

Silent Knights Soaring News

Editors Note.. Remember, this is your Newsletter so let me know what you want to read about. Send me an email at robertB578@aol.com or call me at (302) 376-7517. Bob Bickerton

President's Corner

“Well, we're right in the swing of things. Dick, very generously, had the Birdhouse repainted. We purchased new winch batteries and we're flinging planes to new heights. Thermals are a poppin' and electric motors are singing. We've signed up some new members. Membership is at an all time high. We have 2 club planes for you to fly. If you're still a little shaky with your flying skills, we have a buddy box. You can fly with an experienced pilot right beside you in case you get into trouble. And believe it or not, I even signed our new contract with the state! All in all, things are running as smooth as ever....even smoother! How could it get any better? So come on out and enjoy your field” Terry Lisansky

Safety Reminder

We've had a number of incidents where flyers are not following Club safety rules. PLEASE! Electric pilots must use the runways and fly from the grass immediately adjacent. DO NOT fly from the longer grass between the Birdhouse/tree line and the runways. ALL pilots must NOT launch toward other persons and must NOT fly over, behind or land close to others. DO NOT prepare for flight at the Birdhouse, walk out 10 feet and launch your plane – walk to the runway!!

Sailplanes and

Summer is here and it seems as if we had very little nice flying weather all spring. But, like the famed USPS, rain, cloudy skies, high winds, and cold temperatures didn't stop 25 hearty pilots from flying in the 1st ESL (Eastern Soaring League) contest of the year. SKSS hosted the event on May 17th and 18th at Big Pond field. Saturday the 17th, dawned rainy, cloudy, windy and with temperatures in the low 50's but by contest time the rain had stopped and CD Bob Chatman held the pilots meeting announcing open winch, 45 minute rounds, and tasks of 3,4,5,6 then 7 minutes for all subsequent rounds. Eight rounds and several hours later the winners emerged- they were: EXPERT: 1st Tom Keisling, 2nd John Hauff, 3rd Phil Barnes, 4th Gerry Ziegenfuse; SPORTSMAN: 1st Rainer Wetzling, 2nd Peter Schlitzkus, 3rd Bob Magee, and 4th John Lane. Sunday began with weather a little

Silent Knights Soaring Society

President -	Terry Lisansky
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AMA Chartered Club No. 950

better though temperatures were still in the 50's. The wind was lighter and there remained the threat of rain. Sunday's CD, John Jenks called the pilots meeting and announced open winch, all rounds 45 minutes with 7 minute tasks with four landing tapes. Two rounds were delayed because of light rain but 8 rounds were completed by days end. Sundays winners were: EXPERT: 1st, Joe Melchiorre; 2nd, Bill Groft; 3rd, Tom Keisling; 4th, Ron Bates; SPORTSMAN: 1st, Bruce Musser; 2nd, Peter Schlitzkus; 3rd, Bill Haymaker; and, 4th, Jeb Bushell. The smiling faces in the ubiquitous group photograph tell all!



Some of the winners of the May SKSS hosted ESL Contest

V-tails. There can be much debate over whether conventional or V-tailed aircraft perform better but V-Tails are quite popular on sailplanes. The July, 2003 "Quiet Flyer" magazine had a nice article on V-tails by Don Bailey (page 14) in which he explores the basic aerodynamics of V-tails. Lot's of useful information and well worth the read but the part that caught my attention was his explanation of the need for ruddervator differential. Briefly, he explains that, with V-tails in a rudder-induced turn or yaw, the upward moving ruddervator is more effective than the downward moving ruddervator with the result that the nose of the plane pitches up with yaw commands. Don explains that the up-moving ruddervator extends into the high-pressure region above the tail and the other ruddervator moves down into the low-pressure region beneath the tail thus creating a downward force (like up

elevator) on the tail. To counteract this downward force you need to program your transmitter for more down than up in each ruddervator; just how much more down than up is determined by test flights. Something worth thinking about when you are flight trimming your V-tailed sailplane!

ELECTRIC

Wing E- mini review. Impressed by articles I had read about Todd Long's Wing-E design (www.toddsmodels.com), anxious to try Lithium Polymer batteries and, the realization that these two might go together well, convinced me to order a kit. I ordered the kit on the web on Monday and the mailman delivered it to my house on Wednesday – how's that for service - from the state of Washington no less. For \$29.95 you get 7 sheets of 3/32" balsa with all the parts laser-cut and laser marked for identification and a full size plan including building instructions on the left side. Balsa selection and laser cutting are excellent. I cleared off the building surface, pinned the plan down and started gluing balsa. About an hour and a half later, the next instruction in order said "Cover the bottom surface first!" Wow! 90 minutes from sticks to covering. That's a record for me, but that's how well the laser cut parts fit and easily go together. Took me longer to cover it than the actual construction. I finished it the next day by adding the motor (GWS S1, same as the Zagi FiXX), two micro servos and a receiver. A clever touch is the the way the proper reflex in the elevons is established. The vertical tiplets have a swept trailing edge, starting at the top and bottom and converging toward the leading edge, forming a horizontal Vee. You simply align the trailing edge of the elevons with the vertex of the Vee and the proper reflex is accomplished. How well does it fly with a 2 series pack of 1020 Kokam Lithium polymer batteries? Great! Bill Groft was the test pilot to get trims adjusted for me and he flew it around for a while doing some loops, rolls and, yes some level flight too, before he handed me the transmitter. I found the controls still a little touchy for my likes so after a few circuits Bill landed it and we dialed in some exponential then relaunched. I flew it around for quite a long time then landed it – didn't time the flight but when I got home checked the lithium polymer battery and it was still 50% charged. Two Kokam 1020 mAh LiPo's and the Wing-E make for a nice combination.

