Astro Wings

Spring is Here!

In This Issue

March 2012
AMA Charter Club 1167

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Mark Koerner 414-254-6355

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Safety Officer
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Webmaster
Jeff Thompson 414-704-5900

March Meeting

This month's club meeting is on February 19 at 7:30PM.

From the President

Hi Guys,

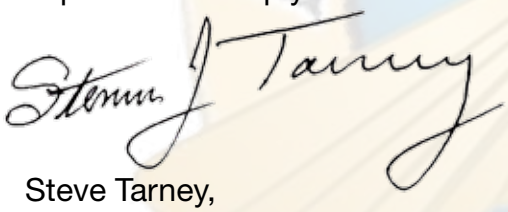
Over the last few months we have had discussions regarding our sound rules. We currently have about 4 airplanes that this directly affects. We don't have to like these limitations but for the moment we have to live with them based on our conditional use permit with the town of Grafton. The following is a little history about our past sound issues provided to us by our Sound Officer, Scott Orten.

Back in late 2000 The Town of Grafton had received several sound complaints about our flying from residents to the east of the field. After they checked, they found that the Astrowings did not have a Conditional Use Permit allowing the Astrowings to use the field. After 8 months of negotiating with the Town of Grafton, the Astrowings came to an agreement for a Conditional Use Permit. The Town issued the Astrowings a Conditional Use Permit with several conditions that the Astrowings have to meet to keep flying at the WE Energies site. The most significant of these is the sound level requirements.

The Conditional Use Permit states "The Astrowings shall maintain complete records of all flight operations at the WEPCO site.

The first sound level was 90 DBA measured at 10 ft. The first renewal of the Conditional Use Permit changed the sound level to 92 DBA measured at 10 ft. The current Permit changed the sound level to 94 DBA at 3 meters.

With this in mind over the next months as we start our 2012 season all members flying a glow or gas plane will need to perform a sound test on each of their planes they believe is at or close to the 94 db limit and document the results on the form in our wind sock box.This is a test that each pilot can do themselves and leave the results at the field in the box. If you don't pass the 94db rule, then you must make an effort to alter your plane to meet the 94db rule and document any changes that you make on the form. I will do additional tests as I see fit on the larger airplanes and will work with those pilots to get their airplanes to comply.



Steve Tarney,

President Astrowings of Wisconsin

Astrowings Field Hours

Fuel Planes

Mon-Fri 10AM-Dusk

Sat-Sun 10AM-5PM

Electrics

All week 8AM-Dusk

Pilots must sign in and out of the flight log for each flying session

During summer months grass cutting is done every Friday morning and no flying is permitted during this time.

Astrowings Flight Instructors

Airplanes Only

Cedarburg:

Gary Keup 262-375-4831

Fox Point:

Steve Tarney 414-351-5015

Glendale:

Sky Sessions 414-810-6812

Milwaukee:

Jim Hendrickson 414-358-9501

Oostburg:

Aaron Cochran 414-365-1571

Port Washington:

Ben Baumann 262-244-6241

John Collins 262-268-0859

Matt Komro 414-378-2022

February Meeting Highlights

President's Welcome

The Astrowings membership meeting of 02/20/2012 was called to order at 7:30 pm by President Steve Tarney. 25 members we present. Welcome to our two newest members Mark Polzin and Russ Fenstermaker.

Field Condition

Great winter condition.

Treasurer's Report

The treasure's report was read and approved.

Old Business

Sky Sessions gave a short presentation on the state of the AstroWings budget with an analysis of 2011 and a projected budget for 2012. This was to illustrate the need to raise dues for regular membership. Discussion followed.

A motion was made and passed to raise membership dues: Dues for an email membership are $50 per year. For post office mailed newsletter $60 per year. New members will pay $100 - $50 initiation and $50 membership. Junior membership will remain at $5 (under 18 years of age). The new family membership dues schedule will be the main member $50, spouse and each child (up to 19 years old) are free.

A motion to accept the old business was made and passed.

New Business

Jim Hendrickson gave the results of his Fun Fly survey. 8 positive and 3 negative. The Fun Fly will be held on July 14th with the 15th as the rain date. A motion was made to approve and passed.

The Electric Fun Fly and Swap Meet will be held on August 25th with the 26th as the rain date. There was some discussion regarding keeping the event electric only or allowing gas planes, also. Motions were made as follows: Motion to accept August 25th as date was made and passed; a vote was taken whether to allow gas planes or to keep the event all electric. As a result of the 22 to 3 vote the event will remain all electric.

Show and Tell

Jeff Thompson showed the new Gee Bee with great scale features including a pilot (who only looked mildly afraid of crashing) and Micro Quad Blade mQX heli from Horizon. Both have the new AS3X System for smooth handling and outstanding precision.

meeting highlights continue next page

January Meeting Highlights Continued

Show and Tell

Steve Tarney demonstrated his new hard body heli that comes complete with it's own palm sized transmitter.

