

Propwash

The Newsletter of the Mercer County Radio Control Society
April 2005

Trees Come Down

March 13th, 9:30, the north end of the MCRCS club field. As a lone wing hung from the upper branches of a distant tree, a small group of dedicated RC flyers, proficient with both aircraft and chainsaws, descended upon the new growth forest that threatened approaches from the north. Fueled by strong coffee and enthusiasm to protect that which they held dear, the group, led by Senior Woodsman August Lucidi, attacked and laid waste to the troublesome vegetation.

A few new members and applicants, including Seth Hunter and a budding newsletter editor, took Augie's advice and left their chainsaws at home. However, it should be noted that their resulting assignment to briar duty led some to suspect that this might have been part of a new-member initiation ritual. Nevertheless, spurred on by thorns and the opportunity to keep all the Monocote they could salvage from the forest floor, the newbies enthusiastically met the challenge.



What do you mean you forgot to ask the ranger?

As the end of the day neared, the forest had disappeared, replaced by a wide swath of fallen trees and bushes destined to become habitat for a variety of forest creatures (and surely the final resting place for more than one model).



Augie Lucidi and Bob Levanduski prepare for battle.



Seth Hunter, before the briar patch assault.

2004 MCRCS Building Contest Results

By Joe Raimondo

The results of the building contest were announced at the Awards meeting held at the Lawrence Library on December 1, 2004. Seventeen people entered the contest this year. We had a very successful fly-off on opening day without any mishaps. Each of the five classes were represented, with five airplanes in Scale, four in Non-Scale, five in the ARF class, one in the Old Timers, and two in the Unorthodox class. The highest scoring airplane was Fred Doldy's scratch-build "Cloud Queen," with a score of 174 points out of a possible 180. This was quite an accomplishment: Usually the factory-built ARFs have the highest scores.

I personally want to thank the judges, Joe Spett, Sal Lucania, Doug McMillan, Jim Feszchak, Bob Levanduski, and Brian Bunda for their efforts.

The results of the building contest are as follows. Winners received a plaque and a cash award.

Scale

1 st Place	J-3 Cub	Fred Doldy	\$50
2 nd Place	P-47 Thunderbolt	Don Rowley	\$40

Non-Scale

1 st Place	Enforcer	Keith Zimmerly	\$50
2 nd Place	Uproar 40	Dan Geerders	\$40

ARF

1 st Place	Ryan STA	Wayne Cassidy	\$50
2 nd Place	Taylorcraft	Bob Scott	\$40

Old Timers

1 st Place	Cloud Queen	Fred Doldy	\$50
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Unorthodox

1 st Place	Square Yard	John Tanzer	\$50
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The following people received a participation award for entering the contest: George Coleman Jr., David Ramsey, Paul Abafi, Carl Gubkin, Andy Zink, Frank Figurelli, Joe Gendron, Alex Nyere, and Paul Bugay.

MCRCS 2005 Building Contest

The 2005 Building Contest begins Thursday, April 20, with the static judging at the Lawrenceville Library. The flight portion of the contest will be held on the morning of Opening Day, which is scheduled for May

1, weather permitting. Joe Raimondo will again be the Contest Director for this event.

The following rules have been established and will apply to this contest.

1. Contestant is allowed only one entry in each class.
2. Classes shall consist of Scale, Non-Scale, Old Timers, Almost Ready to Fly (ARF), and Unorthodox.
3. The model that places first, second, third, or fourth may not be entered in future contests.
4. Model, as flown, must meet all AMA and club rules.
5. Model must be built and finished by member entering model.
6. The builder of the model is not required to fly the model; substitute pilot is acceptable.
7. Contest committee shall judge models.
8. The judges shall not have an entry in the class that they are judging.
9. Static judging will be held on a regular meeting night as specified by the Contest Director.
10. Model flying ability will be judged at a later date as specified by the Contest Director.
11. Weather conditions for flying will be determined on the field at 9:00 AM, on the day of flying. If weather conditions are unfavorable, flying will take place two weekends later, between the hours of 9:00 AM and 2:00 PM.
12. Flying will be conducted between 9:00 AM and 2:00 PM with **no exceptions**. Builder of the model does not need to be present.
13. Models presented for static judging must be demonstrated to be operational.
14. The flying portion will consist of takeoff, 360-degree turn, and controlled landing as a minimum. Hand launching is acceptable.
15. If a score of zero is received for flying portions, the model will be disqualified.
16. Awards
 - 9 or more entries in a class: 4 awards (1st, 2nd, 3rd, and 4th)

