

Magnet Flying - Some hows and whys

Trevor Faulkner

I hope readers of Gladys will forgive my attempts to explain what a small group of club members are doing when anyone with any sense is standing still and twiddling with Tx controls. My excuse is that I was asked to explain - so please accept my apologies in advance.

THE BASICS

Magnet, (or F1E) models are slope-soaring gliders with automatic steering. The majority use a simple pivoted bar magnet linked to a carefully designed fin and rudder unit.

The natural tendency for a magnet is to align itself, N-S, and to keep to this. If a rudder is moved as the magnet moves, it produces a steering effect. Because of the design of the units, it is possible to set the rudder anywhere within a 360° arc so that with the magnet lying N-S, the fin/rudder can be positioned exactly in line with the model's centreline (seen from above). This direction is set to be directly orientated into the prevailing wind. Fin/rudder units are usually at the front but rear steering, via a transmission link is possible. The power (torque) available via the magnet's

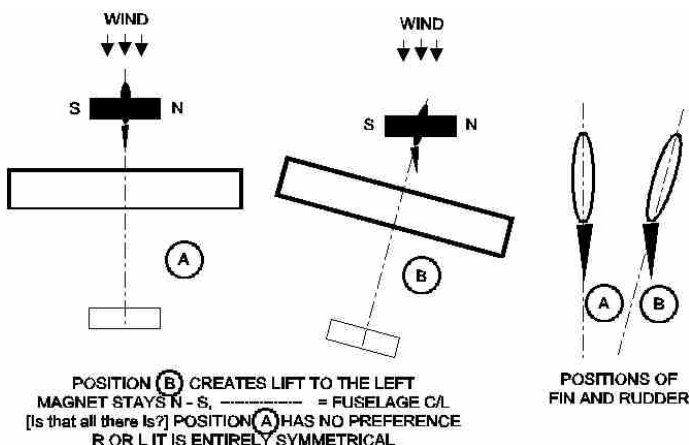
N-S seeking tendency is extremely limited. Thinking in terms of R/C servos, which have "pulls" of 4lbs and upwards, a magnet's power is less than 1oz. (30gms). Hence the need for carefully designed rudder bits.

THE MODELS

are designed to operate within certain speed "brackets", contests allow five models to be used, and these will vary from fast aircraft capable of 20 mph or so, when ballasted, to models capable of floating along at 4-5 mph. The former tend to be smaller, heavier, and with flat-bottomed or semi-symmetrical wing sections, the later with under-cambered high lift, high drag aerofoil, often reaching 9' 0" or so wing span.

ESSENTIALS

With no power to spare, models must be as warp free as possible. They must be capable of being assembled in an exactly pre-determined form, with no "slop" in the wing or tail seating, or in alignment of fuselages or flying surfaces. Magnet units must run freely, but to avoid over-correction when the magnet-bar moves, a



"damper" of aluminium is used to cut oscillation.

SPECIAL FEATURES, which make modern F1E flying much easier, include standard moulded plastic parts, which I import from Germany. [By way of exchange, Sheffield Magnet Company supplies the bar magnets to our German friend for fitting to his units.] In the early days I used home-made bits, which in retrospect seem incredibly crude. The pivot would be a sharpened point (steel), moving in a countersunk bolt head for a bearing. We tried using fine biro points on clock "jewelled" bearings; I made some sprung bearings to avoid bent

pivots or cracked jewels. Setting were old clock gears And everything worked! Now we have complete "front ends", only lacking a rudder, with a fuselage nose, magnet-holder, fin-deck, damper, sprung adjustable jewelled bearings, and plastic setting wheel plus the magnet ---- all for less than £35.00.

