



The Transmitter

Suburban RC Barnstormers - P.O. Box 524, Bloomingdale, IL 60108

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<http://www.suburbanrcbarnstormers.com>

Coming in September and October

September 10th, Club Meeting, Bloomingdale Public Library, 7:00pm

September 16th, Fun Fly #5, Pratt's Wayne Woods, 9:00am Trim Flights, 10:00am First pilot off

September 23rd, Giant Scale Fun Fly, Pratt's Wayne Woods, 9:00am

September 24th, Board Meeting, Bloomingdale Public Library, 7:00pm

October 15th, **!! NOTE DATE CHANGE !!** Club Meeting, Bloomingdale Public Library, 7:00pm

October 22nd, Board Meeting, Bloomingdale Public Library, 7:00pm

President's Corner

By Mike Maciejewski

If this was one of the magazines you read, I would be writing this in June. But I am writing this a week before the meeting. So I know how the summer went.

It is getting almost time for swap meets. If you are a new pilot, and have a little spare cash, you can buy an extra airplane for practicing. It does not have to be the best looking plane at the field, it is there to help with your confidence. Knowing you have another plane at home in case of an accident, it gives you some confidence knowing you will be able to go flying next week.

This has not been my best year for flying. I have had four planes go down, three in the last month. I'm lucky to have a few extra planes at home. I know that next week I will be flying. Now I have some repair work to do. I did not total any of the airplanes that went down. So I have to get into my workroom and fix the damaged ones. They tend to get in the way of the kits I need to build.

Till next time, *Mike*...

Entertainment - R/C Event Reports

By Dave West

August was a busy month for R/C flying events throughout the Midwest: a pancake fly-in in Streator, electric flying near Cain O' Lakes, float flying in the south suburbs, and giant scale meets in Fond du Loc and Campaign. At the September meeting we will hear from members who ventured out to special R/C (and other aviation-related) events this summer.

Maybe that's you! If you attended an event, tell us about it. You don't need to prepare a speech or multimedia presentation (although photos are welcome), just briefly describe the event to your

fellow Barnstormers (in five minutes or so). Here are some questions to get you thinking:

- Where was the event? How long a drive?
- Is it held every year? Is it a multi-day event?
- What kind of pilots & planes attend?
- Did you fly or spectate?
- What is the field like?
- What were the highlights?
- Would you go again? Would you recommend it to others?

Let's all share "what we did this summer"!

Notes of the Suburban RC Barnstormers Membership Meeting

August 13, 2012

ATTENDANCE

There were 35 members present. This included two new members, **Ron Illian** and **Brian Tomasiewicz**. Ron is interested in learning to fly and found out about our club from members at the field. Brian is a member of the Checkerboard club but is interested in our indoor flying.

OFFICER REPORTS

President: Mike Maciejewski presided over the meeting.

Mike said there was nothing new to report on the new field and there did not appear to be any progress on construction.

Mike told members to let the sales people know they are Barnstormers when buying at local hobby shops. Many shops provide a discount to our members and your purchases may provide rewards for our club at the end of the year.

Mike reminded members that even though our meeting will still be on September 10th at the Library, we will only have half of normal conference room. The good news is we get the kitchen half!

Vice President: Dave West said the door prize for the evening was a bottle of IC2000 glue. There was a new rollover for tonight, an F-20 Tigershark. Dave said there would also be a special door prize for builders only. A Fun 51 profile P-51 that was donated.

On the subject of meeting time, Dave added that the October meeting would be one week later than usual due to a conflict with another meeting at the Library. The October meeting will be on 15th instead of the 8th.

Treasurer: Bob Elsner had nothing new to report.

Secretary: Scott Taylor had some extra hard copies of the newsletter.

COMMITTEE REPORTS

Fun Flys – Mike Maciejewski said Scott Stampfli would be out of town during the next Fun Fly. We

are looking for volunteers to chair the event. Please let us know if you are interested.

Flight Instruction - Mike Maciejewski said our instruction Chair Person was out of town, but mentioned that members looking for help flying should normally be able to find help on Saturday or Sunday mornings.

Flight Safety – Tom Lyons asked if members had any special requests for reports on safety topics. Please let him know if you do.

Dome Flying – Marty Schrader said he would be chairing the dome flying this year. Many thanks to Marty for picking up where Stan left off. The dome opens in early November.

OTHER BUSINESS

Ron Hilger mentioned that even though RCM magazine has gone out of business, plans for planes they featured are still available. Just Goggle "RCM Plans".

