



# SANDERSON FIELD

## R.C. NEWS

June 6th Open house/work party Hunter Farms

June 20th Fly-In



CHARTER NO. 3079

### CLUB MEETING

*This months meeting will be held  
on Thursday June 11th from 7:00  
p.m. to 9:00 p.m.*

*at PUD #3*

*At 3rd & Cota*

Minutes were read and accepted as read.

Treasurers report read and accepted as read.

Dick Robb provided a list of events around the NW which has been posted on the web site.

Shay Johnson been selected as our scholarship winner. Shay already has his private pilots license, he is attending the university of Utah and will be going in to the naval ROTC as a pilot.

There were lock issues on the gate at Hunter farms. Be sure to lock the gate by using the big chain that has a lock on either side of the post. Do not use the small chain and always lock the gate after you go through. We don't want the cows escaping!

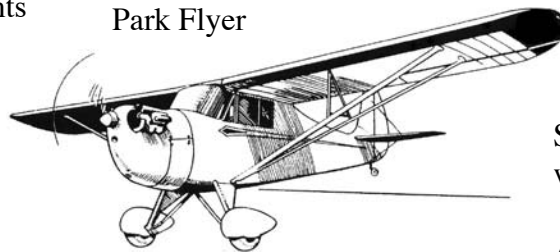
John Tupper is having trouble finding a paint stripper to repaint

the lines. Eric Oberg is looking for one.

Eric asked John Tupper to check out the fire and safety equipment in the shed.

The Board discussed the issue of former members returning for guest flights. The intent of the by-laws is that if you can drive to the field you can pay the dues.

The Board also discussed the Park Flyer



AMA membership as qualification for joining SFRCF. The Park Flyer AMA membership has limited insurance and does not meet requirements for Sanderson Field. You must have a general AMA membership.

The box containing the canopy that was donated by Stacy Myers needs some different wheels, Dick Robb will find wheels. John Tupper motioned to reimburse Dick for the wheels he finds.

Dick Robb motioned we get a port-a-potty out to the grass field. Seconded and passed, John Tupper will call.

Adjourned 7:37

### For Sale



Gordie Osberg 426-5172 has the following airplanes for sale:

Hangar 9 Sopwith Camel biplane 60", glow or electric- all assembled, all servos installed. \$100

Aspire 2 meter (78.5"). glider, electric ready to fly includes lipo batteries and transmitter \$100. (a veteran of Hunter farms)

World Models P51, Thundertiger .46 engine, retracts, all servos installed \$200.

# A123 batteries - A special report by Al Watson

## A123

## BATTERIES

A Special report by Al Watson

Last fall I began to research A123 batteries – Lithium NanoPhosphate, what ever that is! The following information quickly became available:

- A123 batteries are manufactured by A123 Systems ~ located in Watertown, MA. Originally designed for power tools they are quickly finding their way into hybrid vehicles, including hybrid busses and the new Chevy Volt.
- A123 Systems manufacture two cells which are applicable to the R/C hobby Part Number 18650 1100Mah, and Part Number 26650 2300 Mah. They also make a “32 series” cell which is specifically designed for the automotive

industry.

- 3.3V/cell so two cells make up a receiver pack.
- Very low internal impedance- high current draw does not result in a big voltage drop.
- Very low selfdischarge
- A123 Systems claim over 1,000 cycles at 10c discharge.
- NanoPhosphate technology is resistant to explosion/fire even from overcharging.
- Capable of up to 30c discharge.
- Half the weight of comparable capacity five cell NiCads.

Wow! This is all great stuff, but now the real work begins. How do I charge and discharge these batteries and who makes up packs for our use? I wanted a charger that was designed for A123’s and, most importantly, was easy to use. After looking at several chargers and posting some questions on the

Battery Forum in RCU I decided that the \$50.00 FMA CellPro4S



charger would take care of my needs. I especially liked the fact that the factory default setting for that charger is A123. The CelPro 4S is basically a plug and play. Next issue was what to do about discharging A123’s as the CelPro 4S is only a charger– no discharge capability. I was surprised that a number of people asked “What do you want to discharge these batteries for?” Their position was just figure out what your consumption is per flight; figure out how many flights you can go on fifty percent of the batteries

**DUES ARE \$100.**

**IF YOU PAY BY MAIL SEND YOUR DUES, YOUR OLD KEY, PROOF OF 2009 AMA MEMBERSHIP AND A SELF ADDRESSED STAMPED ENVELOPE TO THE TREASURER:**

