

Newsletter

November 2019

Right at the end of October I had a day at the field which I will always happily remember. The memory centres around one day when I watched John Higgins fly his beautiful Fournier RF4. I had so wanted to see the maiden flight of this model and I wasn't disappointed! I have always loved the clean lines of elegant gliders and this model certainly deserves the title of elegant. John had set the model up superbly before it took to the air and he proceeded to put it through it's paces giving me a running commentary on what he was doing. It was very simply a joy to watch and you could tell just how pleased John was with the model. You will read more about it since John very kindly puts some words together about the model.



David Kirkbride was also at the field practicing for his 'A' and flew a very nice trainer. I think this is a really smart looking model and looked good in the air. Do you note the lovely sunlight - regrettably autumn seems to have passed us by and we are straight into winter.

November 2019

This year I missed coming to the annual bonfire night. Judy was simply not well enough to make it - she has good days and bad days. It's what we call life. In fact I even missed our local firework display in Fleetwood which I have always attended. I'm still fighting my camera - really I'm not using it enough - when I do set it up correctly it rewards me with some really good stuff but it's very complicated - in a way it has too many features.

Anyway, back to the flying field, after making a mess of the first few (many!!) Shots of the Fournier, I finally started getting sharp images - it is quite a fast model - it looks really elegant but the way that model just slips through the air is amazing.



The sky wasn't so dramatic and yes it has been 'Photoshopped'.

For Sale

4 N° OS 19s' are for sale - all are R/C versions. Steve Warburton can give you any details you need. He says they run beautifully right from a reliable tick over to full throttle. All proceeds from the sale go straight to Club funds.

November 2019

A VIEW FROM THE HEDGE. (By Will Sparrow)



All through October and early November rain and gales squatted, like a malevolent toad, over your beautiful flying field; but there were a few exceptions to the never-ending gloom...

One fine Monday afternoon, in late October, the conditions were ideal. Okay, the ground was a little on the soft side but the grass had been recently cut and the field was crying out for model aviation action. Your members must have been listening to the siren call as, one by one, folk started to arrive. I was drawn to focus my attention on a model that was being assembled that I had not seen before (that's because it was a new model! WOO). I have a tendency to become a little blasé as more and more models appear, fresh from their boxes, on the flight line, but my spirits are lifted when I spy a new model that has been hand-crafted by a modeller in his own workshop (In your grandad's day all models were produced by this method, Will. –WOO). To cut a long story short, the aircraft, an elegant scale model, took off and flew beautifully, passed all its handling tests with flying colours, and, with airbrakes extended, returned gently to the green sward. In the hedge we all let out a collective sigh. Nice!

I always look forward to your annual bonfire night celebration: I like to see your members and their families socialising. This year the fire was scaled down a bit, but it was every bit as hot – sparrows in the hedge could see the red glow from the converted oil drum, even from a distance. If the fire was scaled down the same could not be said of the fireworks display, which was truly spectacular – yes, it really was that good. My mate, Jim Sparrow, missed most of the action 'cos he's a bit of a wimp and does not like loud bangs and things that go fizz and whoosh in the night: he spent part of the evening hiding in a distant hedge. The night flying, with illuminated models, was as impressive as ever. We all gasped as one model lost all its lights and disappeared into the blackness – only to reappear, seconds later, as the lights returned. Whether this was a Tx-induced tease or an equipment malfunction I'm not sure. All models returned to base safely with nary a scorch or sooty mark. Isn't technology wonderful?

November 2019

Remembrance Sunday surprised us all with decent flying conditions but ground conditions that were likened to those on the third day of the Somme... Yes, it was soggy under foot! As 11 o'clock approached the chatter from the armchair flyers in the club hut diminished and all appeared onto the balcony to observe the two minutes silence – the act of Remembrance. It was the same in the hedge; not a tweet was heard until the moment was over. Flying resumed soon after 11 o'clock and a few members arrived and ventured forth. Graceful aerobatics were performed in the still air and a lone Spitfire took to the sky, sunlight flashing from its invasion stripes. Later on a member turned up with a truly delightful model. This model was from an old KeilKraft kit and was originally designed for rubber power. It was about 20" wingspan, was tissue covered and weighed about as much as a pair of anorexic sparrows. Quality workmanship was evident, even from my position in the hedge. The modern electric power system fitted in preference to the elastic band, would not have pulled the skin from a rice pudding but it flew the model beautifully. Elegant and nostalgic: what's not to like? The same member then flew a large, high wing, petrol-powered model. This model's aerobatic prowess belied its appearance. Two models from different eras...

Remembrance Sunday was special – the days that followed were filled with the usual rain and gales with bruise-hued clouds blotting out the sun. That toad had returned!

WS

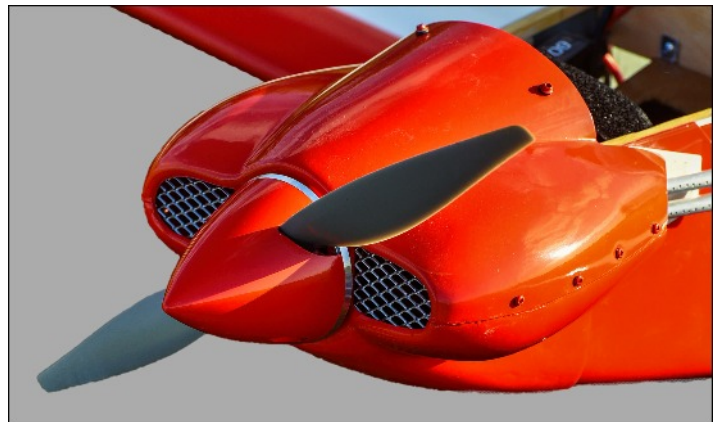


Fournier Finally

November 2019

I have always had a liking for the Fournier RF4-D and have been accumulating information on the type for many years. When a space in my hangar became available (following the sad demise of my 1/4 scale CAP 21 a couple of years ago) I felt that it was high time to get the Fournier off the wish list and into reality. I decided that a kit build, as opposed to a totally scratch-built model, would probably save me about a year of building time. Anyone who has had to make all their own moulds for cowls and plugs for canopies etc. will know what I mean.