And The Raffle Winners Are

Russ Fenstermaker continues the AstroWings new member tradition of winning the first raffle prize: A Multiplex Dogfighter.

"Lucky" Mike Thurner shows off his new glue gun. Guaranteed to be hot and sticky.

Double winner **Jim Hendrickson** is shown here with his prizes The Jigs Up soldering jig and beautiful forest green wire ties.

Silver Spring Hobby sponsor

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Raffle Winners
Dan Wundrock wins the ever desirable Ultrabrush Applicator 10 pack.

Dick Huston can't wait to get home and try the Micorbrush Applicators In a handy blister-pack that he won.

Tony D'Alessio gets balsa wood, in it's own handy storage bag. And ain't he just the proudest.

At The Dome

Jesse Mosca once more shows more skill than the average pilot by making a perfect no-point landing on the sun umbrella at the Currie Park Dome. By the way does anyone know why they actually have sun umbrellas at the dome?

Videos of indoor flying at the Currie Park Dome can be found at http://www.youtube.com/watch?v=1nUl9jcHOJo

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Choosing Electric Power Systems

Most hobbyists have become accustomed to recommending a motor by size or displacement for a particular airframe as opposed to suggesting a motor by power output. It is more correct to select an electric power system based on power output than simply size, current, or capacity. I suspect that recommending motors, batteries, and electric speed controls based on size or capacity stems from the legacy use of internal combustion type engines in model aircraft. This practice has become so common place that a few electric motor manufactures have named their electric motors in marketing literature to resemble that of their glow counterparts - a practice we find particularly misleading. We understand that there are several factors that will influence your power system selection and motor "size" is not always the proper answer. This article was designed to give you some basic guidance on how power loading affects your flight performance and how to match components based upon meaningful power output figures rather than size.

The Basics: It's all about Watts

Lets take the mystery out of this electrical jargon. Watts are to electric motors what horsepower is to internal combustion engines. Watts are a measure of power and can be derived by multiplying the voltage (Volts) times the current (Amps) in your electrical system. When selecting electrical components it's best to level the playing field and convert all numbers to reflect the products Power Rating (Watts). Why watts? Speed controller ratings in Amps do little to describe the actual amount of power they are capable of delivering. The same holds true for motors and batteries.. Initially, we want to classify all of our electrical components by the power output they are capable of delivering. We then use other information such as Voltage or Amps to ensure that our final system will operate within the manufactures specifications. To find out what a products Power Rating is use this simple equation: **Power Rating (Watts) = Volts * Amps**

Step 1 - Target Power Loading for your model based on desired performance level

These following table will give you a good idea of how Power Loading influences model performance. I've found these figures to hold true from the smallest of R/C models on up to giant scale models and even full size general aviation aircraft. Review the information in the table below to find the Power Loading figure that delivers your Desired Performance Level.

Power Loading (Watts / Lb)	Desired Performance Level
50	**Minimal.** Minimum required for flight. Model flies "on wing" with little reserve power. Difficult if not impossible to Rise Off Ground (ROG) depending on runway surface.
70	**Trainer.** Good for general flight and trainers. Not enough power to get into trouble... not too little to avoid trouble. Model readily ROG's from smooth surfaces. Sport aerobatics possible with good energy management.
100	**Sport Aerobatics.** Best for sport and performance models. Model readily ROG's from unimproved fields or short grass. Consecutive loops from level flight. Model can fly entire IMAC basic sequence. Vertical performance is good but not unlimited. Model can "hang" on prop with thrust to weight often approaching 1:1.
130-150	**Unlimited Aerobatics.** 130 Watts/Lb is considered the minimum acceptable for 3D flight. Most 3D pilots agree that 150 Watts/Lb is more appropriate. At this power loading model will have unlimited vertical, can hover, has enough power on reserve to climb vertically from a hover.
200+	**Obscene.** As power loading approaches this figure vertical climb from hover is notably improved. Model appears to "rocket" out of hover and accelerate vertically.

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Step 2 - Determine the Required Power Rating for your model airplane.

We have determined how we wish our model to perform and now have a solid idea of our target Power Loading. Now, we need to rate roughly how many watts will be required from our electric power system to meet our performance expectations we will call this figure our "Required Power Rating". Weigh your complete airframe less motor, flight pack battery, and electric speed control (ESC). Make certain you include all linkage, hardware, servos, servo extensions, and receiver. Use the following formula to determine the Required Power rating ie. how much power, in watts, you will require from your electric power system to meet your performance expectations:

Required Power Rating = [Power Loading] * [Airframe Weight in Lbs.] * 1.5

Note: Our formula for estimating your Required Power Rating assumes that your electric power system will weigh in at 50% of the completed airframe weight you can fine tune this number as you see fit.

