KCRC

KNOX COUNTY RADIO CONTROL

Jan, 2006 ---- Knoxville, Tennessee ---- AMA Chapter 594
Newsletter.....jimscarbrough@charter.net
KCRC website.....www.kcrctn.com
KCRC Newsletter(PDF) available on KCRC website for downloading

The January Banquet will be on Tuesday, Jan 10th, 2006, at The Mandarin House on Downtown West Blvd

KCRC Officers for 2006

President.....Phil Spelt.....Phone 435-1476
Email chuenkan@comcast.net
Vice Pres....Gary Lindner.....Phone 986-9050
Email lindner2@bellsouth.net
Secretary..Jim Scarbrough..phone 986-3857
Email jimscarbrough@charter.net
Treasurer....Joel Hebert.....Phone 927-1624
Email hebertjj@comcast.net
Safety Officer. .Bill Walters..Phone 406-3246
Email williamwalters1@comcast.net

Executive Board
Mike Foley..865-986-6153
Email m_foley@bellsouth.net
Gene Waters... 865-483-9698
Email..ehwaters.1@juno.cm
Jerel Zarestky..865-482-7953
Email jerzee4@comcast.net

Historian.....June Cope.....694-8687
Webmaster.....Phil Spelt.....435-1476
Editor.....Jim Scarbrough.....986-3857

Well, it was bound to happen!
We have been hearing about the danger of using Li-Po batteries from the time they began appearing at the fields on small (and large) electric models. The manufacturers told us and the distributors told us that they could explode or burst into flames. We went for quite a while using them and nothing bad happened, so we began to relax and forget about the warnings.

Recently at KCRC field, one of the members who is very active flying the electrics and mostly using Li-Po batteries had a very scary incident. Here is the way I heard it in an email from one member to another who had been there earlier;

" --we had a good time flying a couple more times., then it got really interesting when the Li-po pack he had in the red and white Cub exploded in flames in the engine bay of his truck! I was flying and Mike was standing with me, and James was flying his Slo Stick . Mike heard a POP which I didn't hear. He shouted "FIRE". I looked back and the whole front of James's truck was blazing! The flames were reaching all the way to the top of the hood which was up. James dumped his model and ran back and slapped the burning model and charger off the engine block and we got the fire extinguisher out of the box and put out the fire on the ground. There was only slight damage to the truck, but all that was left of the model was about an inch and a half of each wing tip."

This could have been a very nasty incident. I had a vehicle on fire once and it is very hard to get the fire out. Impossible if there is no fire extinguisher on hand. I'm glad that we had placed one in the emergency box and that it had pressure enough to work. Lots of times when they are not used in a long time, the charge drains out and they become useless. This is something that the Safety Officer is going to have to check periodically.

A member said that at times he has charged up his batteries in the back seat of his car on the way to the field. Imagine what could happen if this had happened then!.

At least one of the guys has said that he will stay with Nicads and ni -metal hydrides. Personnally, I think it would be a shame to lose the power that the LiPo offers. I think that if the proper precautions are used, they should be safe. There are chargers and batteries now that give you the ability to charge each cell independantly. This seems to be the main source of the problem; one cell being charged at a higher rate than the others, or one cell being weaker or possibly damaged from mishandling.

I would definitely recommend that if you are going to use them, you spend some time studying the science before taking the plunge, but I have an idea that if nothing happens again for a while that we will drift back into carelessness.....Jim.

Here are the Model of the Month entries for the December meeting. Top pic is Mike Gross and his Top Flight (GP) kit built Elder. It has elastic thread for flying wires and is powered by an OS .52 four stroke.

Lower picture is Mike Miller's Great Plains ARF of the venerable Chaos. . Both entries are very good flyers and both modelers are very active flyers at KCRC field.

See Minutes for details of models.

AT THE FIELD

Do you remember, a few issues back, the article written by Phil Spelt covering the new broadcasting techniques called DSSM (Digital Spread Spectrum Modulation) that might revolutionize radio control? Well, it's here! RC Report magazine had a new product announcement in the January, 2006, issue that gives a good description of the radio and the process by which it works.

Can you imagine a radio that is absolutely free of any interference?

The radio is called the Spektrum DX6 and is distributed by Horizon Hobbiy Inc. It is a six channel computer radio that seems to have most, if not all, of the perks of the familiar computer radio; mixing, dual rates, exponential, etc, etc. and the price is very competitive.

According to the write up by editor Gordon Banks, the radio looks suspiciously like a JR 6102 radio, with many controls and switchs in the same place. The antenna looks like the after market rubber ducks we see on some radios.

