

the

Ampeer

June		The EFO Officers		2005	
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Ampeer subscriptions are \$10 a year US & Canada and \$17 a year worldwide		The Next Meeting: Date: Saturday, June 11 Time: 10:00 a.m. Place: Midwest RC Society 5 Mi. Rd. Flying Field			

What's In This Issue:
 A Quiet Storm – Upcoming Keith Shaw Birthday Party Electric Fun Fly - April EFO Meeting - Thoughts from Rich Flinchbaugh - Higher efficiency Can Motors - An Open Letter to the AMA on Bob Kopski's "Retirement" - A Further Update on the Alfa Models Corsair Review – Upcoming Mid-America Electric Flies Info - Li-Poly versus NiMH – Upcoming E-vents

A Quiet Storm
By Ken Myers

The Fliton "Quiet Storm" ARF was reviewed by Dave Keough in the May 2005 *Fly RC* p.54 and by John Glezellis in the April 2005 issue of *Quiet Flyer* p.28.

Once again I found extremely poor editing in the articles by both magazines. I do not feel that the reader should have to "fill in the blanks" of an article appearing in a major national magazine.

The first problem was weight and wing loading. It should be easy enough to weigh a finished aircraft and determine the wing loading, but it seems that it is not!

Fly RC p.55, "Flying Weight: 16.5 oz. (without Apogee 3S 1570mAh)". That's a neat trick. Every time that I've gone flying my electrically powered models, I've had to have a battery onboard to supply power to the motor.

QF p.31, "Model Weight without Battery: 22.4 oz." I did find the almost 6 oz. difference interesting. At least *QF* gave a RTF weight on p.31, "Weight RTF: 1 lb, 9 oz (25 oz)". Unfortunately,

the reviewer in *QF* used two different battery packs, and the weight difference of the two was not noted.

To find out the weights of the various Apogee packs used, I had to go the Internet, as they were not mentioned in either article. First, I went to the PFM Distribution site, as they are the distributor for Apogee batteries. Unfortunately, there are NO battery weights listed on their Web site! How helpful. ☹ I then Goolged and found the Robot Market Place where they gave the following weights for the 3S1P Apogee Li-Poly packs; 1660mAh – 4.23 oz, 1570mAh – 3.82 oz, 1050mAh – 2.61 oz.

The *Fly RC* reviewer used the 1570mAh pack bringing the RTF weight to 20.32 oz, or probably just a little over that. *Fly RC* p.55 "Wing area: 328 sq. in." That works out to 8.92 oz./sq. ft. *Fly RC* p.55 "Wing Loading: 7.3 oz./sq. ft.". Someone there can't do the math.

The *QF* review plane has a RTF weight of 25.01 oz with the 1050mAh pack and 26.63 oz with the 1660mAh pack using the battery weights from above. *QF* did give the RTF weight as

25 oz., therefore the single given weight was for the lighter battery. The interesting thing on p.31 of the *QF* review was “Wing Loading: 20 oz./sq ft”. *QF* also stated on p.31, “Total Wing Area: 354 sq in. (rounded)”.

What is the wing area of this plane? Again I had to go to the Internet to find out, since the reviews were in conflict with each other. The Fliton Web site gave the very useful 22.4 sq dm². ☹ What? Square decimeters squared? I assume they mean dm². That converts to 347.2 sq.in. Take your pick, *Fly RC*, *QF* or Fliton, what is the wing area? Has anyone actually measured it?

Using the *QF* wing area of 354 sq.in. and the two *QF* derived weights the wing loadings come to; 10.17 oz./sq.ft at 25 ounces and 10.83 oz./sq.ft. at 26.63 ounces. Neither one of the wing loadings is close to the 20 oz./sq.ft. stated by *QF*. If the *Fly RC* wing area is used, then the wing loading becomes even greater.

Explaining the Weight Difference

There is an unexplained weight difference between the two planes being reviewed. The *Fly RC* version is said to have weighed 16.5 oz. without motor battery while the *QF* version is said to have weighed 22.4 oz. without motor battery. That is a 5.9 ounce difference. That is significant on this size model. Certainly two ARFs of the identical airplane should be closer in weight.