Dave West said he had received word that former member **Mike McCormick** had recently passed away. Mike was a member of the Barnstormers in 2009 and 2010.

ENTERTAINMENT

Dave West put out a call for suggestions for entertainment ideas and speakers. Most members have areas of interest or unique knowledge. Please let Dave know if you are willing to share your interests.

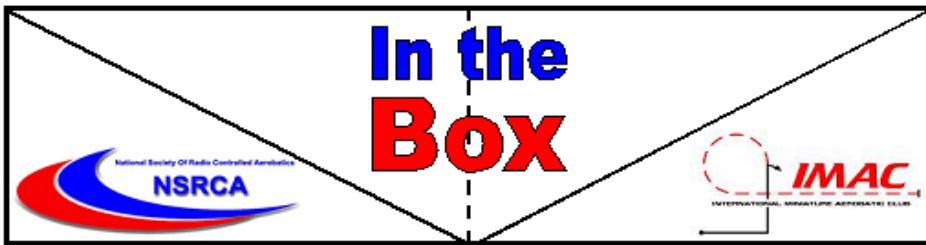
Intraclub Swap – An informal swap was held between members as our entertainment for the month. Lots of interesting models and items for trade.

RAFFLES

Leno DiDonna was the winner of the Turkey raffle. **Marty Schrader** took home the IC 2000 glue, and **Carolyn Doughty** won the builders raffle. There was no rollover winner.

Rollover Raffle

Last month we had a great response to the rollover prize -- an Electrify F-20 Tigershark receiver-ready model. However, no one won. So it rolls over to September. You can still win this 85+ MPH ducted fanjet for only a dollar!



Pattern Flying - Precision Aerobatics

Taking your passion for flying RC airplanes to the next level!

By: Bob Sarley

Were you considering an outrunner brushless electric motor for your pattern ship? In this issue of In the Box we will explore some of the basic variables of electric power systems for RC flight and try to get a handle on their performance characteristics.

Relentless progress. . . I think it is now safe to say that just about any type of RC flying application (sport, scale, pattern, 3D, helicopter, etc.) can be accommodated by either a nitro (glow fuel) or gasoline fueled internal combustion engine **or** a battery powered outrunner brushless electric motor. The choice is a personal one that is no longer influenced or hindered by any technological restrictions or performance compromises. Electric power systems can be applied to model aircraft in sizes ranging from micro-mini to IMAA compliant (80" wingspan and up). Brushless electric motors the size of your fingertip all the way to 65cc gas engine equivalents are available from your local hobby shop or on-line dealer. Many (almost half) of the highly competitive 2 meter pattern planes at last year's AMA/NSRCA Nationals were electric powered.

Much of the mystery and guesswork involving electric power system configuration has been eliminated by the ARF model manufacturers themselves. My previous "Sequence" pattern plane and my current "YAK 55M" precision aerobatic plane are examples Great Planes products that include recommended motors, props and speed controllers that have been performance tested to work well in those airframes. Most other ARF manufacturers provide the same information as well.

With electric powered aircraft, the questions of motor size (weight and power output) and propeller size/pitch for a given application still prevail. As with engine powered aircraft, the proper choice of these variables can make a big difference in the flying experience. Electric power systems introduce a few more things to consider when selecting components.

The total weight and balance of the airplane is still an important parameter for any application. With electric power systems, the weight of the motor, battery (or batteries), electronic speed control (ESC) and battery eliminator circuitry (BEC) must all be considered as well as their placement in the airframe. The power required for the airplane's application (now measured in watts instead of horsepower) must still be matched to the demands of the expected performance level. To get to those power/performance requirements, the following variables must be considered and their respective capacities and limitations understood.

For a given electric motor, its weight and physical dimensions will be a constant. These characteristics will be given by the manufacturer in the specifications. Another parameter that will be constant for a given motor is its kV rating. This is a number that gets thrown around quite a bit when discussing electric power systems and it is important to know what it is. The kV of a motor is the number of revolutions per minute (rpm) the motor shaft will spin for each volt applied under no load. So the kV is the number of rpm/volt. Example: a motor that has a kV rating of 1000 when connected to a 12V battery will spin at 12,000rpm (1000x12) under no load (sport or small scale application?). For the same battery voltage, a 3500kV motor will try to spin at 42,000rpm (3500x12) under no load (ducted fan application?).

