The Seminole Flyer

Charter member of the Academy of Model Aeronautics since 1969

AMA Charter Club 216

August 2014 Issue

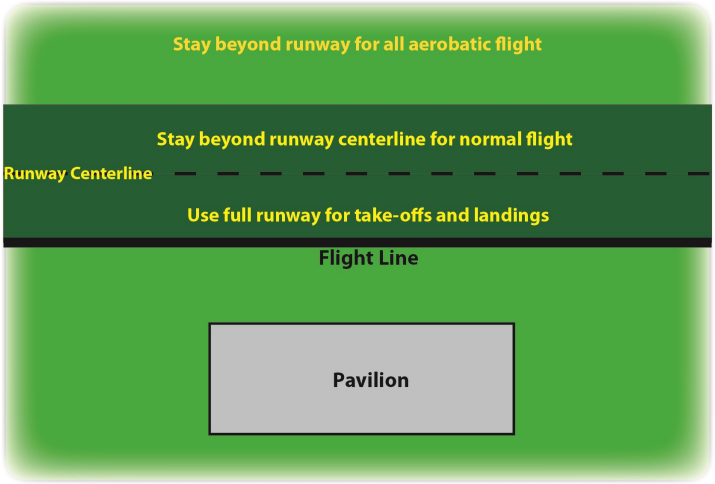
Fly Safe!

Occasionally, we must remind ourselves about the club safety rules. Club safety rules are based on the AMA safety rules and are critical to maintaining our insurance coverage and reducing legal liability. More important than insurance and liabilities, abiding by our safety rules will help prevent accidents and injuries in the first place. They are not to be taken lightly.

The most important parts of the safety rules concern the appropriate areas of the field for general flying and aerobatic flying. To help visualize the safe areas to fly, imagine three walls: one at the flight line, another at the centerline of the runway and another along the far side of the runway.

The black flight line fences are at the base of an imaginary wall that extends upward and beyond the ends of the fences. No flight or taxiing maneuver should ever penetrate the flight line wall into the pit/spectator side.

Obviously, the entire runway is available for takeoffs and landings. However, once an aircraft is in the air, it must be flown beyond the center line of the runway. It should not penetrate the imaginary wall that runs along the centerline of the runway.



Finally, aerobatic maneuvers must remain beyond the imaginary wall along the far edge of the runway.

All safety rules should followed at all times even if there are only one or two people are present at the field. Flying alone is not recommended. A complete copy of our safety rules is located on our website at www.seminolerc.com

Club Meeting News

Randy Yarborough, Secretary

Call to order

President Mike Levine called the August 21, 2014, meeting of the Seminole Radio Control Club to order at 7:02 PM.

No guests or new members were present.

Club Calendar

The only remaining 2014 event on the club calendar is the "Believe in a Cure" fundraiser and fly-in scheduled for October 4th.

Secretary's Report - Randy Yarborough

The July 17th meeting minutes were approved as published in the July newsletter.

Treasurer's Report - Bill Ashbaker

The July club financial report was approved. There are no outstanding expenses anticipated in the near future.

Safety Officer Report - Jim Ogorek

Concerns have been raised over pilots not understanding areas of the field for specific types of flying according to the club's safety rules. The safety officer will help club members understand the appropriate flying areas and the newsletter editor was requested to put a reminder in this month's newsletter.

Training Officer Report - Geoff Lawrence

There are no training issues.

Field Marshal Report - Gordie Meade

The runway is in good shape. However, everyone should be aware of a yellow jacket nest a little beyond the far side of the runway near the south end. Anyone retrieving an aircraft should be alert because yellow jackets are very aggressive and their nests are located underground.

There was a question about who can mow the field. Anyone with a key can access the mower and is welcome to mow the field. Gordie will be in town for the next month. He will be able to mow into September. He will be traveling for a while after that and help will be appreciated. Watch out for the yellow jackets!

Recently the fire extinguishers were discharged. They are being replaced.

Some of the tabletops in the Pavilion need to be repaired. Volunteers are welcome.