6-8 entries in a class: 3 awards (1st, 2nd, and 3rd)

3-5 entries in a class: 2 awards (1st and 2nd)

1-2 entries in a class: 1 award (1st)

17. Value of award

1st place: \$50

2nd place: \$40

3rd place: \$30

4th place: \$20

Student Night Begins April 5th

The MCRCS instructional program begins Tuesday, April 5th, and will continue every Tuesday evening through October 25th. This program makes expert instruction available to novice flyers looking forward to their first solo flight and to more advanced flyers seeking help to improve their skills. All new members must be approved for solo flight by at least two instructors prior to their flying by themselves at the field. This not only keeps club members and their property safe from uncontrolled aircraft, but also allows new flyers to become seasoned flyers while destroying a minimum number of models. In the case of new members with experience, the check flight is primarily to acquaint them with field rules and procedures.

The club has 20 members who are active as instructors. To become a designated instructor, a flyer must demonstrate to three current instructors that he or she has not only sufficient skills to train others, but has a personal demeanor that is compatible with an enjoyable first experience in the hobby. The current MCRCS flight instructors, along with their phone numbers, are listed below.

Although there is a good chance that at least one of these instructors will be at the field most of the afternoon and evening of each Student Night, you may prefer to make an appointment ahead of time to ensure that you have an instructor when you want one. Don't be shy about asking any of these members for help. And don't feel that you have to stick with one instructor for all of your instruction. Find an instructor you are comfortable with, but feel free to fly with more than one instructor. Some instructors actively encourage you to do this because each instructor will have special skills and unique perspectives on your performance.

Instruction is free of charge to MCRCS members and applicants. The instructors teach for the joy of making better flyers. Of course, be aware that you still fly at your own risk. Although the chance of crashing an airplane is significantly less when you have an instructor, it is still possible. (In fact, some of the most exciting crashes in recent memory have been the responsibility of instructors on the list below.) Be aware that, in the unlikely event that your plane crashes with the instructor at the controls, a sincere apology is the instructor's only liability.

Most instructors will confirm that being approved for solo is just your opportunity to learn to fly. It means that your instructors feel that you can safely take off and land. But many of these instructors are extremely proficient pilots, with expertise in aerobatics, soaring, racing, and other areas. The instructional program is your opportunity to take advantage of these skills to become a better pilot. So take advantage of this opportunity this year and engage an instructor to help hone your skills.

Active MCRCS instructors, in alphabetical order, are:

Stan Blyskal	609-586-3239
Michael Clawson	609-259-2753
Frank Figurelli	609-607-5594
Mike Garze	732-382-9054
Armand Graziani	732-821-7524
Nobumitsu Iwasawa	732-238-7873
Stan Karczewski	609-586-4712
Barry Katona	856-727-5253
Sal Lucania	609-587-1248
David Maxham	732-521-0454
Doug McMillan	609-443-3175
Forrest Miller	609-294-9687
Alexander Nyere	609-259-3819
Joseph Raimondo	609-587-9047
David Ramsey	609-259-6757
Bill Schumann	609-586-1320
Walter Siedlecki	732-257-5330
Terry Watros	609-585-1038
William Zentmayer	609-978-8436
Keith Zimmerly	609-587-5347

Ham and Turkey Flies

The weather cooperated with both the scheduled Turkey Fly last November and the Ham Fly on January 1st. Forty turkeys and forty hams were distributed to flyers at those events. Carl Gupkin captured the events on film and his photos are shown here. Keith Zimmerly and Nobu Iwasawa demonstrated how

exciting electric foam aircraft can be, at the Turkey fly, with a thrilling midair collision. Although the wind kept a few on the ground at the Ham fly, the turnout was quite good for a January 1 outdoor event.



