The Flightline

Volume 35, Issue 7 Newsletter of the Propstoppers RC Club AMA 1042 July 2005

Editorial. Systems Failures

We all know that the primary systems failures are human, think Three Mile Island and Chernobyl. So it was that I left my backpack on the trolley hook at London's Gatwick airport on my way from the European SAM Champs to my mother's. Goodbye laptop computer, both cameras, my new favorite Graupner hat, a present from my new German friend, Leo Bussmeier, and many other things I would not trust to my checked luggage. Worse, I lost all the pictures I took. The other effect of the loss of my trusted laptop was my inability to write the July newsletter. Furthermore, business now requires me to travel to SoCal on Thursday morning so this abbreviated edition is brought to you courtesy of Dick Bartkowski and Mick Harris.

I had a wonderful time at the Champs. Imagine the movie " Those Magnificent Men and Their Flying Machines"; a diverse mix of proud aviators from competing nations flying all manner of machines from a primitive early aerodrome where full size antiques fly intermingled with somewhat uncontrolled modelers, and you will get the idea. International rivalries abounded and nobody missed the opportunity to wave the flag or down the opposition. I will report in more depth next month.

Dave Harding

Minutes of the Propstoppers Monthly Meeting June 7th at the Christian Academy Field

- Roll call by membership chairman Ray Wopatek showed 18 members and 1 guest present.
- The minutes of the May meeting were moved and accepted by the membership.
- Treasurer Jim Barrow gave his report.

Old Business:

- Dick Seiwell talked about progress in securing the Sleighton site for recreational use. The township is working on some final issues such as field access and field security.
- The school year at the Christian Academy should be ending soon so we can fly during school hours until school resumes again in the fall.

New Business:

- Bob Crowell was told that someone from our club drove across the farmers' field near the Delaware County Club site in New Jersey. We are requested to stay on the access road.
- Thursday evening flying at the Christian Academy field will continue throughout the summer. Members are invited to come beginning at 5:00 p.m. and fly till dusk. Is a great time to try slow flyers and for learning.
- The meeting was adjourned at 7:30 p.m.

At that point about 10 of the members enjoyed a beautiful session of evening flying.

Richard Bartkowski, Secretary

Agenda for July 5th Meeting Christian Academy Field 7 pm

- Approval of June meeting minutes
- Membership Report
- Finance Report
- Flying Field Issues
- Club Picnic Plans
- Show and Tell
- Flying

INSIDE THIS ISSUE

Electric Basics For The Modeler, Or So You Want To Fly An Electric

The basics of electricity start with electric charge. Charges are found in two types positive and negative. These electric charges lead to a mysterious force-like charges that repel each other but opposite charges attract each other. Forces on the charges lead to the charges moving. This creates a flow of charge that we call a current.

Flows of static charges can often be seen as a spark, which in it's big, form is known as lightning.

The force that the charges feels-the pushing or pulling force is called a voltage.

Working with static electricity did not get people very far.

The next advance came from generating electricity in a battery. A battery generates of voltage by chemical action. This voltage can cause a current flow in a wire. Remember the voltage is a force that pushes and pulls electrical charges.

A conducting wire like copper is basically a pipe full of loose electrons that can move if they are pushed or pulled. When these

Calendar of Events

Club Meetings

Field Meeting 7:00 pm
Tuesday 5th July 2005
Christian Academy Field

Tuesday Breakfast Meeting
The Country Deli, Rt. 352 Glenn Mills
9 till 10 am. Just show up.
Flying afterwards, weather permitting

Events

Club Picnic; Saturday 16th July
Christian Academy Field

Walt Bryan Memorial Electric Fun Fly
Saturday 13th August
Field?

Regular Club Flying

At Christian Academy
Monday through Saturday 10 am till dusk
Sunday, after Church; 12 pm till dusk

Thursday evenings, at CA field.

Note; Flying must be done in accordance with the agreement forged by Vice President Dick Seiwell Specifically, only electric powered airplanes. Beginners using due caution and respecting club rules may fly GWS Slow Stick without instructors.

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Propstoppers Web Site; www.propstoppers.org
Check the web site for back issues of the newsletter, pictures of club events and the calendar of future events.

charge flow through a wire, it is called an electrical current. The current is measured in amps or milliamps if it is small.

