



THE FLIGHTLINE



AMA CLUB 668

SINCE 1968

RACINE RADIO CONTROL CLUB INC

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January 2009 Issue

Next Meeting January 18, 2009 at 6PM Mt Pl Village Hall

Club Officers

President

James Litwin
262-637-2787
jlitwin@wi.rr.com

Vice President

Jerry Rose
262-886-0509
thehandyman52@sbcglobal.net

Secretary/Treasurer

William Dollase
262-554-6217
Esall9@SBCGlobal.net

Field Chairman

Randy Ruddell
262-598-0447
rruddell@wi.rr.com

Safety Officer

Jerry Armantrout
262-633-4585
Jerry@Armantrout.us

Tractor Chairman

Eric Armantrout
262-884-4675
Ericandlaura@Armantrout.us

Compost Director

Bruce Rowland
262-633-5254
tacit@wi.rr.com

Webmaster

Paul Willems
262-619-4119
pwillems2@yahoo.com

Newsletter Editor

Dennis Vollrath
262-639-6362
vollrathd@yahoo.com

MINUTES OF THE DECEMBER 14TH, 2008 MEETING

President Jim Litwin called the meeting to order at 6 PM. The November meeting minutes were accepted as published.

REPORTS:

PRESIDENT: Jim Litwin noted that Dennis Vollrath, our Newsletter Editor, has an article in the Electronics section of R/C REPORT magazine.

The field is "open", the snow is gone, temporarily, and flying is possible. The fence has been distorted by snow loads.

Our field provides many advantages that are not available at other fields. Close proximity of the parking lot to the flight line, a large fly-over area, and a co-operative membership. Not every club is so fortunate.

VICE-PRESIDENT: Jerry Rose reported that we have received a check from the Milwaukee R/C Association to cover a portion of the field improvements made in 2008. The Association also has a program to provide matching funds for charitable activities as well as field improvements.

Overall Fly-in attendance has been down at area events. Our Fly-In actually had a better attendance in 2008 than in the previous year.

There will be an indoor Fly-In, held in Milwaukee. Cost is \$25.00. (All Electric). The intent is to promote support for local hobby shops. If you order your planes, etc. over the internet or through catalogs, your local hobby shop cannot support the type of inventory you would like to see when you shop locally. Details of the indoor fly-in may be obtained through use of fax or phone numbers found on the HAPPY HOBBY SHOP website. <http://www.happyhobby.com/>.

The Milwaukee Association will meet again on February 7th, 2009 and they will need the dates of the fly-ins, so that they can co-ordinate the events.

The EAA provides an area for R/C and control line activities. CIRCLE MASTERS club is looking for volunteers to participate in its control-line instruction activity. (end of July. Oshkosh, WI.)

SECRETARY/TREASURER: Bill Dollase reported on the club's financial status. The club presently has 75 members. Club membership fees and application blanks are available on the website.

SAFETY CHAIRMAN: Jerry Armantrout reported that the field chairman will be purchasing rock salt to be spread on the walk-ways.

FIELD CHAIRMAN: Randy Ruddell said that we won't mow the field, again, until next year.

NEWSLETTER EDITOR: Dennis Vollrath recommends GOOGLE (internet) for a great deal of information about spread spectrum. It is rumored that a comparison of spread spectrum radios may be published in the near future, so if you are thinking about buying that type of equipment, you may want to put off the purchase until the comparison article is published.

TRACTOR CHAIRMAN: Eric Armantrout that the tractor and the mowers in storage are in good condition.

COMPOST DIRECTOR: Jim Litwin reported for Bruce Rowland. The 2008 compost site season is over.

Sign-up for the best slots available in 2009 is now possible. Contact Bruce via the internet or sign up at a meeting.

WEBSITE DIRECTOR: Paul Willems noted that Membership Applications are now on the website. They have been updated to include 2009 fees and address information. The compost site roster is also available. Soon the 2009 Handbook will appear there, also.

NEW BUSINESS:

Dennis Vollrath asked permission to publish on the website the complete article on how radios work. This article might be referenced in a nationally circulated magazine. Paul Willems, website director, felt there were no technical limitations to the request. A poll of the membership supported the request.

(Election of officers)...Jim Litwin asked for nominations at this time for 2009 officers. There were no nominations made. A motion was then made, and seconded to keep the current board of directors for 2009. Motion passed.

(Setting of dates for 2009 events) March 7th was chosen as the date for the awards banquet. Trophies must be returned to Jerry Rose at the JANUARY meeting.

