

Meadow Flyer

## **MEADOW FLYER:**

**Newsletter of the Oxford M.F.C.**

**January 2022**

<https://oxfordmfc.bmfa.uk>



**A glorious summer's day on The Meadow: Chris Brainwood's FF Bleriot X1 slips the surly bonds.**

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## Membership Report – Simon Burch



### Membership

From the end of 2019 to the end of 2021, our membership rose from 58 to 94. So far for 2022, 73 of those memberships have been renewed, and 4 others have expressed their intention to re-join but have requested a delay for administrative reasons.

Thus far, only 3 members have informed me that they do not intend to re-join, and some of those who have yet to re-join are established flyers whom I expect to do so in due course. We have ongoing enquiries from 4 prospective new members.

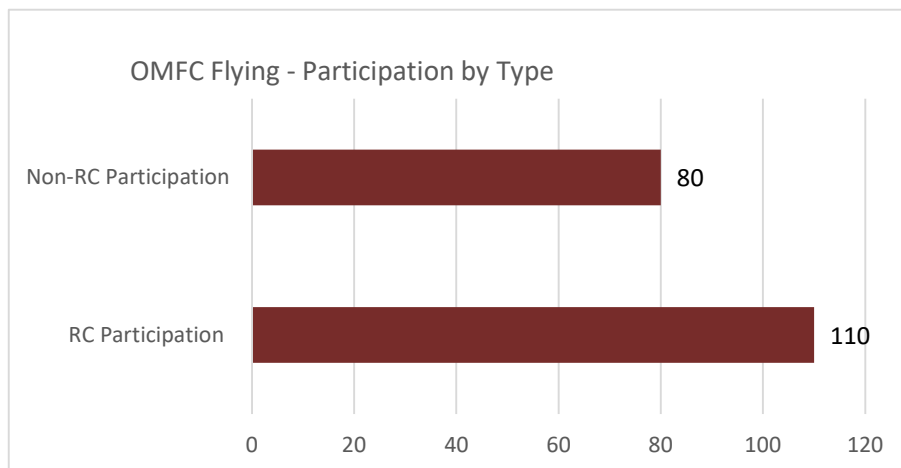
We have one Honorary Member – Charlie Newman.

The average age of our membership is 61yrs; the youngest is 7 and the oldest is 88. We have 2 female members (one of whom is a junior) and 5 junior members.

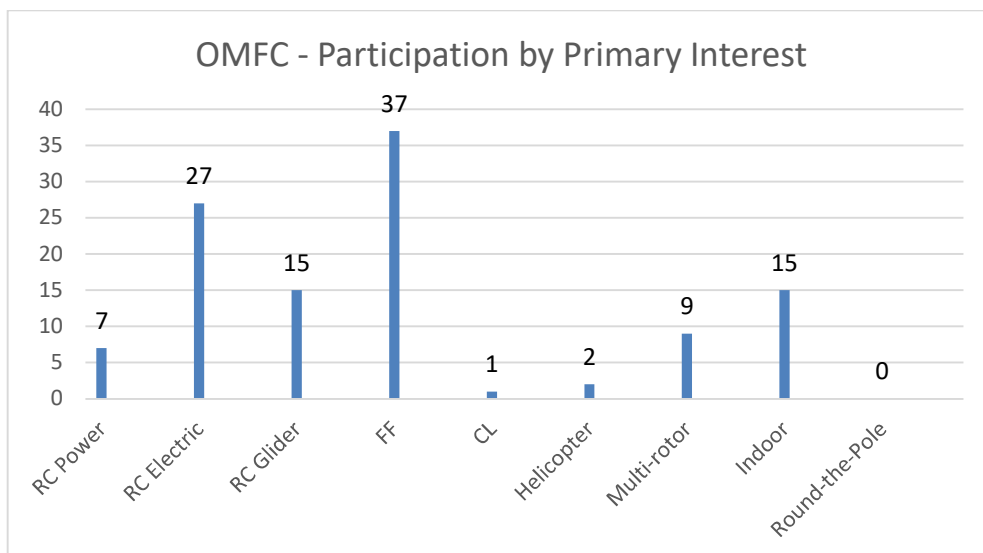
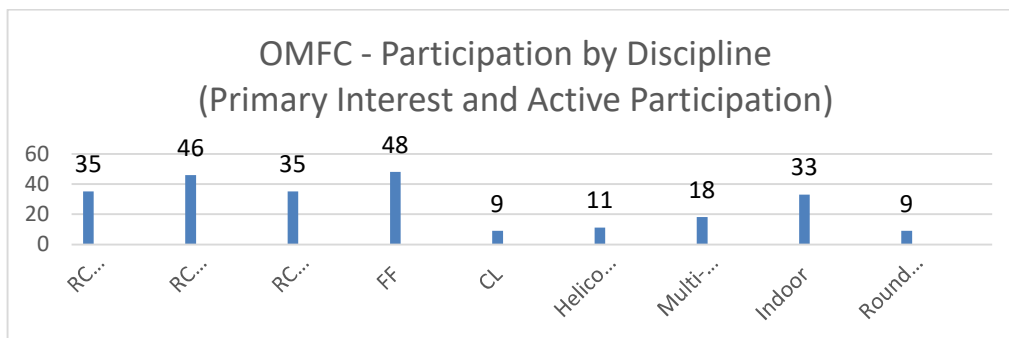
### Membership Statistics

Our membership has a broad spread of interests that covers most aspects of aeromodelling and non-commercial, small, unmanned aircraft flying. A clear majority express RC disciplines as either their Primary Interest, Active Participation or Would Like to Try. However, FF remains our most popular single aeromodelling discipline.

The Club has 25 renewing members who hold BMFA RC Achievement Scheme Certificates; I expect this number to rise when some of our established flyers eventually renew their memberships.



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### BMFA Membership 2022

Recent changes at the BMFA have hugely increased the time required to renew Membership. I'd therefore encourage you all to utilise the BMFA's Online Membership Portal to check your membership status. You may also wish to purchase your own CAA Registration and BMFA Reward Cards. Be reassured, the site is easy to use, the process is relatively simple and doing so will help to reduce the Club's internal administration.

Should you need help with this, please let me know.

### WhatsApp Groups

We now have 3 OMFC WhatsApp groups:

1. Meadow Flyers: primarily for arranging meet-ups on the Meadow, but also general 'chat'
2. RC Training: primarily for those preparing to undertake BMFA Achievement Scheme Tests
3. RC Soaring: primarily for arranging slope and thermal soaring meet-ups at other locations

Anybody wishing to join one or more of these groups should contact the Membership Secretary.

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## Unwanted/Unexpected Control Mixing

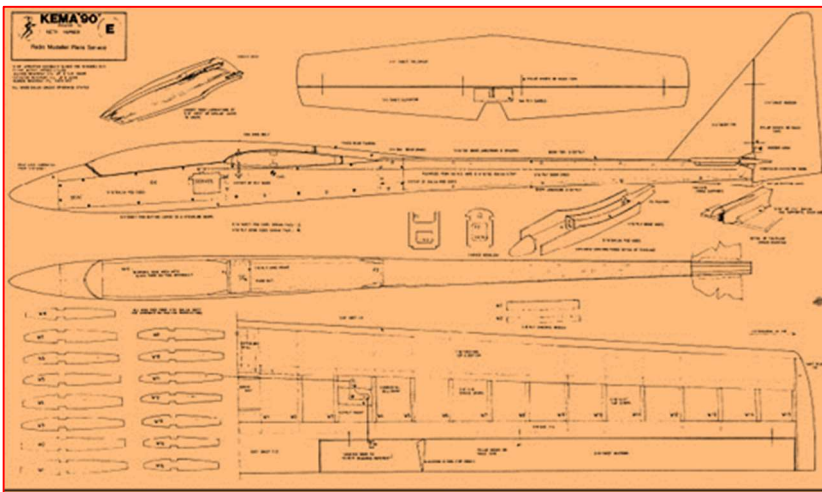
(Author's note – although this incident relates to slope soaring, the lessons apply to all RC types).

St Agnes Head in Cornwall surely has to be one of the UK's finest slope-soaring sites. It's easily accessible by car, the local fliers are welcoming, the Cornish coast and cliffs provide a dramatic backdrop, and it's useable in wind directions ranging from north-east to south west. It's not without its drawbacks; the Cornish weather is unreliable, the well-walked South-west Coastal Path passes directly beneath the launch and overshoot path and flying over cliffs or sea can be unforgiving, should something go wrong. Nonetheless, when conditions are good, it's difficult to think of a better site. In June 2021, I was flying from St Agnes Head's south-west facing slope. Unusually, the weather was exceptionally good and I was the only flyer at the site. Of course, I was not alone; there were many walkers using the coastal path which restricted opportunities for launching and landing and, for most of the time, close-in manoeuvres such as low passes and practise go-arounds were out of the question.



*Kema 90* above the South West Coastal Path at St. Agnes' Head, Cornwall

I had two models with me; my *Yeti* foam wing and my old *Kema 90* glider. The *Kema 90* is a 68in span, traditional balsa-and-ply model designed by Keith Humber. It's a robustly-constructed 3-channel



*Kema 90* plan by Keith Humber



Generic *Zagi*-type Soarer – a slope classic and perennial favourite

(aileron/elevator/rudder) aerobatic slope-soarer which looks similar to a Chris Foss *Phase 6*. It's no lightweight but it's easy to fly and very forgiving. I'd built mine in 1998 and flown it successfully for many hours with no mishaps. Within my stable of four slope-soarers it's my favourite, although the one-piece 68in span wing makes it difficult to transport to Cornwall in a holiday-packed car!

Normally, I flew the *Kema 90* using low rates on aileron and elevator (perhaps perversely, I found that smaller control throws produce smoother, bigger and better looking aerobatics). However, inverted flight needed more down elevator than the low setting provides so, for inverted manoeuvres, I switched the elevator rate switch to 'High'. This clumsy procedure was a legacy from the pre-computerised transmitter days. I'd often considered setting an appropriate exponential on the elevator control instead; I just hadn't done it, and I decided that this flying session was the perfect time to try it out. With 30% expo set on the

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elevator, I test flew the model; its handling seemed to be a little more sensitive in pitch but full down elevator deflection was immediately available. Time for some aerobatic flying!

One of my favourite slope-soaring manoeuvres is a low pass along the slope face, up into a big, wide wing-over away from the slope, into another low pass in the opposite direction, and repeat. On the day in question, the seemingly endless procession of walkers using the coastal path made this impossible for most of the time. However, as lunchtime approached, the number of walkers reduced and large gaps appeared in the procession. Soon, there was sufficient time to achieve several low passes before the next group of people came within range, so I waited for my opportunity and launched. The first couple of wingover manoeuvres were acceptable but I knew I could go lower and faster; with twice the elevator throw available, it was even easier to pitch up into the vertical for wing-overs and stall turns.

*Waiting for a gap in the traffic! (Note walkers on the coastal path below)*

The *Kema 90* was now flying really well; with each low pass my confidence, if not my skill, grew. While it couldn't match the amazing performance of the now-ubiquitous carbon '*Wunderplanes*', it was still pretty good. Each pitch up and wing-over became more aggressive; each pass lower. With a group of walkers approaching from the south, I didn't have much time left so I commenced my final pass, which, indeed, it was . . .



As I pulled the model up towards the vertical for a stall turn to the right, I was shocked when it turned rapidly to the left. Assuming it had flown into turbulence, I applied right aileron which corrected the turn – so all was good. I pulled up again, more gently this time but, once more, the model immediately turned left. Clearly, this wasn't turbulence; something was wrong with the controls. I was able to direct the model towards a clear area but I had only limited control over its flight path. Every pitch input resulted in a turn and although this could be corrected with aileron, a crash looked to be inevitable. Fortunately, the model was more-or-less level when it made a fast arrival on the slope face. It slid rapidly uphill, through the short gorse and heather, eventually coming to halt in the middle of the rock-strewn coastal path.

The *Kema 90* wasn't going to fly again that day but, amazingly, the damage was minimal and largely cosmetic. Most of the damage had been caused by the rough surface of the path; luckily, the softer gorse and heather had cushioned the touchdown and slowed the model down, and the wing-bands (which I'd changed from the original bolt) had absorbed much of the shock to the wings – indeed, three out of four of the bands had broken.

