# ABERDEEN AND DISTRICT SOARERS

Newsletter No.30

7 Ashgrove Road West

Aberdeen

September 1987

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As I sit to enter copy into the word processor for this lastest newsletter, its a sobering thought that we have past the longest day for 1987 and once again the nights are drawing in. After a superb start to the year, the last few months have been a disaster for soaring (or any other sort of flight!). Rain, cold, excessive wind (!) have plagued us weekend after weekend and several Tuesday evenings also. Here's hoping the latter half of the season shows some improvement.

Norrie has been good enough to provide reports of a number of competitions. Take note - those of us who did not attend - that we are obviously missing out. There are more dates left this year, so let me encourage you to join the fun. Try our informal monthly fun competitions for a start.

I met Teun van Waart the other day at Heathrow. It was good to see you Teun. Please contact us next time you are in Aberdeen. Our slopes are MUCH HIGHER than your dunes!

We hear that Peter Rink has not been well. Get better soon Peter - best wishes from all of ADS. Give us a call next time you are back.

It will have been obvious to some of you at least, that the above was written some months ago. I have been promising a newsletter for some time! My sincere apologies to one and all.

Belated congratulations are due to Graham Philip and to Craig Scott (and of course their 'better halves') for doing their bit for the future of ADS - two more prospective ADS members. Prams could make excellent transport for flight boxes, aircraft and power winches!

The last few months has seen a great increase in interest in our club and a very healthy increase in members. Welcome to you all. We are now over 50 with up to a dozen of previous year's members unpaid - shame on them.

## ADS SWEEPS THE BOARD AT ELGIN

Once upon a time dearlybeloved, an edict was sent out from the far north, to announce to all soarers that a gathering wasto be held in Fochabers. Now the northern soarers were a jealous lot who furtively planned and used a secret weapon called Thompson. Thopson never built his own, but secretly gathered parts and pieces on the day and assembled them into one. This action caused much consternation and distress to the others that the Thompson usually won!

In that northern land there lived a soarer named Murphy. His law is well known in the land of soaring. Now Murphy by design, accident or intention did happen to inform those gallant knights of the thermal - known as ADS - about the gathering. They agreed to take part.

The day specified in the deict dawned fair. Five ADS men sallied forth (Sir Jim of Masson, Sir George of Whelan, Sir Norrie of Kerr, Sir John of McConvile and Sir John of Barnes). Such was the dismay of the Northern lot, that curses were cast , causing the wind to change direction, the sky to darken and much sink to appear. This, however did not daunt the ADS team, who produced shiny new models (well some did) and the secret weapon of Sir John of McConville. This latter had a peculiar whirly thing on the front which countered the spell and brought the thermals back.

In the first round, Sir Jim of Masson very uncharacteristically flew away and caused much wailing and knashing of teeth amongst the Northern lot when his flight scored more than anyone else put together. This proves that a High Phase will thermal if left alone! The other knights of ADS put in reasonable scores except for Sir Norrie of Kerr. He discovered an Irish thermal with his Multiphase, and beat the towline to the ground. Sir Norrie of Kerr and Sir George of Whelan were caught in a wicked spell by the bashery and crashery of the Black Knights of Taylor, so much so that their models started to joust against each other on the line. This disagreement still showed at the end of the second round when Sir George of Whelan performed fast aerobatics with his new scale model with its glass wings coming down from a great hight andalmost spearing Sir Norrie's Multiphase to the centre spot.

After the formality of the third round, when the lucky talismen of Sir Jim of Masson's go faster blue tape were affixed to the models, the knaves were vanquished and in penance agreed that the fly-off be demonstrated by ADS. Sir Jim of Masson had agreed to stay on the ground guarding the sacred blue tape from possible interference or witchcraft. The four remaining knights flew a spirited two rounds in the changing air. Sir John of McConville with his 2.5m Algebra proved that a good little 'un can beat a good big 'un if flown proper!

Many converts were made that day and another sacred edict was issued inviting the Northern lot and anyone else to another gathering to be held on the sacred pastures of Balmedie on 31st May. The triumphant horns of victory were carried off the field by Sir John of McConville and borne back to the Bridge of Don stronghold of ADS.The other Knights of the Thermal returned to their respective castles to bash more balsa and prepare for the next challenge.