**CHUCK KENTFIELD  
3122 Madrona Beach Rd.  
Olympia WA 98502**

**Make checks payable to SFRCF**

### CLUB OFFICERS

President .....	Eric Oberg .....	(360)426-8777
Vice President .....	Dick Robb .....	(360)427-4521
Treasurer .....	Charles Kentfield .....	(360)866-9473
Secretary .....	Bob Beatty .....	(360)426-5601
Safety Officer.....	John Tupper.....	(360)426-6383

### BOARD MEMBERS

Board Member.....	Eric Oberg .....	(360)426-8777
Board Member.....	Dick Robb .....	(360)427-4521
Board Member.....	Jody Diaz.....	(360)427-6102
Board Member.....	Stacy Myers.....	(360)426-9367
Board Member.....	Bob Beatty .....	(360)426-5601
Board Member.....	Dave Fisher .....	(360)490-2338
Alt Board Member .....	Bob Mason .....	(360)426-9256
Alt Board Member .....	Chuck Kentfield .....	(360)866-9473

# A123 batteries - continued

capacity and then recharge. I've been around this hobby for a long time and when it comes to batteries I want to know that when the manufacturer tells me that his battery capacity is 2300Mah I want some proof. What's really important is that a year or two down the road you want to know if the battery capacity has degraded and, if so, by how much. Discharging is the only way to determine battery health. In addition since A123 batteries have a discharge curve that is unique I was interested in a discharger that would display voltage in addition to Mah pulled out of the battery. With these requirements in mind I called Peak Electronics in Arizona. I have one of their SuperTest dischargers for four, five and eight cell Ni-Cad/NiMH packs. I was surprised and happy to discover that they had a new version of their dis-charger – the SuperTest Pro. This discharger requires a



separate 12 volt power supply and can be programmed to cut off from 1.0 -14.0 volts in 0.1 volt steps at discharge rates of 125, 250, 500, 750, 1,000,1,500 or 2,000 MaH. So \$100 later I had my new SuperTest Pro discharger.

Now if I only had some A123's I could have fun! I found three companies that make up A123 packs – NoBS Batteries; Fromeco and ElectroDynamics. I chose Fromeco and procured six 2300 Mah packs for three turbine powered models. These batteries come with 16 awg power wires and the connector of your choice. They will also add the charge balancing tap to match your particular charger. Cost of the Fromeco A123 2300 Mah pack is \$46.00 Before I started playing with my new batteries, charger and discharger I needed to get a little more information – What is a good discharge rate and cutoff voltage. NoBS batteries have a lot of good information on A123's on their Website [Http://www.hangtimes.com](http://www.hangtimes.com) – see A123 batteries FAQ. That site suggests discharging at 1 Amp and a cutoff voltage of 2v per cell. So, that is where I started. When the CelPro4S is powered up the screen will tell you that it is in the A123 mode and it will also display the % of charge presently in the battery – more about this % later. Pressing and releasing the mode button will bring up a second screen which tells the voltages of the individual cells. Pressing and releasing the mode button again will bring up a third screen which shows the current charge rate and the number of Mah added to the battery. Pressing and releasing the mode button again will return you to the first screen. Caution Do not push and hold the mode button during charging. This will change the charger's mode to one of the

other chemistries which will ruin the A123's.

A few comments about the CelPro4S -

- Very easy to use.
- Charge start slow and quickly tapers up to 4.0 Amps
- Charger beeps at 100% charge and then continues in the balance mode.
- Beeps when balancing is complete.

The SuperTestPro discharger is also very easy to use. By now you must have guessed that I like stuff like this to be easy! Plug in the A123, hook up to the 12v power supply and select the cutoff voltage to 4v by pressing the higher or lower button; then press both buttons simultaneously to lock in the 4v number. Use the same procedure to select the discharge rates and the discharge process will begin. The screen displays the following through out the discharge cycle:

- Cutoff voltage and discharge rate – the same numbers that were programmed in.
- Battery voltage
- Mah taken from the battery.

I had prepared some graph paper to plot the discharge process. Volts vs Mah –Volts from 4.0 – 7.0 and Mah from 0 – 2400 in 300 Mah steps. I wanted to get the voltage at each 300 Mah step so this meant keeping a close eye on the screen. The first discharge at 1a did surprise me. The battery came off the charger at a little over 7v

## A123 BATTERIES CONTINUED

and very quickly dropped to 6.4 v where it stayed until 1500 Mah had been consumed. By 1800 Mah it had dropped to 6.3 v and from there on the curve was getting very steep = 1950 Mah 6.1 v and at 2100 it was heading straight down. Based on this test I could see no reason to set the cutoff voltage at 4v, so all future tests were set at 5v. In addition I was concerned that the SuperTest Pro showed the pack voltage to the nearest .1v, so all subsequent tests were performed with a multi-meter tied in to the circuit, which allowed me to read the voltage to the second decimal place. Tests were conducted at .5a, 1.0a, 1.5a and 2.0a.