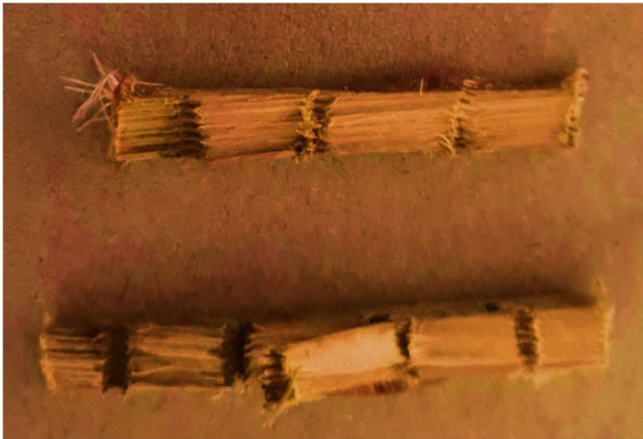
I had been very lucky. The undemanded roll to the left had taken the model towards land. If it had rolled to the right, or if the control malfunction had occurred during a pass in the opposite direction, the model would almost certainly have ended up in the sea. Thankfully, I'd been very careful with regard to the proximity of uninvolved persons ([Article 16 – see update later](#)) and, as far as I knew, nobody else had even witnessed the incident. Fortunately, having an intact model also meant that I was able to find out what had happened, and perhaps help myself and others to avoid the pitfall. So what *had* happened?

On inspection in the field, the probable reason for the control malfunction was easy to see. The rudder and elevator servos were mounted side-by-side, on wooden bearers, in the forward section of the fuselage.

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*R: Elevator/ rudder servo mounting (note: the rear servo bearer is obscured by the wing dowel)*

The two servos were close-fitting, and the aft bearer was concealed from immediate view by the servo mountings and the forward wing-band dowel (see photo).



*Split Rear Servo Bearer (left) and the Failed Bond on the Front Servo Bearer (right)*

At some stage, the aft servo bearer had split along the line of the four mounting screws, which meant that almost all of the fore-and-aft load was being taken by the forward bearer. Under normal flight loads this was not a problem, but I'm fairly sure that the additional forces induced by repeated aggressive manoeuvring in pitch, together with larger control throws, had caused the forward bearer/fuselage bonds to fail.

Effectively, this had turned the servos and their mountings into a single movable unit, similar to an old-fashioned 'sliding servo' mixer – and that's exactly the effect that it had. Applying up-elevator had the effect of moving the entire servo assembly forward, which applied left rudder. The *Kema 90's* rudder is large and effective so the result of applying up elevator was an immediate left turn and vice-versa. Hence the partial loss of control.

For me, there were three key lessons from this incident:

- Firstly, and most importantly, unexpected malfunctions such as this one can happen at any time - which means that it's vital to maintain at least the minimum legal separation from people. I'd taken care to do this so, despite losing full control of the model, there was never a chance of injuring anybody. Similar separation should be applied to property and animals too.
- Secondly, I didn't pick up any control problems during my pre-flight check. I'm fairly certain that the failure occurred in-flight, so that's not surprising, but perhaps a more thorough check of the aft bearer's integrity might have revealed an impending failure. I'll never know, but I'll be sure to check more carefully in future.
- Finally, models should be built with ease of inspection in mind. It's not only servo mountings that can fail; plastic control horns and clevises especially can deteriorate and become brittle with age. Concealed control linkages are a particular problem in this regard (I have three models with this feature) but, in future, I'll make sure that I have easy access to these components.

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I've now replaced the *Kema 90's* servo bearers with a strong ply tray mounting, bonded to the inner walls of the fuselage, with bearers underneath, secured with glass fibre and retained by a part-former. Fortunately, all of this is forward of the CG, so the additional weight isn't a big problem. It's ready to fly again, and I'm hoping for many more years of safe, fully-controlled flying.

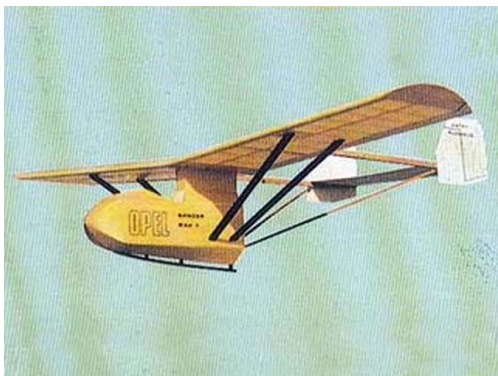
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## Emails To the Editor

A couple of emails have flooded in. First, this one from Simon Milan.

*Hi David - As requested herewith some pix (1 x Mk2 and 2x of the Mk2 with low-thrustline fuselage) of my R-20s and some words....*

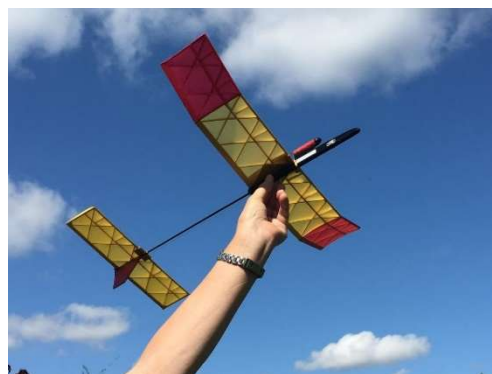
*I first tried Rapier rocket motors about 7 or 8 years ago as I thought they looked another simple free-flight power source albeit of limited application (some scale models and maybe rocket duration. I had cut my teeth way back on IC power duration so small rocket powered stuff looked interesting?).*



*My first attempt with Rapier L2s was in an o/d Opel RAK-1 scale model (L) which proved pretty much impossible to trim... Also, my later semi-profile B-58 Hustler is probably*

*So my next attempt after the Opel RAK was my o/d "R-20" as illustrated on the Club's website's gallery pages. My ideas evolved from searching through Frank Zaic's Yearbooks and the Outerzone website for what seemed suitable layouts, materials and types of construction and cribbing the bits that best fitted my preconceptions. My first attempt (which is on the website gallery pages) caught fire due to insufficient wing protection, so another wing was built. I'd intended to enter it at a Dreaming Spires meeting but by that time (2019) the R-20 class had disappeared from the list of DS contests. Then Covid struck, so no more Dreaming Spires for the time being. Anyway, earlier this year I tried it out on my local "trimming" field up here (too small for serious flying) where, despite the viscous DT it simply flew away in a big boomer and was never seen again! The AAIB was duly notified under the new BMFA dangerous-drone-inspired protocols! (conscientious to a fault – well done Simon! -Ed).*

*Nothing daunted - particularly as I'd stockpiled about 60 L-2 motors - I built another Mk2 'high-thrust-line' R-20 model. Simpler than the first (no geodetics and a flat-bottomed wing section; tip dihedral with tapered tips). Initial flights weren't promising (more down than up!) and the motor pylon proved to be fragile and vulnerable. After the necessary repairs, I managed to get it flying well on the Meadow on a visit in September. Having built 2 "high-thrust" models, I wanted to find out whether the high thrust layout gave any power-phase nose-down tendencies and certainly the climb of the Mk2 was wide and relatively shallow. So I've now built a new fuselage for the Mk2 with the rocket pod below the fuselage, but using the same wings and tail.*

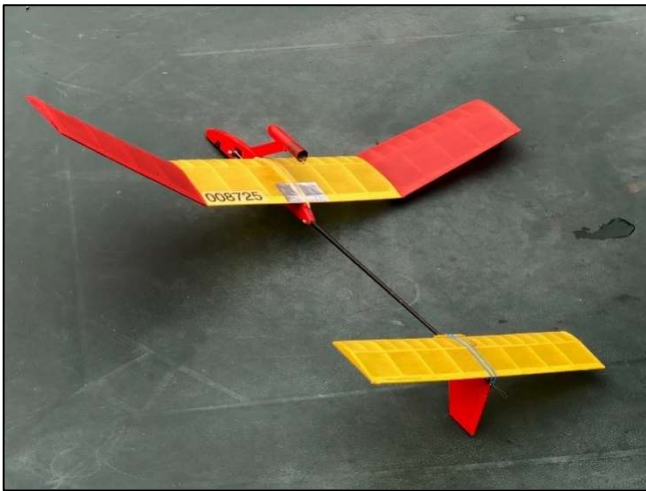


*As soon as circumstances (mostly weather-related) permit I'll test-fly both layouts to see whether there's any appreciable difference in the climb performance. The new fuselage is a few grammes heavier than the original (as it's fitted with a BMK band-burner DT timer rather than one of Mike Woodhouse's viscous dampers, as on the original fuselage), but hopefully this won't affect the performance too much.*

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*I will report back in due course!*

*Cheers, Simon*



HighThrust-line R.20 . . .



and Low Thrust-line R.20

### And a Little Postscript from the editor:

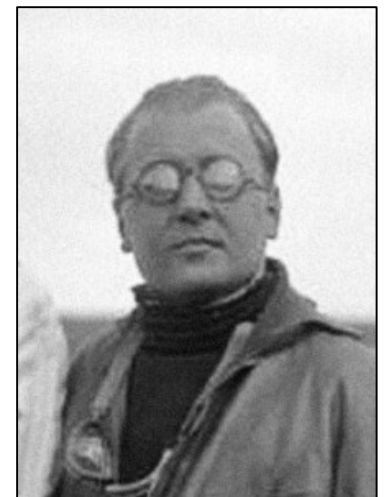
You might be wondering about the “Opel” which appears in the name of that early aircraft at the top of Simon’s email. If you thought it sounded familiar in the context of German cars, you’d be right!

The gentleman pictured below on the right is Fritz von Opel, boss of the illustrious car-making family at that time (the early 1920s) and a pioneer of rocket power. That included not only aircraft, but also record-breaking racing cars and even boats! To say these efforts had mixed results is no less than the bare minimum truth – there were explosions and misfires galore . . .



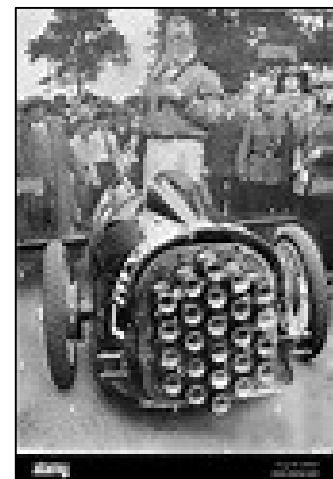
Interestingly, the launching of aircraft seen here on the left, perched on its launching rail, was assisted by a rubber catapult – sounds familiar?

(R) Fritz Von Opel



Left: Fritz von Opel's rocket-powered racing car. Hot stuff!

It's a fascinating story and you can read more here:



<http://fly.historicwings.com/2012/09/opel-flies-his-rocket-plane/>



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### Article 16 Update

You'll no doubt all remember that a few days before Christmas, the BMFA (incorporating the BDF) circulated an email notice to all members, telling us that their/our 'Article 16' authorisation had been renewed. Apparently there was just one change from what went before, and that affects only one area of our activities - Control Line flying.

Prior to the issue of this new authorisation, the provision was that, alongside indoor model flying of any description, control-line flyers were exempted from the requirement to apply for the cursed Operator Registration (a.k.a. Model Flying Tax?).

The indoor flying exemption still stands, but with the current authorisation (which came into effect on the 21st of December 2021) the previous 'blanket' exemption for control-line flyers was modified.

**Article 16 now states that provided the tethered or control line model(s) weigh(s) less than 7.5kgs, the flyer is not required to apply for Operator Registration.**

Given that OMFC has only a couple of occasional C/L flyers, and that their models weigh significantly less than a kilogram, this means there's no material change. At our combined ages of approximately one hundred and sixty-five years, hanging on for dear life to a control-liner weighing much more than that would be challenging!

So don't worry Alan T. - they haven't nobbled us yet!

