you build Chispas Li-Po Beeper, he'd love to hear from you. KM

Student Flyers e-Book

From Colin Bedson cvbed@hotmail.com

I received the following email from Colin. KM

I believe "The Complete Beginners Guide to Flying Radio Control IC Powered Model Aircraft" and "The Complete Beginners Guide to Flying Radio Control Electric Model Aircraft" are the first e-Books specifically written to help people wanting to learn to fly fixed wing, glow powered or electric model aircraft.

There are numerous model supply companies, clubs and individuals offering articles and brief help notes for novice model flyers. The aim of these e-Books is to bring together all of the essential information required by the student pilot so that they have a complete resource to use during their training and to help their instructor cover all the essential subject matter.

The information and advice offered comes from my 30 or so years experience as a modeller. This covers a number of model types from gliders, both thermal and slope, club 20 and pylon racers, sport models and my all time favourite, competition scale modelling.

Much of this time was spent with one club where I held the post of competition and events secretary for a number of consecutive years. I also qualified through the BMFA as an instructor and examiner, and as a result was responsible for helping a good number of student pilots achieve their "wings".

"The Complete Beginners Guide to Flying Radio Control IC Powered Model Aircraft"
And

"The Complete Beginners Guide to Flying Radio Control Electric Model Aircraft"
Are priced at £4.99 each (approx US\$9).

Please visit our website www.rcfly.co.uk

I am receiving excellent response to my website and from those who have purchased my eBooks.
Colin Bedson

The Complete Beginners Guide to Flying Radio Control Electric Model Aircraft: An e-Book Mini-review
By Ken Myers

This e-Book is the perfect introduction for the person who would like to enter the exciting hobby/sport of learning to fly fixed-wing, electrically powered R/C aircraft. Colin's easygoing, familiar style welcomes the beginner with the right amount of accurate information and without the intimidation of too many technical details.

Part 1 includes sound advice about the essential considerations for the beginner:

- Where are you going to learn to fly your model?
- Who's going to teach you?
- What sort of model will you choose?

- How are you going to power it?
- What radio equipment will you choose to control it?

There are many illustrations and suggestions that continually point the beginner toward success.

Part 2, The Basics of Flight, informs without overwhelming the beginner with the essential information about "how airplanes fly" and the relevance of this information for the model aircraft pilot. It also includes how the controls on the model work and their flight effects. Good diagrams and descriptions give the beginning pilot a solid background.

Part 3, Model Preparation, includes typical; Motor Installation, Radio Installation, Control Linkages and Push Rods, Static Trimming, Wing Alignment, Balancing the Model, and Controls Familiarization.

Pictures, diagrams and well-written text lead the beginner through these basics.

Part 4, At the Field includes; Final Checks on the aircraft and radio system including setting up the receiver failsafe, Taxiing Trials (for ROG models), What to expect on The First Flight, What to expect on Your First Flight, Some Basic Maneuvres, Circuits, Rectangular Circuits, Procedure Turns, Figures of Eight, Take Off, Landing, Simple Aerobatics, and Motor Off or Dead Stick Landing.

All of the flying sequences are excellently illustrated. The use of a Flight Simulator and a summary are also included in this section.

Part 5, Resources, includes; notes on Additional Equipment, a Pre-Flight Check List, Propeller Safety, Knowing Your Electric Motor System, Batteries & Battery Care, Some Beginners Tips, a Model Aircraft: Glossary, a Model Aircraft Motors: Glossary, a Radio Control Systems: Glossary and Some Useful Websites.

This e-Book gives the beginner an excellent overall view of what will be happening at the various stages when entering this hobby and a firm foundation of the basics. I recommend it for every beginner. It would be a good idea for instructors to recommend this e-Book to their students as well.

More on the "Best Wire Bender"

From Tony Ives tony_ives@yahoo.com

Hi Ken,

Got to agree with you that the bending tool you bought is the best ever. I have the same make and have been using it for at least the past 20 years. I lost the wing nut and original bolt, so I made a new bolt with nut as the clamp. I've attached an article I had published in the UK magazine Aviation Modeller International a while back based on an idea I came up with for bending identical items. Thought it might be of interest. *(You can write to Tony and see if he might share it with you. In the US, you can get this bender from Hobby Lobby. They call it "Best Wire Bender". It is part number HLH704 and sells for \$25.90. KM)*

