

THE FLYER



Middlesex County
RC Fliers

April 2015



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UMass Lowell Airplane Design Challenge

Lowell students were at the field recently trying to get in a few flights on their electric powered plane. *Photo by Jim Orsborn*

President's Message, by Jerry Crowley

Here we are, it's April and we still have plenty of snow around. I was at the field on Sunday assisting the UMass Lowell team make their maiden flight of a scratch built competition plane constructed for the National College competition. See the short article by Jim Orsborn on page 5. We wish them good-luck at the formal competition in a couple of weeks. As Jim points out in the newsletter the field is actually nice with packed snow excluding the muddy spots. I expect that it will be a few more weeks before we can drive into the pit areas so please be patient.

We look forward to our annual field cleanup day. Due to the amount of snow we have this year, we've scheduled May 2nd for this event. Some things are sure to come up that day, but there are a number of things that we know need to be done to get the field in shape for the year. This is usually a fun event as well, so mark the date and look for more details to follow.

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Notes from the Mar. Meeting

Jeff reported that he has paid the school rental bill and that the club netted just over \$1,100 for the 2015 Raffle. The bank balance as of Feb 27th was \$14,818.85 and we are currently standing as 68 paid members for 2015. There were 22 members at the meeting, with two new members including Mel Suarez and Alan Holt.

A draft flyer for the Construction Derby was discussed with the group. Everyone liked the idea of an electric powered plane, but the group felt that the planning committee should pick the recommended motor and that the club will buy the motors in advance of the event. Jim Orsborn agreed to pick a motor and present a budget at the next meeting.

As a potential cost savings proposal, Jim mentioned that the Flight Training this year will likely involve more pilots who want to learn on electric versus the glow powered planes that we currently recommend. If the club buys motors (and batteries) for the construction derby, then they will probably come in handy as spare units for the training program.

Jeff mentioned that the Town is no longer considering Veteran's Field as a possible site for a proposed new High School.

There are rumors that a new AMA club is starting up in Tyngsboro; and an agreement has been reached to keep the sod farm site open for another year pending town by-law questions.

The Club's Event Calendar was discussed but event details are still pending.

Construction Derby Update

We discussed the proposed plans for the 2015 Construction Derby during the March meeting. The general plan was approved with one change — everyone at the meeting wanted us to pick the motor in advance and have the club provide it as part of the kit. So please take a look at the accompanying article that describes how we picked a motor and our progress finalizing the choice.

Thus far, we've had only three of four members sign up to be Team Captains. We would really like to identify a couple more, so that we can accept everyone who shows up for the event. With the change that the club will provide the motor; all that a Team Captain will need to supply will be the team radio (Tx, Rx and servos) and a few common construction tools. If you are interested, please contact Jim Orsborn.

Understanding the motor specification numbers

Cobra uses the diameter and length of the motor as the first two numbers so a C-2221 is 22 mm in diameter and 21 mm long. The last number is the number of turns in the motor windings. The Kv number relates to prop RPM for every volt of applied power. Finally, the Max Amps and Power values should not be exceeded when selecting a prop.



Construction Derby: Selecting an Electric Motor

The membership asked us to select a motor, ESC and battery combination that everyone would use for the 2015 Construction Derby. So this article will explain the process that was used to select these items.

Based on some initial ideas discussed last month, we expect that a typical derby model will weigh about 2 pounds, and based on typical guidelines for power requirements, we expect that the motor need to deliver about 300 Watts (W) of power.

With this information, I chose to start by looking at Cobra motors. Cobra seems to offer the widest selection of motors, and each motor has a propeller data sheet that provides information on how a range of props will work with the motor. Having data on appropriate as well as inappropriate props is extremely helpful.

So I began the search, by looking for motors with a Kv rating that was just under 1,000. The Kv rating of a motor is an indication of how fast the motor will turn a prop with a given battery. With our 3S bat-

tery, we can expect this range of motors to turn our prop at about 9,000 RPM (e.g. 3S = 11.1 V times 950 is 10,500)

The Cobra (innov8tivedesigns.com) website offered several motors in this range, so I needed to compare all of the choices. The table below compares six Cobra motors and the Power 15 from E-Flite. The first six columns show data straight from the motor spec sheets. The prop data is from the accompanying data sheet where I selected the best prop choice for delivering about 300 W of power.

Based on this data set, I have chosen the C-2820/12 motor. The Power 15 would be a good second choice; but the Cobra motor is \$20 less expensive, weighs 14 gm (10%) less, and will deliver 300 W with a 10" versus an 11" prop (and moving up to the 11" prop will deliver just over 300 W if needed).

NEWS UPDATE: Once the motor arrived, Ray installed the combo on a three year old derby plane he had saved and we plan to test fly it to confirm all of these estimates.