RESULTS

| | |
|---|---|
| John McConville | 2.5m Algebra (with ailerons) |
| John Barns | Aquila |
| George Whelan | ? |
| Norrie Kerr | Multiphase |
| Jim Masson | High Phase (blue tape mod included) |

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Norrie Kerr

## BRIAN SHERRIFFS TROPHY

The weather at Balmedie on the 31st May made this event interesting to say the least - one minute great lift, the next solid water. Funnily enough there was no rain in Aberdeen, but that's Murphy's law. Thanks to the RAFMA lads from Lossiemouth we started with an entry of 10, but lost Neil and George in the first round. I believe George got his scale model fixed, but Neil needs new wings for his Pheonix.

After a rain break the second round was flown and some good lift was available. With three man slots, all the scores were close. At one point I had the Multiphase at about 150ft doing nothing - not going up or down, not moving! However, it did not stay up long enough to beat Jim and Dave. Dave Norris and that Chieftain are worth watching.

Round three sorted eveything out. Everyone got wet again and the lift was either there or it wasn't. One slot was won with a time of 3min 40sec!

The three man fly-off was reduced to one round as the thunder and lightning was turned on. Sitting in the car with the wipers on high speed, you could only just see six figures on the flight line. They ALL deserved to win. In the end John took the honours. Well done all who turned up - where were the rest of you?

1st John McConville
2nd Tony Crocomb RAFMA
3rd Jim Anderson

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Norrie Kerr

## SEATON - 26th May

Sitting here trying to explain to all of you out there, I feel like the columnist in the June Radio Modeller (yes, I know it is difficult to get a copy since a certain shop in George Street closed down). He is suffering from a shortage of copy. The same applies to YOUR magazine, so until you, yes you, Joe Soap or whoever put pen to paper you will have to suffer another competition report by ADS flyers of ADS flyers. (your efforts are greatly appreciated Norrie. Ed)

Overheard during the evening and either ignored or generally discounted :-

| | |
|---|---|
| What rules? Oh! I thought this was serious. | |
| Sorry, I am not a competition flyer | 2nd Place |
| I'll do better next time | 6th Place |
| Someone is cheating, they've got a real glider | J.A. |
| If it's got a hook, it'll fly | F.S. |
| I've a good big 'un | G.D. |

Now who thought it was serious? When three scale gliders, two slope soarers, six proper gliders and an assorted bunch of people get together, it is serious. The second place winner shared his jelly babies, the winner would not let us share his model (doesn't matter it was a power job). A winner won, a looser lost, but everyone enjoyed themselves.

George won a comp, Andy bent a glider, Norrie bent the rules, Pauline got a placing (Membership is only £11.00 - hint, hint). Twelve entered, ten flew, eleven got a placing. Now if you noticed the enordynamical (are you sure Norrie!) gap in the last bit, the equation to solve it is - entry 12 = E, flyers 12+2-1+P = F, results = R. Therefore ExF = R. P & J were variables and B didn't count. Answers please to the editor on abroken glider wing.

The competition proper was based on three flights with a total aggregated duration of 20 minutes. One point per second was deducted for overflying, a 50 point penalty if at least one spot landing was not achieved, four flights were allowed for slope soarers and a seven minute max was allowed on any flight.

RESULTS

| | | |
|---|---|---|
| 1. | George Whelan | 1188 |
| 2. | Dave Norris | 1145 |
| 3. | Jim Anderson | 1109 |
| 4. | Alan Watt | 1079 |
| 5. | Graham Donaldson | 954 |
| 6. | Colin Stewart | 772 |
| 7. | Clive Grundy | 634 |
| 8. | Pauline Kerr | 609 |
| 9. | Alan Stewart | 605 |
| 10. | Frank Skilbeck | 295 |
| 11. | John McConville | 201 |

Norrie Kerr

## CHRIS FOSS'S 'MULTIPHASE'

Owing to business commitments, I no longer have the time to build that I would like. I was so impressed with way Chris Foss handled the new Multiphase at the Oxford RADIOGLIDE, that I returned home with the part kit under my arm.

For your money you get an excellent set of foam wings, wing joiner and tube, AMT linkage and an extremely well drawn plan. Construction is very simple. A slot must be cut in the main panels for a spruce spar. This is easily done using a piece of 3/16th sheet and some fine sandpaper. Airbrake cutouts were formed with a wire bent to shape and heated in a blowtorch. The tail feathers are standard construction. Just cut out, fit tubes and sand to section (keep them light).

