

Springfield Radio Control Flying Club



AIRMAIL



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AMA CHARTER CLUB 394

JUNE 2006

VOLUME 18 NUMBER 6

NEXT MEETING

**Thursday
June 1st
The Library Center
4653 S. Campbell
room B**

**DON'T FORGET TO
CHECK YOUR
NEWSLETTER FOR THE
ATTACHED NEW GATE
COMBINATION**

REDUCING DRAG

-by Clay Ramskill

This subject is tough, assuming we want to stay clear of complexity. To get into the nitty-gritty of drag reduction, we need a wind tunnel, some heavy computations, and a whole bunch of witchcraft!

So we'll stick to some more basic principles, and leave the name dropping and number crunching to someone more learned than we are!! We do, however, have to make one distinction -- drag due to lift. That is pretty much separate from the rest, because it's strictly a function of lift -- the more lift we need, the higher the angle of attack our wing must operate at, the more lift drag we have. And once our wing area, shape, and airfoil are established, there's really only one control we have, and that is the weight of the plane.

Put simply, the heavier the plane, the more this form of drag

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Mark Copeland assists Tim Hankins in making adjustments on his new giant Sukhoi [it flew very well!!]

2006 Events Calendar

Jun 3	Fun Scale Contest
July 29	Float Fly Practice, Lake Springfield
Aug 12-13	Annual Float Fly, Lake Springfield
Sep 9-10	Annual Pattern Contest
Oct 6-8	Annual Heli Fly
Dec 7	Christmas Party

Springfield RC Club Minutes for June 2006. Don Bordwell, Secretary

A very downscale May meeting was brought to order at the Brentwood Branch Library, May 4th at 7:00 PM. A whopping 14 members and one visitor were in attendance. As many people had not yet received their newsletter, Secretary Don Bordwell read the minutes to the previous meeting and Treasurer David Campbell read the Treasurer's Report. Both were accepted as read.

Old Business: Mike Howard gave a report on the Field Day event. The details are in the May Newsletter but it was considered a success and thanks was expressed to all who showed up and lent a hand. A reminder of the upcoming May 13th swap-meet was given. Mike report-

ed that Tim Johnson is working on a hasp system for the club's refrigerator. President Doug Bennett led a discussion on the June 3rd Fun Scale contest and reported already having a CD and judges, but needed two people to volunteer their culinary services. Don Bordwell and Forest Wilhite stepped up to the plate. Anyone wishing to review the rules of the contest can view them on the AMA web-site or contact Doug. There were no particular updates to be given on the Float Fly complications or the Springfield Parks flying site. Russ Rhodes reported no definite schedule yet for locations on meetings for the rest of the year. Web Master John White sent a request for photos or other material to update

the club's web-site.

New Business: A list was passed around to voluntarily remove members from the hard copy newsletter mailing list and receive only the e-mail version. Anyone else wishing to do so should e-mail their request to Don Bordwell @ (donbordwell@yahoo.com). David brought up that Sparky needed postage money for mailing float-fly materials. Sparky agreed to cover the cost and turn in receipts for reimbursement.

The meeting adjourned at 7:43 PM, which might have been a new record for shortest club meeting.

KEEPING THE GOODIES IN PLACE

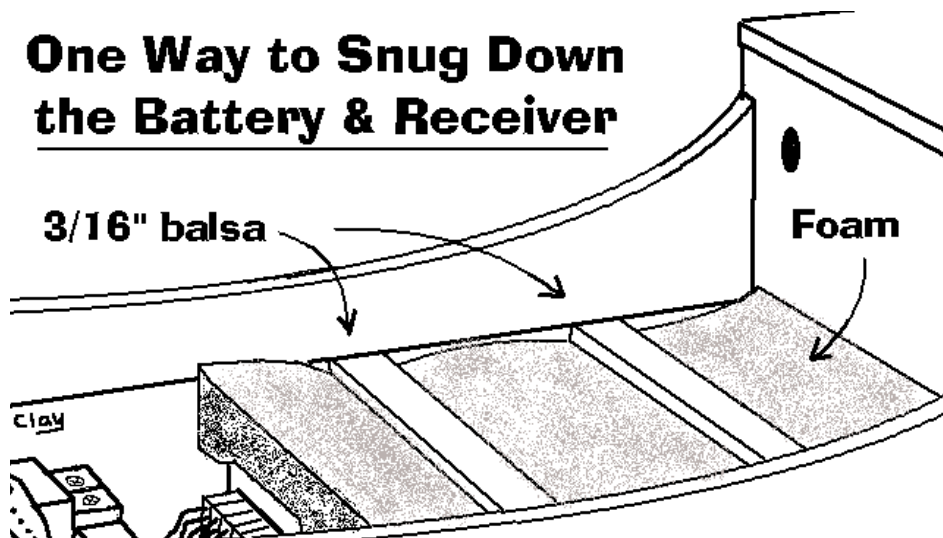
Most kits show you about where the battery and receiver should go in your new airplane - but they don't tell you how to KEEP them there. You want them well packed in foam, so that they don't bang around inside your plane.