Cobra Motor Choices (See pg. 2 for an explanation of these numbers):

| <u>Model</u> | <u>Kv</u> | <u>Price</u> | <u>Max Amps / Power</u> | <u>Wt.</u> | <u>Shaft Dia.</u> | <u>Prop Data</u> |
|-------------------------|------------|----------------|-------------------------|------------|-------------------|---------------------|
| C-2217/20 | 960 | \$30.99 | 20 A / 220 W | 72 gm | 3.17 | Less than 200 W |
| C-2221/16 | 940 | \$32.99 | 25 A / 280 W | 88 gm | 4 mm | Less than 200 W |
| <u>C-2820/12</u> | 970 | \$42.99 | 40 A / 440 W | 138 gm | 5 mm | 10x7-E, 26A, 288W |
| C-2820/14 | 840 | \$42.99 | 36 A / 400 W | 140 gm | 5 mm | 11x7-E, 20A, 222 W |
| C-2814/20 | 850 | \$37.99 | 25 A / 280 W | 109 gm | 5 mm | 11x7-E, 17 A, 195 W |
| C-3515/14 | 950 | \$51.99 | 44 A / 490 W | 178 gm | 5 mm | 9x9-E, 25 A, 281 W |
| Power 15 | 950 | \$64.99 | 42 A / 575 W | 152 gm | 5 mm | 11x7-E, 28 A, 308 W |

President's Message (Cont.)

Some of the items that we intend to address on Clean-up Day include:

- General clean up of the area
- Painting
- Replace the Gazebo end gables
- Replace rotted bench boards
- Install a solar charging station
- Install the new Lock Box
- Over seed the pit area

Jim Orsborn is off to a good start with our Newsletter, but I would remind you that it is your Newsletter as well. See Jim's article on Selecting a Motor for the Construction Derby Event. I think he has plans for a couple construction articles and more on the Second Flight School. If you have another idea or a special topic of interest, let us know so we can include it in a future issue.

Try and make the Club meeting on Wednesday, April 8th, we need your inputs. I hope to see everyone at the field soon, good safe flying.

Jerry Crowley
President MCRCF

2015 Event Calendar:

Next Month

Field Clean-up Day Sat. May 2nd

Future Events

Construction Derby Sun. Jun 7th

Family Day Sun. Jun 28th

Club Mtg at Field Wed. Jul 8th

Open Fun Fly * Aug (date is tbd)

Yankee Doodle Day Sat. Sep 12th

Xmas Party Sat. Jan 9th 2016

25th MCRCF Auction Sun. Jan 31, 2016

Construction Derby (Cont.)

So the motor, ESC combo was installed on "Quickie," a Const. Derby plane built a couple years ago. Ray took it to the field and it flew like great; plenty of power, good thrust and no trimming needed. Here are the final quantitative numbers:

Full up plane weight — 2 Lb. 5.4 oz.

9x7.5 E Prop = 12.7v, 21.2A, 270 W

10x7 E Prop = 12.5v, 24A, 300W

These numbers are dead on with what we expected/needed, so we're ready to recommend that the Club purchase this combo and we can proceed with final plans for the 2015 Construction Derby.



News From the Field

by *Jim Orsborn*

Sunday, Mar 29th. We had some UMass Lowell students at the field today. See the cover photo. The students are part of a design challenge. They have an electric plane that is designed to carry a 5 lb. wood block in the guppy shaped mid section. It can also carry and drop a 2 oz. whiffle ball. The students made three successful flights (but without the extra weight) from the snow covered runway before I had to leave.

Plenty of other MCRCF club members were on site as well. Big gas planes and the electric helicopters.

Welcome our newest and youngest member, Teddy (Ray's grandson). Teddy came to the field to show us how he can do flips with his quadcopter. Ray expect to see him solo this summer.

So winds were from the north and the runway was mostly covered with packed snow. The upper entrance was quite wet and muddy where the snow has melted. Parking is limited to one row of parallel cars along the roadway.

Coffee, winter cover, sunglasses and boots were standard for the day.

Advanced Flight Training

Well I decided to take a suggestion offered by Don Fitzreiter at last month's meeting. Basically, Don thought that an Advanced Training Class should focus on selecting a second plane — what should follow that Sig Kadet LT-40. So I'm planning to put together a couple articles with pictures and run thru a couple informal training night lessons at the field.

As a start, I've selected a Great Planes Easy Sport MKII as the plane. This is a well designed shoulder wing plane. It has a symmetrical wing with only a few degrees of dihedral. It still uses a nose wheel steering, so ground handling will not be a problem. With an OS .55 AX for power, the plane should be able to handle all of the maneuvers that I plan to cover.

What I'm going to do is start with the model construction, and try to introduce everyone to a few techniques for "tightening" up the control linkages. I also plan to include the extras that I think are important with any model. The plane is still under construction, so these How To articles will start appearing next month.

If you are interested in following along, Paul at RCBuyers says that he has a couple units on back order with expected delivery in late April. I also know of a used plane that is available. Following the construction, I intend to take the plane up to the field and go thru a detailed flight trimming sequence. I want to make sure everything is trimmed properly before starting to use the plane for any demo flights.

Official Publication of the Middlesex County R-C Fliers, Inc.

The FLYER is the official publication of the Middlesex County R-C Fliers, Inc., a non-profit organization chartered for the promotion of radio controlled model aircraft building and flying. The club operates a flying field located on Treble Cove Road, Billerica, MA. The club offers free flight instruction to any member provided they have a current membership with the Academy of Model Aeronautics. Contact any club member for details. Meetings are held on the second Wednesday of every month between September and June in the Billerica Recreation Dept building at 248 Boston Road in Billerica, starting at 7:30 PM.

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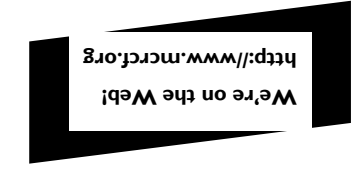
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