FLYING F1E models are great for "fun flying". A flight of 40secs - 1 min. can often result in the flier being able to assess his trimming and directional- tuning of the glider, give a worthwhile gain in altitude and relatively short recovery distance. A session with 20-25 launches

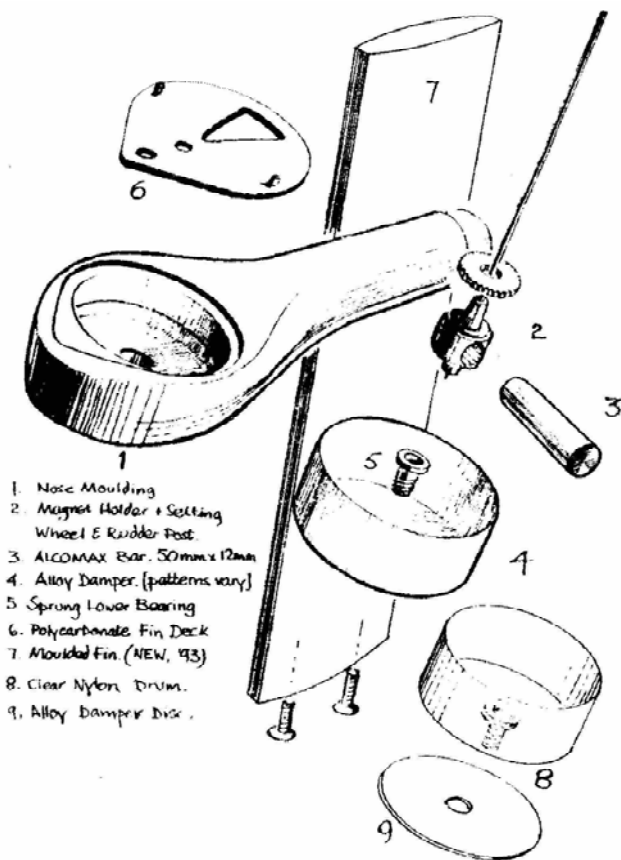
constitutes a good day's flying.