SHOW & TELL: Eric Armantrout displayed a "control surface throw indicator" he assembled. It is a clip-on device reading degrees of surface movement rather than inches.

RYGASEWICZ DRAWING: Dave Czarnowski won the prize.

Our Annual New Year's Day Fun Fly takes place on January 1st at the field. 9AM, Dress appropriately.

NEXT MEETING DATE: January 18th, 2009. 6 PM at the Village Hall, corner of hay 31 and 11.
Motion made, seconded and passed for adjournment.

JIM'S CORNER

The year started out with quite a few of the club members celebrating the start of the New Year by gathering out at the field. The "First Flight" of the year goes to Jim Furby, and unfortunately, the "First Crash" of the year goes to Jerry Armantrout. It seems that now that we have the heated shelter, more members show up and stay inside eating than before when we stood around a smoking burn barrel to stay warm. I wonder why???

At this month's club meeting we need to vote on club awards for the past 2008 year. Those awards are described elsewhere in this newsletter. Give it some thought.

Jerry Rose has set up the club's annual banquet and you will find that information elsewhere in the newsletter.

The gate pad lock combination code will be changed on March 1st, so get your membership dues in. Your newsletters will also stop coming after the February issue if you have not renewed your membership.

As I write this article, the weather is getting colder and the snow deeper. Sounds like building time!!

I hope to see you at the next club meeting on Sunday, January 18th at 6:00 Pm at the Mt. Pleasant Village Hall.

Jim Litwin
President

Dennys Stuff

Take a look at page seven of this newsletter. This is a file that I put together a few months ago with no documentation.

Page seven is a summary of the various types of batteries available for our models. This includes the high power batteries required for electric models, as well as the normal batteries required for our receivers, ignition systems for gasoline powered models and so on. Specifically, this table shows what batteries are suitable for a model using a brushless motor size similar to the four stroke 70 sized glow engines.

That would be a battery capable of putting out about 20 volts DC at around 50-60 Amperes, or 1000 to 1200 watts.

NiHyd (Nickel Hydride) type battery.

This is the common "Sub C" type of battery commonly used in just about all of the portable battery operated tools such

as drills, hedge cutters and similar items. These batteries are fairly economical, and last a long time under reasonable loads.

As mentioned previously, these type batteries are quite suitable for receiver power for the larger quarter scale type models, where their weight is not really an issue. These batteries are reliable, readily available and are suitable for both receiver and ignition power sources. Stick with name brand batteries such as Sanyo for your receiver batteries.

Many modelers are using a five cell battery pack for the larger models, mostly for the faster and more powerful servo action that these 5 cell battery packs give. Please note that a few radio servo's out there do not work well with a five cell battery pack. Before using a 5 cell battery pack with your radio, check around with other club members. (JR is one radio supplier that has a servo or two that is not compatible with these 5 cell packs.)

(On that subject Rodger Olsen talked about a new servo that is on the horizon. JR has a very high powered servo coming to market that is beyond belief. This is the JR part number 8711HV servo that is rated for 480 inch ounces. This servo is capable of putting **30 POUNDS** of force on a servo arm one inch long. And, its designed to operate directly from a two cell LiPo pack without a voltage regulator. Of course, this thing is not cheap, list price is on the order of \$200 each. It uses "supersteel" gears and an aluminum case. This single servo can replace multiple servos normally used for rudder, elevator and so on for the larger models. Availability is February 2009.)

Back to page 7. Note that using these NiHyd cells for a large Hacker A50 class model is not practical. Looking at the "Specifications" column, it takes 22 cells that will weigh in at 51 ounces. This 51 ounce battery pack contains energy equivalent to a 5.3 horse power motor running for exactly one minute. (Or, 0.53 horse power motor running for 10 minutes.) The pack weighs in at 9.6 ounces per Horsepower Minute of capacity, and has a volume of 4.3 cubic inches per horsepower minute of capacity.

The estimated battery life of this NiHyd pack when used on a Hacker A50 class motor is not very good. Personal experience, these batteries will run very hot, requiring an external fan to cool the batteries while recharging after a flight. I've found that they will only last about 75 flights or so, before their output voltage under load drops significantly. Its simply a matter of overloading these cells when used with the Hacker A50 motors. Because these cells are being overloaded with the Hacker motor, their lifespan is short, resulting in an estimated cost of \$1.65 for each flight.