Old Business

The "Believe in a Cure" charity fundraiser and fly-in is scheduled for October 4th. Planning for this event started too late to develop it into a major event this year. It was generally agreed that an event committee for next year should be formed at least six months or more before the planned date of the event. An event committee should be formed in January or February 2015.

Consequently, this year's event will be relatively modest as it has been in prior years. There is no plan to have event shirts or extensive sponsor participation. Club members and visiting public will be the primary sources of charity funds. There will be a $10 landing fee for flyers. Food will be available at $5.00 for members and $10.00 for non-members. All gross proceeds will be donated to the selected charity.

New Business

Pop Warner football will start next month and various other events will be held at the sport fields throughout the fall. The good news is that the county has completed improvements to the west entrance to the park. This is the entrance we have used for many years near our Seminole Radio Control Club sign. This entrance will now have two-way traffic and all sporting event and club traffic should enter and exit at this entrance rather than at the main entrance near the county recycling facilities. This will make it easier for Saturday flyers. We will not have to drive through all of the sporting event traffic and pedestrians. We should be able to drive straight through to our field.

The president is planning to send out a survey to all club members requesting input on formal events and special activities we would like to see next year. There will also be a request for suggestions on ways to make club meetings more interesting such as special programs.

Frank Bastos reserved eight tables for club use at the Southeastern Model Show (the Perry swap meet) next March.

Next meeting

September 18th at Beef O'Brady's, 1800 Thomasville Road at 7:00 PM.

Adjournment

Please contact Mike Levine at southwood-mike@yahoo.com if you have any questions, concerns or suggestions regarding the club.

The president adjourned the meeting at 7:46 PM.

New Members

Two new members recently joined the club. Please welcome **Doug Janecek** and **Stefan Schmitt** when you have the opportunity.

Electric Flight for Newbies

Bill Ashbaker
bill.ashbaker@comcast.net

Motors

This is the second in a series of articles for club members who are new to electric aircraft. Last month we covered some key points about lithium polymer batteries. This month we will explore electric motors. We will try to establish a basic understanding of the entire electrical system for RC aircraft by the end of this series.

This series of articles is not intended to get into the excruciating details of each component of your aircraft's electrical system. The objective is to get your aircraft into the air. Quite often, writers who describe electric motors get very involved in how motors work. Well, I'll tell you how motors work. You connect a battery and a little shaft spins around. That's really all you need to know about how they work. It is much more important to understand a few basic concepts for choosing and installing a motor. (Warning: I exaggerate for the sake of humor. Do not directly connect a battery to any of the leads of a brushless motor. It will not run and you will probably burn up the motor's internal windings. Don't do it. A brushless motor can only be connected to an electronic speed control designed for brushless motors.)

You do not need to know a lot about motors in many cases. If you buy a ready-to-fly (RTF), bind-and-fly (BnF) or plug-and-play (PnP) aircraft, the manufacturer has already picked out an appropriate motor for you. Even if you buy an almost-ready-to-fly (ARF) aircraft kit that does not include a power system, the manufacturer usually recommends appropriate components. However, it is good to be able to look at options that are available to you.

Brushless versus Brushed?

It is not a big decision whether to buy a brushless motor or a brushed motor. The market is dominated by brushless motors and it is difficult to find a suitable brushed motor. There is a good reason for that. Brushless motors are more efficient than brushed motors. Brushless motors are typically 85-90% efficient, whereas brushed are around 75-80% efficient. This difference in efficiency means that more power used by the motor is being turned into rotational force and less lost as heat. A brushless motor runs cooler and has more torque than a similar brushed motor.

The easiest, non-technical way to tell the difference between brushed and brushless motors is to notice the number of electrical leads. A brushed motor has the traditional two electrical leads. While a brushless motor has three leads.

Inrunner versus Outrunner?

Brushless motors come in two flavors, inrunner and outrunner. An inrunner motor looks very similar to older brushed motors. They have closed cylindrical casings with a motor shaft extending from one end. Only the shaft turns as they run. On the other hand, a good portion of an outrunner motor casing spins along with the propeller shaft.

