

# DCRC



## March 2009

**DCRC Club Meeting**  
**Friday 3/20/09 7:30 PM**  
**Montgomery County**  
**Council building**  
**100 Maryland Ave**  
**Rockville, MD**  
**Meeting program:**  
**David Harris Painting**  
**WW1 Planes**  
**Meeting Raffle:**  
**Nir Schweizer**

### NEWSLETTER

Volume 55, Issue 3

Roy Day: How'd they do that?  
Spring is almost here!

Check out the new monthly column.  
by David Drazin "AirWays"



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**www.dc-rc.org**

*Did you know that any airplane brought in to the model shop will receive 3 free raffle tickets. Bring in your models each month for your free tickets, and to share ideas.*

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**Cover: Roy Day Retire NASA Engineer wondering how they got than man to fly.**

*Photo by Thomas Pfarr*

# AirWays!

BY DAVID DRAZIN



This is a new series of articles about club events and happenings. I will write about gatherings when they occur. The intention is to report on club activities with some humor thrown in.

During the cold weather, the club has been allowed the use of the indoor facilities at the Germantown SoccerPlex. We have had 4 flying sessions there on Wednesdays from around 12:30PM until about 4:00PM. Everyone that has participated really enjoyed the flying. It is very relaxed because the speeds are generally slower and the models are not the more expensive types.



Most were the indoor "Vapor" planes which are perfect for the site. Even the



author, who has yet to fly, can handle the slow flyer. With so many "Vapors"



in the air some had trouble watching their own craft while trying not to hit another one. Naturally there were many near misses and some spectacular mid-air collisions. Everyone laughed and rehashed the event with much alleging as to who was guilty. Laughter followed with each excuse given and flying continued. The people with the 3D foamies were dodging the smaller (and slower) planes while performing their stunts. Several "Vapors", which Andy Kane just happened to have new in the box for sale, were sliced & diced from the foamies. (He knows an opportunity when he sees one.) The more inexperienced pilots, including myself, stayed down at one end so as not to be in the way.

Notably, Dave McQueeney brought something resembling a flying saucer with a nylon type cloth stretched over a round wire frame. The motor is inside of the frame, which resembles a "bra", to protect the prop. A single wheel for landing is very flexible with guy wires to prevent breaking. I don't remember seeing a rudder, but, it can turn almost within its own body length. Nir Schweizer was constantly "CAing" and hot gluing his own and others models. He must have used about a 1/2 gal of CA from the many repairs.

Most of the flyers are those that are the



more avid people with giant models. It is impossible to mention everyone who came, besides I can't remember anyway. We must give credit to Jim McDaniel for making to arrangements for this facility. Check our website for the next time we can use it.

The Maxcutters will hold a fly-in at the National Building Museum on Sunday, March 15<sup>th</sup> starting @ 11 AM. Check their website for further details.

## February Club Meeting Minutes

BY DOUG HARPER



President Andy Kane called the meeting to order at 7:40 PM. Andy called for introduction of guests or new members. Andrea Russ and Mike O'Hara are new to the hobby. They have ordered an Extra 300 to get started. Andy recommended they check out flight training which is about to get started this spring. New member Adid has built an electric Alpha 40 and is getting into the hobby. Bill Gray is new to the RC game and came to see what it's all about. He wants to learn to fly RC. Kelly Reagan is joining the club. He is a veteran who flies 40% Cardins. He has been to the field and finds it more than suitable. He also flies helis.

**County Liaison/SoccerPlex:** Jim announced that the next indoor electric flyin is next Wednesday, Feb 26.

**Field Maintenance:** Allan announced that a work detail is scheduled for April 11.

**Sound an Safety:** Nir reminded everyone that the season is about to start so we should all pay attention to making sure our planes are ground checked for flight worthiness. Also, we should ensure that we meet sound requirements.

**Raffle:** Nir has two micro fliers for tonight's raffle. He also had a larger electric kit. Alec Jennison picked the winning three tickets. The winners were Allan Hoffman, Mike Preisner, and Terry Lamb. They all received a loud round of applause.

**Flight Training:** Mike reported that the training schedule has been posted on the web. First session is April 25 and will be twice a month after that.