Here's one way to do it. Using light foam, sandwich the items between two layers, so that the foam sticks up past the wing saddle reinforcement a bit, but can be pushed below it. Use two or three sticks of 3/16" balsa or lite ply for crossbars - push and turn them so they wedge in. You

could also glue in a couple of rails to wedge the crossbars under as necessary.

The foam will hold the crossbars firmly in place, the crossbars will hold the receiver and battery in nicely.

One Way to Snug Down the Battery & Receiver



Springfield R/C Flying Club Fun Scale Contest

SPRINGFIELD MO

June 3, 2006

Registration at 9:00 a.m.

Static Judging at 10:00 a.m.

Flight Judging at 11:00 a.m.

- ◆ AMA Sanctioned
- ◆ 2 Classes Military & Civilian
- ◆ Plaques through 3rd place in each.
- ◆ Food and Refreshment on site
- ◆ Due to noise restrictions gas engines are prohibited
- ◆ Landing fee \$5

GPS Coordinates:

N 37d 20.55m W93d 12.196m

Directions to field:

From I-44 & 65 take 65 North approx. 7 miles to Highway KK, turn left. Go 2 miles to Farm Rd. 189, turn right and go 1/4 mile and your there.

For more information visit our web site at:

www.angelfire.com/mo2/blacksheeprc/index2.html

or contact the CD, Doug Bennett

[\(iflyrc@sbcglobal.net\)](mailto:iflyrc@sbcglobal.net) or 417-880-8330 or 417-887-1529

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will degrade performance, throughout the speed range!

Having gotten past that, there are several other drag components to look at -- skin friction, form drag, and interference drag, as well as cross-sectional area.

Cross-sectional area is easy. The more air you have to push aside as you go through it, the more drag. So we need to keep fuselages reasonably slender, airfoils reasonably thin. But the size is not nearly as important as shape.

Form Drag: Good "streamlining" is an area where we can really see some results. What we'd like to see is every component of the plane shaped like a good symmetrical airfoil -- or like a drop tank as seen on jet aircraft. At the speeds we're interested in, a really sharp point in the front is not necessary (that's what you see on supersonic planes!). What is desirable is a nice smooth curvature.

Where we DO want the "pointiness" is at the rear. A good, smooth, continually tapering curve ending at a relatively

sharp trailing edge or point. The main thing to avoid is abrupt or angular changes in the airflow.

Retracts: Easily the worst contributor to drag is the landing gear. Fixed gear drag can be reduced by wheel pants and cuffs on struts -- but retracting gear is the obvious solution. There are, however, weight, complexity and expense penalties.

Now, let's look at skin friction. First, the less skin, the less friction! Rounding corners not only cuts form drag, it cuts the skin area. Round forms enclose the most interior volume with the least skin area. A smooth skin cuts drag -- dirt, rough covering overlaps, and covering wrinkles all increase drag. You won't do much better than good sanding and Monocote! We should point out that sharp corners, even when aligned with the airflow, will tend to increase turbulence and produce more drag. A rounded fuselage is less draggy than square -- the same goes for wingtips.

Interference Drag: We did a nice little wind tunnel experiment in school: we measured the drag of a fuselage, and then the wing.

Then we put in the wing and fuselage attached together. The combination had extra drag beyond the sum of the components!