So far, the radio is sold only for park flyers, but full service radios won't be far behind. The best thing about them is that they will relieve the pressure on the 72 mhtz band. These radios operate on the 2.4 ghtz band and there will be essentially four BILLION possible codes that will eliminate the need for frequency pins or even the possibility of two radios being on the same channel because of the way the transmitter and the receiver lock on to their channel.....Jim

---

PROPWASH
by Phil Spelt

At the December meeting, the Club voted on the issue of whether or not we should permit instructors to charge students for flight instruction. Several ideas emerged from the discussion, which I will cover in a moment. The bottom line is that KCRC re-affirmed the decision made under Jerel Zarestky's tenure as president: any financial arrangements are between the instructor and student.

Beyond this, there was strong sentiment that all of us in the hobby were taught, coached and helped by volunteering fellow R/Cers, and that we are giving back to the hobby by continuing that tradition. Most any day at the field, we can find modelers helping others with problems, tips, suggestions and coaching. In my opinion, this is one of the best aspects of the hobby! My question to the meeting was, "Do we REALLY want someone flying who pays for instruction when there is such good free instruction?" Joking, of course.

By now, most of you have heard about the fire at the field that resulted from charging a lithium-polymer battery. I won't recap the event here (Jim Scarborough has an article elsewhere in this issue), but I do want to make some suggestions about safety with li-po's. KCRC has a fire extinguisher stored in the lock-box on the east end of the pavilion (same combination as the gate). In fact, people using li-po's would be well advised to purchase and carry their own extinguisher, and have it handy when charging. Small extinguishers are not expensive ($15-$30), and are good insurance. Be sure the type is ABC, and is suitable for electrical fires. If you do not buy your own, AT LEAST open the lock box and retrieve the Club's extinguisher to have handy while charging.

Anyone who discharges the Club's extinguisher should replace it as rapidly as possible – this was done after the recent fire.

Remember this slogan I saw somewhere:

SAFETY IS NO ACCIDENT.

Meanwhile, this is The Wingman, turning final…Phil

Three Tools You Can't Do Without
by Jeff Procise

Ask most modelers about the most valuable tools in their toolboxes and they'll tell you about wrenches, Dremel tools, hemostats, and the like. But ask me the same question and you'll get a very different answer. Here are three of my favorite weapons in the workshop. Here's how I use them and why I wouldn't think of building a model without them.

Scotch Colored Plastic Tape

Go to your local Target store and for the handsome price of $4, you can go home with a 5-pack of Scotch colored plastic tape (catalog #190T). It's invaluable for color-coding servo leads and other connections that are routinely broken and restored. Nothing good comes of plugging an aileron lead into a retract servo or vice versa, especially if you fail to check the control surfaces before putting your model in the air. Spend 5 minutes color-coding your leads with Scoth colored plastic tape and you'll never cross-connect your servos again.

Velcro Plant Ties

The gardening section of Lowe's, Home Depot, and other do-it-yourself stores is home to the best hook-and-loop fasteners a modeler can buy. A mere $2.50 buys a 45-foot roll of ½"-wide Velcro plant ties. Gardeners use them to tie plants to poles. You can use them to secure foam rubber around fuel tanks and batteries, bundle servo leads to neaten the interior of your plane, and more. Unlike masking tape, they don't tear foam padding when removed. And the attractive green color adds sparkle to an otherwise dull fuselage interior.

3/8" Heat-Shrink Tubing

Experienced modelers use all sorts of techniques to secure servo and battery lead connections: dental floss, security clips, and masking tape, just to name a few. My favorite material for securing connections is heat-shrink tubing. It looks nice, it's secure, and it protects connectors from exhaust fumes, fuel vapors, glue, and other foreign substances. You can buy packs of Gardner Bender 12-4 AWG (3/8") heat-shrink tubing (catalog #HST-375) from Lowe's. Each pack contains three 4" pieces—enough to secure 8 to 10 connections—and goes for less than $2. That's a small price to pay for the peace of mind of knowing your servo and battery leads won't disconnect in flight...

Jeff sent pictures, but I was short of room this issue.....Jim

DECEMBER MEETING MINUTES

Taken by KCRC Secretary Mike Foley

The December 13, 2005 meeting of the Knox County Radio Control Society was held at Deane Hill Recreation Center in Knoxville, Tennessee. The meeting minutes from the previous meeting were passed as read in the newsletter. Joel Hebert presented the Treasury Report. President Phil Spelt called the meeting to order at 7pm and welcomed all members and guests. There were 27 members present.

OLD BUSINESS

The first order of business was the election of Officers. The ballots were passed out to those that did not vote before the meeting. After the vote, the ballots were counted and the results were: President-Phil Spelt, Vice President-Gary Lindner, Treasurer-Joel Hebert, Secretary-Jim Scarbrough, Safety Officer-Bill Walters, Board of Directors-Gene Waters, Mike Foley and Jerel Zarestky.