Keith Zimmerly's giant-scale Jenny did not participate in the midair demo.



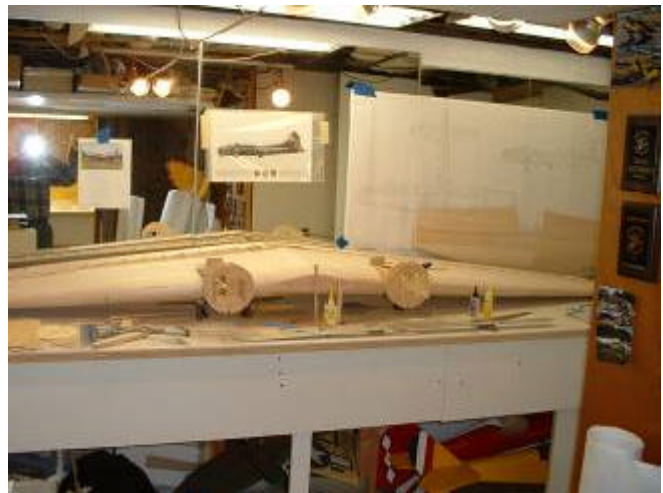
Bob Scott's Clipped Wing Cub.



Brian Bunda's Spacewalker at the Turkey Fly.

Keith Zimmerly Thinks Big

With a wingspan of 16 feet, Keith Zimmerly's Jenny is probably the largest airplane in the club. And although he has been known to build models of more modest size (e.g., his late Spitfire), it appears that he is once again stretching the limits of his trailer with the addition of a B-17 to his collection. This recent photos from his workshop show that construction is well underway on a Don Smith B-17, which Keith got as a kit from All American Kit Cutters. The model has a wingspan or 138 inches, a length of 98 inches, is powered by four four-stroke .91 glow engines, and will weigh just under forty pounds. Keith expects to have it ready to fly in early April.



The one-piece 138" wing demands a serious trailer.



Assembling the motor mounts.



The finished model will be fiber glassed and painted in Forest Service colors.

Electric Conversion of Large RC Models

By David Vale

While most of the airplanes designed for electric flight are still relatively small, that is one to two pounds gross weight, conversion of large models intended for glow power is now feasible and limited only by the number of batteries you can afford. My current collection of electric conversions includes several .20 size airplanes, a couple of .40 size models, and a .60-size Hangar 9 P-51, which I expect to fly this spring.

Except for the power system, an electric model is virtually identical to a glow-powered model. So conversion needs to consider four things: the battery, the motor, the speed control, and the propeller. Everything else is the same.



My latest electric conversion, a Hangar 9 P-51.

The troublesome issue in electric conversion has always been weight. Although lithium polymer (LiPo) technology makes large glow conversion reasonable, weight remains a significant design consideration. Most large electric motors have a weight comparable to their glow counterparts. The Model Motors AXI 2820 series, comparable to .20 size engines, weighs about 6 ounces. The AXI 4130 series, roughly comparable to something in the .60 to .90 (two-cycle) class, weighs about 14 ounces.

The batteries are somewhat heavier than fuel, however. Consider a typical Kokam 2000 mah cell. Assembled into a pack, this cell weighs about 2 ounces. Planning for a comfortable 10-minute flight (typical flying with 3 minutes reserve), this requires about three cells for each .10 cubic inches of equivalent glow displacement. Thus, a .20-sized aircraft would need six cells, a .40 size would need twelve cells, and a .60 size would need 18 cells. This suggests that the batteries for a .60-sized airplane will weigh about 36 ounces, or about 24 ounces more than the fuel for the comparable glow engine.

A few things are worth noting about LiPos. First, a cell is a single 3.7-volt LiPo cell. Rarely do I work with cells, but rather packs of two or three cells that I connect together to form an even larger battery. Connecting them in series (+ to -) gives more voltage; connecting in parallel (+ to +) gives more capacity. The cells must be connected in the proper series-parallel configuration to match the requirements of the motor and propeller. A pack with three pairs of parallel packs connected in series would be denoted 3S2P.