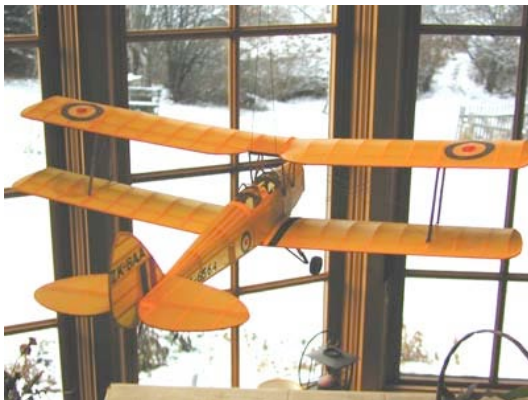


Also, perhaps you can help me on something. I am building a Northrop XB35 flying wing powered by 4 X speed 400/480 motors and was wondering whether I can use 2 off Kontronics controllers running off the same battery pack and RX? Just trying to save having to buy a new bigger one.

Keep up the good work and have a good New Year.

Regards,
Tony Ives

Thanks for your feedback on the bender Tony. I found your article very helpful! I don't have the answer to your question, so I am asking the Ampeer readers if they might be able to help you with your question? What do you think folks? KM



Multipurpose Tiger Moth and More
From Dick Adams rradams@charter.net

I'm the guy from the western end of the U.P. (*U.P. is what we call the upper peninsula of Michigan. We also call it "God's Country". KM*) Here are some shots of my latest electric project, which is also my smallest. It's a Tern Aero Tiger Moth (the rubber FF kit from the '70's) that is about to take its first indoor test flight with the Plantraco equipment on board. It has a 17" Wingspan and AUW (all up weight) of 31 grams with a 7 mm Atomic SS pager motor and a 145mAh Li-Poly cell on board.



I have the motor, radio, and actuators on a stick that takes the place of the rubber motor (see photo). The linkages can pop off the actuators and be parked inside the fuselage and a rubber motor put back in with its nylon thrust-bearing nose. So it's "dual platform." If you are interested, I will send some better, completed photos and a flight report.

Thanks,
Dick

And the follow-up:

The Moth is still in evolution. I have had one successful, but marginal, flight at my local gym. The problem appears to be the Plantraco radio, in that even though they advertise that their ESC can handle 2 amps, it cannot handle the bigger 7 mm pager motor I used without browning out, even though it was drawing but 500-600mAh. I suspect that to make this system the 0.9-gram wonder that it is, they had to sacrifice a top-drawer voltage stabilizing system.

I am now experimenting with the 2 gram Bob Selman JMP receiver and waiting for the Plantraco factory to check out my equipment, just in case the

problem was a production problem and not a design problem.



The JMP Rx is being test flown in my Hangar Rat with different motor/gearbox/prop/battery combos and has been rock solid so far. As I am having a lot of fun flying my Hangar Rat, I won't make the switch to the Moth until I get the Plantraco equipment back from the factory and rule it in or rule it out for the Moth. I suspect the JMP will be transferred to the heavier Moth and the Plantraco will go on my Hangar Rat with a milder wind 7mm battery and a 4:1 box with at GWS 5x3 prop.

I have found a great single Li-Poly 130mAh capacity cell that is capable of high discharge applications and is outperforming the gold standard Kokam 145 by an easy 2:1 ratio. For your readers who play with electrics this small and are looking for a higher discharge battery I strongly recommend the Atomic Ultra High Discharge battery. It's available here: <http://www.atomicworkshop.co.uk/index.htm>

It's been a fun and challenging winter as I explored indoor R/C for the first time. It has combated "Big Snow Country" cabin fever here in the Western U.P.!

I'll attach some photos of the dual platform Tern Tiger Moth and of what I have dubbed the "R/C-3 Hangar Rat." Can you guess where the "C-3" comes from? :)

TTYL,
Dick

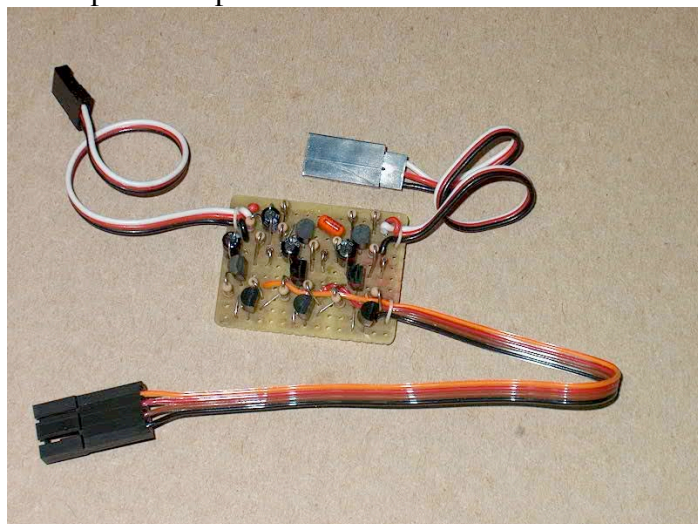
Thanks Dick. Pretty interesting stuff. Ken the Troll.