The fuselage has conventional plywood sides and is built upsidedown over the rear quarter sheet panel to ensure accuracy. When sanded, it's surprising how elegant a square box can become.

The radio installation is well thought out and the tubes previously built in make the replacement of any wires a doddle. I had decided to build two models side by side. One is meant as a heavy weather machine with a full glass cloth and epoxy finish. The other is dope on tissue. Both are cellulose sprayed.

Flying is excellent. As yet, I still have to learn how to handle it properly, but it is already evident that I have a model capable of a wide range of speed capable of tight thermal turns with little height loss. The brakes are very efficient and will bring her down fast when necessary.

For someone looking for a good twelve footer, this is a good one to go for. There are no major construction problems and a film covered model could be completed in a couple of weeks by the average builder.

Norrie Kerr

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## FOR SALE

| | |
|---|---|
| P51D Mustang incl OS40FSR (in need of some repair) | £50 |
| Gangster (needs finishing) | £20 |
| Enya 35 R/C (used) | £20 |
| H.G.K. 21 R/C (unused) | £30 |
| H.B. 20 R/C (unused) | £30 |
| O.S. 25 FSR (unused) | £45 |
| Enya 40 R/C (unused) | £40 |

Phone Brian Ord on 698449

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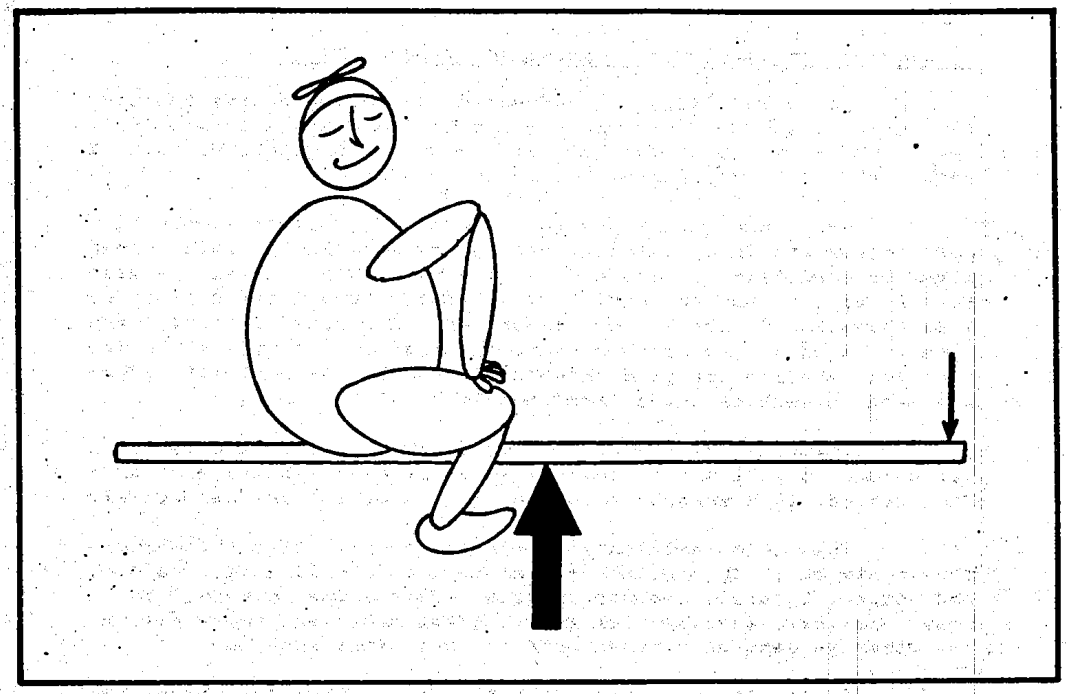

# CENTER OF PRESSURE

**By DAVE THORNBURG . . . Nobody hates theory more than the author . . . but here's a simple, well-written aerodynamic discussion that just might keep your sailplane wings from exploding on that next speed run!**

• I prefer not think about Center of Pressure at all, but when I do, I like to think of it as a kind of invisible black arrow, poking around underneath my airfoil, looking for weak spots in my Monokote. Just like the drawings in the textbooks: **Fig. A**

It represents the magic point where all the lifting force of the wing is focused. (Why it's called "Center of Pressure", and not "Center of Lift", is a question that always embarrasses the serious aerodynamicists. For their sake, let's skip it.)