I decided to figure the weights of the motor/gearbox and onboard RC equipment for each plane. Finding the weight of the Cobri gearbox used in the *Fly RC* review proved impossible, so I substituted a weight for a similar box made by Himax. After all was said and done, the *QF* reviewed plane only carried 0.25 ounces more. That meant that the finished airframe weight for the *Fly RC* version weighed about 10.33 oz. while the finished airframe weight of the *QF* example was about 15.97 ounces, still a 5.67 ounce difference. I have no idea whether two identical ARFs would have this much weight difference out of the box, but it seems highly unlikely.

What the authors said:

The following are quotes from John Glezellis in the *QF* review:

p.29 “The Fliton Quiet Storm sets a new standard in the world of park flyer airplanes.”

p.29 “If you do not mount the EZ Connector upside down, the aileron pushrod will be at an

extreme angle and will bind when the servo arm is forced to move at an angle.”

p.30 “The first production models were supplied with a landing gear that could break when the wheel pants were attached.”

p.30 “I had to slightly shorten the spar, as it was too long. Second, I also had to enlarge the opening in the wing where the spar is inserted, because the opening was not large enough to accept the thickness of the spar.”

p.30 “I needed to sand down the spar at each end (where it interlocks with the wing rib) so that the spar would fit into the wing panel.”

p.30 “I secured the cowling and belly pan in place using clear adhesive tape. After these components were taped in place, I used a Dremel® tool to open up cooling openings. Cooling is critical on all electric motors.”

p.30 “If you tape the hatch in place, you will need to use a strip of tape every time you want to fly the model. I just used four wood screws and made two light-ply hard points that install inside the fuselage so that the wood screws have something to thread into.”

p.30 “Note that this model will be somewhat tail-heavy side if built per the instructions and will require weight in the front of the model in order to properly balance.” (*You didn’t read that incorrectly. That is exactly what it says. KM*)

p.31 “When the model is slowed down to a stall, it will drop a wingtip (the left wingtip). Recovery is simple: You need to only reduce the elevator input and add power.”

p.31 On landing - “Also, to avoid stalling your model, do not use too much elevator control.”

In the *Fly RC* review, John Keough said the following.

p.54 “Fliton is building its brand with a focus on quality;...”

p.55 “This company’s goal is to produce a higher quality kit... and they’ve done it with the Quiet Storm.”

p.56 “You have to keep your speed up or it will stall without a huge amount of forewarning.”

p.56 “That said, fly this ship to the ground when coming in for a landing: she doesn’t float down like a trainer, but heck, that’s not what this kind of flying is all about.”

p.56 “The canopy and cowl can be installed with a very light clear tape. I used small rare earth magnets

from Radio Shack to hold the canopy and cowl to the fuselage...”

p.56 “Nothing is perfect; the plastic landing gear was fairly weak and cracked. This has been addressed by the manufacturer...”

p.56 “The Quiet Storm is a lightweight, robustly designed but nonetheless delicate airplane. Stating the obvious, I’d recommend that you be careful in how you handle and transport it.”

Unlike the *QF* review, Dave had very little to say about putting the ARF together. He did not note the wing joining problems experienced by John and simply said, “Assembly is straightforward.”

I’m sure that many of you think that I point out these inconsistencies and errors because I have something against these magazines or the reviewers. This is NOT true. I do not know either reviewer and have only a nodding acquaintance with the editors of both magazines. My plea to the magazines, all of our modeling magazines, is to please get someone to edit these articles for facts, grammar and useful information before you publish them!

Again, I note that I am responsible for the poorly reported facts, poor grammar and misinformation that have been in the *Ampeers* over all these years. I am only one person, and I try very hard to do the best that I can. I just wish that the professionals would try very hard as well.

References:

Fliton USA: www.fliton.com

PFM Distribution: www.pfmdistribution.com

The Robot Market Place:

www.robotcombat.com/marketplace_lipoly-ap.html

You are invited to attend the...