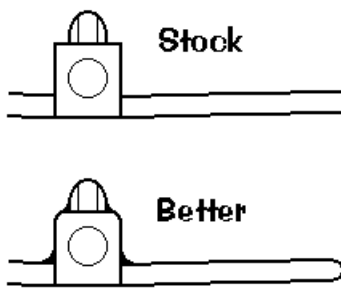
The interference caused by projecting objects (like wings, landing gear, gear struts, stabs, etc.) can be reduced, usually by the use of fillets. These were quite pronounced on WWII fighter wings, as on the Spitfire and P-40, and just rounded off the interior square corners, carrying the rounding well aft of the wing. You'll see these on pattern and racing planes.

Projections: The best solution to projections is -- get rid of them! Retract the landing gear, hide the control horns, enclose the radio antenna, countersink the bolt heads, etc. Cowl in the engine, use an enclosed muffler. Look at a competitive pattern plane -- you'll see all of these features.

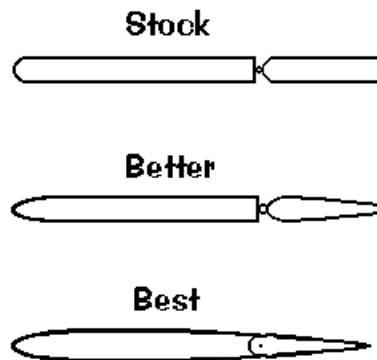
Like most things aerodynamic, drag reduction involves many details, all of which add up in achieving your goal. "If you want to go fast, get out the sandpaper"? Yep, but remember, we need both a smooth skin AND a smooth form!

Reducing Drag

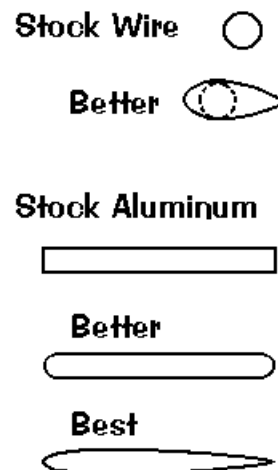
Smoothing



Stab / Fin



Landing Gear



Your on/off switch - is in or out on?

The on/off orientation of a push/pull switch can make a difference. For years, many of us have been taught that "IN" should be "ON" in a push/pull switch. Why: there have been many reports over the years like loose covering flapping into a push = off switch, turning the model's receiver power off resulting in loss of the model. There was an unfortunate loss of a large biplane recently at our field when a pilot figure in the front open cockpit position vibrated loose and bailed out, but before doing so hit the power switch (IN = OFF). It was only the second flight. Even the very best of pilots can do nothing at this point but watch the inevitable.

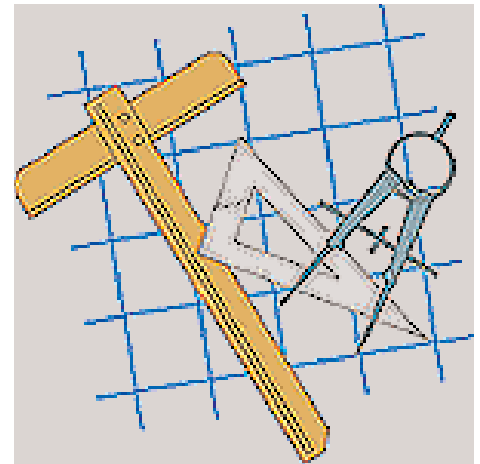
There are arguments against itself off (slide forward) thus saving the battery or minimizing damage to servos. Many hold the position that during transport or handling, a model's power can accidentally be turned on, resulting in a drained or damaged battery. So, one must evaluate the potential of either liability - a dead or damaged battery versus the potential for a lost aircraft. Bottom line: the location and orientation of a push/pull switch can make a difference.

This brings up the orientation argument for slide switches as well -- is forward "OFF" or "ON"? Many of us were taught orienting a slide switch forward as "OFF" might actually be beneficial in a sudden "gravity attack". The theory is: if the model goes in hard, the switch might turn

itself off (slide forward) thus saving the battery or minimizing damage to servos.

Something to think about when you install your next switch....

Barry Harper



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