If we're dealing with a battery, the voltage is fixed. It is determined by the battery's chemical makeup. Our zinc carbon or alkaline cells are about 1.5 Volts. NiCad's and nickel metal hydride cells are about 1.25 Volts, and Lithium based cells are about 3.75 volts.

This is the battery voltage when it is just sitting there at rest and not connected to anything. In that state nothing happens there is no current flow. It is like the water pressure behind a dam. If the gates are closed, you have a pressure but no flow.
We can measure the battery voltage with our voltmeter or multimeter.

The voltage does not tell us any more about the state of the battery. It doesn't tell us how big the battery is, what is its state of charge or how much current it can deliver.

What about the current of the battery? Well, just sitting there; there's none. If you connect a wire from the positive to the negative terminal you can get a very large current because you have created a short circuit (no resistance). You will get near the maximum that the battery can deliver and this can be quite large.

When dealing with a car battery, we often find them rated in cold cranking amps. This is the amount of current that they can deliver at 0 degrees. That current is often in the neighborhood of 600 amps. The battery can do even better at a warmer temperature. Our cells are not quite that potent, but do have a surprising ability to deliver current. Sub C NiCad and NiMh cells can deliver 130 amps when shorted. Even the smaller 800 mah. A type cells can deliver 80 amps. That is quite a lot of current.

If you short one of these cells with a wire, the wire will soon be glowing red-hot like an electric stove. If you short the terminals with your watchband or ring, the same thing can happen. So, be careful.

A multimeter can also measure current in amps. The meter is made to measure how many amps are going through something. The meter itself usually has a limit of how many amps it can handle. If you connect the meter in the current mode across a battery it will get the full output of a short circuit which is likely to fry the meter.

How many amps are flowing through the wires of one of our circuits? This depends on the overall resistance of the circuit. That is all of the resistance between the positive and negative terminals of the battery.

Resistance is another item your meter can measure and another element to be dealt with in understanding electricity. Resistance is measured in ohms. Resistance has been set up so that a current of one amp will flow through a one-ohm resistor if it is driven by one volt. The higher the resistance, the lower the current. At 2 ohms that same one-volt will cause 1/2 amps to flow and so on. This by the way is Ohm's law, one of the fundamentals of electricity.

Electricity does not do us much good just sitting there going through a meter. We need it to do useful things like provide energy and power for our models. It is worth looking at how much power we are getting in an electric model.

The power in Watts is just Volts times Amps. To put this in perspective, 1 horsepower is about 750 Watts (actually 746). A typical sport 40-glow engine puts out about ½ horsepower. An electric puts out about 60% of the watts going in – so you can compare it to glow;

(Volts x Amps x 0.6) / 750 = Approximate Equivalent HP

You may remember Dave Harding's 40-size Cub could fly on 16 cells (about 20 Volts). So, at 25 amps it had similar power to a typical (not HOT) glow.

(Dave's note, the Cub now has a bigger motor and 24 cells so it now flies like it has a HOT 40!)

If we look over a range of successful models of various sizes, we can come up with a useful rule of thumb for electrics. Most of our sport models can fly reasonably well at 50-Watts input per pound (Kopski's Rule). Slow gliders can make it on half that while really hot models may need up to twice that. Just knowing these simple rules can get you started in electric power.