**"Keith Shaw Birthday Party Electric Fun Fly"
(Repeated Information)**

June 4 & 5, 2005

At the Balsa Butcher's Flying site in
Coldwater Michigan –
(see map)

Contest Director: Dave Grife - E-mail:
grifesd@yahoo.com or
Phone: 517.279.8445 –

Please e-mail or call with any questions

The Flying Field will be open Friday, June 3 for early arrivals

Saturday, June 4,

hours are from 9 a.m. 'til 5 p.m.

Sunday, June 5

hours are form 9 a.m. 'til 3 p.m.

Landing Fee is \$10 for the weekend.

Directions: Quincy is approximately 4.5 miles east of I-69. Clizbe Road is approximately 1.6 miles east of Quincy. The Flying site is approximately 1.5 miles south of US-12 on the west side of Clizbe Road.

Places to Stay:

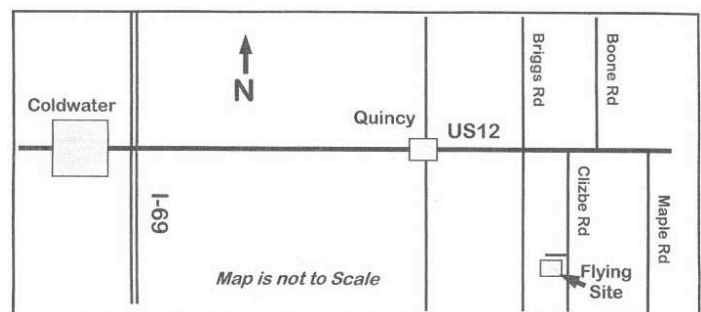
Holiday Inn Express 517.279.0900,

Red Roof Inn 517.279.1199,

Econo-Lodge 517.278.4501,

Ramada Inn 517.278.2017

All except Econo-Lodge are located near I-69 & US-12. Econo-Lodge is on the west side of Coldwater.



The April EFO Meeting

The meeting was held in conjunction with the Michigan International Soaring Society (MISS). Tom Blazak did a wonderful job of organizing the event. The EFO had a HUGE turnout. The weather was fairly nice, sunny, near 70 degrees most of the day, but with a fairly heavy wind from the south for some of the smaller planes to handle.

It was difficult to get any really good photos to show the action because the flight line was spread out over quite and area, and was away from the gathering spot, a nice sun shelter provided by Lyon Oaks Park. Most of the folks pitted by their cars in the parking lot.



MISS provided a “field lunch”, and a great time was had by all.

Channel 56, the local PBS station was there to do some videos for an upcoming show on what is happening in the Detroit/Metro Area.

The EFO wish to send a HUGE thank you to the folks from MISS for allowing us to share this day with them.

Here are some photos of the meet from James Maughan, EFO member.



An Easy Star Face Off



Jim's Mountain Models Switchback
Great Flying Plane



Jim with his 4D

MISS will be presenting a Flying Extravaganza at Lyon Oaks Park 10 AM to 3 PM on May 21.

More on some of the planes flown

Hi Ken,

I wanted to drop a line to tell you thanks for helping me out at Lyon Oaks Park. It was great to get out and see what everyone was doing and see how my Parkzone J-3 Cub handled. Too bad the weather wasn't conducive to my flying it.

I took an opportunity to take the Cub out this afternoon, since I have been really feeling the need to fly and the wind was finally calm. Well, after several attempts to get the thing up in the air I finally got a few good minutes of flying in. Landing was a new experience however and I ended up cracking the cowling and I think I broke the gearbox too. Well, when I get a chance to work with an instructor I hope things go a little smoother.

I've also started building my next kit since we met. It's a Dare Sopwith Pup and it's about half done now since I've been able to spend several hours on it over the last couple of weeks. It's coming together really easy and I'm really looking forward to having a finished plane. I know that it's going to be a while before I'm proficient enough to fly it, but I just couldn't leave it on the shelf any longer and had to start it.

Hopefully I'll be able to connect with a trainer at the MISS meeting, as I joined their group while at Lyon Oaks. From what I was told there should be someone who is willing to work with me.

Take care. Talk to you later,
Rob Dillon

I was very happy to hear from Rob after test flying his plane at the meeting. I had noted to him that I thought he might be able to use it as a "trainer" if he got help.