**Treasurer's Report:** Scott announced three expenses over \$100.

**Vice President:** Dave announced that he is in the process of resubmitting the forms to AMA to continue our Gold Club status.

**Events:** Swan Harbor is having a flyin on June 6 north of Baltimore. RCMB is having a flyin on June 13.

**Old/New Business:** Don Gray reported that member Bob Hale has passed away. Ed Liebolt announced that the DCRC Flying Camp is scheduled for the first week of August. He plans to follow the proven approach that has worked so well in previous years. He is looking for members to attend during the week to help.

He is thinking of adding an indoor event to the week.

**Model Shop:** Walt Gallagher showed a micro heli that costs about \$98 and is a bind-and-fly to Spektrum transmitters. It comes with a 110 mah battery. Using two rotors, it flies very well and provides a lot of entertainment. Walt also demonstrated his new JR 9303 radio. Walt showed the features of the 9303 and feels it has much to offer for all but the very high end flyer at a very reasonable cost. It has a 30-model memory and uses a thumb dial instead of a touch screen to select features. It has a 2048 frame rate which provides a very high response. It also uses digital trims on all but the throttle.

Ed Leibolt showed another electric heli which is the next size up from Walts. It is called a Blade and is about twice the size. It also flies very well as was demonstrated by Ed when he flew around the meeting room.

Don Gray brought a power supply that he uses to charge batteries. He uses a 500W, 18 amp on 12v supply that he converted from a computer supply. He modified it to use banana plugs for his charge cables and an on/off switch. It cost him less than \$20 with a rebate and works great.

Dave McQueeney showed his Yellow Aircraft F15 that comes already painted. He installed a Wren 160 and will provide 36 lbs of thrust in a 28 pound aircraft (dry) so should fly well.

He used a bifurcated pipe to simulate dual pipes from one engine. It uses a flying stab with ball bearing controls. Dave pointed out the extreme washout at the wing tip of the model and looked at the full-scale version to check and sure enough it uses the same washout. Interestingly, the original version did not use this and was found lacking so the washout was added in the next model. The gear doors are sequencing just like the full-scale. This provided quite a plumbing challenge. The model is quite beautiful and Dave hopes to test fly it this spring.

**Program:** Terry Lamb continued his presentation of building a large Waco YF5 that ended up being flown in Top Gun last year. It was also flown in the Monster Plane flying in Florida.

The same gentleman, Gonzales, asked Terry to build a large Mk IX Spitfire using a Canadian kit from Clark. The kit comes in a big box full of sticks. This is a true craftsman kit and Terry was told to "build this plane like it was yours".

The plane has a 10 foot wingspan so Terry had to make the wing in two pieces to fit in an Escalade. He used aluminum wing tubes to join the wing halves. He used a very clever technique using a pencil embedded in the wing tube to mark each successive wing rib so he could drill the tube hole accurately. As he usually does, Terry came up with many "mods" to the kit to improve the design or strengthen the part.

The aileron is built up and used a control piece that Terry redesigned to give better and stronger control elements. The flaps are complex and Terry used photos he took of a full scale Spit in Kissimmee Florida. He tried various ways of installing the flap servos before he came up with the final approach. When he was finished, the look and accuracy of his model was far superior to the original kit.

The retracts were not at all close to correct. Terry found retracts and tires from Sierra that were much better. He beefed the mounting rail area to provide additional strength. He also made the retracts so they were removable if needed. This was a great improvement.

Fitting the wing to the fuse turned out to be a major job. Terry made a jig to help in fitting all the parts and in sheeting the wing. He still feels there are several areas where the kit deviates from the full-scale version. And this from the "best" kit on the market.

Terry feels the techniques the kit used to introduce cooling air to the engine left a lot to be desired. He went with it only after talking to the kit manufacturer who assured him that it would work.

There were many other areas that Terry had to improvise or modify to help build a better model.

The final product was a beauty to behold. Much stronger, easier to maintain and greatly improved in scale fidelity. Terry proved one more time that he is a master craftsman in our hobby.

Terry received a resounding round of applause for his great presentation. And they say that real model builders are gone, not as long as Terry is around.

The meeting was adjourned at 9:17 PM.