Individual cells are rated in terms of the milliamp hours (just like NiCad flight packs). They are also rated in terms of their discharge rate, expressed as a C-multiple. C for a 2,000 MaH pack is 2 (i.e., the Amp-hour rating). A cell with a discharge rating of 10C is capable of providing 20 amperes. One with 20C is capable of providing 40 amperes. Wiring two cells, each capable of 40 amps, in parallel results in a battery capable of 80 amps. Cells with higher discharge ratings tend to be heavier, because of their construction. I generally design my systems to draw 6C or less. A 6C discharge will result in a 10-minute flight. Higher discharge rates are useful for burst applications, such as motor gliders. (Note that the cells in a battery pack or network of packs must all have the same capacity and discharge rating.)

Thus, an electric model will weigh about 20% more than a comparable glow model. A rule of thumb for models of .60 size is that the wing loading should be

under 30 ounces per square foot of wing area, with the upper limit being about 32-34. This suggests that the glow version of the model you are planning to convert should probably have a wing loading under about 26 ounces per square foot.

While glow power is usually described in terms of engine displacement, electric power is described in terms of watts. Wattage has a direct correspondence to horsepower, one horsepower being equivalent to 746 watts. Although it is the wattage output to the propeller that is important, inputs watts are much easier to measure and output is usually about 75% of input. Input wattage is calculated as the battery voltage times the applied current in amps. The general rule of thumb for motor power is that input wattage should be between 50 and 100 watts per pound. A power system providing 50 watts per pound is fine for a docile trainer and will result in a long, scale-like takeoff. My experience with aircraft in the 100-watt/pound range is that they tend to jump off the ground after a very short takeoff run.

The majority of my electric motors are outrunners. Outrunner motors are a bit unusual in that, while the face of the motor (which is fastened to the mount) remains stationary, the rest of the motor rotates. I initially found this a bit disconcerting, but I got used to it and find I really like the silent power these gearless, high-torque motors provide, spinning their relatively large propellers.

Selecting an electric motor is a bit more intimidating than selecting a glow engine, though. The "problem" comes from the fact that electric motors are very versatile in the amounts of power they can supply. But the wrong combination of prop, gear, and battery can result in inadequate thrust, or worse can overload and burn out the motor. Fortunately, two useful computer programs, MotoCalc and ElectriCalc, help to avoid this situation. These programs take as input data the size and shape of the airplane and its desired use and duration to suggest motors and batteries. While I rarely take its recommended systems, I almost always use MotoCalc to evaluate several of my own alternatives.

Between the battery and motor, you need an electronic speed control (ESC). The ESC switches the power on and off very quickly and gives the effect of unlimited variations in speed between a few RPMs and the maximum RPM the system is capable of. The ESC plugs into the throttle slot of the receiver and, from that

point, behaves much like a conventional throttle, except for a couple of other features.

The AXI motors I use are brushless motors. What this means is that they have no commutator and thus no brushes to make sparks, carbon dust, or electrical noise. They are, in fact, little three-phase motors, technically very similar to the three-phase motors used in much larger industrial applications. The ESCs for brushless motors convert the direct current from the batteries into three-phase electric current of the frequency necessary to achieve the desired speed of the motor.

The second feature often found on ESCs is a battery eliminator circuit (BEC). The BEC converts the higher voltage of the motor battery to 5 volts for use by the receiver. This offers several advantages including no separate receiver pack to carry, no separate pack to charge (or forget to charge), and a virtual guarantee that the motor will quit before the receiver does. There is a potential trouble spot in the current BEC technology, however, that problem being the fact that the conversion is typically passive. This means that the difference in voltage is dropped through resistance, which turns electrical energy into heat. If the difference is too great, too much heat will be generated and the BEC (and the ESC) will melt. ESCs can often be used with more voltage than can their associated BECs. Be very careful to observe the limitations so as not to destroy the BEC and the associated equipment (the airplane, for example).

There is a way around the BEC voltage limitation and this is by the use of a universal BEC (UBEC). The UBEC is a switching power supply that can convert higher voltages to 5 volts efficiently with little generation of heat. I use UBECs in all of my models of .40 size and greater.