Low Cell Detect Circuit (LCDC) For Li-Poly Batteries

By Bob Kopski
25 W. End Dr.
Lansdale, PA 19446

In the 02/06 and 03/06 *Ampeer* I described some of my frustrations with Li-Poly (lithium polymer) cells. I had spent big money on them and got little in return. In particular, I described how some costly 3.2 AH and 2.0 AH "high rate" packs were "not so good" from the start and then seemed to quickly get worse ("die on the shelf") thereafter. In contrast, I also described some other (brand) packs that were doing well at the start and ever since. (I bought more of these!)

These experiences caused me to "dig deeper" into the poor pack behavior and last month I included some graphs of cell behavior within a 3 cell 3.2 AH, "not so good" pack. The data showed that the individual cells were not discharging evenly - even after the pack was "balanced". Such uneven behavior could easily lead to a cell being damaged by over-discharge. This suggested that in-flight monitoring of each cell within a pack and stopping further discharge when the first cell "went down" would make a lot of sense. Since I have dual hobbies of aero modeling and electronics I felt I could use the latter to accomplish this protective task.



A photo shows a circuit assembly (LCDC) designed to do this task for a 3 cell Li-Po pack. This is a 0.6 oz assembly that I have exercised vigorously on the bench and also have flown. It is constructed with discrete ("thru-hole") components on some standard pc hole board. While it's not of the smallest

possible circuit construction, it is very big on performance!

In operation, the LCDC is connected in-line with the Rx-to-ESC cable, and also to a pack's "balancing connector". The latter makes connection with each individual cell within a pack. As installed, the LCDC faithfully passes the Rx-to-ESC throttle pulses. This is the case if all the cells in the motor pack are a little above 3 volts - my normal choice of ESC cutoff voltage on a pack basis.

While the LCDC is ordinarily "transparent" to throttle operation, as any cell within the pack drops to the "detect" level (about 3 volts), the LCDC becomes influential. It begins to narrow the throttle pulses that are present i.e., it begins to automatically retard throttle no matter the throttle setting. This in turn lowers current drain and stops further decline of the cell that is low and causing the "detect" operation in the first place. At the same time the LCDC allows full throttle control from "OFF" up to the retarded level, i.e., it does not stop the operator from exercising at least some "remote control".

LCDC action is illustrated in the accompanying graphic. This is actual cell-by-cell voltage and battery current data as acquired during a bench run of this installation. The pack is the same 3-cell, 3.2 AH "high rate" pack used in last month's graphic - it has