I also like to think of an airplane in stable flight as being balanced upon this magic point . . . in the same way that a seesaw can be made to balance across its axle (if you can get two kids to sit still long enough). Designers usually bring about this balance by placing their "fat kid" (the Center of Gravity, or weight-focus of the whole plane) just slightly ahead of the black arrow, and then countering this huge down-force with a long tail moment and a negative-lifting stabilizer: **Fig. B**

The plane's nose begins to want desperately to "tuck under", and all that keeps this from happening is a tremendous increase in negative lift from the stabilizer: **Fig. C**

This works. You really *can* balance Fat Albert, if you can get him to sit up near the seesaw's axle, while you scoot out to the very end of the board. The seesaw balances; the airplane flies.

Good, you say; this is simple. But how can knowing about it keep me from ripping my wings off?

Well, Gentlemen, there's one more factor . . . the bad news that I've been holding back. The Center of Pressure isn't a simple, fixed point, like the axle of our seesaw. It's shifty. It moves around a lot.

But its movement follows a simple rule, at least: raise the leading edge (as in a climb) and the arrow moves forward; lower the leading edge (as in a dive) and the arrow moves back. We can forget about the forward movement . . . if the stabilizer doesn't catch it in time, it will only cause the airplane to stall, and stalls are seldom fatal to a sailplane.

It's the backward movement of the Center of Pressure that's the killer. If our arrow moves too far behind the Center of Gravity, it's like Fat Albert sitting too far from the axle. A dangerous situation . . .

This may not look too lethal on paper, but you can demonstrate what's happening with whatever plane you're now flying. Put it into a high-speed (30° or steeper) dive,

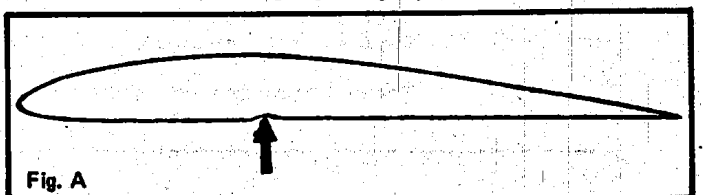

**Fig. A**

**The Center of Pressure (arrow) is the point on the wing where all of the wing's lift is focused. The amount of lift forward of this point is the same as the amount of lift aft.**

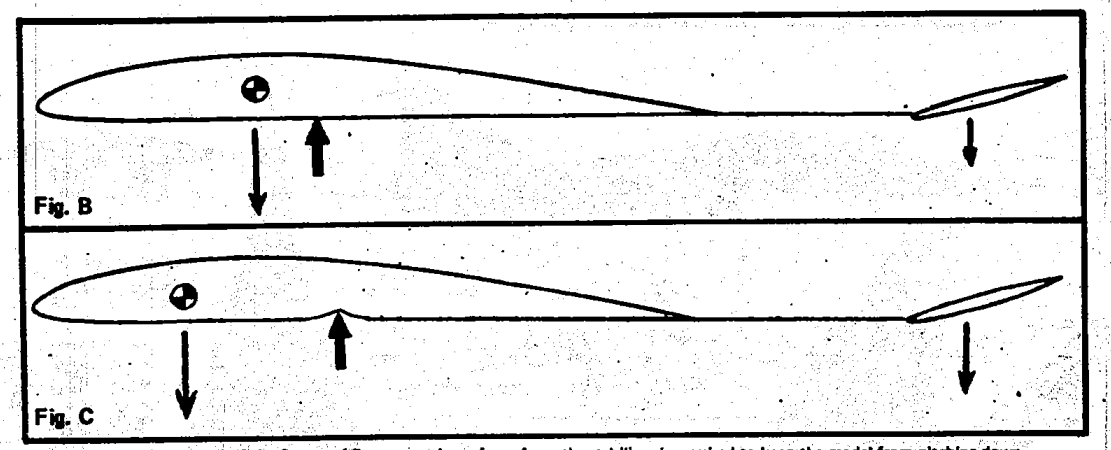


**Fig. B: If the CG is forward of the Center of Pressure, a down-force from the stabilizer is required to keep the model from pitching down.**
**Fig. C: The farther forward the CG is from the Center of Pressure, the more down-force is required to maintain level flight.**

straight towards you. Watch the stabilizer. Unless your stab is incredibly stiff, you'll probably see some anhedral . . . both tips will begin to sag down.