On the other hand, these type batteries are very good when used at currents below 30 Amperes, such as would be the case for receiver power on a large gas

powered model. Typical servo loads on this type of model would likely peak at less than 10-15 Amps. And, running these batteries completely dead has little effect on them, provided they are recharged in a reasonable time. And DO NOTE that these types of batteries should NEVER be recharged with that charger that came with your radio. These radio chargers do not put out a high enough charge rate for these larger NiHyd cells.

A123 type Battery 2300 MaHr 26650 cells

Two of these cells put out (3.6 X 2) 7.2 Volts DC right after being recharged. The voltage drops to about 7.0 Volts DC after taking it off of the charger. Compare that to the typical NiHyd 5 cell pack that will measure about 7.0 VDC right after taking it off of a peak charger. That voltage drops to about 6.0 Volts DC at a 30 Ampere load.

(These A123 cells are available only in the 2300 MaHr and 1100 MaHr capacity. The Black and Decker VPX battery system uses two of these 1100 MaHr cells. Various Internet sites have indicated that these VPX battery packs are easily disassembled for access to the individual cells. These VPX packs sell for around \$20.00 or so.)

A lot of information on the Internet indicates that modelers are using these A123 batteries directly on their radios without a voltage regulator. That is putting 7.0 VDC on your radios, something JR does NOT recommend. But, people are doing it, and two of these cells are very close to the maximum voltage put out by a five cell NiHyd battery pack, immediately after charging.

As for use in a Hacker A50 type motor, these A123 cells should be used in parallel, with a six series cell, two parallel battery pack. That's 12 cells total. The chart indicates that this 12 cell A123 pack will weigh in at 30 ounces, nearly one-half that of the NiHyd pack. This 30 ounce battery pack contains an energy equivalent to a 5.79 horsepower motor running for exactly one minute, or a 0.57 horsepower motor running for 10 minutes. Its weight of 5.2 ounces per HP minute is about 1/2 of that for the NiHyd pack, and its volume per HP minute is about the same.

The very big difference between the NiHyd and A123 packs comes about from their performance in the model. These batteries can be recharged in 15 minutes, and will run very cool both during a flight, and during recharging. This battery pack consisting of six series, two parallel cells can easily handle 75 Amperes, and it appears that they will last over 400 flights. That amounts to some 50 cents per flight. Seventy five amperes, and 18 Volts DC represents 1350 watts, or 1 3/4 horsepower!

Even though these batteries are more expensive, their price is coming down. I just bought a 10 cell Dewalt DC9360 battery on Ebay for \$120 plus shipping. That works out to a cost of \$12 for each cell. One 3.6 VDC A123 cell is directly equivalent to three NiHyd cells.

Various Internet sites have indicated that 400 flights might be very conservative. I've only found one A123 pack on the Internet that failed, reportedly because the modeler

connected the battery to his charger with reverse polarity.

These batteries can be damaged by over discharging, but a number of Internet sites have indicated that they have discharged these cells down to 1/2 volt DC per cell and got away with it. I've also done this once, and got away with it. But this is definitely NOT RECOMMENDED!

It's interesting, one Internet site had an article about a modeler that took a single A123 cell, and set it up to fully charge, then discharge to ZERO volts, then fully charge, discharge and so on automatically. After 400 cycles, this single cell did not lose ANY capacity! (Don't try this with a A123 battery pack, as explained later in this column.)

LIPO Type Battery

Two of these cells put out 8.4 Volts DC right off of the of the charger, dropping to about 7.6 VDC after removing from the charger. This is above the ratings for just about every radio receiver system on the market. These cells require the use of a voltage regulator that can handle the typical loads of the radio you have selected.

As for the use with a Hacker A50 series motor, these cells will also work quite well provided a battery of at least 5000 MaHr capacity, along with a "C" rating of at least 15 or 20 is used. Their weight is far less than the NiHyd, and noticeably less than the A123 cells. Their energy rating of about 4.9 Horsepower minutes (1/2 HP for 10 minutes) is similar to the NiHyd and A123 packs. Their weight per HP minute is considerably less, at 3.4 ounces per HP Minute. Also, note that these cells are also considerably smaller, at 2.9 Cubic Inches per HP Minute. They also have a maximum current rating of about 75 Amperes.

On the other hand, these cells have a history of very violent catastrophic failure when abused, either by over charging, discharging at to high of a current level, or by physical damage.

When operated under reasonable conditions, these cells might give 150 five minute flights. This is subject to debate. In fact, one of the advertisements of these LiPo batteries has indicated that when running these cells at their maximum "C" rate, their batteries may have a useful life span of 30-40 flights. That gets extremely expensive if you are talking about a battery pack that costs well North of \$300 each.