DFL

**And now, Bob Lee describes yet more "Oh, bother" moments. He does seem to have more than his fair share of problem models, doesn't he?**

### Not so Ready to Fly

As I am sure you all know, my main aeromodelling interest is free flight, both outdoor and indoor. I have dabbled a bit in RC in the past. This has normally not gone well, and maybe the less said about that the better. However, midway through the year I decided that it was about time that I took some RC seriously and worked towards an A cert. Why, you may well ask, and the reason is that I would like to build some of the vintage IC designs of the past, converted to electric and flown with radio, all of which require an 'A' Cert in order to be able to fly them on the Meadow, and most other club sites.



RC doesn't come naturally to me. I am not of the generation that was bought up on gaming joysticks; I need thinking time! My first serious venture then was a *Multiplex Funnystar*. This is an electric glider of approx. 1m wingspan and a tad under 250 grams. For me this was an ideal introduction to RC. The *Funnystar* is slow, stable and very forgiving: it really would be very difficult to get it into a situation that wasn't sorted by just letting go of the sticks. Being slow, it also teaches a very important lesson, which is that (when learning), **stay upwind!** Landings are easy. In any sort of a breeze the approach is so slow you can get bored waiting for it to arrive and I quickly learnt to get it down on the patch every time.

The *Funnystar* gave me the confidence to move forward to a more capable model, more suited to a BMFA SFE "A" Cert. test, and a 2m 'foamy' electric glider of some sort was suggested. The choice was partly driven by what was currently available. I am sure that you are aware that these are all made in the Far East and stocks of anything from there are in short supply at the moment, but I settled on the *Dynam Sonic 185*. As the name implies, the span is 1.85m and it has a T-tail which seemed like a good idea, to avoid damage on landing. The box declared 'Ready to Fly' and it seemed that all you have to do is fit a receiver and a battery and head off to the Meadow. Really . . . ?

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What follows shouldn't be taken as undue criticism of this particular model, it seems that many of the problems that I had are common among this type of mass produced model and my problems and solutions should therefore be of interest to anyone considering this general type of model.



First impressions were pretty good. The build standard all looked OK and it just 'looked like it will fly', it just seemed right. I therefore hooked up a servo tester and checked out the controls at which point two issues were obvious. The first, and easy to fix, is that although the control surfaces all centre at centre stick, the servo arms were off centre, the result of course was more movement in one direction than the other. So all the servo arms had to come off to correctly centred, at which point I found that the elevator servo hadn't been glued in place; wasn't fixed at all in fact, but more on that later. The more serious issue is that all the servos were clearly straining, even when they were trying to centre the controls.

It wasn't difficult to find the reason for this, since all of the control surfaces are hinged by the foam and are very stiff, even after having been worked by hand for a while. At this point I consulted Simon Burch and David Lovegrove who between them gave me the solution. At David's suggestion I cut through about 2/3 of the length of the hinge on each control surface, just leaving hinge at the ends and the centre. Actually, you need to do more than just run a scalpel through, ideally it should be a V-groove but I just settled for a 1.5mm(ish) wide cut. Much better now, the surfaces were moving freely. At Simon's suggestion I then taped (Servo tape or Blenderm tape, same thing) the hinges on both sides, which reinforced the hinge and sealed the gap without adding much friction to the hinge. Lots of stuff on Youtube on how to do this. Now the ailerons and rudder worked OK but we have to talk about the elevator - remember that the servo that hadn't been glued in place?

The rudder and elevator servos are opposite each other in the fuselage and I realised that the servo arms were going to crash into each other at centre travel, not good! The solution was twofold. One was to file a millimetre or so off the end of each arm and the other was to glue the elevator servo in the other way around, which offset the arms and increased the centre-to-centre distance. At least they didn't crash any more but I could see the next issue which was that the elevator wouldn't reliably centre each time. After pulling say full 'up' and releasing the stick, some up was left in, rather than returning to true centre; again, not good.

*“the new servo was clearly much happier than the one that came with the model”*

The reason for the elevator issue wasn't hard to see, it was the control run to the T tail. It's a 1mm wire pushrod running in a 3mm ID tube that has to go through two, near 90-degree bends to get to the elevator (and I thought a "T-tail" was good idea!). I did seriously think of fitting the elevator servo in the fin with just a short, straight linkage but the issue was that there was no way of getting the servo leads down the fuselage other than on the outside. Simon suggested that before I do that I change the existing servo to a higher torque metal geared unit. Of course I had just glued the original servo into place so had to dig that out and fit the new one. Magic! It now worked perfectly and the new servo was clearly much happier than the one that came with the model.\* So much so that I then replaced the rudder servo as well. Actually, if I could do it easily (which I can't), I would replace the aileron servos as well.

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\* (bear in mind that excessive friction in any linkage will significantly increase the servo's current drain. If you can do anything to reduce it, so much the better. Ed.)

OK, so all of the controls now work, what next?

Next was the canopy/hatch. The front slips under a plastic clip and the rear is held down by a magnet under the canopy and another in the fuselage - except that one of the magnets was in the wrong position, so that when they engaged, the canopy was pulled back, out of the front clip. More not good! I had to dig out the magnet in the fuselage, add a short length of balsa and then glue in a new magnet in the correct place. Actually even after that, I tape down the canopy to be on the safe side.

Fitting the receiver involved some time staring at the model, running through ideas. In the end it wasn't hard but the best way wasn't obvious and I don't think the manufacturers even thought about where it was going to go. Nothing about it in the instructions.

Having a folding prop, the ESC needs to be set to 'BRAKE ON'\* but the default is 'BRAKE OFF'. OK, they do include the ESC instructions with the model but there is nothing about this step in the model instructions. Nearly there, just need to fit the battery and check the balance.

\* (If the ESC's brake isn't activated, the prop will "windmill", generating a lot of undesirable drag. Ed.)

At different places in the instructions they talk about a 2S, 1800mA/h and a 3S, 1250mA/h LiPo – so which one to fit? I opted for the 2S since this was what is recommended on most websites that sell this model, but to be on the safe side, only bought one initially. Just a balance check left to do now.

The result actually was no surprise, since everyone on the web says that it needs tail-weight, 40 grams in my case. More staring at the model and musing over how to do this. It now has a ply plate, with a captive nut, epoxied under the back end of the fuselage. A second ply plate with four wheel balance weights epoxied to it is bolted in place but can be removed/ replaced for final adjustment. Now it was ready to fly, just needed the right day when Simon was free to test fly it for me.

I'm not sure about it being the right day. It was freezing and blowing 10-15mph from the North but Simon said it would be OK, so off we went. A quick test glide by Simon had it floating gently off for an impressive distance so it was launched for a power flight. After a few minutes Simon announced that it was definitely a glider rather than a power model and after settling it into a glide at 400 feet or so, gave me the controls. The glide is impressive; it seemed to stay up forever, even on a cold, thermal-less day. When it was time to climb out to height again, Simon did warn me that it would roll right and was difficult to make a left turn and he was certainly right, I would have been in serious trouble if he hadn't warned me. After several climb-outs and glides we lost the power and since it was now 'dead stick' I gave it to Simon to land. As far as the battery is concerned, the 2S is fine, I really wouldn't want it to climb any faster, but I have to set the transmitter timer so I don't run out of power in the future.

**The conclusion.** It was by no means, 'Ready to Fly'. Anyone trying to fly it straight from the box would have been in serious trouble but after the time I put into getting it right, I think it will make a very good trainer; just what I need. I have to increase the aileron throws and sort out the roll to the right under power. Ideally this would be some left side thrust but that would be difficult (or impossible) so I may have to mix some left aileron with the throttle. We have also to sort out the spoilers as well, but all that is for a warm day with a gentle breeze.

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## FROG Senior Series *Widgeon*

You might remember that in October's edition of MF, Bob Lee described the trials and tribulations he suffered with the wings of his twice-size FROG Senior Series *Tomtit*.

To remind you, he said he'd had the parts laser-cut by SLEC and was highly chuffed that most of them actually fitted nicely where intended. Evidently not necessarily a given! Thanks to the Draftsight CAD system he'd used for the design, the odd mis-alignment was easily corrected, but more major snags arrived at the covering stage. As we left him, he was still working on version three of the top wing, having lost previous bouts on points to *Vector Board* and lightweight Polyspan. Hopefully those travails are now out of the way and the completed model is about ready for its maiden flight!



Coincidentally, at roughly the same time as Bob commenced work on his *Tomtit*, I was cornered by the Editor of the *Aero Modeller*, who asked if I would be interested in doing a test build from a plan drawn up by his late father, David (Boddo). The model? Another of the FROG Senior Series models – the *Widgeon*!

It's always flattering to be asked to undertake a commission of this nature so, with eyes wide shut, I agreed. Those racy lines are soooo appealing and, as I'd built the original 18" version not that long before, I had half an idea of what I was letting myself in for.



However, such was the backlog on the workbench at that point that a start on the model was delayed for a couple of months. Then, with the fuselage half-finished, something else more pressing hove into view and, well, it was last October before I really got going again on the model. For sure, Boddo's plan was attractive but I should have known that of all the FROG Senior series, the *Widgeon* is possibly the most tricky to construct. I'd found that out when building one from the plan on Mike Stuart's splendid *House Of Frog* website (from which I pinched the images here – thanks Mike). What? Never heard of it? Do have a look. It's a treasure trove of plans and information galore. You'll find it here:

<http://www.houseoffrog.co.uk>

The principal difficulty is the superstructure, which, owing to the shoulder-wing layout, is challenging enough at the smaller size. I'll come back to this. It's undeniably a very pretty design but when you factor in a) the bigger model's removable wing b) the substitution of my preferred electric power for Boddo's noisy, smelly, oily diesel engine (that's won me no friends!) and c) the need to make space for, and gain access to, a suitable Lithium Polymer battery, plus a 20 Amp Electronic Speed Controller (ESC) as well as a receiver and two servos, doubts begin to surface. It could all just get a bit squirrely. And then there's that V-Tail . . .

Maybe now you can see why this model didn't exactly race off the bench and into the air. To further compound the problems, I began to have nagging doubts that Boddo's flat-bottomed wing section (as per the original) would cut the mustard. I've been down that road before with ex-freeflight models sporting flat-bottomed *Clark-Y* type wing sections that turned out to be "ballooners", meaning they had a strong tendency to rear up when coming out of a turn. It's an unpleasant trait. It can be reduced, but not always

## Meadow Flyer

completely rectified, by removing some of the wing incidence. Even better would be to change the wing section to a semi-symmetrical one. Consulting my *Profili* airfoils software, I quickly settled on an old favourite, the NACA 2412 - a flexible and user-friendly section.

Would Lord Boddo have approved? I'm not sure, but he'd certainly recoil in horror at my decision to install electric power, my automatic choice these days but one of his pet hates! However, the die was cast and again several important changes would emerge from that decision.

Taking a step back, sucking my teeth and squinting at the superstructure, there were clearly going to be a few challenges. The wing, cockpit and a part of the cowling would need to be removable (fixed, on the smaller, rubber powered model) and I'd need a hatch for battery access, plus a removable cowl front for motor access. For all of which read: lots of supermagnets! Incidentally, the eagle-eyed nostalgistas amongst you will have spotted that I initially got the top line of the fairing wrong, forward of the canopy. Corrected later.



Work started with the wing, where the changes to the structure followed my normal simple format of a sheeted D-Box with capped ribs behind. Unless you build it wonky, this arrangement is always warp-proof. And it came out well. Strong and, tho' I sez it meself, commendably light. On then to the fuselage, where the basic shape and most of the original internals were incorporated without alteration, although there was a need for some revision of the formers forward of the wing. This smallish model would need only modest power and I chose a little 2812-1500-ish size motor of unknown origin from my hoard. Driving an 8" x 6" APC-E prop via a 2S, 450 MAh Lithium Polymer battery and a 20-Amp ESC, this provided around 80 Watts of power for a weight just shy of 16 ounces (439 grams).

Rather to my surprise, the easiest bit of all was the V-Tail, a feature that adds tremendously to the overall aesthetic and the character of the model. Boddo had wisely opted for snakes-in-tubes to waggle the ruddervators. Not an option I'd normally have chosen but, in the event, they were perfect. Friction-free and easily routed through the rear fuselage.