## DESIGNING YOUR OWN MODEL

By Ron Bozzonetti

Why would anyone want to design their own model when there are so many kits or ARF's available for purchase at a reasonable price? For me it is the pleasure of the actual construction, seeing a structure taking form and the satisfaction of seeing something that I've created taking to the air. I believe that we all have within us a creative urge. For me this urge is satisfied by the design and construction of my own design. Fortunately there have been numerous articles in the modeling magazines that have furnished us with the proportions needed to successfully design your dream model which does not require an engineering background. The article that I've used over the years appeared in RCM Modeler magazine in 1968 and was written by the late Chuck Cunningham. When Maynard Hill was writing a column for Flying Models magazine he, likewise, furnished in the February 1970 issue the proportions needed to design your own model. Those who attended the February 2008 DCRC meeting were fortunate to hear Marc De Angelis and Bepe Fascione make a presentation on how to "Cure Yourself of ARF'itis." In this presentation they talked about the process of designing your own model and provided a handout containing the proportions for doing so. Comparing the data in these referenced articles you will find a remarkable similarity in the proportions that are furnished. For those who want a little more technical information there are some publications that furnish 'everything that you would want to know' in more depth than the preceding articles. One book by the late Andy Lennon "Basics of R/C Aircraft

not necessary as the articles first mentioned will give you all the data you need to successfully design your own model.

An advantage to doing it yourself is that you can employ your favorite building techniques and are not restricted by the kit manufacturers choices. I've never built a kit model that I haven't modified in some way to suit my way of building a model. Another benefit of doing it yourself is the ability to choose the wood for its intended usage. I can recall many kits where the wood that was furnished was wholly inadequate for its intended use. I've had wood that was too soft where a harder wood would've been a more logical choice. Likewise, I've had wood that was too hard where a softer wood would've been a better choice. Also, if you're inclined to expend a little bit extra effort you can submit your design to one of the modeling magazines for publication. When RCM Modeler was still in business they paid me \$600 for one of my designs. Flying Models paid me \$300 for another one of my designs. Their rate is \$50 per page. I don't know what Model Aviation or Model Airplane News pays for a design. I would guess that it would be somewhere between \$300 and \$600. The amount the magazines pay you depends on what they perceive the interest in the model would be and how much work they have to do to make it ready for print.

You do not need a lot of equipment to draw the plans for your creation. When I first started my drawing board was my kitchen table. I did have a T-square, some triangles and a scale. Drafting vellum with 1/8" gridded lines was the drawing medium that I used which was very practical. Keeping all of your dimensions in 1/8" increments is accurate enough. We're fortunate today to have places like Staples and Office Depot that can make copies of your plans at a modest cost

and in one piece. My inking skills are not that great so that I make all of my plans in pencil. The copies that are made by Staples and Office Depot render the lines in a solid black that makes them easily visible. I've since gotten a drafting table which is a nice luxury but not essential.