I test flew it for him with winds near 10 mph and was pleasantly surprised at its decent performance. It easily rose off of a concrete slab in the middle of the flying area and was quite controllable, even in the fairly windy conditions of the day. The flight time seemed quite long with the 600mAh NiMH 7-cell pack.

I recommended that he not fly it that day though, as he would not be able to tell whether it was him or the wind that made the plane do something "strange". We did fly my EasyStar, so he did get some stick time.

It appears, from Rob's email, that my recommendation of getting help was correct. This is not a first time RC trainer for zero time pilots without an instructor. Horizon Hobby, Inc., the distributor of this plane, notes in its print ads, "Mode Change Flight Control™ for transitioning pilots". To me, this indicates that there should be some type of "trainer" before this plane is attempted.

With an estimated cubic foot wing loading over 10 oz./cu.ft, this plane falls into the sport class of flyability, which is just above the trainer/easy sport class. It also shows why the plane handled the 10 mph wind well enough, as there is pretty much a direct relation to the cubic foot wing loading and amount of wind the plane can comfortably handle when piloted by a pilot capable of flying in that much wind. At about 29 watts per pound it is powered so that, at full throttle, it is just a little over twice the watts needed to fly the plane in level flight. Obviously, climbs are not awesome.

Tony Petricca had his new Multiplex EasyStar for me to do the final setup and test fly with him. Like the EasyStar I reviewed, his had the elevator setup in the wrong direction. A quick flip of the elevator switch on the transmitter "fixed" that little problem. I don't know why Multiplex USA doesn't just throw the

elevator switch before shipping the model. Makes no sense to me!

The plane flew entirely as expected, and soon Tony was on the sticks.

The EasyStar is a zero time pilots' plane. Everything about it allows the new pilot the best chance of learning to fly RC with an instructor, or even on his or her own. While I don't recommend learning without an instructor, it is possible with this plane. KM

Thoughts from Rich Flinchbaugh

r.flinchbaugh@att.net

Our Electric RC Hobby is unique! We are blessed with some truly remarkable individuals. To name just a few, you modelers in mid-America have Keith Shaw (a man who's always generous with his time – to assist others), then there's the highly respected Patrick del Castillo, another great leader, and innovator. Let's include the *Ampeer* editor as well!

So as not to ignore the South, modelers who live in the Sebastian area of Florida are fortunate to fly with the lead preacher in a local church by the name of Thomas Kempf. He's an outstanding electric pilot, instructor, and he builds well too!

Aren't we fortunate to be members of a hobby that includes such outstanding people? These folks we will always remember!

The photos show Tom flying his "PRETTY XL" ARF at the Airmasters field in Sebastian, FL. It is an excellent flying field. It goes straight up after take off. I believe he's using an AXI 2826/10 to power it. It really goes.

The other photo shows my youngest son, Mark, and his son Jacob. They live in the Los Angeles area of California. We are trying to introduce Jacob to electric flight. He sure loved the prop. The photo was taken in our sunroom in Vero Beach, FL.



Rev. Thomas Kempf flying his Pretty XL



Mark introducing Jacob to an RC plane.

Higher efficiency Can Motors: Supercharging Can Motors!

By Richard Duczmal

Via *the Electric Model Flyer*

Voice of the Electric Model Flyers of Southern
Ontario

Editor: John Werner wernerj@globalserve.net

Everyone knows that ferrite can motors are at the bottom of the pecking order when it comes to efficiency and brushless motors are at the other end. There are several reasons which all contribute to this, electronic commutation, ball bearings, and magnets. Well we can't do anything about the commutation but cobalt can and some ferrite types have ball bearings. The one thing that sets these apart is the magnet. Ferrites are the weakest; cobalt is two to four times more powerful but neodymium are ten times more powerful than cheapo ferrites. The ferrites are used only where cost is a consideration. What would happen if I substituted the ferrite magnets in a S400 with neodymium magnets?

Well that's just what I set out to do. But the cost must be in line with economic constraints that make can motors feasible. That is it should not be as or more expensive than a brushless. I was in luck when I noticed that Air-Craft World had 20x4x2 mm super magnets on for only 30 cents US. I ordered 20 to play with for a whopping \$6.