What's going on? You're applying down elevator, right? Down elevator is supposed to increase the stab's lift, right? And a surface that's lifting ought to bend *up*, not down, right? Then why is it going anhedral?

The answer is that the good ol' Center of Pressure has slid backward until it's dangerously far behind the Center of Gravity . . . so it's now pulling up on the tail of the airplane. And pulling up hard.

If you continue to dive at this angle, one of two things must happen. Let's begin with the worst. The stabilizer will quite suddenly give up the ghost, folding downward and allowing the nose of the plane to tuck under, which is what it wanted to do all along. The instant this happens, your wing is going to explode. I guarantee it. Nobody builds wings tough enough to withstand this particular maneuver.

It will explode, and it will all happen so quickly that you'll probably blame the whole thing on "wing failure". This happened to a plane I had built, during the speed run at the 1976 Southwestern Regionals. When I did the autopsy, I found that the wing panel that failed had folded *downward*, and at first I couldn't believe it!

It took me a week to reconstruct the actual event. To my sluggish eyeballs, the ship had simply exploded all at once, like a firecracker. When I finally got my hypothesis straight, I called the Air Force F-111 pilot who had timed the flight, and asked him what he saw. "The plane tumbled forward and the right wing blew off," he told me. Voila!

But that's the very worst thing that can happen, and it doesn't happen often (only once per airplane, at the most). What is more likely is that the stabilizer will hold (hurrah!) and the plane will settle into a terminal velocity for that particular wing loading and dive angle.

If you happen to be flying a speed course, or even just a distance course, you should be very interested in this terminal velocity. Is it the *maximum* velocity your plane is capable of, under those conditions? Not if your stabs are bending down, it ain't. Not by a long shot.

Why? Because the bending indicates that your stabilizer is carrying a heavy load, and *that's not what stabilizers are for.* Any time you load them, their drag goes up astronomically; they make lousy wings. Stabilizers are designed for stabilizing, for carrying the minimum possible load to keep the wing in aerodynamic balance.

So you ought to be wary of people who tell you to move your Center of Gravity *forward* to fly a speed course. They're asking you to do one of two things: 1) fold your stabilizer, followed instantly by at least one of your wing panels; or 2) fly the course with so much negative load on your stabs that you might as well be dragging a small parachute along behind you.

So what am I suggesting . . . that you move the Center of Gravity *back* to fly speed? That you go into that feared and dreaded and seldom-practiced speed run with a *tailheavy* airplane?

Yup.

And the reason is simple: when you line her up with the speed course and push in that down-stick, your little black arrow is going to start sliding towards the trailing edge of the wing. You want your Center of Gravity to be right back there, waiting for it to arrive.

If the black arrow arrives, and stops directly under your Center of Gravity, you have the ideal aerodynamic balance for your dive: Fat Albert sitting directly over the axle, and you balancing the board with the merest finger pressure on your end. Almost all of the force is off your stabilizer now, and your plane will go faster without ballast than your buddy's plane will go ballasted.

Try it.

Start moving your CG back, 1/8 of an inch or so at a time. Almost all kit designers deliberately show it too far forward, because this loads the stab and makes the elevator relatively insensitive, which is good for beginners. I can't give you any figures, because it's going to vary from airfoil to airfoil. And it will vary with your dive angle, of course, so you need to practice a specific course to really fine-tune. I'd be a little nervous if my balance point strayed much more than 1/2 inch from that shown on the plans.

Remember: the aerodynamic efficiency of your model is roughly proportional to the sensitivity of its elevator. When you get that CG back to the point that your elevator stick is touchy as a boiled owl, you'll have a faster, cleaner, more efficient model. Cut your throws down and learn to fly it that way, and you'll have a definite competitive edge.

Still not convinced? Go back and reread World Champion Skip Miller's article in the December 1977 *Model Aviation*. Buried inconspicuously in one of his final paragraphs is the note that he sometimes flies his Aquila with the CG so far back that the fuselage angles up at 45° or more, when the model is suspended at the back edge of the wing spar.●

Lifted from MODEL BUILDER October 1978 with thanks.

# MORE PSS SUGGESTIONS