The next order of business was the issue of paying for flight instruction. There was quite a discussion about this from various members of the Club. Most said they would never ask a student to pay for flight instruction. However it was brought out that there were times that some folks would. After hearing all sides, a vote was taken, with the question being…"the Club will prohibit payment for flight instruction". It was soundly defeated.

The next order of business was a discussion on a place to post ads at the field. One suggestion was to put up a bulletin board in the pavilion just for personal ads, provided we could get a volunteer to do it. Another option was to use the bulletin board feature on the Club website, and to post a sign at the field telling folks that items for sale could be found on the Club website. If you want an ad posted on the website, please e-mail Phil Spelt. A motion was made to put up a bulletin board for ads, with a time limit on the ads, based on the premise that we can find a volunteer to build a board. It was voted on and passed. Another motion was made to put the URL for the Club's "for sale" page in the newsletter and out at the field, with an invitation to e-mail Phil with any ads they may have so he may post them. It was voted on and passed by the membership present.

The next order of business was the dues structure. It currently stands as: $48 regular, $24 student, $60 family membership a year. New members joining late in the year are pro-rated at $4 a month for the remaining year. Any members paying after the January meeting will be charged $5 after the February meeting, $10 after the March meeting as a late fee. This was voted on and passed by the members present.

The next order of business was the Annual January Club Banquet, where all the Club Officers are installed. We had several members scout out different locations where we could hold our banquet, but in the end, only 2 places seemed to be what we were looking for. One was the Mandarin House in Knoxville and the other choice was the Super China Buffet in Oak Ridge. The Mandarin House has a buffet also, and the price is $12.20 per person, tax and gratuity included. The Super China Buffet was $9 per person. After a very short discussion, a vote was taken and the Mandarin House won the vote. It was decided that we will meet there at 6:30pm and eat at 7pm. So, remember to mark your January 10, 2006 calendar and we'll see you there!!

NEW BUSINESS

There was no new business at this meeting.

MODEL OF THE MONTH

Mike Gross brought out a beautiful Top Flight Elder built from a kit and powered by an OS 52 four stroke. It featured wire spoke wheels and Williams Brothers Vickers machine guns. He said it flies very well, a very gentle flier and has about 7 flights on it so far. Jerel was the test pilot. It's a very detailed model.

Mike Miller brought out a Tower Hobbies KAOS 40 ARF that he got a real deal on. He said that the plane was powered by an OS 46AX 2 stroke and he put dual aileron servos in the plane. He said it flies real well, a very agile plane that will do just about anything you want, and then some. It was noted that it's also SPA legal!

Phil Spelt brought out the fuselage from the Great Planes Seawind that be bought from Tower Hobbies. The plane features a fiberglassed fuselage and has plenty of room for your equipment. A real nice plane. Can't wait to see it on the water.

A vote was taken on 2 of the planes, since Phil just brought his out to show off the craftsmanship of the Seawind. Mike Gross won the bottle of fuel.

CRASH OF THE MONTH

Doll Thompson told about the loss of his Kyosho Stearman ARF, after many flights. He said that he had been flying the plane and had a couple of hard landings, one at our field and one at the Harriman field. Doll said he had looked the plane over and repaired the problems the plane. So the next time he took the plane out the elevator broke in half and the plane spun in. He said it was a complete loss. He said that Kyosho didn't make that model anymore. He said he spent a lot of time on the plane putting it together, especially putting the model radial engine together.

Doll won a bottle of glue.

The meeting adjourned at 8:30pm and Jeff Prosise showed an entertaining 7 minute film for the group after the meeting..... Mike

Here is the winner of November's Model of the Month contest. Jeff Procise sent me a picture of his winning B-25. I had forgot my camera.....Jim

Watt's Up

by Scott Anderson

This is the conclusion of last month's electric article by Scott Anderson.

Now then.

2. **Lithium What?**

Lithium Polymer batteries are used in many electronic devices. Cell Phone, Laptops, PDA's, Hearing Aids just to name a few. Most ,if not all, lithium polymer batteries are not designed for RC use, we use them in different applications than they were designed for. They are similar to Lithium Ion batteries in that they each have a nominal voltage of 3.6 volts, but dissimilar in that they do not have a hard metal casing but rather a flexible material encloses the chemicals inside. The "normal" lithium polymer batteries are thin rectangle shapes with two tabs on the top one positive one negative. The reason we use Lithium cells is that they are significantly lighter than comparable NiCad or NiMH batteries, which makes our planes fly longer and better.

3. Voltage and Cell Count:

LiPolys act differently than NiCad or NiMH batteries do when charging and discharging. Lithium batteries are fully charged when each cell has a voltage of 4.2 volts. They are fully discharged when each cell has a voltage of 3.0 volts. It is important not to exceed both the high voltage of 4.2 volts and the low voltage of 3.0 resting volts or 2.5 during discharge. Exceeding these limits can harm the battery.