They arrived promptly but it was several weeks before I could play with them and find out what I wanted to know. I have both Speed 400 and Speed 480 can motors, which I wanted to test using the new magnets. For this reason I decided to take the flux ring off one of the 480 motors and use that as a mount for the new magnets. To do this I had to cut the front to back measurement down to the length of the

magnets and cut off a section of the flux ring circumference so that it would fit inside the can. The idea being that I could then remove the flux ring with magnets and put them into any can that I decided to. This would allow me the flexibility to test various motors. However it would be just as well to mount the magnets in the can itself and then switch the cans as required. If the armature or the brushes burned out all you have to do is buy a new motor and replace the armature and brushes.

To mount the magnets I first sanded the inside of the armature ring to assure good adhesion. The plan was to mount the magnets using super glue. The magnets have to be mounted in the same arrangement as the original ferrite magnets. That is one side must have the North poles facing inward and the other side must have the South poles facing inward.

It is a wise idea to color code the poles before you get started.

Mark one side with a black marker to indicate one pole or the other. Furthermore they should cover the same amount of arc as the original ferrite magnets did and leave equal gaps on both sides. This meant that

I needed six magnets per side and each of them had to have the poles pointed in the correct direction.

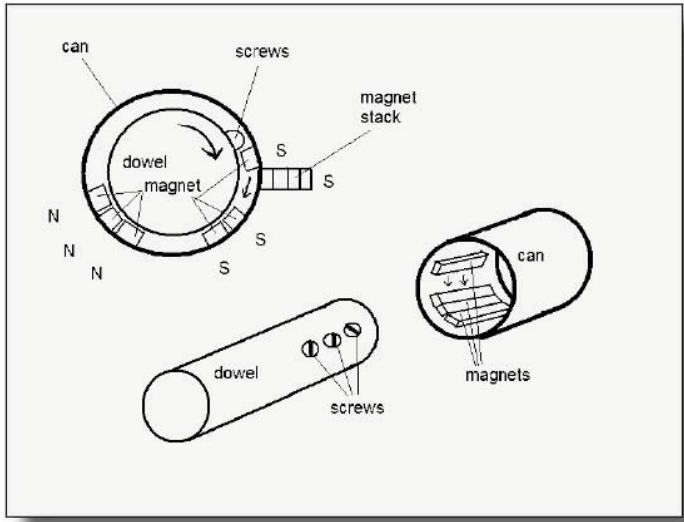
The biggest problem with putting the magnets in is that they tend to want to flip over north to south while you try to glue them in place. Believe me crazy glue doesn't want to wait for you to move them back.

There are a couple tricks I used to make this job easier. One was to use a dowel [covered with release agent] that had three screws imbedded along the long axis and was the same diameter as the inside of the finished flux ring after the magnets were mounted. This way there was no room for the magnets to flip over on top of the previous one. I would insert a magnet 1/4 inch away against the flux ring and then insert my dowel and twist it into place. Super glue was then dropped down the length of the magnet to glue it in place. Yes that was messy.

The second trick was to use a stack of magnets just opposite to the magnet that was being moved into place on the outside of the flux ring. This helped somewhat to negate the magnets tendency to flip over on the inside.

On a can motor I would start from the indentation used to originally hold the ferrite magnets in place. Mount North Pole magnets on one side and South pole magnets on the other. Stop when the gap between them is approximately the same as the gap at

the indentations.



I tested this on an old speed 400 and motor that I had lying around. I removed the end bell and the old ferrite magnets. The new magnet ring was cut so that the ends would perfectly mate with the indentations used to hold the old ferrite rings. It does not matter if the poles are reversed, your motor will simply turn the other direction and all you need do is reverse the leads.

I set this up in my homemade thrust test stand and used an old Canadian Tire lead acid battery charger as a power source. I then hooked up a shunt and a volt/ohm meter to test the current levels. I set the charger to the six-volt reading as the 12 V rating would probably of had too much power and I wanted to play it safe. I later found out that the six-volt setting would put out only about 4 V.