You'll probably not be surprised to hear that I can be a bit of a ditherer; a bit indecisive . . . In this particular case, my final problem was sorting out the workings of the V-Tail. Faulty logic was telling me that the two "ruddervator" halves should go in certain directions, but the correct answer was actually the direct opposite.

It might help if I described the simple way I found to confirm the correct control surface movements for V-tails.

1. Hold the model with the nose pointing away from you.
2. Rotate the model until the left side of the stabiliser is vertical in front of you (ignore the other half).
3. What you're now looking at is essentially a "normal" fin and rudder, so continuing that analogy, to yaw the model to the left, you'd deflect the "rudder" to the left. Hold that thought.
4. Now, rotating the model back to the normal orientation, deflecting the left ruddervator **down** and the right side **up** will yaw the model to the left. And that is correct.

The Elevator component is obvious, so overall it was very simple, but it took me a while to cotton on to it. I told you I was a ditherer!

First test flights at my local patch were exciting, buttock-clenching even. Squirrely doesn't begin to describe it! Clearly, I'd got the Balance Point wrong – the model was hugely tail-heavy. Re-visiting my



calculations had me removing most of the half-a-church-roof's-worth of lead from the tail end. After which, I was rewarded with a sweet-flying pussycat of a model. No drama whatsoever.

It was an interesting exercise; a few moderate challenges along the way together with a few scares, but ultimately very satisfying and a good-looking addition to my hangar.

It's probable that the plan will be published in AeroModeller sometime in the coming months, so if you're minded to build your own *Widgeon*, hold your water.

David L.

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*Now, Simon Richardson, a resident of sunny Aberdeen, relates his experience of building and trimming the popular Sweet P-30.*

### **Trimming and Flying the Sweet P30**

As a follow up to Andrew Longhurst and Andy Blackburn's excellent articles on building the Sweet P30 in the April and October 2021 issues of Meadow Flyer, I thought a few words recounting my own experience with trimming and flying the model would be useful. First, a little background. Although I've been building model aeroplanes (on and off) for nearly fifty years, I still consider myself a beginner. My pattern of aeromodelling is probably fairly typical – I built free flight gliders when I was a schoolboy, and then dabbled with small rubber models when my children were younger, and now retirement has allowed me to take up rubber power free flight once again.

I live in Aberdeen in the north-east of Scotland. There are several local RC clubs, but nobody flies free flight, as far as I know. The nearest free flight competitions take place south of Edinburgh, which is over three hours' drive away. I travel to southern England regularly to visit my elderly mother, so I joined the OMFC so I could combine these visits with model flying. I've really enjoyed the community spirit of the Club and have had an enthusiastic welcome from everyone I have met.

*“the flying season is short – typically from May to September”*

Scotland has many empty spaces, but they are mainly on upland ground. The terrain is rough, wet underfoot and rarely flat, so good free flight sites are few and far between. I fly on the playing fields of Hazelhead Park about two miles from my house. The area is about 300m x 450m and surrounded by high trees, and as an extra hazard, the football goal posts remain in place all year round! I've found that early in the morning and late in the evening the wind is often calm enough to fly if I use RDT to keep the model in the field. The flying season is short – typically from May to September.

This will sound astonishing, but the first time I saw a rubber model in flight (apart from one of my own) was on Port Meadow in July 2021! My modelling and flying have been entirely self-taught. Fortunately, there is a vast amount information on how to build and fly free flight rubber models in books, magazines and the

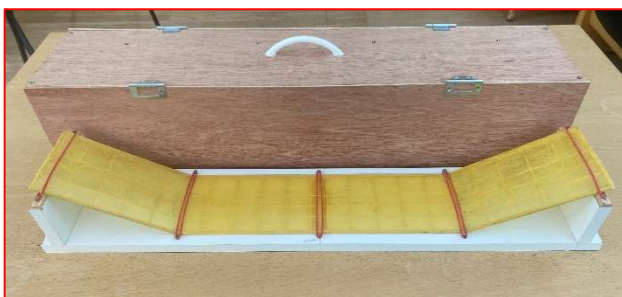
## Meadow Flyer

internet, so what follows is a beginner's journey along the learning curve. If I'm doing something wrong, or it can be done in a more effective way, then please let me know! - simrich99@btinternet.com

I built a P30 fifteen years ago – the Pee Wee from an Ikara kit. It was heavy at 51g, but I was delighted with durations of a minute or so. On higher turns it has a nasty tendency to spiral dive to the right and fuselage design means it keeps breaking behind the rear peg. So, with the Sweet P30 I was looking for a more resilient model that could achieve times closer to two minutes. The model also had to be water resistant – even on perfect summer mornings there is a heavy dew on Hazelhead - and fitted with RDT.

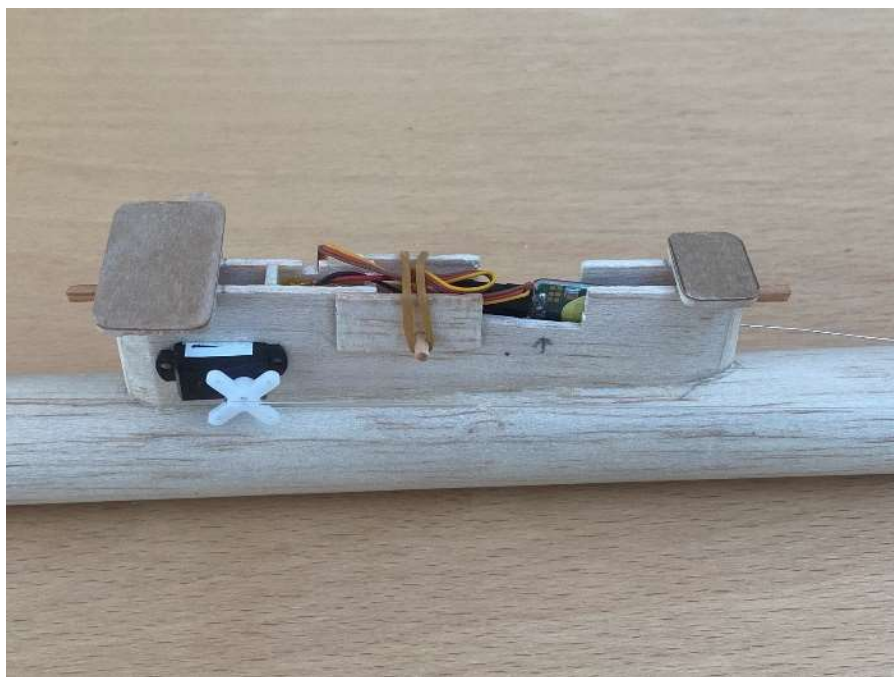
There is a lot of literature about rubber power. The advice is consistent - build it straight, build it light, make it adjustable, use a winding tube and wind to constant torque.

**Building it Straight** The building board I used when I was a boy was not perfectly flat so nowadays, I build on a glass shelf covered with cork tiles. I make a jig for every wing – this makes setting up the dihedral easy and keeps everything true. Once the model is built, I put plywood sides and flaps on the jig which turns it into a model box. The wings and stab are permanently kept banded down locking in any built-in warps (none for Sweet P30). The box is significant extra work, but it allows me to travel with the model down from Aberdeen and I know the model will be set up correctly each time.



**Building it Light** BMFA rules stipulate a minimum P30 airframe weight of 40g. It is quite a challenge to build a model that light, especially with RDT (Radio De-Thermaliser) installed, so I was aiming for 45g. The wood in the kit is very good and the rolled fuselage a work of art! I replaced a spar in the stab which seemed over heavy. I covered the model with tissue over mylar to meet my water-resistant requirement. Total weight is 48.7g, so I exceeded my target, but it was lighter than the Pee Wee.

**Fitting the RDT** I use the Leo Bodbar RDT system (sadly no longer available but BMK\* make a good alternative). I replaced the 3/16in sheet pylon in the kit with a built-up pylon with 1/16 in sides with 1/8in uprights either end. Inside, there is a compartment to stop the battery from moving around. The servo is a



press fit into a slot and the receiver is fitted under the wing.

\* reviewed in the October edition. Ed  
There is no mousetrap - the DT line to the tail is elastic monofilament (0.5mm String Magic designed for stringing beads - available from Amazon) that links straight onto the servo arm.

I know you aren't meant to do this (battery drain), but the tension is small, and I have not noticed a problem. The setup (L) is not very tidy, but it is reliable, and the installation is very light.

## Meadow Flyer

**Making it Adjustable** The front end is a *Gizmo Geezer* (R) nose plug mounted in the nose block with the three adjustment screws positioned to form an inverted triangle.



Down thrust is altered by adjusting the lower screw. This may seem obvious, but to add right thrust you need to wind the right screw in and the left screw out. If you don't change the left and right screws equal amounts you will inadvertently change the down thrust setting. I make changes one quarter of a turn at a time (equivalent to 0.6 degree) which means a side thrust setting involves one eighth of turn of the two top screws. An advantage of the *Gizmo Geezer*\* system is that it comes with a sleeved clevis to attach the rubber motor (photo L). This only weighs 0.44g which is significantly lighter than other alternatives. You can buy further sleeved clevis attachments with a *Gizmo Geezer PFW-01 Part Package* which allows multiple motors



\*available from Freeflight Supplies: <https://freeflightsupplies.co.uk/index.php/products/gizmogeezer-products>

A nylon screw adjusts the tail incidence (see photo below L.) and right turn for the glide is via a Gurney flap. I keep strips of 1/32in balsa with double sided tape ready to go in the field model box.



**Making a Winding /Blast Tube** I struggled to find suitable tubing that had a small enough OD to make a blast tube.\* In the end I made my own by rolling up sheet acetate (remember overhead projectors!) secured with double sided tape. This has ample strength, and you could probably make something similar from brown paper. The acetate is not rigid enough to make a J-slot to fit over the rear peg, so instead I made a raised rim of insulating tape that keeps it within the fuselage at the nose block end. It is easily removed after winding by a quick squeeze.

\* Aquarium supplies shops often have suitable plastic tubing

**Building a Torque Meter** I followed the Herb

Kothe design here:

<https://freeflight.org/Library/TechLibrary/TorqueMeterKothe.pdf> using 0.032in piano wire.



This gives about half a turn deflection for a typical P30 motor. The meter (L) takes a couple of hours to build and involves a little soldering but is well worth the time. There is no need to calibrate the meter – it is only used to reproduce similar torque for each flight.

**Rubber Motor** The kit is supplied with 1/8in rubber to be made up with six strands. Based on my *Ikara Pee Wee* experience I decided to limit the torque by reducing the cross section with 10 strands of 1/16in Tan Super Sport. I have also tried 6 strands of 3/32in which gives a slightly thinner cross section and allows more turns. These thinner sections require a little braiding to maintain enough tension on the *Gizmo Geezer* assembly.

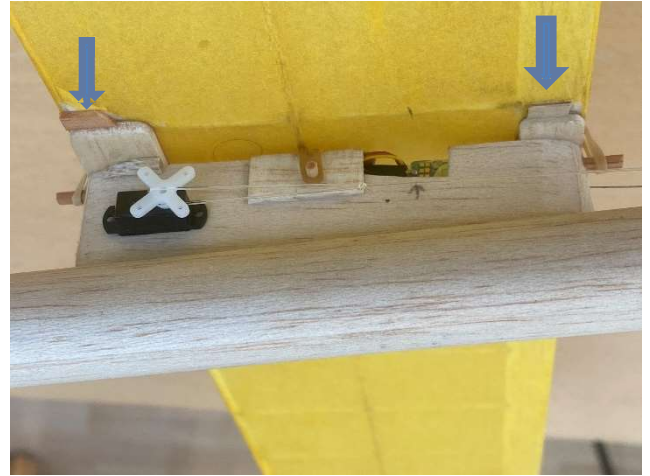




## Meadow Flyer

I've found that once I wind to higher torques, I only get two flights per motor. More flights and the rubber performance is significantly reduced or a strand breaks. It is important to wind to torque, not turns. As the motor is used and stretched it will take more turns, but it is the final torque that determines the crucial initial climb.