When a propeller is attached, the motor will try to spin the prop at the rated kV, but nothing comes for free. The amount of current drawn by the motor will depend on the diameter and pitch of the propeller. The motor will draw more current as the load increases (as the diameter or pitch increase, the harder it is for the motor to spin). The watt/current meters available from your hobby dealer is the instrument of choice here and will be used to measure current and voltage. It will calculate watts and display that as well. One of the specified parameters of the motor is the maximum current it can safely take based on its design and cooling ability. The maximum size of propeller that can be used for a given motor can be determined by using the watt/current meter to monitor the maximum current being drawn. A propeller that is too large in diameter or pitch will overload the motor and cause it to spin at a much lower rpm than its rated kV. This will cause the motor to draw an excessive amount of current (causing it to overheat). Conversely, a propeller that is too small will require little effort (current) to turn the prop at the rated kV, but will produce much less thrust to move the airplane.

Ideally the motor should be matched with a propeller that causes the motor to draw 80% to 100% of its rated maximum constant current. Propeller diameter and pitch can be fine-tuned by measuring the amount of current the motor is drawing for each test case. Here again the flight application will influence the propeller selection. A larger diameter for a given pitch will produce more static thrust to accommodate better vertical performance. A smaller diameter propeller with a higher pitch will produce more speed (or same speed at lower rpm) during level flight. Ground clearance may also be a factor in propeller diameter selection. In either case, we do not want to exceed the maximum safe current handling capabilities of the motor or the ESC.

We can also juggle the battery voltage to match our required performance. The kV of a motor does not change with voltage. If a higher voltage is applied to the motor, it will try to spin the same propeller at a higher rpm. This will cause the motor to draw more current and possibly exceed the maximum rated current of the motor. If a battery with lower voltage is replaced with one with a higher voltage, a smaller propeller should be used to keep the current below the recommended maximum. If a higher voltage battery is replaced by a lower voltage battery, the size of the propeller could be increased to keep the motor at its rated current. Another way to fine tune the power system's performance with a given propeller is to use a motor with higher kV to increase the current or a lower kV to lower the current. Remember that any of these changes will also affect the amount of static thrust available.

But how do I know what where to start with my power system? If you know the approximate weight of your airplane, including the motor and battery, and the performance you want from it, the suggested parameters below will help determine the correct power system for your application. You may need to make more than one calculation using different motors and battery combinations to accommodate your airframe and application.

1. Perform the following calculation to determine the approximate wattage required:

- If you expect trainer-like performance, then multiply the Airplane Weight (lbs) by 75
- **If you expect precision aerobatic performance then multiply the Airplane Weight (lbs) by 100**
- If you expect 3D (high alpha) or high speed performance multiply the Airplane Weight (lbs) by 150

The number you get is the minimum wattage you will need for acceptable performance for that application.

2. Select a LiPo battery voltage within the recommended range of the motor. Keep in mind that voltage affects prop size (lower volts typically require bigger props).

3. Divide the wattage that you came up with by the voltage you selected to get the current you should expect the power system to draw.

4. Determine the battery capacity needed based on the current draw of your system and your desired flight time. Weight and size will be a consideration. See the chart below for typical weights for various 25C LiPo battery capacities.

5. Determine the ESC you need based on the system current draw. Don't be stingy here. Select an ESC with a capacity that is at least 10% to 20% greater than the maximum anticipated current draw. This will allow the ESC to survive short periods of extreme duress without danger of overheating and failure (we aerobatic pilots are at times a demanding bunch).

By keeping the current draw within the limits of your selected motor and ESC, you will insure longevity while obtaining the maximum performance from the selected combination of motor size, kV rating and propeller configuration.

Many of the Barnstormers have valuable experience in the configuration and implementation of electric power systems in their model aircraft. Do not hesitate to ask them for advice or information – they will be glad to share it with you.

Good flying to all.

Some typical LiPo battery weights:

Voltage	Capacity	Weight
7.4V (2S)	3350mAh	9.7 oz (275g)
11.1V (3S)	3350mAh	6.6 oz (187g)
14.8V (4S)	3350mAh	12.2 oz (347g)
18.5V (5S)	3350mAh	15.3 oz (435g)
7.4V (2S)	5300mAh	10.3 oz (291g)
11.1V (3S)	5300mAh	15.4 oz (426g)
14.8V (4S)	5300mAh	19.6 oz (555g)
18.5V (5S)	5300mAh	24.6 oz (697g)

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This newsletter is published monthly by the Suburban RC Barnstormers, Inc.

We reserve the right to edit all information forwarded to us. Permission is hereby given to reprint any article that we publish as long as proper credit is given.

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Articles must be received by the 4th Saturday of the month to be included in the following month's newsletter.

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