Spinning motor casings are a little scary for those new to electric flight. However, there are distinct advantages to outrunner motors. Outrunner motors tend to operate at speeds compatible with desired propeller speeds. Inrunners run at very high speeds with lower torque than outrunners. Inrunner motors frequently require a reduction gear device to slow the RPMs down to propeller speed. This adds weight and complications. Even though inrunners tend to be more efficient, outrunner motors have taken over the market. There is not much of a decision on which to purchase.

The Real Concerns

So far, the decisions required to select an electric motor are no-brainers. Now, it gets interesting. The most important considerations when selecting a motor are power needs of the aircraft, the motor constant (Kv), size, weight, shaft length and shaft diameter.

What's that in Cubic Inches?

The most daunting issue facing those who are new to electric motors is the confusing array of electric motor designations. For over 80 years, modelers have been able to select a motor by cylinder displacement. We did it for so many years it became intuitive. It used to be, "I need a .40 engine." Now, it's, "I don't know whether to get a 4020-16T or a 2040-20." The basic problem is to determine how much power you need and select the right motor. Power is described in Watts in the electric motor world rather than cubic inches of displacement.

This introduces the need for the concept of power loading. This concept suggests that a particular type of airplane and the way it should perform requires a specific range of

power per pound of the airplane's total weight. The airplane weight is multiplied by the power per pound required for the performance you want. The result is the total power needed.

Here is a table to help out:

Model Type or Performance Desired	Required Watts per Pound
Park Flyer, Slow Flyer, Micro	50 or less
Trainer, Sailplane, Scale	60 to 80
Sport, Basic Aerobatic	90 to 100
Pattern, racing, ducted fan, Warbird	110 to 140
3-D, Pattern, large aircraft	150 to 200+

For example, you have a 6 pound warbird that you want to perform well, but not crazy:

6 pounds X 140 Watts per pound = 840 Watts. You need an 840 Watt motor.

Some manufacturers try to make it easy for electric newbies. If we are to believe E-Flite, a 925 Watt electric motor is equivalent to a .46-size glow engine. This would be enough to power a 9.25 pound sport aerobatic model or a 6.2 pound 3-D model. Likewise, a 1.4 kilowatt motor is equivalent to a .60-size glow engine, and so on.

You can compare horsepower with Watts, 1 HP = 746 Watts. But, there is no completely accurate way to compare glow engine power output with electric motor power output. Sorry. If you're new to electric flight, you will have to gain experience with Watts until you are comfortable.

What's a Kv?

Kv is the motor voltage constant. It indicates approximately how fast the motor will rotate when appropriately connected to a battery. Allow me one little equation:

Kv = RPM/volt or, stated differently, RPM = Kv X volts

In other words, if you power a 1000 Kv motor with a three cell 11.1 V battery, it will run at 11,100 RPM. If you run that same motor with a four cell 14.8 V battery, it will run at 14,800 RPM. Like most things in real life, this is not exactly true, but it is a starting point.

Determine the battery size that will best fit your model, the prop speed you want and use them to determine the motor Kv. You can try various battery voltages (number of cells) in searching for a suitable Kv that will produce the best prop speed.

Size, Weight and Shaft Size

After you determine your power and Kv requirements, the next task is to pick a motor that will fit the model's firewall, is not too heavy and has body and shaft lengths to fit between the firewall and the front of the cowling. Shaft diameter and length are important considerations at this time. Does the motor come with a matching prop adapter or is the motor shaft compatible with an adapter you have? Is the adapter diameter compatible with the prop you want to use? Most of the manufacturers that provide good information on their motors will also suggest a matching range of propellers and battery voltages that will work best with an individual motor. Now we're back to the confusing array of electric motor designations.

There is no standard for naming electric motors that indicate motor capabilities. In some cases they are coded dimensions of the motor stator or other dimension. In other cases, they are completely meaningless model numbers. Most of the time, you have to do some online research delving into the manufacturer's specification sheets. Then, you discover that some manufacturers don't even specify the wattage rating of their motors. The only solution is select a few manufacturers that produce well-known, good-quality motors. These manufacturers usually have tables you can use to quickly narrow your search for the best motor for your needs.