**Setting Up** I set the CG at 66% (as per the plan) by gluing the pylon at the appropriate point to establish the balance point. I used balsa cement for this so if I need to change it, I can dissolve the joint with acetone. I sanded in the 3 degrees right and down thrust into motor tube during construction, but in hindsight there was no need to do this as I could have simply adjusted the thrust settings with the Gizmo (see later!). There are no wing warps as per plan. Keys on the wing and stab keep assembly identical - I added these after covering by scraping the tissue away and gluing the keys to bare wood (R).



Several people on the Meadow have asked about my collapsible stooge (L). It is simply mounted on an old walking pole which makes it easier to transport. A small tarp is useful to lay on the grass and I mark all the field equipment with red insulating tape. The *Gizmo Geezer* thrust setting Allen Key is tiny and can be easily lost.

**Trimming and Flying** At last, I was ready to start flying! The first thing to do was to establish a good glide by adjusting the tail incidence. With a freewheeling prop this is quite difficult to do, but when the glide looked more or less correct it was time to start adding turns. I was trimming for a right-right pattern to minimise flying space on my constricted field.

The model flew beautifully on low torque and the cruise had a lovely a nose up attitude slowly gaining height. I added two 1/32" strips (Gurney Flaps) on the right side of the fin to establish a right turn on the glide. I increased the turns in steps, but with higher torque I began to get a nasty power stall, similar to my experience with the Pee Wee. I tried adding more down thrust, but this resulted in fast high power turns without gaining much height, and it killed the cruise. I juggled down thrust and tail incidence settings over a couple of flying sessions with no success.

Andrew Longhurst came to the rescue via his excellent article 'The Art of Trimming' in SAM35 Yearbook No 12. The answer to the power stalls was more right thrust. It only needed a small adjustment and soon I was getting a beautiful high angle spiral climb. I thought this was a fluke at



## Meadow Flyer

first, and on subsequent visits to the field I would start on half turns and work my way up again. This was a mistake, and this is where the torque meter comes in. By winding to the same torque each time, you can start from where you left off. Keeping careful notes is important (I use my phone and note turns, torque, duration, and a general comment on the flight).

While writing this article, I measured the thrust settings by using a couple of meter rules and some trigonometry. I was surprised to find that my final right side thrust setting is only 2.7 degrees – this explains my initial power stall problems. Despite using a jig, I hadn't sanded in enough right thrust - Ooops! The down thrust is even smaller at 1.9 deg which probably helps the excellent cruise.

My Sweet P30 now flew consistently, and I would be disappointed if I didn't achieve flights close to two minutes. Flying on the Meadow in the middle of the day however, was a different experience to still air flying early and late on Hazelhead. On the Meadow I was grateful for the RDT to bring the model down when it disappeared upwards in a thermal, but I also quickly realised that with rising air there are corresponding downdrafts too, and I found it difficult to pick good air and achieve a consistent set of flights.

I entered the Jim Moseley International Postal P30 competition with a set of early morning flights at Hazelhead one glorious September morning. My times of 1m 59s followed by two 2-minute maxes were made using six strands of 3/32in. I missed the fly off stage by one second, but I was very satisfied. I still have a long way to go, but the Sweet P30 had taken me up the learning curve!

**What Next?** There are many things to improve. The nose block on the Sweet P30 is a little loose and sometimes pops out on the glide. This doesn't affect performance too much, but I may be losing consistency maintaining the thrust settings. The challenge over the winter is to build a lighter P30. So far, built up fuselage construction has helped little, but keeping weight down to 40g with tissue over mylar and RDT – both essential for my flying site – is proving something of a challenge! Finally, here's my trimming Set Up Summary

CG	66% wing chord
Right thrust	2.7 deg
Down thrust	1.9deg
Decalage	5.8 deg
Fin Gurney flap	1/16 x 1/8in strip 65 mm long
Wing Warps	None
10 x 1/16in max turns	1300 turns
6 x 3/32in max turns	1500 turns

### Component Weights

Fuselage	12.7g
Wing	16.2g
Stab	4.8g
Prop assembly	10.4g
RDT	4.6g
Total	48.7g

Simon Richardson, 17 December 2021

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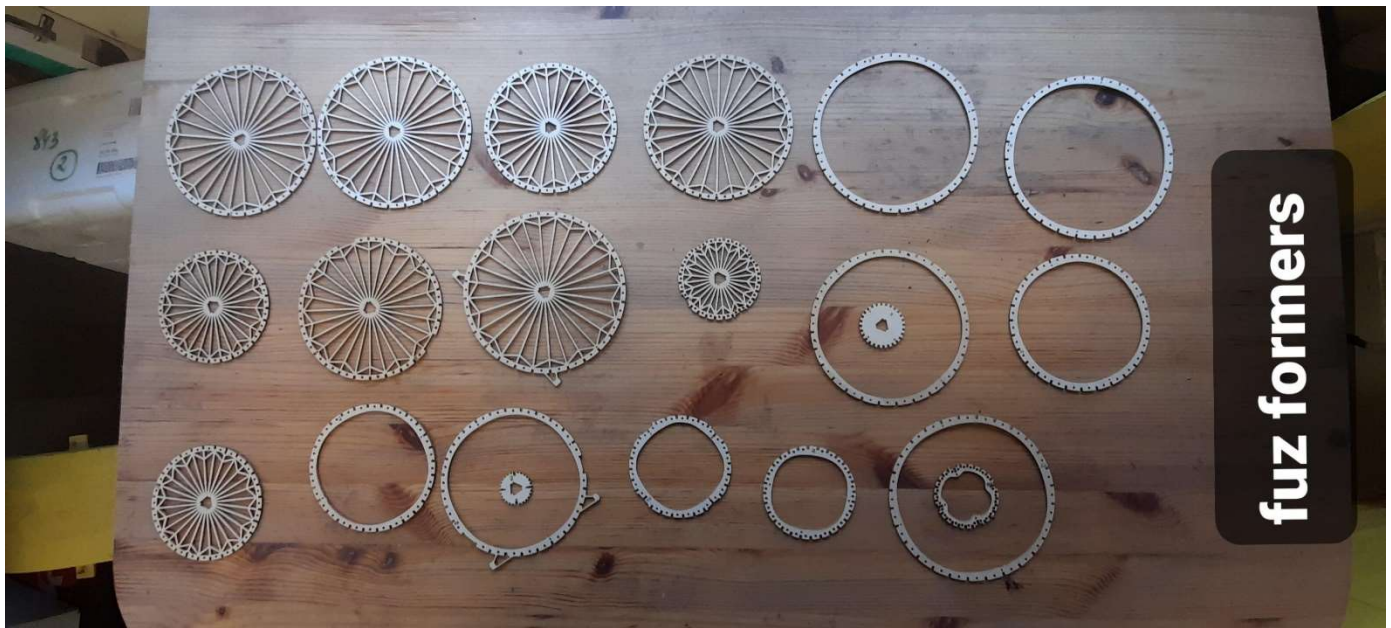
## Meadow Flyer

### An email from Rob (Robin Smith), received 29 December:

Oops, just pressed send by mistake! Anyway where was I, oh yes non flying model (a lot of my models are like that). It is a *Dancing Wings* static model of the Hindenberg sent to me by Mark Tilbury (Century UK) to while away some lockdown time.

I won't bore everyone with a blow by blow account of the build except to say that although looking terribly complicated it was a lot of fun once I realised that the formers had to have the correct orientation. Nothing on the instruction sheet of course. I won't be taking it to Lakehurst! \* Happy New Year'

\* A US Naval Air Station in New Jersey



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Jim Paton responded swiftly to my plea for copy with this contribution. Thanks Jim - nostalgia rules!

Please ignore the decoration. It's about to be improved! I built two models after I received a birthday present of an *ED Bee* when I was 11 years old. The first was a *KK Ranger* for control line. The second was the *KK Pirate* for free flight. An *ED Bee* was shown on the plan so I assumed it was appropriate.

Of course it was terribly nose heavy and grossly overpowered. The prototype must never have been flown. The inevitable happened and as a result I turned from model aircraft to cricket!

## Meadow Flyer



I bought this kit at Old Warden, completed it and fitted the DC Dart. It is radio assist and flew well at the next Old Warden do. However, it didn't half get mucky due to poor fuel proofing. I've spent the last few weeks re covering the fuselage and experimenting rather unsuccessfully with white trim.

These days, because of having too many models, I am into improving old models rather than building new. This effort was inspired by Richard Fryer flying his *Veron Cardinal*. There is something about small diesels you don't get with electric. I'm not referring to the grime from the exhaust or the incessant flicking to get the right combination of mixture and compression, or the remaining ether content of the fuel. It's more the smell and noise and the challenge that has to be overcome at each outing.

Jim Paton

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[Drone aficionado Mathew Lodge tells why you might want to wait before getting a new drone in 2022 . . .](#)

Flying a drone in and around Oxford can be a fun activity and is a great way to take photos and videos of the city's famous architecture and skyline. You might be tempted to get a new drone in the January sales, but regulatory changes mean you might not be able to fly your new drone in most places in Oxford after December 2022.

**Why?** Because after December 2022, all current drones must be flown 150m or further away from "uninvolved persons" (with some exceptions explained below). That effectively means they can't be used in most built-up areas, and even if you can find somewhere, 150m is a long way from a subject to be taking a good photo or video.

## Meadow Flyer

There has been a stand-off between the regulatory agencies (CAA in the UK and the EU Aviation Safety Agency (EASA)) and drone manufacturers. The regulators have decreed that only drones designed and manufactured to meet the standard and carrying a certification mark can be sold after June 2022. Yet there are no certified drones on the market today, and there is no ETA for when they might be available.

**The Background** Back in 2019, the EU decided to harmonise drone laws. Drones would have to meet new compliance specs designed to make them safer to operate closer to people and property. The good news: you could legally operate a certified drone anywhere in the EU (and UK) by following one set of rules. The bad news: the definitions of the drone certifications weren't ready, so manufacturers had no spec to follow – there was no way for them to make drones that met the certification requirements.

The EASA solution was to have a 2-year “transitional period” after the specs were finalised, to give manufacturers time to meet the new standards. This was scheduled to start in April 2020 but was delayed until November 2020, and it now expires in December 2022.

**Now . . .** Minimum horizontal separation distances vary according to drone category and the certification of the pilot, but can be as low as 5m, with 30m or 50m being typical. This makes a big difference if you want to take photos or video with your drone.

**Then . . .** In December 2022 the transitional rules are scheduled to end, and all drones without the certification stamp (i.e., all current drones) will have to operate at least 150m from “uninvolved persons”. In Oxford, like other densely populated areas, that essentially means they can't be legally operated in most parts of the city during typical working hours when people are out and about. It's hard to maintain 150m distance even in a large space like Port Meadow as it's a popular area, and taking photos and video from 150m away is often pointless.

BMFA members operate under a different CAA authorisation (Article 16) vs. the general “open category” rules I've outlined above. So the BMFA minimum separation distance of 30m (for drones less than 7.5kg maximum take-off mass) applies at “The Patch” on Port Meadow. But if you want to fly anywhere else in the city, or indeed any built-up area, you'll find it hard to meet the separation distance requirement after December 2022.



DJI Mavic Pro

**Think about it . . .** So what to do if you're in the market for a drone? The CAA and EASA are adamant that existing drones cannot be “grandfathered” into the new rules, even though many drones already meet the hardware requirements and software updates could bring them into full compliance. DJI has indicated it is exploring a service where they'd remanufacture DJI drones with required updates and apply the mandatory official certification sticker. But no promises have been made, and it seems it would be difficult to scale cost-effectively.

It's hard to believe that manufacturers won't ever produce certified drones. But manufacturers have seen that the regulators delayed implementing new regulations already, and may reckon they have negotiating power to “grandfather” existing drones given the large installed base of non-compliant aircraft. Policing mass non-compliance with drone regulations doesn't seem like it would be a top priority for law enforcement.

**What to do?** All of which leaves drone buyers in a bind: get a drone now knowing you'll likely need to be 150m or more away from anyone in a year's time, wait for new certified drones to appear, or see if current drones will be grandfathered in?