Something else is involved with the A123 and Lipo batteries. And this is critical to their useful lifespan.

First Issue

None of these batteries should ever be operated above 140 degrees F case temperature. Going over the 140 F temperature will drastically shorten their life.

Second issue

Flying your model until the batteries noticeably loose power. That is not an issue with the NiHyd packs. It is a SERIOUS issue with the A123/LiPo packs.

When you have multiple cells, such as my six series cell battery pack for my Hacker A50 motors, its just a fact that these cells are not exactly identical. They will vary slightly between individual cells of a battery pack in their ampere hour capacity. Along with this, these cells drop off voltage very rapidly when they are completely discharged.

Now, when you have six cells in series, say five of them have 2.30 Ampere Hours, and one of them has 2.20 Ampere Hours. While discharging this battery pack completely, that cell with the 2.20 Ampere Hour capacity will discharge first, and it will drop voltage very rapidly. Meanwhile, the remaining 5 cells are still putting out power. That 2.20 Ampere hour cell will continue to drop in voltage, down to 2 VDC, 1 VDC,) VDC, then **REVERSE VOLTAGE!**

That reverse voltage can seriously damage A123 cells. And it goes without saying, that once the LiPo cells drop below 3.00 Volts DC, (even once!) they will also be damaged. And the damage will be greatly reduced ampere hour capacity. This is not good with a LiPo battery powering your model airplanes radio system, that is having a LiPo battery that was up to par one flight, and next day, having one cell of that LiPo pack with greatly reduced Ampere Hour capacity.

That is a summery of these three different battery types. Under the proper operating conditions, they all work fairly well. If you need absolute battery reliability in your larger 1/4 scale model, dual primary/backup battery packs of 4 or 5 cell NiHyd battery packs is hard to beat. If weight is a little bit of an issue, and your radio can handle the two cell A123 packs, the A123 packs can be considered. And, if weight is a real issue, you can consider the LiPo packs for the receiver and servos. Just be aware that the A123 and LiPo packs may exceed the voltage rating of your radios. And, the A123 and LiPo packs each use different chargers!

What's in the future?

The February "The Flightline" issue will start a series of articles on "How your Ignition Systems Work". It's going to start at the very basic electricity/magnetism relationship, and continue through the CDI systems many gas models are using.

Its interesting to note, that the very early gasoline engines of the late 1800s did not use Spark Plugs!!

Some of these old engines without spark plugs can be found still in running condition at some of the old Steam and Gas exhibits around the Wisconsin area. They are extremely rare. Many of them have been converted to run with a spark plug. The upcoming series of articles will also describe just how these engines without sparkplugs worked.

GREENFIELD NEWS & HOBBY

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RACINE R/C AWARDS BANQUET MARCH 7

CHARCOAL GRILL AND ROTISSERIE
8300 WASHINGTON AVE.

COCKTAILS 6:00

DINNER 7:00
WOOD GRILLED CHICKEN

BARBEQUE PORK RIB PIECES WITH BBQ SAUCE

\$ 21.00 PER PERSON

SEND RESERVATIONS TO
JERRY ROSE 10832 WASHINGTON AVE.
STURTEVANT WI. 53177

RESERVATION MUST BE IN BEFORE 2/28/09

Awards Listing January 18, 2009

CRAFTSMANSHIP AWARD

For outstanding craftsmanship; awarded by the club board based upon nominations from the membership. The trophy was donated by Steve Holly to honor the wonderful and precise crafting by the modelers in the club.

Last years recipient – Ron Dixon

SPORTSMANSHIP AWARD

This award to be awarded to a member who has displayed outstanding “Sportsmanship” during the year. “Sportsmanship” is a broad term encompassing a members helping of others, friendly attitude, and an outgoing warm representative of the club based upon nominations from the membership.

This award trophy was donated by Ron Dixon in 2007, as a means to recognize genuine good, outgoing, friendly, and helpful behavior of our club members.

Last years recipient – Jerry Rose

RYGASEWICZ AWARD

Presented for outstanding service to the R/C Club and/or the community based on nominations from the membership.

When Art Rygasewicz died in December 1988, his wife, Marie, sold all of his planes, equipment and tools. The money gained from the sale was donated by Marie for a trophy in memory of Art and also presented for service to the R/C Club and/or the community based on nominations from the membership.