Earlier I had checked this motor while trying to time it under load with a 6x3 propeller, it had produced in the vicinity of 85 to 90g of thrust at about 4.3 amps. I was shocked to find out that with the new super magnets in place it was now only producing 55 to 60 g of thrust! But looking at the current levels they were down to 3.4 amps. I don't have any method of checking for rpm but rpm/volt must have gone down. That means that torque must've gone up!

Ok, so how do I bring the amperage up? Why, use a bigger propeller. I had a seven by four propeller and a fitted that on to the Speed 400 but the current only went up a little bit. I had no 8 in. propellers so I put on a nine by five GWS. Now the current was up to 4.6 amps in but the thrust was a whopping 130g. We achieved a 40-gram increase in thrust by merely exchanging the magnets!

I suspect an 8x5 or 8x6 propeller would probably be right on the money as far as amperage is

concerned. Nonetheless here I was using the speed 400 to turn a 9x5 propeller.

Now, will this compete with an AXI or a Mega? Not a chance! But it is probably in the low range brushless territory. It is also still be substantially less expensive than either of those other two motors. I would suspect that the efficiency is probably in the 65 to 70% range or better. That's the equivalent of many of the cheap brushless motors out there today. I did try this on an eight-cell pack with an Aircraft World QRP Speed 400 turning a 6x3 propeller and got around 200g of thrust but the supercharged can motor put out nearly 300g of thrust. Please note the battery pack was in bad shape.

What would I do if I were to do this again? I would not use the thrust ring at all. Instead I would double stack the super magnets so that they would be 4 mm x 4 mm x 20 mm in size. This would more closely approximate the thickness of the original ferrite magnets and would increase the power even more by bringing the magnets closer to the armature and increasing the flux density.

Unfortunately Aircraft World no longer sells those magnets. They and other similar sizes are available from various places on the net.

May your ferrite motors never be the same.

An Open Letter to the AMA on Bob Kopski's "Retirement" By Ken Myers

The May issue of *Model Aviation* contained Bob Kopski's farewell note in his last column. In the same issue Bob Hunt noted the huge surge of interest in electrically powered flight that had caught the AMA off guard. Somehow these two ideas don't seem to go together.

Instead of expanding coverage of the electric flight segment of our hobby, the AMA magazine, *Model Aviation*, has chosen to dilute the coverage with alternating columns from two great resources.

For over two decades, Bob has been the inspiration and information pipeline for those interested in this aspect of the hobby. His original articles about getting started in electrically powered flight inspired many of today's leaders in the field to "give it a try." His EOC beeper was a great help when chargers didn't come with any way of letting the user know that the peak charge had terminated. His Skyvolt design was a huge step forward, as it was

not only a good flying plane in its own right, it was a wonderful test bed for those tinkering with various power systems.

The majority of his columns were based on reader input and answers to common questions that he had received. His most recent columns have included ways to improve the current generation of the popular ARF electric planes and equipment.

His columns concentrated on planes that fly, instead of flit, and the power systems and support equipment to do just that.

I do not understand why, when the AMA through its voice, *Model Aviation*, acknowledges the growth of electrically powered flight, they have let this valuable resource and electric flight pioneer go.

I am sure that Bob still has a lot to contribute to the advancement of our hobby. I hope he finds an outlet to do so.

As for the AMA and *Model Aviation*, I feel that they have thrown out the baby with the bathwater. Shame on them!

A Further Update on the Alfa Models Corsair Review

From Mike Southwood
michael.southwood@ntlworld.com

Here is another update to my review of Alfa Models Corsair. It has now flown using the brushless direct drive, quite a few times. The main difference is the noise, or lack of it. Performance is very similar, it still climbs nearly vertical, but also flies very well on half throttle. Using the original 800mah Li-Poly packs, I get fed up before they run out. I have also started using an 1800mah 2 cell Li-Poly without any other change. To my surprise this produces about the same power and 7800 rpm as the 3-cell power. It is probably because it is a better pack and will not be restricted by drawing high amps. It is slightly heavier, but does not affect the way the Corsair flies. Duration is unknown as I land after 15 minutes. What has surprised me is its ability to fly in quite high winds.