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## Meadow Flyer

Bill Dennis also sent in these photos from his archive. The model is a *Gollywock* (since you ask, although the freeflight nuts will know that . . . )



(R) Trish Dennis gives the Gollywock the old heave-ho



*Les Trumeaux*

The name apparently means "spaces on a wall between two windows. Or it's a hotel.apartment block in Avignon. Eh . . . ?



Bill Dean's *KK Slicker*

## Bill's Stinson (Reliant?)



## Meadow Flyer

Our Ex - Hon.Sec. Gary Law's been busy building a 'Felix'

My Christmas Holiday build (I am trying to complete the model in two weeks) is a 22" span, pylon, rubber model named 'Felix'. \*

It was designed by Albert Hatfull (of Senator fame, among many others) in 1939 and published in Aeromodeller in 1998. I saw one flying gracefully at this years Peterborough Flying Aces event and thought I should build one.

The fuselage is built on the crutch system, something I hadn't tried before. The resulting fuselage is straight but none of the individual stringers are; each one meandering along the fuse, in a series of curves extra to those required by the design.

The flying surfaces are covered in 5 micron mylar and Esaki tissue. Watered Covergrip to fix the mylar and Ezedope 30% x two coats to fix and shrink the tissue.

The fuselage is covered in free flight supplies lightweight polyester tissue, heat shrunk and then sealed with 30% Ezedope x three coats into which I may have added a little fluorescent pink acrylic paint!

I carved the prop from balsa and for some reason painted it black with yellow tips. The colour 'scheme' is awful but I have created an individual piece that would have looked ok in the 1970s

Power is six strands of 1/8" rubber.



R: Looking lovely in pink and all ready to go

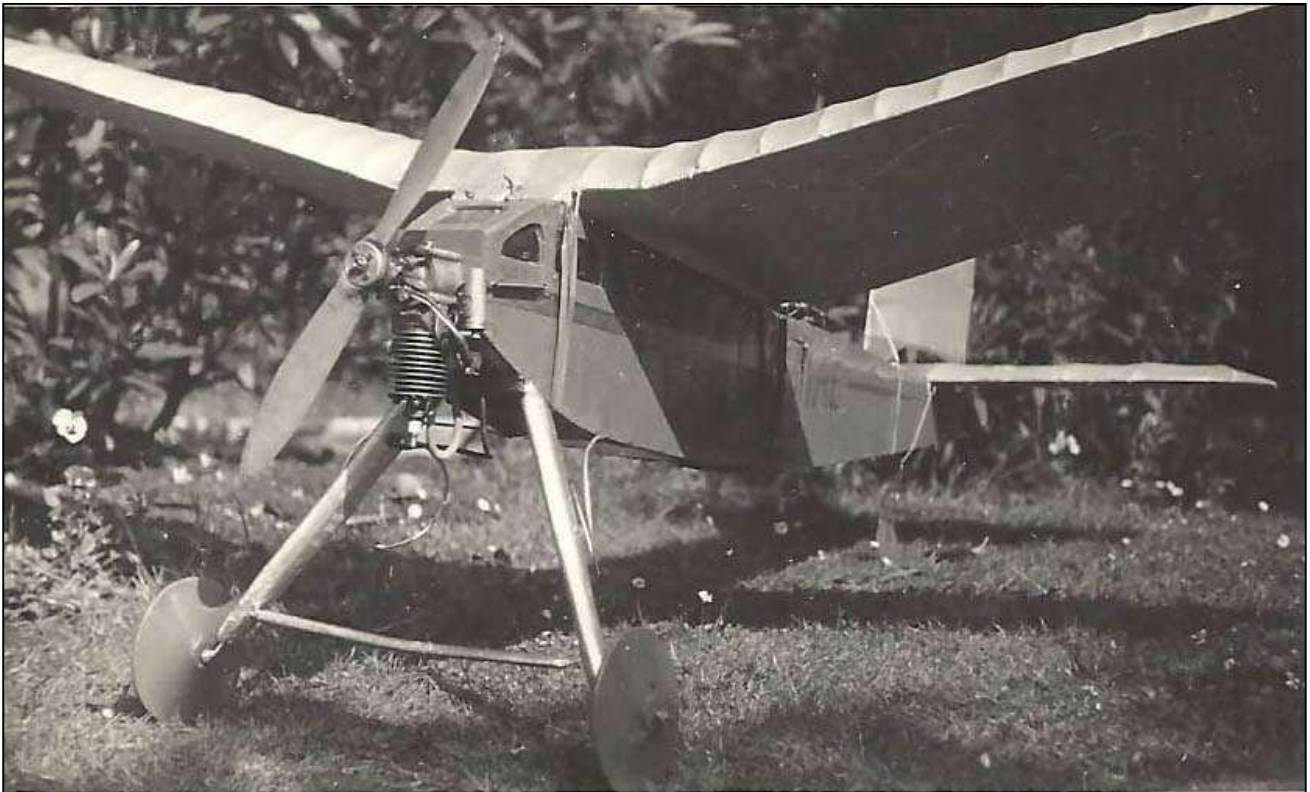
\* The plan featured in Aero Modeller a few years ago.

The photograph shows the model 'drying' after the last coat of Ezedope. Hopefully, if the wind drops in the evening tomorrow (Thursday 30th Dec.), I can try 50 turns on the small green in front of my house, under the street lamps.



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## A Ghost from Christmas Past (From Chris Brainwood)



*Photo: Petrol Engined Model Aeroplanes by C E Bowden (<http://www.antiquemodelaircraft.co.uk>)*

Ok so the "Christmas" bit maybe stretching it a bit and well, when I say ghost it may be more accurate to say model but anyway. Over on *Hippocketaeronautics.com* they have been running a new 'cook up' which, for those that don't know, is rough brief to build a particular type of model, open to all. The progress of the builds and resulting flights are posted on the site. This year's Cook Up is 'Scaled Down Classics' and has attracted around 16 modellers from around the world.

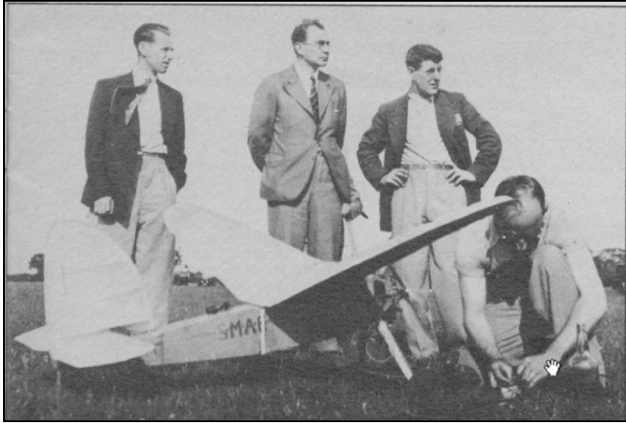
My own attempt is a Blue Dragon from 1933 built by model aircraft pioneer Col. C.E Bowden.

Claude Evelyn Bowden (CEB) began modelling as a 14 year old boarder at Radley College, just south of Oxford where, in 1913 he set up a model aeroplane club. Remarkably, all the members of his club went on to serve in the RFC during the First World War. CEB himself was initially commissioned into the infantry but soon applied for a transfer to the RFC. It wasn't until 1916 that the transfer finally came through and he began training on the DH6 and Avro 504K. By 1918 he was flying Sopwith Pups and SE5As in the RFC as a 'scout pilot'.

At the end of the war he had hoped to stay on in the newly formed RAF, but the reduction in the size of the armed forces meant this wasn't to be and he had to settle for returning to the army where he served a long career, rising to the rank of lieutenant Colonel before retiring in 1946. This end of his flying career was a pivotal moment for model aviation though; as his greatest legacy must be his contribution to the early days of model aircraft when powered model flight was in its infancy in the UK. Had he continued his flying career he may not have carried on modelling with such enthusiasm.



## Meadow Flyer



R: Col. C.E. Bowden pictured at his home in 1982.

L: CEB preparing the *Blue Dragon* (Photos courtesy of Aeromodeller)



After the end of the First World War he was stationed at Feltham in Middlesex in the Royal Army Service Corps and indulged in the hobby whenever to could, initially

building rubber driven biplanes to his own design. Then, in 1931, Edgar Westbury made it known that he would provide a small 2- stroke petrol to anyone or any club willing to build a machine suitable for it. CEB jumped at the chance

Edgar T. Westbury had already been producing and tuning 2 stroke petrol engines for model boats and one of these was adapted into what was to become the Atom Minor engine, which had enough power to lift a model off the ground. CEB's first big power model, the 7 foot span biplane '*Kanga*', achieved a British record flight duration of 86.8s in 1932.

In 1933 the Colonel began construction of the *Blue Dragon*, an 8 foot span, high-winged monoplane powered by the 14.2cc Atom Minor 2 stroke petrol engine. CEB's designs have a particular look to them, often with large fins and thick wing sections. The comparatively short fuselage on the *Blue Dragon* was so it could fit in the restricted space in his Aston Martin sports car! This free flight model must have been an impressive sight and in 1934 it set a new British record flying out of site from Fairey's Great West Aerodrome (now Heathrow)

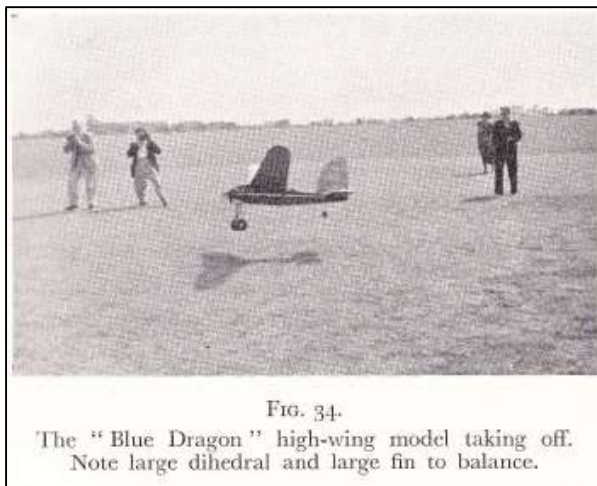


FIG. 34.

The "Blue Dragon" high-wing model taking off. Note large dihedral and large fin to balance.

Photo L. from *Petrol Engined Model Aeroplanes* by C. E. Bowden

In his book the Colonel writes of the flight:

*"The model took off under its own power and rapidly gained altitude, estimated by several experienced flying men at the time, of over 4,000ft.*

*It encountered a bank of cumulus cloud in which it played hide and seek. Eventually it clocked out at 12 minutes 48 seconds"*

The Colonel mounted a chase after persuading Reginald Brie, Cierva's Chief Test Pilot to give take him a lift from nearby Hanworth in an autogyro to look for the flyaway. The model was found intact 8 miles away.

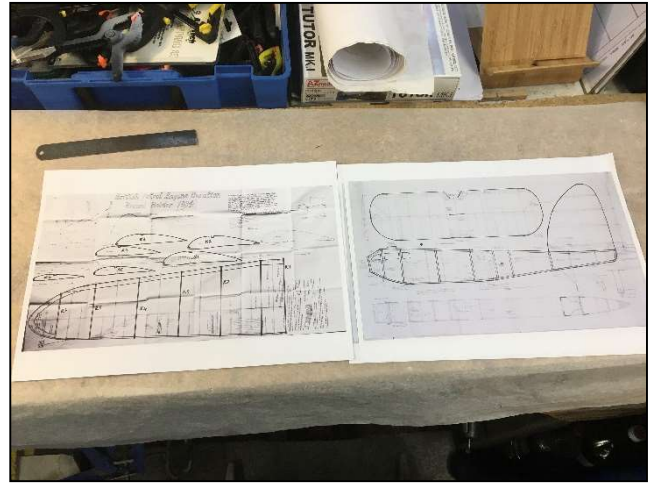
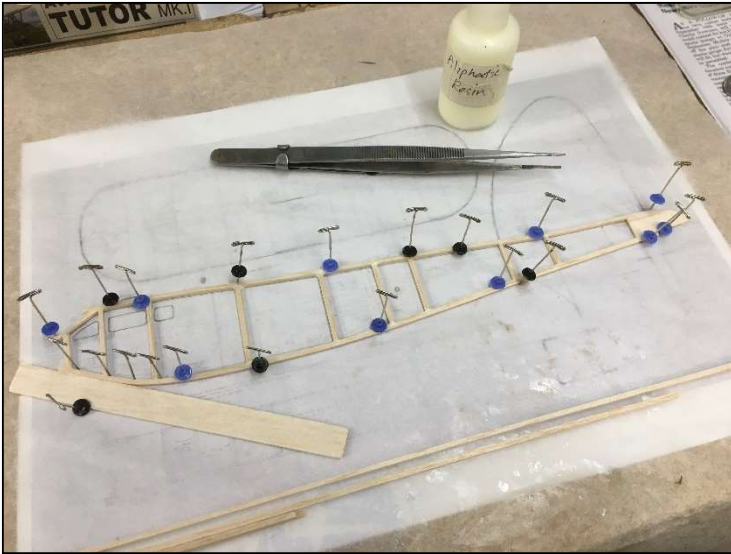
In the 90 years since that record breaking flight the rules regarding free flight models have changed somewhat so my plans to build a full size petrol powered replica have ended in nothing, particularly after the loss of Middle Wallop as a flying site . . . This Cook Up is a great opportunity to build a tiny version so I have started an 18" span or roughly 1/5 scale version for indoor rubber power.