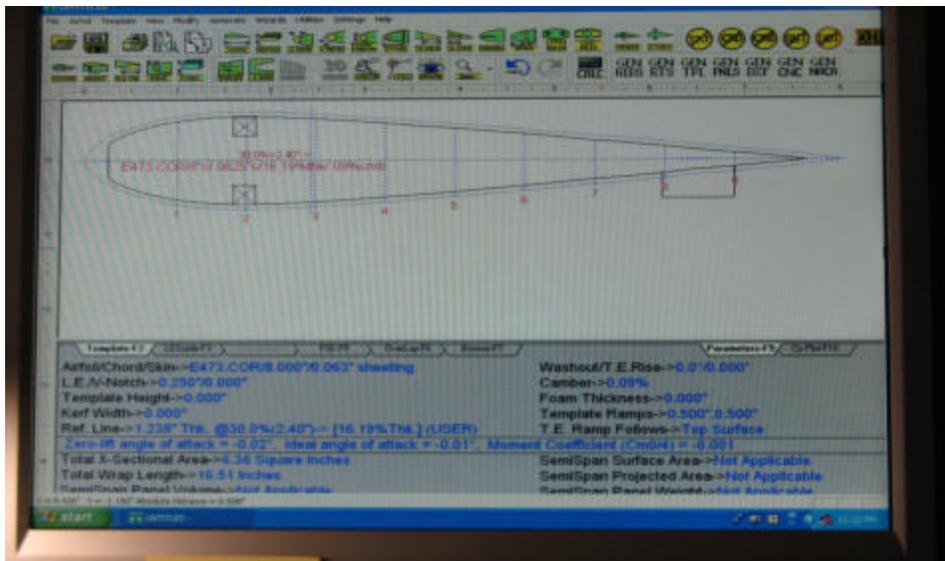
The era of the computer has certainly made an impact on our lives. It has been a Godsend for those of us who like to design our own models. There are two areas where the computer has dramatically made the job of designing your own model much easier and more pleasant. The one job that the computer has made a lot easier are the programs for plotting airfoils. Before the advent of the computer you had to find a source for the data of an airfoil and then painstakingly plot numerous points and connect them with ships curves. If you had a tapered wing you had to plot each rib which was a time consuming effort. Now with one of these airfoil plotting programs you merely have to specify the particular airfoil of your choice and whatever features you want such as the chord length, the thickness of the balsa skin, the size and location of the spars, the size and location of building tabs, the size of the leading edge and on and on. These programs have more features than I've mentioned. There are two programs that are very popular. There is CompuFoil at around \$200 and Profili2 at around \$25. I've got both programs but have been using the CompuFoil program only because I started with it and am familiar with it. The image shown below is a sample of an airfoil generated by CompuFoil.

The second area where the use of a computer has made the life of a designer a lot

*(Continued on page 7)*



Design" is a collection of articles he wrote for Model Airplane News. Another book is by Howard Chevalier "Model Airplane Design and Performance." A new book has recently been published entitled "Model Airplane Design Made Easy" by Carlos Reyes which can be obtained from the authors web site [www.rcadvisor.com](http://www.rcadvisor.com). While any of these books are nice to have as references they are



## Converting the Vapor Charger to NiCads or NiMHs

BY DON GRAY



The Vapor, one of the latest models in Park Zone's Etoic series, has become very popular in recent times. It is a perfect choice for indoor flying, especially when space is limited.

The model comes with a charger with four AA alkaline cells for charging the 70 mAh 3.7 volt LiPo battery. Not being fond of replacing alkaline cells every 15-20 charges, which can also become costly over time, I decided to replace the alkaline batteries with four NiCads. Substituting NiCads or NiMHs for alkalines reduces the charger supply from 6 volts to a nominal 5 volts. This 1 volt reduction will result in a somewhat longer charging time. The charger draws an average of about 330 mA at 6 volts versus 220 mA at 5 volts. A fully charged 700 mAh battery provides a little over 3 hours of charging time. To date, 3 hours has been more than enough, and that is with almost continuously charging since I have three of the 70 mAh batteries and one is usually on charge at any given time. If more time is desired, higher capacity batteries such as 2700 mAh NiMHs can be used. They run around \$12 for a pack of four (plus shipping). This would provide over eleven hours of charging time, a very long day of flying. Another option if using 600-700mAh cells is to quick charge on site using a portable peak-detector charger or simply carry extra charged cells. If necessary, an expandable voltmeter can be used to monitor the charge state. The 700 mAh NiCads I'm using were purchased from Harbor Freight Tools, on sale for under \$3 for a pack of four. I have used these cells in some of my older transmitters for a few years with no problems. At that price, they quickly become more cost-effective than replacing alkalines every 15-20 charges. Harbor Freight also carries NiMHs for a few dollars more, when on sale.

Converting the charger to rechargeable batteries is rather simple and straight forward. The cost can be under \$5, depending on the cost of the batteries used and if you don't have to purchase the other couple of items needed. Some of you more experienced modelers will find the instructions for this project too detailed. I have tried to write them so that those with little or no experience in this type of project can hopefully complete it with little or no difficulty.

The basic items needed are shown in Photo #1 and include the following:



1. Four NiCads or NiMH cells, 600 mAh or higher in capacity,
2. A battery pigtail, Servo lead, or an Aileron Extension,
3. One Servo Grommet or 3/4" of heat-shrink tubing if a grommet is not available,
4. A small (~1.4 mm) flat screwdriver and a #1 Phillips,

A 25-30 Watt soldering iron and a small amount of rosin-core solder.