How To! Lithium Battery Packs!

With the availability of Lithium Polymer batteries for model airplane use and reports of long flight times many modelers have wanted to use them but have been confused. We hear questions such as: 'Can I use them to power my Sailplane receiver?' or "How many cells do I need to power my brushless motor?" or 'Can I use lithium polymer batteries to power my Speed

XXX motor?' Let's look at some differences between NiCad/NiMH batteries and LiPo's.

	Nominal Voltage per Cell	Peak Voltage Per Cell	Charge Rate X(C)	Discharge Rate X(C)	Weight of single 1000 mAH cell
NiCads and NiMH	1.2	1.5	2-4 times capacity	Up to 10 or more times Capacity	~60 grams
Lithium Polymer	3.7	4.2	1 times capacity	2xC Kokam*** 7xC Etec***	~20 grams

***These rates apply to current production and NOT to the new HD cells.

This table shows both the advantages and disadvantages of LiPo's. Three times the voltage at 1/3 the weight is great but 1xC charge rates and a maximum of 7C discharge rates make life more difficult. How does the table help us use LiPo's. Let's take the example of using LiPo's with our sailplane receiver which operates at 4.8 to 6 volts (4 or 5 NiCads). One LiPo is not enough (3.7 volts) and 2 LiPo's is too much (7.4 volts). Can we use LiPo's? YES, but we need to add a voltage regulator to a 2 cell series LiPo pack to keep the receiver voltage at 5 volts (FMA sells a tiny regulator to do the job). Now let's determine how to select a LiPo battery pack for an electric powered airplane. Regardless of the motor size or type, you need to know the current the motor will draw. You can do this by direct measurement with a Whattmeter or through use of MotoCalc or ElectricCalc. Using a Whattmeter, simply plug in the NiCad pack you have been using and run the motor at full throttle and read the current. In MotoCalc or ElectricCalc simply insert the number of NiCads you use and the motor you'll use and the program tells you the current draw. As an example let's take a motor that draws 15 Amps with 8 500 mAh cells. Divide the current drawn by the battery manufacturer's recommended maximum discharge rate; currently 2 (for Kokam) or 7 (for Etec). Let's use Etec for this example. $15/7=2.14$ and this tells us that we need a 2.14 Ah battery to supply the current we need (a 2.14 Ah Etec LiPo battery will supply 7 times its capacity [15amps]). How do we get a 2.14Ah battery? Simply add cells in parallel until we get to as close to 2.14 as we can; 2x1200 mAh in parallel gives us 2400 mAh or 2.4 Ah. Pretty close! Now, how about voltage. Our string of 2 parallel batteries gives us 3.7 volts nominal or 4.2 volts peak while our 8 cell NiCad produced 9.6 volts nominal and 12 volts peak. Two LiPo's in series gives us 7.4 volts nominal and 8.4 volts peak while

3 LiPo's in series would give us 11.1 volts nominal and 12.6 volts peak. So, do we use 2 in series or 3 in series. Two in series would give us the performance of a 6-7 cell NiCad and 3 in series would give us the performance of a 9-10 cell NiCad so it's your choice. Just remember the 2 or 3 in series mean 2 (or 3) strings of 2 cells in parallel. What you end up with is a pack called a 2 series, 2 parallel pack or 2S2P for short. This pack would give us a slightly higher voltage and 2.4 times the flight duration of our 500mAh pack. There are alternative packs we could use as well. For example Kokam LiPo's come in 3270 mAh capacity and each would handle 6.5 amps so two in parallel would handle 13 amps we could wire two 3270 mAh cells in parallel and then two of these in series (2S2P) and it would work as well and give us a 2.7 fold increase in duration over the 2.4 Ah pack provided the plane can carry the additional weight. Note that when determining the number of cells in parallel required it can get ridiculous – 15 Kokam 145 mAh cells in parallel gives us a 2.18 Ah battery but 30 or 60 cells in a flight pack is ridiculous to me. The bottom line is that LiPo's offer an alternative and now you can put a pack together for your application. Without all the verbage here it is stepwise.

1. Determine the current drawn by your motor (A)
2. Divide the amps from (A) by the manufacturer's max discharge rate (Pack Amps)
3. Add cells in PARALLEL until you are as close to (Pack Amps) as you can get. Use common sense here! Etec has cells from 250 to 1200 mAh, Kokam has cells from 45 to 3270 mAh and, Thunderpower has 1950 mAh cells
4. Determine the number of packs of cells required to give the voltage you want.
5. Solder the cells from Step 3 in PARALLEL.
6. Solder the packs from Step 5 in SERIES.
7. MAKE SURE YOU HAVE A CHARGER CAPABLE OF CHARGING LITHIUM BATTERIES

Coming Events at Big Pond Field

June 27, 2003 Delaware Aerospace Acad. Will use the field from 12:30 until 2:00PM

July 11-12 10 AM – 2 PM Delaware Aerospace Acad. Will use the field for model rocket launching.

July 19, 2003 Club Contest

August 2-3, 2003 SKSS hosted ESL contest (Volunteer, we can use the help!!!!)

August 9, 2003 Club Contest

September 27, 2003 Club Contest

Every Wednesday evening throughout the summer we have an electric fun-fly. Bring a model and join the fun!!

Electric Fun-Fly Wednesday Nights