I spent a lot of time watching that discharger multi meter and I was more than impressed with these batteries. The consistency from one pack to another was amazing! So here are my conclusions about all these discharge cycles:

- All packs came off the charger at a little over 7v and the surface charge was gone very quickly. From that point out to approximately 15000 Mah the discharge was a straight line dropping only about .1v.
- The tail off was similar for all packs. The curve was gentle out to 1800 Mah and at 2100 Mah the packs were fully expended – don't know where the 2300 Mah came from!

There has been a lot of discussion on RCU about selecting a “No Fly Voltage” for these batteries. Look

at the attached graph displaying the voltage for a .5a and a 2.0a load. If you were to use an Expanded Scale Voltmeter (ESV) to determine a “No Fly Voltage” it would be vitally important that you know the load imposed and that you selected the “No Fly Voltage” based on a discharge curve that was generated using that same load. This can be a risky business and I don't plan on going this route.

Let's go back and look at the CelPro4S charger. Remember that the charger displays the % of charge in the battery at the start of charge and throughout the process. I did a number of tests with batteries that were partially charged to validate the % of capacity shown and found that it was reasonably accurate. So to determine the state of charge you can simply plug in the CellPro4S and look at the fuel % and go from there.

Now it was time to get some flight time on the A123's. For this part of my evaluation I used my Kingcat—(2) A123 2300 Mah packs installed. My flight timer is set for 10 minutes and the timer is started after I am in take off position on the runway. The plan was to charge both packs after three flights and record the number of Mah to get back to 100% charge. Looking at the data from the first three flights I consumed 507 Mah and 535 Mah, the second, three flights, 475 Mah and 505 Mah. Averaging these numbers the Kingcat consumes a little over 500 Mah from each of the two batteries for three flights. Based on that data I could easily

fly six or seven flights and still have a good margin of Safety. So for my Kingcat I have two ways to determine if it is okay to fly - plug in the CelPro4S and look at the % charge in the battery, or since I know that three flights consume approximately 500 Mah from each battery I can easily determine when to recharge.

A few final comments. There seems to be a question about whether or not balancing is required on these two cell packs. Since the CelPro4S has the capability why not use it? If you look at the second screen during charging you will see the individual cell voltages and the biggest difference I have seen is less than .05v. I have been letting the charger balance every three or four charges when it is convenient.

Another question concerns state of charge during storage. I have seen 100 % mentioned and also 50%. All the packs I got from Fromeco seemed to be around 50%. All seem to agree that you should not store these packs fully discharged and they are best kept at room temperature. Anyhow I hope that you find some of this information useful. I believe that A123's will be the battery of choice in the future for our turbine powered models.

Happy Flying,

Al Watson

June 2009						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 7:00p SFRFC Board Meeting	3	4	5	6 Fly-in (Hunter farms) NWACC motor cross
7 NWACC Motor cross	8	9	10	11 7:00p SFRFC Regular meeting	12 WSP	13
14	15	16	17 WSP	18	19 WSP	20 Fly-In
21	22	23	24	25	26	27 BAEC Auto Club
28	29	30				

Events listed in red are no fly days - Events listed in green are OK to fly - Events in orange are our events

Only a couple of no-fly days this month so far ...Be sure to check the Events page on the Web Site.

<http://sfrfc.quintex.com/Events.html>

## Club Scheduled Events for 2009

January 1st.....First fly of the year - No go... snow and rain  
 February 8th.....Pylon Race - Come out and help officiate  
 March 15th .....Pylon Race - Come out and help officiate  
 April 18th .....Sanderson Field RC flyers annual swap meet 9:00 to 12:00 SHS Sub  
 April 19th .....Pylon Race - Come out and help officiate  
 May 23th.....Fly-In - 9:00 a.m. to ?????  
 May 24th.....Pylon Race - Come out and help officiate  
 May 30th.....Forest festival Parade float  
 May 31st .....Public Fly-In 9:00 a.m. to ?????  
 June 6th.....Open House Fly-in/work party - Hunter Farms  
 June 20th.....Public Fly-In 9:00 a.m. to ????  
 July 18th.....Scale fly-in/Public/potluck BBQ - 9:00 a.m. to ?????  
 July 24th - 26th.....Pylon Race - Locked  
 August 22nd.....Fly-in - 9:00 am to ????  
 August 28th-30th.....Pylon Race - Locked  
 September 12th.....Fly-In 9:00 a.m. to ????  
 October 10th.....Fly-In 9:00 a.m. to ????  
 December 10th .....Christmas Party 6:00 p.m. to 9:00 p.m. (potluck)

**It's time for 2009 dues, dues are \$100.00**

Check out our web site at <http://sfrfc.quintex.com>