I had already bought a plan from Tony Penhall who had spent some time researching and drawing the design from the original model with the help of Phil Smith. The original model was rebuilt in the late 1980's by model aircraft historian Alwyn Greenhalgh who bought *the Blue Dragon* after the Colonel's death in

## Meadow Flyer

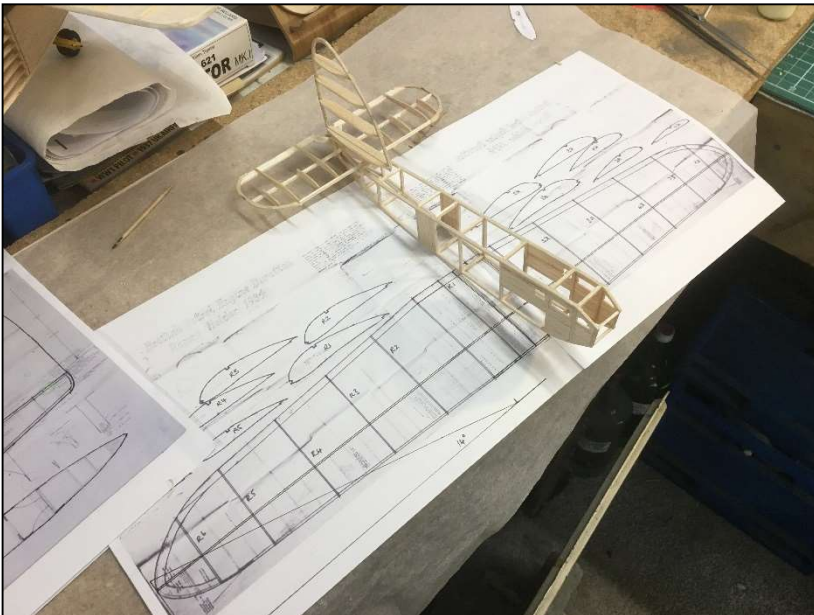
1984 and the rebuild featured in article in the January 1988 edition of *Aeromodeller*, which was also very useful

My model is built from a very much scaled-down version of this plan using mostly 1/16" sq balsa.



Key features to the model are its huge dihedral angle and very large fin. The large dihedral was thought essential to keep the model stable and the large fin an aerodynamic result of doing that.

With such a short nose my rubber design needs to keep the tail end as light as possible so I have 1/32" laminated tail and fin outlines, and minimal structure. The motor peg is quite far forward to keep the rubber split 50/50 across the CG to further reduce overall weight



CEB, in his book *'Petrol Engined Model Aeroplanes'* gives a whole chapter to the Blue Dragon and even a small 3-view drawing. It states the dihedral angle is 11 deg but Tony Penhall's plan says 14 deg. is more accurate. I initially set my wing to 14 deg. but it still didn't look as much as the photos, so I have increased it to 17 deg . . . I'll just say that again - 17 deg dihedral!

CE Bowden though, had his own reasons for such a large dihedral angle, as he writes in *Petrol Engined Model Aeroplanes*:

*" The large dihedral angle was used to quickly right the model in the gusty weather that I expected might take place during the 1934 Sir John Shelley Cup, which the model won. This pessimistic outlook was justified – the day was very windy and gusty"*

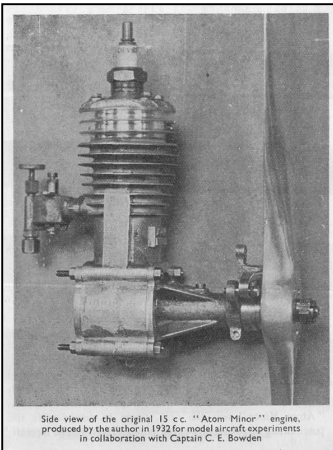
# Meadow Flyer

Below: my model (L) and *Blue Dragon*: CE Bowden (<http://www.antiquemodelaircraft.co.uk>)

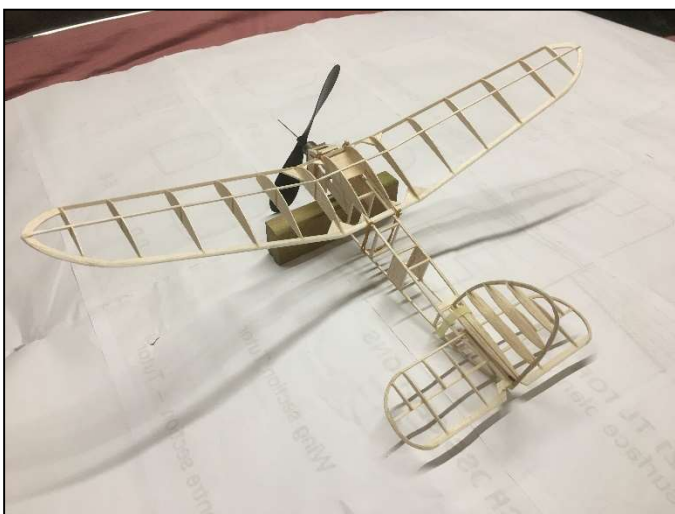


To finish off the front end I have made the nose block into a very rough representation of the Atom Minor. I found a spare Williams Brothers plastic moulded cylinder in my tool box so stuck that on ... well I did say a rough representation.

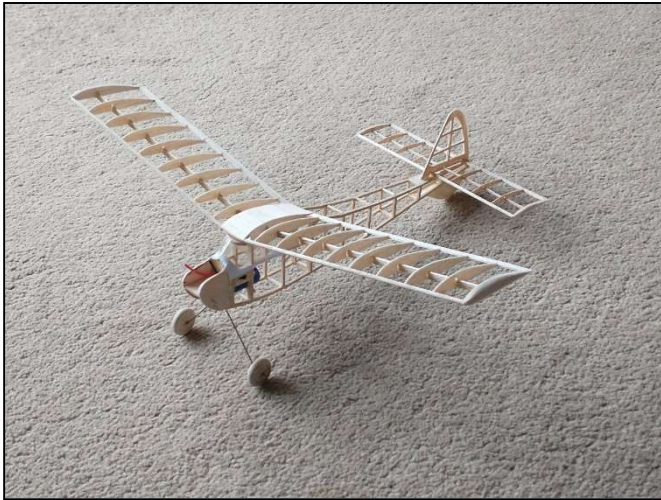
Atom Minor Photo: (<http://www.antiquemodelaircraft.co.uk>) and my representation of it.



At the time of writing I'm waiting for some fine 28swg wire for the U/C to arrive in the post so I can finish the fuselage but hope to have it flying soon.



## More from HPA 'Scaled Down Classics' Cook Up



The HPA thread has already produced some great flying models like this 12" span capacitor powered *Tomboy* by Ron Marking named the *Tombaby*.

The *Tomboy* designed by Vic Smeed is one of the most popular vintage designs of today. Originally 36" span for .75cc diesel power.

Ron Marking has built a 1/3-scale version, that he's named the *Tombaby*. It's capacitor powered. He has written the piece below describing how he went about it.



### Tombaby (by Ron Marking)

I printed the plan at a scale of 33% and built the model exactly to the plan, ie same construction, same number of ribs etc. As the fuselage is all 3/16" sq, that became 1/16" square. Anything which was 1/8" I cut from a sheet of 1mm and for the ribs and other parts from 1/16" I made from a slightly thinned sheet of 1/32". Both wing and tail sections were as the plan.

It is covered with Esaki and given one coat of 25% dope and one coat of 25% Banana Oil. The power train is a 617 coreless 3.7v DC motor with a 47mm prop driven by a 10F super capacitor. The motor is mounted with about 3° right side thrust but no down thrust.

I had to add a small amount of lead to the tail to get the CG just behind the main spar and also had to raise the TE of the tail about 1/16". It now weighs 12.25g.

First flights were outdoors and it had a natural left turn of about the right size to fly indoors. I charged the capacitor to 2.5v for most of my indoor flights which were very consistent. Later I charged it to 2.7v and it climbed to within about a foot of the roof.

It is a delight to watch and I'm very glad I chose it. I am sure I will continue to fly it regularly at our indoor meetings. If you'd like to see the model in action, there's a video of it flying here:

## Meadow Flyer

<https://www.youtube.com/watch?v=Hj8sU6Sjhl>

Closer to home, Gerard Moore, a regular at Berinsfield, has made a beautiful *Super Sky Rocket* (Below L) powered by a CO2 motor. There's a video here:

<https://vimeo.com/658159207>



The original *Super Sky Rocket* is by American Leon Shulman of the Skyscrapers Club NY and was first published in 1942. It was 49" span and aimed at the new market for smaller size petrol engines like the Ohlsson 23.

Gerard's model is powered by a Gasparin G5a and weighs just 5.25g. A larger prop has been fitted since the picture was taken.

Lurker (not his real name! - an indoor flyer at Trinity School, Newbury) has done this very nice 12" rubber powered Vic Smeed *Courtesan* (L). There's a video here <https://vimeo.com/658157931>

The *Courtesan* was originally designed in the 1950's but wasn't published until the 1980's. The original was 38" span for .75cc diesels

Lurker's model weighs just 7.86g without its rubber motor. The early trimming flights saw it up in the rafters on only 600 turns so Lurker plans to fit some thinner rubber strip to calm it.

And finally Kevin M has done another Vic Smeed Design – Poppet . This was originally a 32" model designed for .5 cc Diesels. Kevin's rubber powered version is just 18" span

A bumper selection! Thanks Chris. Ed.

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## From Andrew Longhurst

### New AM Cabin Duration

64 years ago, my big sister's boyfriend gave me a plan of Bill Dean's *New AM Cabin Duration*. I was 10 and it was the grandest picture I had ever seen in my short life. I stuck it up on my bedroom wall with Sellotape and studied it regularly. I would love to have built it but it was far too complicated even though it was a simplification of Bill's earlier wartime original. When I left home a decade later, I took the plan off the wall, carefully folded it up and took it with me. It stayed that way until 2016



## Meadow Flyer

when I got it out and studied it again. I was just about to start cutting out the bits out when I got a visit from the big C and it took a year for the NHS to put me back together again . . . by which time I had forgotten all about it.