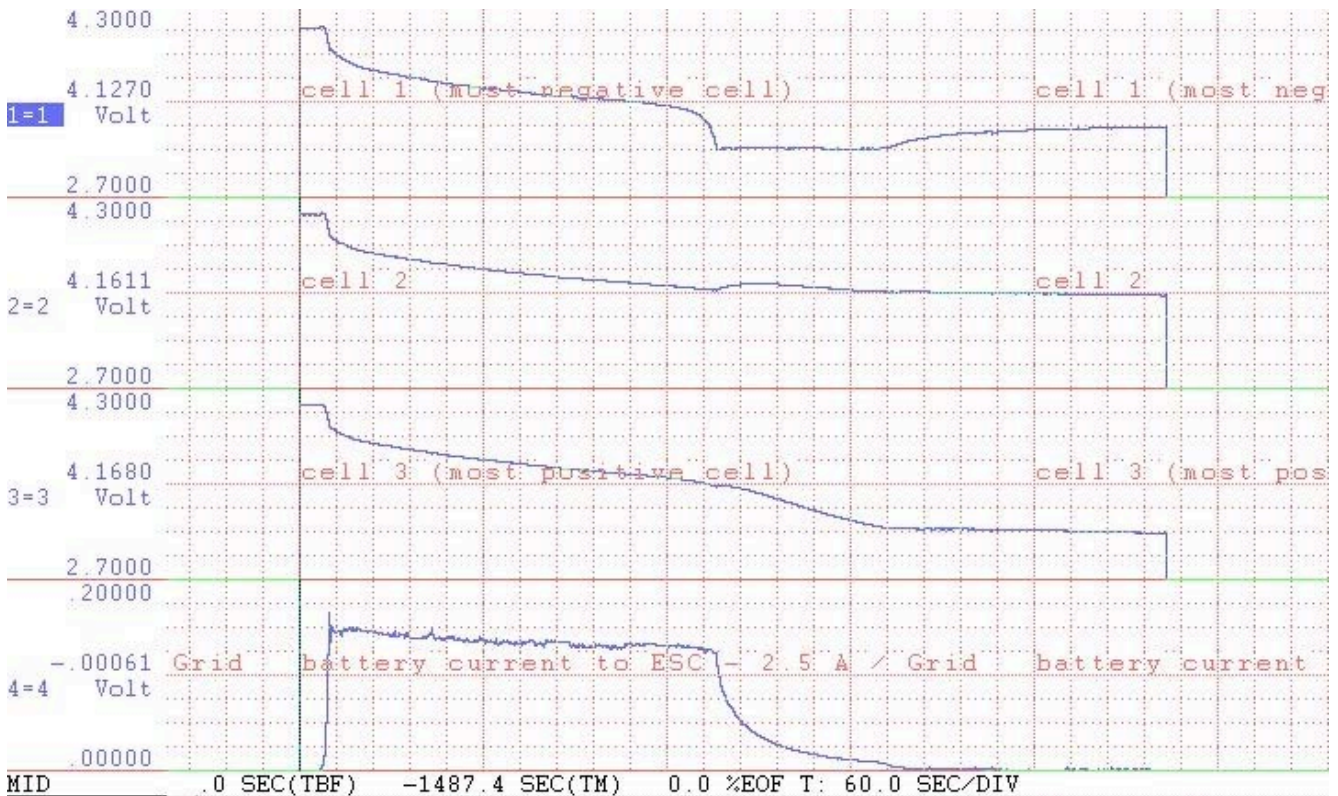
known "bad behavior".

The top three curves are the cell voltages as recorded during the rundown of the fully charged pack. Partial throttle was set for a 15-amp initial current and then left in that (stick) position thereafter. This was intended to approximate the average in-flight current drain for this plane. The fourth (bottom) curve displays this current throughout the run. Its scale is 2.5 amps per grid.

In this pack cell #1 (top trace) is clearly the first of the three to approach the 3.1-volt "detect" level. At this point the current (see graph four) begins to drop because the LCDC begins to automatically retard throttle - the stick has not been moved. In effect the LCDC has suddenly "appeared" out of "transparency" and has formed a closed loop control system along with the battery, ESC, and motor.

It is clear that the power system operation is now moderated and that cell #1 voltage is holding steady near the 3.1 volt level. It is protected from killing itself - even if one attempts to increase throttle stick. At the same time there is plenty of in-air warning and no problem in setting up the plane for landing. This is much the same as with an ordinary decaying battery, or with the (smooth) low cutoff of an ESC.

If the system is allowed to continue running during the declining current period, another cell



would eventually drop to the “detect” level and even further retard throttle. This is evident in curve 3 (cell #3). You can also see the effect (a small step down) in the current curve. In fact, this data shows that now cell #3 is calling the shots - it’s further driving down throttle and current so that in this case cell #1 - with lowered overall system drain - is actually drifting up in voltage!

So far, I’ve completed 3 LCDC’s and exercised them all on the bench over 4 different systems (4 planes) using two different batteries, and all seem to work well. Because of the prevailing weather conditions I’ve only been able fly one system and it worked in the air as it did on the bench. As I write this I’m building two more circuits for friends to try out.

Summarizing, present practice uses the low voltage cutoff feature of contemporary ESC’s to prevent the Li-Po pack voltage from being driven too low and damaging the battery. However, this level of protection is often inadequate because there can be some cell within a pack that goes below the magic number of 2.5 volts while the overall pack voltage is still higher than “cutoff“. The LCDC is intended to better protect costly Li-Po packs by watching individual cell voltages and reacting to the first signs of low voltage at the cell level. I feel that the best that can be done with present Li-Po technology is to combine individual cell discharge oversight with a cell balancing method of charging.

As such, I fully expect to see cell-level discharge-monitoring (LCDC-like) products explode on the market in the coming year - not unlike pack “balancing” stuff is doing now. One compact (but less likely) way for this to happen would be to combine this function with that of an ESC, i.e., build into an ESC the LCDC idea instead of the familiar but obsolescence-bound pack “cutoff” one.