You will also need a hand drill and bit.

**WARNING**, modifying the charger may void part or all of the your limited warranty.

To get started, first remove the four existing batteries and put them aside. If they are in good condition, they can be used as back-ups for either the Tx or charger in an emergency. Next we need to remove the four rubber feet on the bottom of the case in order to get at the screws that hold the two case halves together. The feet are

recessed and held in place with re-useable adhesive on the end. To remove them, place a small flat screwdriver or other suitable tool all the way down the edge as shown in Photo #2, then pry up, lifting the foot out. Make sure the screwdriver is all the way down the edge of the foot;



otherwise you may tear the foot material. Next remove the four screws and pull the case halves apart, being careful not to damage the wires by pulling too hard. Notice that there are three wires, two red and one black, that go between the upper section of the case and the metal battery contacts located in the lower section. Locate the red and black wires that are on the same end of the battery case near the rear. Slide each metal contact up towards the wire and clear of the plastic case (See Photo #3). The contacts should slide easily once nudged with a screwdriver.

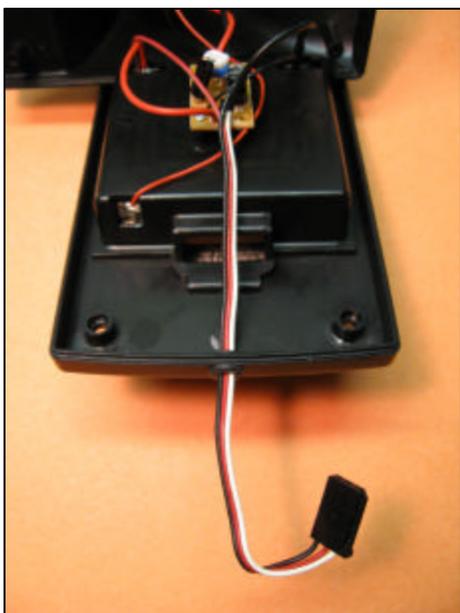


Next, we need to drill a hole in the bottom part of the case for the battery charging lead. You can either put the hole in the front or in the back of the case. I have done it both ways and prefer having it at the back. If you

*(Continued on page 6)*

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are going to use a standard servo grommet as a strain relief, I found that either an 11/64" or a 3/16" drill bit should do the trick. Center the hole left to right and far enough above the bottom edge of the lower case so that the outer diameter of the grommet clears the case radius on the inside; otherwise, it will be difficult to get the grommet to seat fully. Once the hole is drilled, insert the grommet and make sure it is seated fully on both sides (See Photo #4). If you are going to use heat-shrink material, a slightly smaller hole should be



drilled. I would experiment on a scrap piece of material to determine the correct size drill bit to use so that after the tubing is shrunk, the lead will fit snugly in the hole. Test this out using a spare piece of lead. Next we need to prepare the lead wires and solder them to the two metal contacts. If you plan on using an aileron extension, cut the extension off about six or seven inches from the **receiver end**, and set the other portion aside. The preparation is basically the same whether you use a battery lead, servo lead, or an aileron extension. Since we will be using only the black and red wires, if you use either a servo pigtail or an aileron extension, the (white or yellow) signal wire will not

be needed and will be cut later. Separate the red and black wires enough so that each wire will reach the metal contacts without pulling. Next remove about 3/16" of insulation from the end of the black and red wires. Tin the exposed wire by first twisting the strands, making sure no loose strands are sticking out. Then using your soldering iron, apply sufficient solder to tin both wires. I like to see solder all the way around the wire. If you are using a grommet, insert the lead in the grommet and pull it in sufficiently so that both wires can easily reach the battery contacts. Cut the third wire at the point where the others separate. If you are using heat shrink material, insert the lead through the hole and pull it all the way in. Cut a 3/4" piece of the heat shrink tubing and slide it over the wires and all the way up until it touches the inside of the base (this is so that heat from soldering the wires to the contacts won't shrink the material before it is in place. Cut the third wire at the point where the others separate. Carefully position each wire on its respective contact, red-to-red and black-to-black. Make sure the contact is pulled up away from the case. To help prevent accidentally melting the plastic case with the iron, place a small piece of cardboard or similar material between the contact and the case. Then carefully solder the wires to the contacts next to the existing wires, being careful not to unsolder them. Also make sure that the new solder joint is not higher than the original (See Photo #5); otherwise, there may be a problem getting the batteries to fit properly. With a little practice, this should not be too difficult. If you find you are having a problem with soldering, see if you can ask someone to either show you or do it for you. We are almost finished.