The way to ensure that you do not go below 2.5 volts while flying is to set the low voltage cutoff (LVC) of your electronic speed control (ESC). It important to use a programmable ESC since the correct voltage cutoff is critical to the life of your batteries. Use the ESC's programming mode to set the LVC to 2.5 volts per cell with a hard cutoff, or 3.0 volts per cell with a soft cutoff. If your ESC does not have hard or soft cutoff, use 3.0 volts per cell. You will know when flying that it is time to land when you experience a sudden drop in power caused by the LVC.

If you have previously been flying with NiCad or NiMH batteries, switching over to lithium polymer will result in a different number of cells being used. If you had 6 to 7 cells of round cells then 2 lithium polymer cells will correctly duplicate the voltage of those cells. If you had 10-11 cells then 3 lithium polymer cells would be right for you. There are a lot of 8 cell flyer's out there that are stuck between 2 and 3 cells. In my experience, the best option is to determine how many watts you were using before and duplicate that with your Lithium Polymers, Motor, and Prop. For example. If you were running 8 cells (9.6volts) at 10 amps on a speed 400 airplane, then you have 9.6 x10, 96 watts. So if you went with 2 lithium polymer cells (7.2 volts nominal) then you would need to change your prop such that you used 13 amps. If you went to 3 LiPoly's (10.8 volts nominal) then you'd need to reduce the amperage to 8.9 amps. These estimates are approximate, and some experimentation is required for best results but conserving Watts is a good way to start.

4. **10C from 3S4P?**

How fast a battery can discharge is it's maximum current capacity. Current is generally rated in C's for the battery. C is how long it takes to discharge the battery in fractions of an hour. For instance 1 C discharges the battery in 1/1 hours or 1 hour. 2 C discharges the battery in ½ or half an hour. All RC batteries are rated in milli Amp hours. If a battery is rated at 2000 mAh and you discharge it at 2000mA (or 2 amps, 1 amp = 1000mA) it will be completely discharged in one hour. The C rating of the battery is thus based on its capacity. A 2000mAh cell discharged a 2 amps is being discharged at 1C (2000mA x 1), a 2000mAh cell discharged at 6 amps is being discharged at 3C(2000mA x 3).

Currently LiPoly technology does not allow currents as high as NiCad or NiMH batteries do. Because of this many LiPoly batteries are put in parallel to increase the current capacity of the battery pack. When 2 batteries are wired positive to positive and negative to negative they become like one battery with double the capacity. If you have 2 2000mAh cells and you wire them in parallel then the result is the same as 1 4000mAh cell. This 4000mAh cell has the same C rating as the original 2000mAh cells did. Thus if the 2000mAh cells could discharge at a maximum of 5C, or 10 amps then the new 4000mAh cell can also discharge at 5C or (4000mA x 5) 20 amps. This method of battery pack building allows us to use LiPoly batteries at higher currents than single cells could produce.

The naming convention that allows you to decipher how many cells are in parallel and how many are in series is the XSXP method. The number in front of the S represents the number of series cells in the pack so 3S means it's a 3 cell pack. The number in front of P means the number of cells in parallel. So a 3S4P pack of 2100mAh cells has a total of 12 cells inside. It will have the voltage of any other 3S pack since the number of cells in series determines the voltage. It will have the current handling of 4 times the maximum C rating of the 12 individual cells. So say our 3S4P pack had a maximum discharge of 6C. That means that it has a nominal voltage of 10.8 volts (3x3.6) and a maximum discharge rate of 50.4 amps (2100mAh x 6Cx4P).

`5. **General usage tips.**

1.Lithium batteries don't work well in cold air. If you are flying in the winter keep the batteries in your car for best performance.
2.Don't let the batteries overheat. Try to keep them under 140-160 degrees F. This will prolong your battery life.
3.Don't push the batteries past their rated maximum C rating. This will damage the battery and the apparent capacity of the batteries will drop. If when you recharge you are only putting ½ to ¾ of the rated capacity back into the batteries you are probably pushing them too hard. This is not recommended!
4.If you are building your own cells then put spacing between each cell in the pack to help cooling of the pack. This is most important when building packs larger than 2 cells.
5.Some LiPoly cells use aluminum tabs that you must solder to. Normal soldering procedures will not work on aluminum. You'll need to purchase aluminum soldering paste.

On a lighter note, the newer packs are a lot more stable and with the higher "c" discharge rate, the packs run a lot cooler. Awhile ago I did a "break" in of my new Tanic 5s2p packs and the warmest the pack became during this simple break in is 107 F.

Many of the manufactures do not stress the "break" in but it does work and there are packs with close to two hundred cycles on them and you cannot see any difference from a pack with fifty cycles.

Well next month we will look at the speed controllers, If anyone, needs some numbers run thru MotorCalc 7 let me know, or if anyone has any question, feel free to email me at scott@rcfoamy.com..... Happy Landings .....Scott