Last years recipient – Jeff Leach

INSTRUCTORS AWARD

This award will be given to the instructor chosen by the Instructors of the club.

This trophy was donated by Gary Anderson in recognition of the instruction and training of new student pilots by club instructors, and in honor of outstanding efforts made by RC Flight Instructor Joe Colletta.

Note: Selection process changed for 2007

Last years recipient – Jerry Armantrout

GOLDEN PROPELLER AWARD

The award was conceived to honor a flyer who has performed outstanding or exceptional service to the club and is awarded by past winners of the award.

Last years recipient – Randy Ruddell

BATTERY COMPARISONS		All Specs based on battery for Hacker A50 Motor			Esti-
		mates based on Internet Info			
Battery Type	Specification Using Hacker A50 Motors	Calculations	Estimated Battery Life	Battery Life Cost Per (5 min) flight	
NIHYD CELLS	No Cells	22 (22S1P)	75 (5 Min) Flights	\$1.65	
(Low is best)	Weight - oz	51	Batt Cost \$125		
(High is best)	Watt Hours	66	Recharge time 20 Minutes		
(High is best)	HP Minutes	5.3	Batt Temp Rise 45F		
(Low is best)	Weight per HP Minute	9.6 oz	Batt very hot after charging		
(Low is best)	Volume per HP Minute	4.3 Cu In	Max Current 30 Amps		
Hacker A50 overloads			Fire Hazard (None)		
These cells			Over Discharge Limitation (good)		
A123 26650 CELLS	No Cells	12 (6S2P)	400 (5 Min) Flights	\$0.54	
(Low is best)	Weight - oz	30	Batt Cost \$216		
(High is best)	Watt Hours	72	Recharge time 15 Minutes		
(High is best)	HP Minutes	5.79	Batt Temp Rise 10 F		
(Low is best)	Weight per HP Minute	5.2 oz	Batt temp cool after charging		
(Low is best)	Volume per HP Minute	4.8 Cu In	Max Current 75 Amps		
Can recharge in model			Fire Hazard (None)		
			Over Discharge Limitation (Fair)		
LIPO 5000 MA HR CELLS	No Cells	5 (5S1P)	150 (5 Min) Flights	\$1.93	
(Low is best)	Weight - oz	17	Batt Cost \$290		
(High is best)	Watt Hours	61	Recharge time 70 Minutes		
(High is best)	HP Minutes	4.9	Batt Temp Rise 20F		
(Low is best)	Weight per HP Minute	3.4 oz	Batt temp warm after charging		
(Low is best)	Volume per HP Minute	2.9 Cu In	Max Current 75 Amps		
Can NOT recharge in model			Fire Hazard (Yes)		
			Over Discharge Limitation (Very poor)		

d:\vacine rc club data\123 info\batt comparison info

COMPOST SCHEDULE

	Noon to 2 PM	2 PM to 4 PM
15-Apr	Bob Lupia Gerald Bublavy	Bob Lupia Gerald Bublavy
22-Apr	Gerald Jones	Gerald Jones
29-Apr	Richard Gobeli Jerry Rose	Richard Gobeli Jerry Rose
6-May	Richard Cook John Czarnecki	John Czarnecki
13-May	Shel Berman Paul Willems	Jim Litwin Paul Willems
20-May	Shel Berman Bill Dollase	Jim Litwin Bill Dollase
27-May	David Czarnowski Richard Cook	David Czarnowski
3-Jun	Merv Sommerfeld Dennis Vollrath	Merv Sommerfeld
10-Jun	Dennis Vollrath Boyd Recknagel	Boyd Recknagel
17-Jun	Jerry Armantrout Gary Anderson	Jerry Armantrout Eric Armantrout
24-Jun	Larry Danko Randy Ruddell	Larry Danko Randy Rudell
1-Jul	Roger Olsen	Roger Olsen
8-Jul	Curt Sommerfeld	Curt Sommerfeld
15-Jul		
22-Jul		
29-Jul		

	Noon to 2 PM	2 PM to 4 PM
5-Aug		
12-Aug		
19-Aug	Jim Engholt	Jim Engholt
26-Aug	Ron Dixon GaryAnderson	Ron Dixon Eric Armantrout
2-Sep	Jim Furby Keith Bushka	Jim Furby Keith Buschka
9-Sep		
16-Sep		
23-Sep		
30-Sep	Steve Kozlik	
7-Oct		
14-Oct		
21-Oct	Steve Kozlik	
28-Oct		
4-Nov		
11-Nov		
18-Nov		
25-Nov		