I think that covers the essentials of electric conversion, except for issues of balance and prop clearance. I touch on these issues in a longer version of this article available at <http://wrcr.rchomepage.com>. If you want more information, you can generally find me at the club meetings and I love to answer questions.

The Plane Poet

A talented flyer named Keith
Said his little foam Spitfire had teeth.
But the next thing we knew,
He'd encountered Nobu
And the ground was all foamy beneath.

IMAC Competition Proposed

Alexander Szemere, at the February 16th meeting, related a request by the IMAC North-East Region for MCRCS to consider hosting a competition at the MCRCS field. Discussion ensued and Alex agreed to request a written proposal from IMAC so that the benefits of such an event, such as observing competition precision aerobatics, could be weighted against the costs (which would include tying up our field for at least a day). Alex will report back upon receipt of a formal proposal from IMAC.

For Sale

Circus Hobby AT-6 Texan Kit, 72" wing, .90 engine \$75

Sig Spacewalker 2 Kit, 84" wing, .90 engine. \$90

Ace Sporty Bipe Kit, 47" wing, .19-.40 (one wing tip block missing) \$15

Great Planes Profile P-38 Twin Kit, 60" wing, .19-.25 \$45


Ace Cloud Dancer, 60" wing, .40-.45. \$45


Call Charles Skowronski at 732-821-6174 or email Ctuna51@aol.com

MCRCS

SPRING JACKET SALE

APRIL 6TH MEETING





Designer Notes: Exceptional value nylon jacket offers protection from the wind and rain with a flannel lining for added warmth. Versatile styling for on or off the field.

[Fabric/Style:] 100% nylon shell with lightweight flannel lining in the body, nylon-lined sleeves for easy on/off; locker loop, slash pockets, raglan sleeves with elastic cuffs, drawstring bottom hem, inside pocket with Velcro closures. Snap closure.

Adult XS-4XL
 XS-XL 60.00
 2XL 62.00
 3XL 66.00



Designer Notes: Casually styled jacket is perfect for nearly any occasion, rain or shine, thanks to the water repellent protection. Contrasting colors on the collar and body give this jacket a distinctive look.

[Fabric/Style:] 65/35 poly/cotton shell, mesh body with sleeves lined in nylon for easy on and off; drawstring collar with cord locks. Zipper closure.

Adult XS-6XL
 XS-XL 70.00
 2XL 72.00
 3XL 76.00



Designer Notes: It's easy to see why this is our most requested jacket! Hard working and extremely durable, it repels the rain, resists the wind, and locks in your body warmth (thanks to the lining and rib knit trim). And look at all those sizes!

[Fabric/Style:] Teklon nylon shell, poly-filled body with heavyweight fleece lining; 1 x 1 rib knit trim at the waistband and cuffs; front zip close slash pockets and interior pocket. zipper closure.

Youth S-XL Adult XS-6XL

S-xl 80.00	Available Tall Lg-4XL +5.00
2xl 82.00	Youth sizes -8.00
3XL 86.00	

Jackets have NEW club jacket back design, American flag on arm, club patch on chest, your name on opposite chest.

Orders taken on April 6th will be delivered at April 20th meeting

Upcoming Events

April

5th Student Night Begins
6th Meeting at WWL (Jacket Night)
20th Meeting and Static judging for the Building Contest at Lawrence Township Library

May

1st Opening Day and Building Contest fly-off
4th Meeting at WWL
18th Meeting at WWL
27th Setup for the Jumbo Jamboree
28th-29th Jumbo Jamboree

June

1st Meeting at WWL
12th Family Picnic
15th Meeting at WWL

Club Information

The Mercer County Radio Control Society is an AMA Chartered Gold Leader Club. Its field is in Assunpink Wildlife Preserve off Exit 11 of Hwy 195. It meets at the West Windsor Branch of the Mercer County Public Library on the first and third Wednesday of each month. The club publishes this newsletter for members approximately six times a year and operates a web site at www.mcrcs.com.

Officers

President: Doug McMillan
VP, Membership: Sal Lucania
VP, Events: Armand Graziani
Secretary: James Feszchak
Treasurer: Jans Brower

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