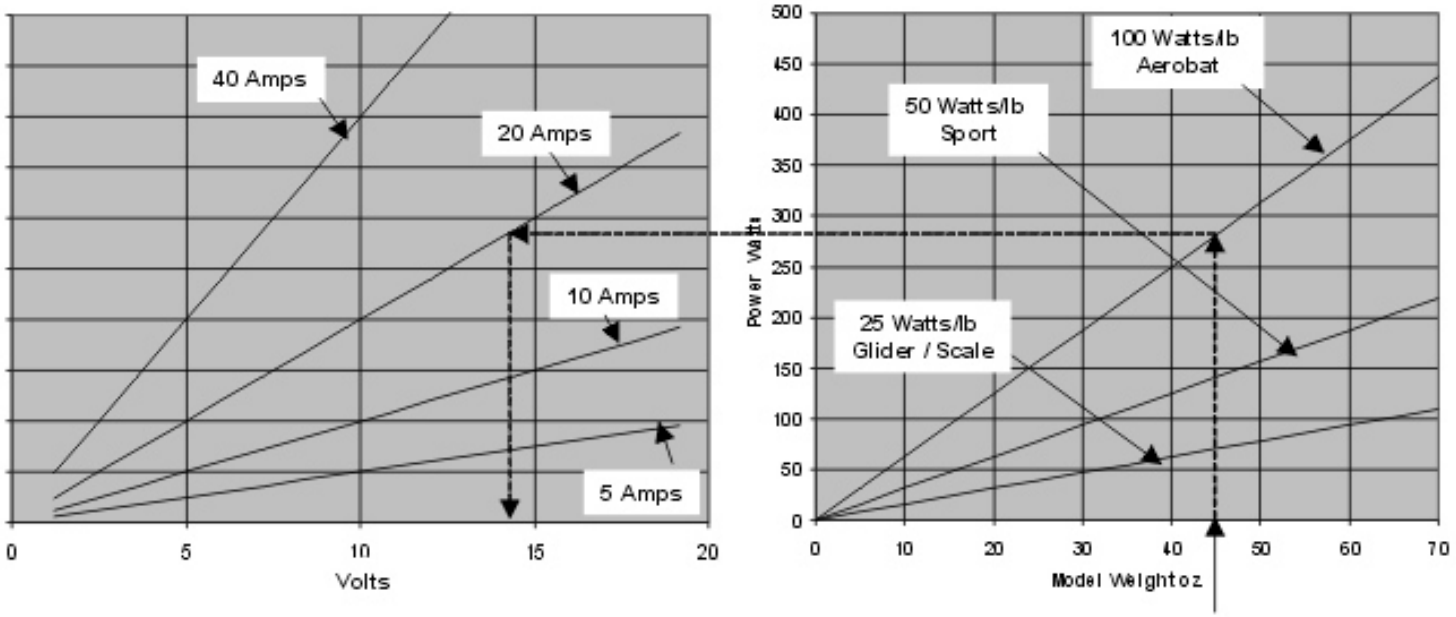
Shown below are the relationships described above in chart form. In fact, you can use this chart to make an initial selection of your power system if you can estimate your model's weight.

For the example shown you enter a model with a weight of 45 ounces, shown by the arrow entering the right hand pane. Follow up to the type of model you are building, here it is an aerobat, so we require 100 watts per pound. Read off the power required by following over to the left hand axis. The power required for this model is about 280 watts. Now to select the motor you continue to the left drawing a horizontal line at the 280-watt level. In the example we have selected a motor that can run at 20 amps and the chart shows it will need to run on about 14 volts to produce the desired power level. With NiCad or NiMh cells you will need twelve cells. You could select a motor that produces the necessary power at 40 amps with six or seven cells too.

As we will explain in the next article, different motors run at different speeds and in addition to matching the current and voltage you need to match the output speed to the desired propeller, but that is for the next time.

These basics are just a start for understanding electricity. Models and particularly electric models have many electrical components that have to be put together. These are batteries, chargers, speed controllers receivers and servos. Even though this may look complicated they're all handled through a basic understanding of voltage, current and resistance that we touched upon so far. Next we will push on to specifics about these items as used in modeling.