Next push the two metal contacts fully back in their slots and install the batteries, making sure they fit ok and are facing in the correct position and polarity. For the lead with heat shrink material, first pull the lead back out and mark it where you want



it to exit the case. Then pull it back in all the way, center the heat material on the mark, and carefully shrink it with a heat gun or soldering iron. Pull the lead back out so that about 1/2" of the strain relief is showing. Before closing up the case, plug in one of your Rx chargers to see if the LED (on your Rx charger) lights. If not, one or more of the NiCads may not be making contact or one or both of the charging lead wires may not be making good contact. Once any problem is corrected and the batteries are charging ok, unplug the charger, close up the case, install the four screws and replace the rubber feet (sticky side down). Charge the new battery for 12-14 hours at around 0.10 C, and you are in business. For those of you who have an Eflite Blade MCX, it uses the same type of charger and can be modified the same way. Photo #6 shows converted chargers for both the Vapor and Blade, one with the charge lead at the front and the other with the lead at the back.



This is a rather simple project and I would guess that it took me less time to convert two chargers than it took

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easier is in the utilization of a spreadsheet program to make all of the calculations for your model. Using the proportions from the references cited at the beginning of this article and entering the data in a spreadsheet you can generate the final dimensions for the model that you are designing. One of the nice features of a spreadsheet is that you can instantly see the results of the data that you are inputting. If any changes need to be made you can immediately see the results of these changes and make any changes that you want to come up with the values you are looking for. The following image is the results of the spreadsheet that I developed which has served me well. The data on the left side is the input data and the results are shown on the right side.

CONVENTIONAL MODEL DESIGN	
INPUT	OUTPUT
WING SPAN	36.0
ROOT CHORD	18.0
TIP CHORD	18.0
LE SWEEP (FWD +, BKWD +)	0.0
ARNDL CENTER VIBRLE	0.00
SWEEP ENCLASER & = SEI	
PLAT	= 37
LINDER CHAMBER = 30	
SECTION	
ROOT - E 475	
TIP - E 475	
H. STAB	
SPAN	23.5
ROOT CHORD	11.75
TIP CHORD	5.875
LE SWEEP (FWD +, BKWD +)	0.0
SECTION	
ROOT - FLAT	
TIP - FLAT	
V. STAB	
HOW MANY	1
HEIGHT	6.5
ROOT CHORD	11.75
TIP CHORD	5.875
LE SWEEP (FWD +, BKWD +)	0.0
SECTION	
ROOT - FLAT	
TIP - FLAT	
FUSLAGE	
DISC NOSE TO WING LE	12.0
DISC WING TE TO H STAB LE	27.5
DISC H STAB TE TO FUSE END	2.0
ENGINE	
DISPLACEMENT (CU. IN.)	0.75
HORSEPOWER	1.5
WEIGHT	
MODEL WEIGHT - LBS (EST. #)	1.0
MODEL WEIGHT - LBS (EST. #)	7.25
MODEL WEIGHT - LBS (EST. #)	7.0
	LANCIA 15-Feb-2008

The other area where a computer would be helpful to a designer is the utilization of a CAD program to generate the plans of your model. While I have a CAD program I just haven't spent the time to master it to where I am able to generate a set of plans. CAD generated plans would probably be welcomed by the magazines and result in a larger payment to you as it would save them a lot of preparation time.

While the use of the proportions cited in the references at the beginning of this article will assure you that your design will fly you can take it one step further and build a small balsa model scaled down from the sizes you came up with to test the validity of your figures. While the use of scaled down balsa models I feel isn't needed for a conventional design it might have some practical value in determining if a design that is a little bit out of the ordinary will present any

problems. So long as the balsa model gives you a nice steady glide you will be assured that the full size model will behave properly with no surprises. I generally will take the root chord of the wing and scale it to 3" to



come up with a factor which I apply to all of the dimensions. Again, this will not tell you how well your model will fly only that it will fly with no unexpected results.