The various comments about charging Li-Poly's and the dangers have caused me to keep my charge rates low, even though it takes longer. I also get them out of the plane and feel them for heat build up. One of my 800mah packs was left in the plane connected up and ran down to 0.5 volts after which it would not accept a charge from my cheap special charger. I connected it up to my normal transmitter 60mah

charge and monitored the volts. They eventually rose to 9v after which I switched to the normal 1 amp charge rate and away it went, charging as normal. It does not appear to have damaged the cells, despite the manufacturers instructions warning about "not letting the volts go below 3 per cell".

Regards,
Mike Southwood.
Hemel Hempstead. England

Upcoming Mid-America Electric Flies

AMA Sanctioned

Saturday, July 9 & Sunday, July 10, 2005

Hosted by the: Ann Arbor Falcons and
Electric Flyers Only

Site Provided by the: Midwest R/C Society

Your Contest Directors are:

Ken Myers phone (810) 679-3238 or

KMyersEFO@aol.com –

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

Keith Shaw (734) 973-6309

Flying both days is at the Midwest R/C Society
Flying Field - 5 Mile Rd., Northville Twp., MI

Registration: 9 A.M. both days

Flying from 10 A.M. - 5 P.M. (Sat.) & 10 A.M. – 3
P.M. (Sun.)

Narrowband Transmitters are required - Channels 00 through 60, the six 27Mhz frequencies, & eight 53MHz frequencies, will be in use. Flying on five 49 MHz frequencies may be accommodated on request - Narrowband receivers are recommended for flying on Channels 00 - 60 - Very Wideband 27, 49, & 53 MHz, receivers may be accommodated on request

Pilot Entry Fee \$15 a day or \$25 both days - - - -
Parking Donation Requested from Spectators

Saturday's Events

All Up - Last Down

(No Li ion, Li-Po, etc.– NiCads or NiMH only in

AULD – any size motor)

Pilots' Choice

Best Scale

Most Beautiful

Best Ducted Fan

Best Sport Plane

CD's Choice

Sunday's Events

Pilots' Choice
Best Scale
Most Beautiful
Best Mini-Electric
Best Multi-motor
CD's Choice

All Planes Must Fly To Be Considered for Any Award

**Open Flying Possible on Friday
Night Flying Possible, Weather Permitting, Friday
& Saturday Nights**

Refreshments will be available at the field both days.

**There will be a potluck picnic at the field on
Saturday evening.**

Come and join us for two days of fun and relaxed
electric flying.

Even though this is called a contest, the purpose is fun
and the enjoyment of sharing the electric experience.

**Come, Look, Listen, Learn - Fly Electric - Fly the
Future!**

**Saturday's & Sunday's Awards:
Plaques for 1st in each category
Merchandise drawing for ALL entrants**

Li-Poly versus NiMH

By Ken Myers

In the June 2005 issue of *Quiet Flyer*, p. 28, Gary Ritchie took "a look at buying Lithium Polymer Batteries for an 0.40-Size Airplane."

The plane he used in his comparison was the Stevens Aeromodel CAP 232 (.40e) (www.stevensaero.com). From all reports that I've read, including Gary's, this is an excellent flying model!

Gary made a very strong case showing that in some 0.40-size projects, high discharge NiMH cells can give "almost" as good performance as Li-Po and actually more flight time on a given day at the field.

It makes for interesting and thought provoking reading.

One thing I didn't understand was his choice of an APC 13x6.5e for the Model Motors AXI 2820/10 motor with 10 3300mAh NiMH cells or a 3S2P Tanic Li-Po pack. The instructions that come with the AXI 2820/10 note that a 10x6 should be used with 10-cells. On the Model Motors Web site (www.modelmotors.cz) they note the various props

on 10-cells (or a 3SxP Li-Po pack) are the APC 9x6 (22.8 amps) through the APC 12x6 slim (40.5 amps). Model Motors recommends a maximum of 42 amps for no longer than 60 seconds for this motor.