Dick Bartkowski



Power Selection For Electric Airplanes ~ Based on Kopski's Watts / Pound Rules

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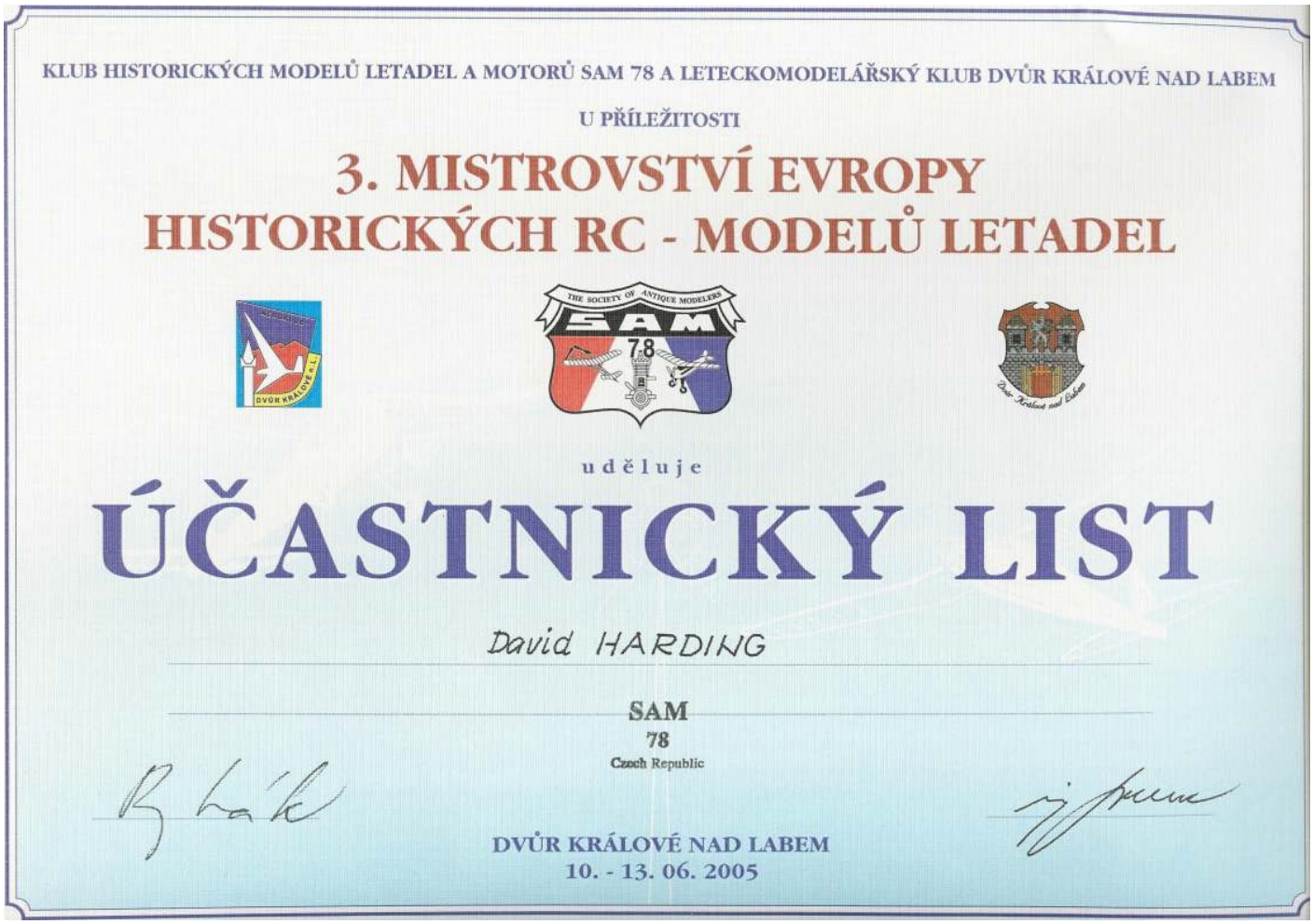
KLUB HISTORICKÝCH MODELŮ LETADEL A MOTORŮ SAM 78 A LETECKOMODELÁŘSKÝ KLUB DVŮR KRÁLOVÉ NAD LABEM

U PŘÍLEŽITOSTI

3. MISTROVSTVÍ EVROPY
HISTORICKÝCH RC - MODELŮ LETADEL

uděluje

ÚČASTNICKÝ LIST

David HARDING

SAM
78
Czech Republic

DVŮR KRÁLOVÉ NAD LABEM
10. - 13. 06. 2005

Propstoppers Club Picnic
Saturday 16th July
Christian Academy Field
10 am till 4 pm

Rain Date Sunday

Bring your models, canopies, food and sunscreen; we are going to have a marvelous time.

Of course, you could get together with some other members and between you rationalize the provisions of hot dogs, hamburgers and buns, maybe even you could bring your party favorite dish to share.

How about ice and soda too?

Note; Summer Meetings at the Christian Academy Field July Meeting Tuesday 5th

Business meeting starts at 7 pm but bring a model or two and fly before and after. Join us at 4:30 for an evening of flying.

No time for dinner? Why not stop at one of Brookhaven's wonderful eating establishments; Burger King, McDonalds, Wendy's, KFC and picnic at the field.

We suggest you bring some insect repellent as we have found ticks at the field, just as we did at Moore.