So, there you have it. Enough information to get you started on designing your own model. The investment in time and effort to get started is small, the satisfaction is immense.

(Continued from page 6)

to write these instructions and shoot the photos. Basically all we are doing is replacing the original cells with rechargeable ones and adding a charging lead.

**WARNING** Don't leave your LiPo battery plugged into the charger for any length of time after it has finished charging. If so, even though the battery won't over charge, the charger remains on and will drain the charger batteries. In the case of Alkalines, they should be removed and thrown away. In the case of NiCads or NiMHs, they should be ok. Just put them on your overnight charger and check each cell with a voltmeter to see if they are at about the same voltage.

If you have any questions or suggestions, you can email me at [degray@verizon.net](mailto:degray@verizon.net).

## Calendar of Events 2009

### March

- 5-8 Florida Jets, Lakeland FL Frank Tiano
- 6-8 Tucson Jet Rally AZ
- 13-15 18th Annual Dick Cole Memorial Fly In IMAA Palmetto, FL
- 14 Lebanon Flea Market, PA
- 14-15 Venice IMAC Venice FL
- 20 DCRC Club Meeting Rockville, MD Program by David Harris Painting of WWI Lozenges
- 21-22 Gathering of the Giants IMAA Cape Coral FL
- 21-22 Tarheel IMAC Challenge Wilson, NC
- 25 DCRC Board Meeting/ Dave McQueeney
- 27-29 Piedmont Aero modelers Host IMAA Dist IV Mini Fest Fayetteville NC

### April

- 3-5 Weak Signals Trade Show Toledo, OH, [www.toledoshow.com](http://www.toledoshow.com)
- 4 Rhinebeck South Jamboree FL Delray Beach, FL
- 11 DRC Field Clean up Day
- 17 DCRC Club Meeting Rockville, MD Program Walt Gallagher Converting that old computer power supply
- 18 DCRC Opening Day fun fly and Chili picnic the 2 Andy's
- 25 DCRC Training Session, Walt Good RC Field, Germantown, MD Mike Peizer [mpcomm@verizon.net](mailto:mpcomm@verizon.net)

### May

- 2-3 Eastern Shore IMAC Opener Hurlock, MD
- 6-10 Top Gun, Lakeland, FL Linder Regional Airport, [www.franktiano.com](http://www.franktiano.com)
- 9 DCRC Training Session, Walt Good RC Field, Germantown, MD Mike Peizer [mpcomm@verizon.net](mailto:mpcomm@verizon.net)
- 13-16 Joe Nall IMAA Woodruff, SC
- 15 DCRC Club Meeting Rockville, MD Program Mike Kroese 2007 Gathering of Mustangs and Legends

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Radio Control Club

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March 2009

First Class Mail

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# Auction

March 29 2009  
(SUNDAY)

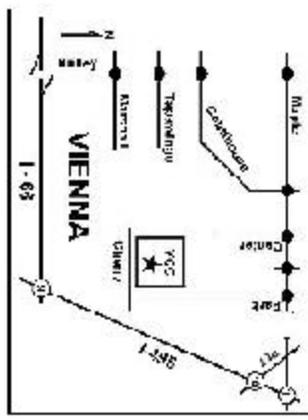
Vienna Community Center  
120 Cherry Street, Vienna, Virginia  
Setup and Viewing 8-10 a.m. - Auction 10 a.m.

**RC Airplanes, Helicopters, Cars, Boats, Supplies**  
Buy and/or Sell  
Auction Tags Provided  
Fixed-Price Table Available



**Admission and Door Prize Entry - \$3**  
\$15 Auction Minimum; Fixed Price Table No Minimum  
10% of Sale Proceeds to Club; Computerized Accounting  
NO PRIVATE SALES

Check your garage and basement - turn your old radios and models into cash - trade for that engine you really want - enjoy our expert auctioneers - see the products of area master builders - pick up great stuff at a great price - food and drink available - spend the day with us!



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