In the tables on p.31 Gary showed that he was putting 500 watts at 51 amps into the ESC when using the 10 3300mAh NiMH cells and 415 watts and 45 amps when using the 3S4P 4300mAh Tanic Li-Po pack. That works out to 0.98v per NiMH cell and 3.07v per Li-Po cell. At these relatively high currents, that is pretty good for NiMH cells, but pretty poor for the Li-Po cells. If you'll reference any of Steve Neu's Li-Po tests, you'll notice that the ones that he rates highly can deliver about 3.4v per cell at their rated C discharge rate. While the Tanic cells are rated at 10 to 12 C discharge, their performance, in this instance, seem to indicate otherwise. As Gary said on p.29 of the article, "Perhaps the above difference reflects variations in internal battery resistance." The word "above" in Gary's quote refers to what he'd written above the quote, not what I wrote, but the same conclusion could be drawn.

Gary also realized that he'd over-propped this motor because it was becoming quite hot during the tests, so he said p.29, "... so I don't recommend using a 13-in. prop with this motor." He probably got away with his six tests on this motor with the 13x6.5e because his "average" current draw when using Li-Po cells as about 16 amps for the flight, while it was about 19 amps per flight for the NiMH cells.

While Gary did give a lot of data in the article, he did not indicate the air temperature or wind velocity on the day he did the six test flights. On p.30 he said, "Yes, there was a performance difference with the two packs. The difference was not shocking, but it was definitely noticeable. With the Li-Poly pack, the CAP felt lighter on the sticks, was a tad more nimble, and had more impressive vertical performance."

When this plane is equipped with the Li-Po pack it has a cubic wing loading of 6.29 oz./cu.ft. and when equipped with the NiMH pack the cubic wing loading is 7.98 oz./cu.ft. What I would really like to know is how the plane felt with the two different packs when flying in some wind, say 10 mph. It is not surprising that the plane, when equipped with the Li-Po battery, hovered easier, but for general sport flying, my prediction is that the plane equipped with the NiMH pack will be more comfortable to fly in some wind.

**Upcoming E-vents
2005**

May 28 - 29 Capital Area Soaring Association Spring Sizzle, Rockville, Maryland, Memorial Day Weekend, Monday May 30 F5J competition, info: /home.comcast.net/~mkroese3/ or www.soarcasa.org/Events/events_content.htm

June 4 & 5 "Keith Shaw Birthday Party Electric Fun Fly", Balsa Butcher's Flying site in Coldwater Michigan - Contest Director: Dave Grife - E-mail: grifesd@yahoo.com or Phone: 517.279.8445 ? Please e-mail or call with any questions

June 11 & 12 River Valley Flyers Electric Fun Fly, Wisconsin Rapids, WI, More info at club web site www.RiverValleyFlyers.com, Contact: Chuck Benner cjbenner@tznet.com

June 24-25-26 MARCEE 2005 Electric Fly, 3M Club R/C Flyers' Field, St. Paul, Minnesota, Contact Steven Mundt mundt@mninter.net Web site: www.marcee.org See marcee.org for details.

July 9 & 10 Mid-America Fun Flies 2005, Northville Twp., MI for information contact Ken Myers via email at kmyersefo@aol.com or phone: 810.679.3238 Check the EFO Web site for details <http://members.aol.com/kmyersefo/>

July 30 - Aug 2 Electric Nationals, AMA Headquarters, Muncie, IN contact: lonniee@modelaircraft.org Visit the AMA site for more info at www.modelaircraft.org

August 6 & 7 Cedar Rapids (IOWA) Skyhawks 2nd Annual E Fun Fly, info at: www.foxcoins.com/skyhawks/funfly/, contact Plenny Bates, 2505 White Eagle Trail SE, Cedar Rapids IA 52403-1547, 319-362-2969

August 13 & 14 Sharks All Electric Fun Fly #2, Sheboygan Falls, WI, Web site www.mcallisterdesigns.com/elec05.htm for map and updated information.

August 27 BATTLE CREEK Balsa Bees 2ND ANNUAL ELECTRIC FLY, FLYING SITE JUST SOUTH OF BATTLE CREEK, WITH A RAIN DATE OF THE 28TH. Contact: DAVID SOOTSMAN, Event Director email: NScaleNuts@aol.com



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The Next Flying Meeting:

Date: Saturday, June 11 **Time:** 10:00 a.m.

Place: Midwest RC Society 5 Mi Rd. Flying Field