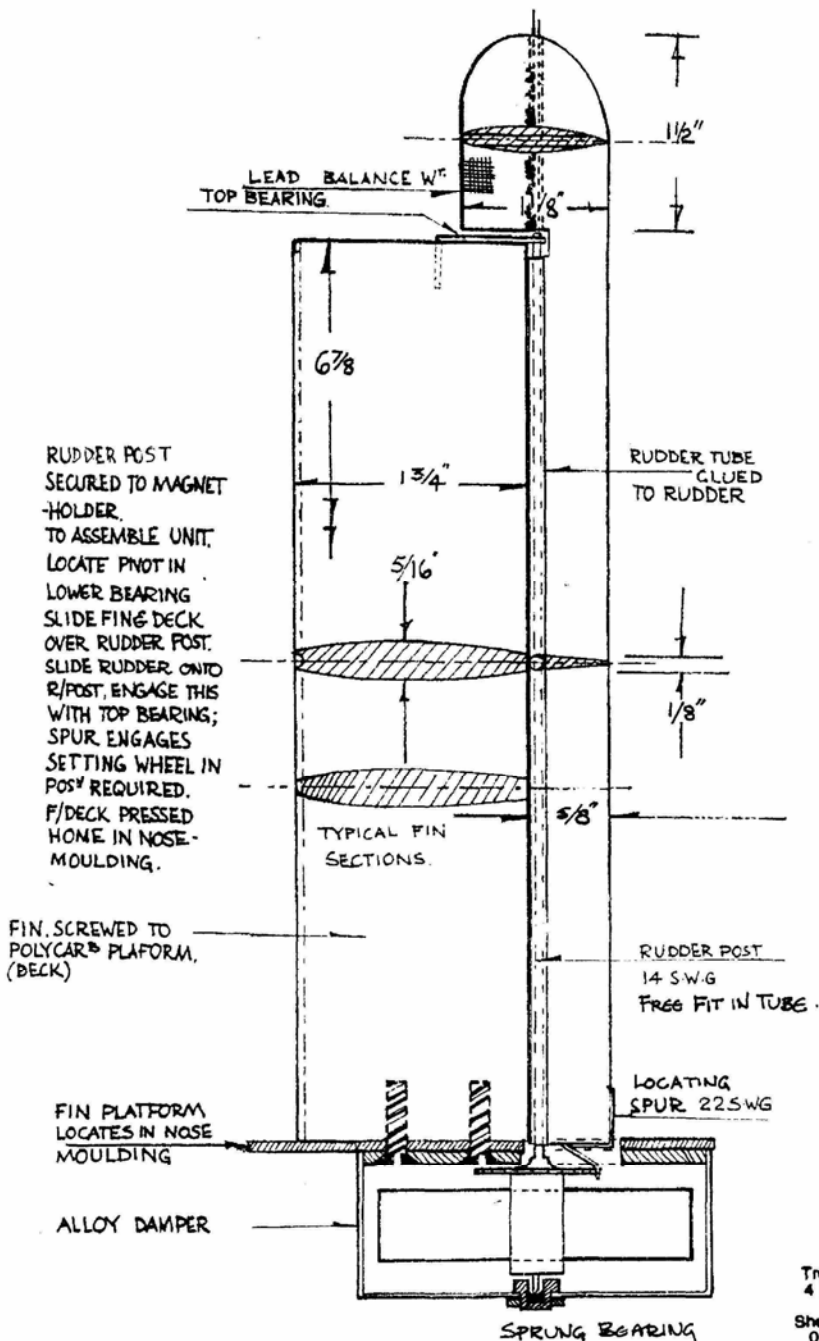
COMPETITIONS

Target times are set by a contest Director for each of five rounds. A good C.D. (like Brian Castleton) will use his experience to find a winner by indicating a target (time) that is reasonably within reach, but not too easy. If, for example, two minutes is chosen, and everyone reaches that flight time, the next round will probably be to a higher target - say two and half or three minutes.

A good C.D. will endeavour to produce a winner without exhausting his competitors too much, as recovery of the model on our slopes is not easy.

Times can vary from two - five minutes and in cases where two or more





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competitors "max-out" a fly-off is arranged, usually but not always, going up to seven, nine or even eleven minutes. In the unusual event of a tie being reached without a "perfect" - (i.e. five maximums) is reached, the C.D. will decide on what is a reasonable target in view of the conditions.

WHY DO WE DO IT? Oddly enough we love the hills, like the exercise and enjoy the thrill of launching a model, which has, as far as we can make it, been tuned to fly predictably and effectively in the prevailing conditions. Going home tired after a good session is very satisfying. I often lose a couple of pounds - an easy way to reduce weight. (Ed. I don't see any evidence of this being a problem for Trevor.)

REGRETS

First, the usual one - that there are no young British F1E fliers [Poland, Romania, Czech Republic, etc. all have lots of young fliers who build excellent models.] All our traditional skills seem to be going Eastwards, if not to pot.

Second, the "boffin" approach - Global positioning is definitely on the cards - as is the use of an electronic compass linked to a servo and hence to a rudder. I see this appealing to technophiles who are more interested in the gizmo than the aircraft. The appeal of doing a lot with minimum complication has been one of the main attractions of magnet- flying for me.

Third, I have heard that complete "ready to fly" F1E models are now to be had - at a price. Well you pay your money and take your choice. For this old codger that's not really aeromodelling, simply model flying. [S.M.A.E. versus B.M.F.A. that says it all.]

MEMORIES

1. Visiting and flying in a thermal competition way, way back some 30 years ago - and placing second with a single channel model, self designed and built. [The winner had a two channel multi-proportional gear. Mine had "bang-bang" - ever heard of it?] Graham Freeston towed for me, the model had never been "on the line" before and there was no spot-landing requirement. All the models were built by fliers and all varied considerably. Wonderful!
2. Lying on my back on the South slope one evening, watching my magnet-model holding lift perfectly dead ahead. Utopia.
3. Staying with Hans Gremma (inventor of magnet flying as we know it) and seeing his slow flying "Flamingo Section" models perform at walking speed. Sadly Hans died some four years ago. A modest genius Nostalgia!

CONCLUSIONS

I started magnet-modelling by accident! An old copy of "Aeromodeller" came my way, with an article by Hans. My (then) club was Luton and D.M.A.C. - mostly into R/C slope soaring. I couldn't afford R/C - but living near Ivinghoe I wanted to slope fly. Free flight models offered me a way forward.

My first model was a success - (luck) - winning a free-flight slope-soaring contest at Ivinghoe. This was in '58, Since then I have written countless articles for "A-M", "S-F" and "A.M.I". I still enjoy the class - and being with the people that fly it. They all contribute to making magnet flying a wonderful activity.