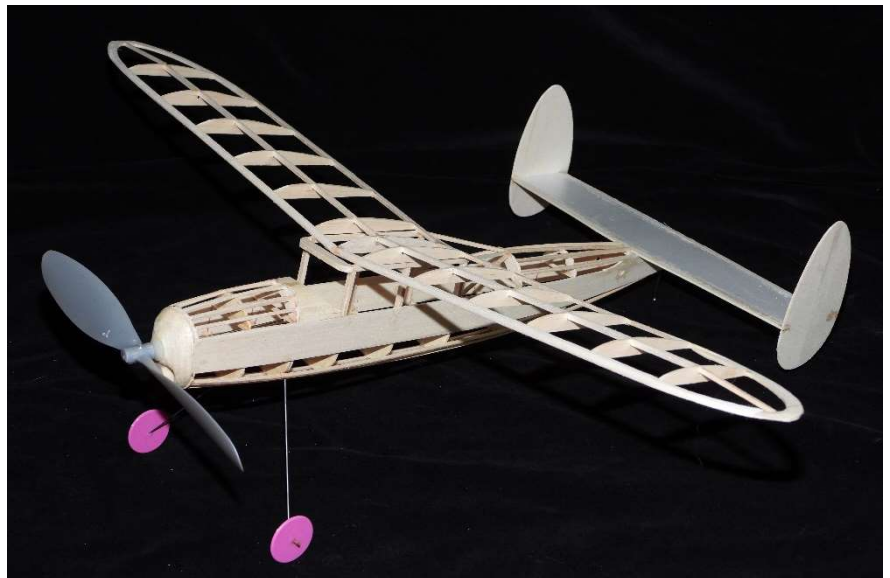
The other day I was writing up some stuff about early *Jetex* models designed by Bill when it came to my notice that 2022 is the twentieth anniversary of his death and 2023 is the centenary of his birth. As he is undoubtedly the most influential aeromodeller/designer this country ever produced I thought the least I could do was to build this little plane, so beautiful that it still tugs at the old heartstrings.

If you are wondering who Bill Dean is and what he did you can read his biography on [Jetex.org: History - Hall of Fame: Bill Dean](http://Jetex.org: History - Hall of Fame: Bill Dean)

Suffice it to say that between 1946 and 1952, when he emigrated to America to work for Frank Ziac's company, he designed 40 kit models for KeilKraft in all the pre-radio disciplines. Many are still in production by Ripmax and The Vintage Model Company. Simultaneously he produced another 20 or more designs for magazines such as the *AeroModeller* of which the *New AM Cabin Duration* is one (plan now free on [www.outerzone](http://www.outerzone)).

Perhaps we all ought to build one of Bill's designs, he claimed he drew up 500!

Andrew Longhurst



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No-Cals are featuring quite a bit recently. Here's Alan Trinder's account of building his Aeronca.

### ***I'm A No-cal Rookie***

The OFMAC\* indoor fliers organiser, Ian Melville, had suggested to me a few weeks ago that I ought to build a No-Cal. When I read your editor's similar suggestion in the Xmas Special *Meadow Flyer*, I was finally persuaded to have a go. I had no intention of publicising my efforts but the editor's recent plea for articles has prompted the writing of these notes.

\* Old Farts Model Aeroplane Club

Having read and re-read Andy Blackburn's article, I did some further Internet research. Whilst there are many excellent model plans available online, they are mainly of low wing models. In my experience low wing models are not easily trimmed and I eventually found a late 1940's high wing light aircraft, an

## Meadow Flyer

*Aeronca Sedan*. The details shown are of a proper 3D kit rather than a No-Cal, but coloured plan view illustrations of fuselage and flying surfaces are available and these were duly downloaded and printed onto tissue.

The first difficulty I had was a lack of tissue. I had enough to cover the model but only by printing pieces customised to fit the size of the individual parts of the model's framework, not as four A4 size pieces of tissue. For example, the attached scan is of one wing downloaded from the coloured model plan view: I cut a piece of tissue just large enough to cover the wing and with a suitable margin all round. This was Sellotaped to the A4 sheet along the front and back edge relevant to the way it was to be fed into the printer. A piece of tissue printed with a wing half was produced and I repeated the procedure for the other wing half, the fuselage side and the tail appendages. Each piece was then taped to a frame and lightly sprayed, allowed to dry thoroughly and given a coat of very dilute dope. I now needed to make the supporting framework.

I used the suggested hot soldering iron method for the sharper bends. This took a fair amount of trial and error but it was fun and worked well in the end, although I used 1/32" for the sharper bends which may not have been sensible as 1/16th is recommended.

The adhesive I used was *Deluxe Superphatic* which seemed to work well and the joints have stayed together even with my subsequent, not exactly featherlight, handling. Covering was easier than I expected. I used the suggested method with the tissue lying flat on the bench and previously "glued" framework carefully aligned onto it. I used Deluxe Tissue Paste with which I am familiar and it appears O.K.



The suggested cylindrical motor stick looked to have possibilities and, having downloaded the detailed instructions, I thought it worth trying. The appropriate sized piece of 1/32" was thoroughly soaked and then wound tightly round a 1/4" dowel sandwiched between tissue paper. Here I suspect my balsa was too dense as there was some slight splitting.

Binding tightly with masking tape worked O.K. and the instructions were to leave until thoroughly dry. At this stage the build was abandoned for a couple of days while the Trinder family spent Christmas at daughter's residence in Brighton.

On our return, the motor tube was removed from its swaddling clothes (somewhat time consuming to remove all the tissue paper). It appeared to have reasonably retained its shape. Now came the really interesting part; to accurately cut a line down the centre of the tube and join the resulting two edges.

Here's where an error became apparent. The balsa sheet had not formed into a true cylinder but rather a loose spiral. Hence cutting a true straight line down its length would not be easy despite using the excellent jig suggested in the instructions. Anyway, I tightly taped the tube to the jig whilst trying to eliminate the spiral as much as possible. Using a steel ruler, I cut through the overlapping edges of the tube and removed the two cut strips. The resulting two edges were not completely parallel but when tightly taped together there was a reasonable level of togetherness.

*Superphatic* was again used between the masking tape strips and left to set. When the tape was removed there was a far-from-perfect tube but when sanded it looked functional at least. Now came something of a surprise. The construction details for the motor tube only explain the tube construction, but not how it is actually used. In my ignorance I thought the rubber motor would go inside the tube with the thrust plug inside the tube. Not feasible when you think about it but with the time it takes to make a tube I'll probably use a motor stick next time.

## Meadow Flyer

So the tube was plugged at each end and an aluminium prop hanger formed and attached. When stuck to the fuselage side the thrust line of the prop is going to be way outside the centre line of the fuselage. I'm not surprised that Andy says "No-Cals are a bit odd when trimming".



And that essentially is the stage the model is at as I write this article. See photo attached. Two days are left to complete before the January 2nd flying session at Berinsfield. It may be finished in time but I am puzzling how to firmly affix the two wing halves to the Fuselage. Difficult to see how the root ribs are to be held in place while the glue dries.

Incidentally, test flights at Berinsfield were reasonably successful. Not much in the way of duration but at least fairly stable. A larger prop was suggested, which I have now fitted.

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Ed.: I referred Alan's email to Andy Blackburn, who very kindly responded with these additional notes.

### Printing Tissue

On printing tissue covering, the canonical method is:

1. Pre-shrink the tissue on a frame (you will probably need 2 A4 pages of tissue for a No-Cal). Jap tissue is, of course, best. Condenser paper is outlawed.
2. Get some Spray-Mount and very lightly spray (less than a second's worth of spray!) a sheet of A4, having masked off a few millimetres (3mm-ish) of one of the shorter ends. Invert the can and spray to clear it.
3. Let the Spray-Mount dry for at least 2 minutes, then de-stickify it with another sheet of A4, or your fingers.
4. Lay the frame flat on the bench and carefully roll the sticky sheet of A4 onto it. Cut the tissue from the frame, smooth out the tissue on the sheet of A4 and cut to size. When it goes into the paper hopper, make sure it's the right way round and that the non-sticky edge is the *trailing* edge. Make sure that you can lift the tissue from this edge.
5. Do a test-print in the printer mode that you're planning to use (normal mode works OK for me) before risking the specially-prepared tissue piece of A4.
6. Print the tissue; you can re-use the sticky A4 for the second piece.

For indoors, you don't need to dope or otherwise finish the tissue. And it should be slack, otherwise it might still shrink when the weather changes.

### **Adhesives**

*Superphatic* can be made to work, although the problem with it is that one tends to use too much because the blobs are quite big, so it tends to run everywhere unless you're very, very careful. I find the best stuff to use is a rigid PVA (such as Red or Blue label *Titebond*; anything similar will do as long as it doesn't dry rubbery) thinned about 10% with water and applied with a cocktail stick.

### **Motor Tubes**

If the wood splits even after a good soak in hot water, it's too dense. If you haven't got any other wood, try sanding it thinner. I believe there was quite a good description of how to do this in the most recent Trinity Snoozeletter; I'm sure the editor (Lurk - [cgreenock@bcs.org.uk](mailto:cgreenock@bcs.org.uk)) would be happy for you to reprint it, as long as full credit is given...

Cutting a true straight line down the middle of a motor tube absolutely requires  
a) some sort of jig, as described in the downloaded instructions, and



## Meadow Flyer

- b) a ***New Knife Blade***, and
- c) Don't do it all in one cut - cut part-way through the first time, making sure that the cut is as straight as possible.

CA is often the right stuff to use for specialised jobs such as joining motor tubes, used very sparingly - about one *tiny* dot of thin CA per inch. If you're allergic to it (as I am), Bob Smith Industries medium and thick odourless CA is now available in the UK, the bottles will take a standard Zap nozzle.

### Fixing Wing Halves

Normally, you'd join the wings at the correct dihedral angle (PVA/Aliphatic is best, balsa cement can be used), then when it's dry you'd slide the wing through the fuselage, block everything up so that the fuselage is vertical (paint pots, etc) and the wings have the right dihedral on each side (scrap balsa) and then use a few small dots of medium CA to stick it in position.

However, if you don't like CA than it can be done with PVA on a high-winger thusly;

- a) Cut the top of the fuselage so that the root rib will fit on top of the fuselage.
- b) Join the wings as normal.
- c) Apply the glue (sparingly) and make sure it doesn't move by using a couple of 1/16" wide strips of masking tape at the leading and trailing edge.
- d) Put it back in the jig to dry.

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**All Done And Dusted**

**Mea culpa:** No sooner had the October edition of the *Flyer* pinged into your Inboxes, than Phil Kilby was on the blower, pointing out my first error. You might remember that I'd waxed lyrical over the fact that we'd just had a raft of four BMFA Achievement Scheme Test successes in one day. In my ignorance, I thought was almost certainly a record and a first in the Club's history. Not so, said Phil.

Back in 1986/87, under his guidance, no fewer than **EIGHT** had passed on a single day. That included seven "A" Certs and one Club Examiner. Phew! - a full day's work and Saturday 29th September 2021's achievement pales into insignificance by comparison. So thanks Phil – now we know!

Anyway, winter is here and I trust you are all busy in your workshops, turning out new models for next season's fun on the Meadow. We'd all be interested to hear what you're up to (some already have – my special thanks to all those who kindly sent in additional contributions in response to my panicky email of a few days ago!).

It probably won't have escaped your notice that by far the majority of the articles in this issue, and those that went before it, have come from from our very active freeflight contingent. But according to Simon's Membership statistics, there are at least as many of us flying RC models as freeflight, so why don't we hear more from you guys?

I appreciate that ARTFs are the main event in the RC world today, and that this limits what can meaningfully be said and written about them, but I promise you, even a straightforward review of your latest kit will be of interest to fellow club members.

There was even a report a few days ago (we've all seen the photo!) that a member had turned up at the patch with a full-blown, all- electric, all-bells-and-whistles, deep-bellied aerobatic model. Who was that, and would he please write a review of the kit and the trimming process?

## Meadow Flyer

On that note, I'm happy to help those who might need their confidence boosted in the writing stakes; so please don't let that prevent you from firing up the Mighty Wurlitzer and ping-ponging something over to me. I look forward to hearing from you!

And don't forget the New Year's indoor flying events at Berinsfield where there are currently very healthy attendances and a lot of innocent fun on offer. Here's a reminder of the dates:

Sundays, from 9am to 4pm; **Feb. 6th, Mar. 6th.**

David (Editor)

**Please let me have your contributions by 31st March for inclusion in the April, 2022 newsletter. Send them to: David Lovegrove at [david.lovegrove11@btinternet.com](mailto:david.lovegrove11@btinternet.com)**

**Or by post to 17 Chiltern Crescent, Wallingford, Oxon OX10 0PE. Tel. 01491 200558**

If submitting photographs (which we all enjoy) it's best to send the files separately, using [www.wetransfer.com](http://www.wetransfer.com). And please include a photo of yourself.

**If you can't send an electronic version of your submission, I'm happy to accept hand-written copy, together with hard copies of photographs. These will be returned after scanning.**