It's a System

Unlike the old days when motor size and fuel tank size were somewhat independent, RC aircraft electrical systems require that all components work together as a system. The battery and the motor must be compatible. You have selected your motor type, determined the Kv, determined the power requirement for your model, pored over manufacturer's specifications sheets and selected a specific motor that complies with all of your needs including size and weight. Now is the time to step back and examine your original assumption of what battery you will use.

What are the manufacturer's estimates of current flow given the propeller and battery cell count (voltage) that you have assumed this far? Is the estimated current flow compatible with the battery C-rating? Will the battery capacity and current flow result in a good flight time? If things do not match well, you may have to make some new assumptions and do another round of guesses until everything matches.

Software to the Rescue!!

Now that we have rambled through 1,600 words of somewhat confusing material, I'll let you know that there is an easy way out if you are comfortable with computers. There is computer software that does all of the heavy lifting for you. The software interface is very easy and intuitive. You put in some fairly detailed specifications about your airplane, all the way down to the altitude of your field above sea level and the average temperature of your flying days. These software programs include extensive databases of the most popular electric motors. You can easily try alternative motors by different manufacturers and see the predicted performance results on a graph.

Two very popular software programs are eCalc and MotoCalc. You can Google them. They are not too expensive. In fact, you can run eCalc for as little as $1.99 for three months. eCalc is a subscription service and you run their software on their website. MotoCalc is a program that you purchase and download to your computer or purchase on a disk. Motor database updates are free to download. MotoCalc only handles airplanes while eCalc has modules for airplanes, helicopters, multi-rotors and ducted fan systems.

Have fun!

Next month, I plan to complete this initial series of articles with a little more discussion about the overall electrical system and electronic speed controls.

Until then . . . Fly safe.

Classified Ads

Anyone in the club who wants to sell or buy RC equipment, send an email to seminoleradiocontrolclub@gmail.com with a very short description. We prefer a one or two line description: what it is, condition, price, who to contact and email or phone.

For Sale

Airplanes

Precision Aerobatics Addiction X, 50 inch wingspan, very good condition, $350, Robin Driscoll, 850-597-2424,

robin.marcy@gmail.com

Powerplants

SAITO FA-82a 4-Stroke Nitro Engine with extras, new in box, $490, Bill Ashbaker, bill.ashbaker@comcast.net

Electrical Accessories

Thunder Power LiPo Charger Model TP-1010C, like new, $40, Bill Ashbaker, bill.ashbaker@comcast.net

Field Equipment

Hobbico Ultra-Tote Plywood Kit, new in box, $12, Bill Ashbaker, bill.ahbaker@comcast.net

Seminole Radio Control Club
Tallahassee, Florida

SRCC Officers

President	Mike Levine southwoodmike@yahoo.com
Vice President	Jeff Owens jfolso@comcast.net
Secretary	Randy Yarborough rdyarborough@gmail.com
Treasurer	Bill Ashbaker bill.ashbaker@comcast.net
Field Safety Officer	Jim Ogorek jim.ogorek@yahoo.com
Field Marshal	Gordie Meade lmeade@fsu.edu
Training Coordinator	Geoff Lawrence k4nkc@comcast.net

Flight Training

Primary flight training is available by appointment on Saturdays from 10:00 am until 2:00 pm when the weather is nice and not too breezy. Contact the Training Coordinator or one of the instructors to make an appointment:

Geoff Lawrence 850-591-6879

Mike Levine 860-922-4050

Jeff Owens 850-644-4765

Bill Ashbaker 850-656-5932

Randy Yarborough 850-523-0020

Jim Ogorek 850-766-2477

Matthew Hendrix 954-448-2738

Field Hours

Electrics/Sailplanes	9:00 AM till 9:00 PM
Gassers/Nitros	12 Noon till Dusk
Electric Service	8:30 AM till 9:15 PM

The Seminole Flyer is a publication of the Seminole Radio Control Club of Tallahassee, Florida.

We welcome and encourage items for publishing in *The Seminole Flyer*. Please submit your suggestions to SeminoleRadioControlClub@gmail.com in Word format. Thank You.

www.seminolerc.com