Step 3 - Explore your options

Armed with your models "Required Power Rating" figure you may now begin researching motors, batteries, and speed controllers capable of delivering your required power. Wherever possible our web site classifies electrical components by their peak power output or Power Rating you will find this data in the specifications tab for most electric power system products.

Develop a short list of compatible motors, battery, electric speed controller that are capable of meeting or exceeding your "Required Power Rating".

Note: always select batteries and speed controllers that meet or exceed the electric motors power rating.

Step 4 - Perform a reality check on your selected components

Select from your short list of electric power system components the most suitable items based upon mounting considerations, recomended propeller size, and system weight. Now that you've selected an electric motor, flight pack battery, and electric speed control (ESC) for your aircraft add the weight of these components to your total airframe weight and run the following formula:

Power Loading = [Power Rating] / [Airframe Weight in Lbs.]

Compare your Power Loading figure back to the table in Step 1 to see if your selected system will meet your performance expectations. If you turn up short on Power Loading select a lighter weight electric motor, battery, or electric speed control that still meets your [Power Rating] figure. If you have come out ahead in power you have more power system choices and could consider lighter weight systems to minimize your models wing loading.

A real world example

Airframe: Stevens G-480 Groove
Completed airframe weight: 16 oz. (1.00 lbs) (Less Motor, Battery, ESC)
Desired Performance Level: 150 Watts/Lb - Unlimited Aerobatics
Required Power Rating: 225 (150*1.0*1.5)

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A real world example (cont.)

Power System Option A
Motor: Hacker A30-28S
Weight: 2.5 oz (0.16 lbs)
Peak Amps: 25
Input Volts: 11.1V
Power Rating (Watts): 277

Battery: ThunderPower 2100 Pro-Lite
Weight: 4.98 oz. (0.31 lbs)
Max Continuous Amps: 31.5
Voltage: 11.1
Power Rating (Watts): 350

ESC: Castle Creations Phoenix 25
Weight: 0.60 oz (0.038 lbs)
Continuous Amps: 25
Max Input Volts w/BEC: 12.6
Power Rating: 315

For option A our Power Rating = 277 the limiting factor is the motor power output. Batteries and ESC are capable of higher power output which is desirable to prevent burning out a speed control or over amping a battery. The weight of this system is: 8.16 oz (0.51 lbs) Which brings our airframe complete weight up to: 24.16 oz (1.51 lbs). Running this through our reality check in step 4 we find our power loading equals: 183 Watts/lb which exceeds our Required Power.

Power System Option B
Motor: E-Flite Park 480 910kv
Weight: 3.1 oz (0.19 lbs)
Peak Amps: 25
Input volts: 11.1
Power Rating (Watts): 277

Battery: E-Flite 2100 20C
Weight: 6.6 oz. (0.41 lbs)
Max Continuous Amps: 44A
Voltage: 11.1
Power Rating (Watts): 488

ESC: E-Flite Pro 25A Brushless ESC
Weight: 1.2 oz (0.08 lbs)
Continuous Amps: 25
Max Input Volts w/BEC: 12.6
Power Rating: 315

For option B our Power Rating remains the same at 277 the limiting factor is again the motor power output. Batteries and ESC are capable of higher power output which is desirable to prevent burning out a speed control or over amping a battery. The weight of this system is: 10.88 oz (0.68 lbs) Which brings our airframe complete weight up to: 26.88 oz (1.68 lbs). Running this through our reality check in step 4 we find our power loading equals: 165 Watts/lb which still meets our performance expectations though it produces the heaviest flying weight of the bunch.

Power System Option C
Motor: Hacker A20-20L
Weight: 2.01 oz (0.13 lbs)
Peak Amps: 19
Input Volts: 11.1V
Power Rating (Watts): 211

Battery: ThunderPower 1320 Pro-Lite
Weight: 2.95 oz. (0.18 lbs)
Max Amps: 17 / 27 (continuous / burst)
Voltage: 11.1
Power Rating (Watts): 188 / 299 (continuous / burst)

ESC: Castle Creations Thunderbird 18
Weight: 0.60 oz (0.038 lbs)
Continuous Amps: 18
Max Input Volts w/BEC: 12.6
Power Rating: 227

A case can be made for exploring lighter power systems that still meet your needs. For option C our Power Rating = 211 that's 14 watts shy of the Required Power Rating of 225 calculated in Step 2. Limiting factor is the motor and battery power output. Batteries and ESC are closely matched to peak motor power output so it would be wise to use a bit of restraint with the throttle on this setup. The weight of this system is: 5.57 oz (0.35 lbs) Which brings our airframe complete weight up to: 21.57 oz (1.35 lbs). Running this through our reality check in step 4 we find our power loading equals: 156 Watts/lb which exceeds our original target by 6 watts, and produces the lightest overall airframe weight of the selected options.

So there you have it.. a real world example of the process of selecting a power system based on power output and power loading. As in our Option C example don't discount a slightly lighter power system as long as it is still within 10% of your Required Power Rating.

Thanks to Stevens AeroModel