Whatever, today’s Li-Po cells, a still-young technology, simply need too much “care and feeding” - in an increasingly “band aid” manner. I feel that eventually a maturing technology will bring the ULTIMATE answer to Li-Po SAFETY and LONG LIFE - packs with protective electronics built in. At least, I hope so!

In the meantime, I really do enjoy technical challenges like this and the convergence of my two hobbies. HEY - this is how R/C itself got started so many decades ago!

Thanks again for you input Bob. It certainly appears that Fred Marks of FMAdirect.com is trying to do this with his BalancePro HD system that includes tapped cells, a Charge Protection Module and a Discharge Protection Module (DPM). While not exactly the same principle as Bob’s LCDC, Fred’s DPM prevents BalancePro HD battery packs from over discharging by monitoring individual cells in the pack, and providing a warning when voltage gets low. KM

Upcoming April EFO Flying Meeting

The April EFO meeting is the first flying meeting of the year. It will be at 10:00 a.m. on Saturday, April 15 at the Midwest RC Society 5 Mile Rd. flying field. The field is located on 5 Mile Rd. between Ridge Rd. and Naiper Rd. in Northville Township and is just west of the city of Plymouth, MI. You MUST have your 2006 AMA card. If you do not have it with you, you MAY NOT FLY. Sorry, but saying you have it won’t do.

As usual, it will depend on the weather! If the weather is bad, we will have our next meeting in May. It is possible that the field may be too wet to drive on this early in the year, so be prepared to carry some of your planes and gear to the flight line. I plan to be there early, but please, no one drive onto the parking area until I have checked it out. This is very important! We don’t want to lose our welcome! EFO members and friends are welcome. See you then, Ken.

Drive Calculator 3.0 Beta 4 Released

Christian Persson has released a beta version of Drive Calculator. It is now an application that runs on Windows or the Mac operating system. It is available at www.drivecalc.de. This is a Freeware program is for figuring out the possible performance of a chosen electric motor, gearbox, ESC, battery and prop combination. It appears to be reasonably accurate and is very easy to use.

The units used on the application screen are metric system values, but right clicking the value brings up the Imperial/English units. Rolling the mouse over a questionable term provides definitions. A popup window on the mouse rollover provides the term’s definition. Try it, you just might like it, I know that I do.

Upcoming E-vents 2006**April**

7, 8 & 9 Weak Signals 52 Annual RC Expo, Toledo, OH, info at www.toledoshow.com

May

4-7, Southeast Electric Flight Festival Hosted by the Fayette Flyers of Georgia, Andersonville, GA, info at www.hodgeshobbies.com

5-7 Silent Electric Flyers of San Diego Midwinter Electric Fly-in, info at <http://sefsd.org/>

20 All Electric Fly, Midland R/C Modelers Club, MRCMC Field, 200 Patterson Rd., Midland, MI Paved & Grass runway, no landing fee, Free camping w/electrical outlets, TX impound, AMA Members Only, Lunch Available, 10 a.m. Pilot meeting, John R. Hoovener, SR. CD, 989-832-2785 or Jerry Hanfeld 989-631-1168, www.midlandrc.org

21 Kishwaukee RC Flyers of DeKalb, Illinois 3rd Annual Electric Fly-in on May 21, 2006. Information at <http://www.kishwaukeeercflyers.org/>

Spectators are always welcome at our event. Lunch will be available on-site, and is free for registered pilots.

June

June 3 - 4 The Keith Shaw's Birthday Electric Fly, Quincey, MI near Coldwater, MI, Dave Grife CD, 517-279-8445.

July

9-10 Mid-America Electric Flies, Midwest RC Society Flying Field on 5 Mile Rd. west of Ridge Rd., just west of Plymouth, MI CD's Keith Shaw & Ken Myers

August

26 Saturday BATTLE CREEK Balsa Bees 3RD ANNUAL OPEN ELECTRIC FLY, Contact Event Chair at 269-979-9272, or email at NSCALENUTS@AOL.COM, Cell phone help will be 269-275-9272.

Please get event info to Ken Myers ASAP for the 2006 E-vents



The Ampeer/Ken Myers

5256 Wildcat

Crosswell, MI 48422

<http://members.aol.com/kmyersefo>

The Next Flying Meeting:

Date: Saturday, April 15 **Time:** 10:00 a.m.

Place: Midwest RC Society 5 Mile Rd. Flying Field,
Between Ridge & Naiper Roads