I had a good look at the available kits and finally decided on the Mick Reeves 1/4 scale kit (there is a 1/3 scale version but it would be much too big to fit the storage space available). My choice was influenced by the fact that I had seen at least two of these models fly at scale events and had managed to get good feedback from the owners. Good feedback, that is, of the flying qualities of the completed model – the construction methods employed on the model, however, drew a few sideways glances. Mick Reeves won the world scale championships with this model in 1974, if memory serves me correctly, so I could trust that the model was very close to true scale. Mick's model was powered by a 61 glow engine... mine would be powered by the wonder of electricity!



The kit is laser-cut and is a semi-kit – one has to provide all the sheet and strip wood – but the hard-to-do bits, such as the cowl, canopy and fairings are all provided. Mick will also supply the mono-wheel retract, which turned out to be of high quality, good and strong and came complete with a scale wheel.

The parts are all laser cut. Unfortunately, very few of them actually fit! One finds one's self forever modifying or re-making the parts. The construction, in my humble opinion, is also seriously flawed in one or two areas. The two-part wing (and this is a 2.8 m aeroplane) is joined by a couple of plywood tongues which are screwed together with wood screws before the wing is bolted to the fuselage.

November 2019

My model uses rectangular section brass boxes properly integrated into the spruce wing spars. The wing halves are then joined with steel blades. I have every faith in the integrity of my Fournier's wings! The full-size aircraft is fitted with airbrakes of a rather novel design (the blades are like petals that rotate out of slots in the wing's top surface). Mick has replicated this on his plan and the drive system looks a real nightmare with rotating dowels being driven from a central servo. Fortunately, I have no ambition to win a world scale champs (and not the skill either!) so I had no qualms over fitting a pair of nice, modern electric airbrakes.



Because this is a proper scale model, designed to stand up to the scrutiny of expert judges (just like our own scale events!) things like trailing edge sections turn out, at model sizes, to be a bit on the flimsy side. Builders of this model have told me that avoiding a bent or wavy trailing edge to the wing is next to impossible. Forewarned, I fabricated my trailing edges from two strips of balsa sandwiching



November 2019

a layer of unidirectional carbon fibre. When the resin set I had two dead-straight and stiff trailing edges.

To cut a long story short, the model was finally completed some two years after first starting to glue wood. The solid surfaces are finished in glass/epoxy and the open parts of the structure are covered in Solartex. When the warm weather arrived, the model was sprayed in acrylic paints and finished with registration letters laser-cut by a kindly clubmate.

With the model now complete, I spent a happy afternoon setting up all the control surfaces with the correct throws and differentials. (It is my practice to measure everything with a steel rule and record the measurements on paper). With models of this size one needs space in which to rig them indoors – the wise modeller thus chooses a day when his loved one is going to be out for a few hours!

We have all known the frustrations of having a model to test fly and having to wait for favourable conditions for the test flight to take place. The Fournier sits quite low to the ground and so needs short(ish) grass which is not water-logged – a requirement which was



somewhat lacking in October 2019. Still, all comes to he who waits and Monday, 28th October was an ideal day with an ENE gentle breeze down the length of the strip. The grass had been recently cut and much of the wet had drained away.



The Fournier weighs just short of 9.5 lbs and has 1.3Kw of power so take off was not a problem. The landing, with air brakes and landing settings deployed, was all that I could

November 2019

wish. The model is a picture of grace in the air (to my eye, anyway). It is often said that, "You can't make a silk purse out of a sow's ear"... but you can make a graceful swan from a dodgy duckling of a kit!

John Higgins





Glider Set Up

November 2019

Article by Brian Holdsworth

Another objective in the first flight of an electric glider is the initial assessment of its performance under power. The interaction is rather complex, and numerous flights are likely to be needed to achieve a satisfactory compromise with continued fine tuning since even small changes to CG position can have significant effects.

When power is applied, the airspeed will increase and an aircraft with positive stability, as generally recommended for thermal soarers, will tend to climb. Depending upon the amount of stability and power available, this nose-up tendency may be sufficient, if uncorrected, to produce such a steep climb as to result in a stall or even going over onto its back in a clumsy loop. Excessive pitch stability from too much wing incidence and consequential forward CG can be seen in some models, especially those converted from free flight to R/C, where ridiculous amounts of down thrust are applied in an attempt to control this zooming tendency - better performance would be achieved by reducing that incidence and moving the CG back to a more reasonable position!

The term down thrust is generally applied to the angle between the thrust line and the reference datum (chord-line of the tail plane section) . However, it is actually a pitching moment so that a high thrust line, such as from a motor mounted on a pylon above the wing, produces a considerable down thrust effect, even where the thrust line is parallel to the datum. Down thrust effects are proportional to the amount of thrust and could be adjusted to achieve a reasonable balance, though such mechanical changes can be difficult. More than about 3 degrees down thrust is likely to produce an undesirable initial dive as power is applied in flight for additional climbs to extend flight time. It would also increase the need for up-elevator during a hand-launch to lift the nose for the initial climb.

Due to the considerable altitude at the end of the climb, visibility of the climb angle would be too poor for adequate manual corrections, so it is desirable to trim the model for relatively "hands-off" handling. The additional down trim to correct the remaining zooming tendency may be achieved by mixing throttle into elevator from above about half throttle, so that increasing amounts of down elevator are introduced as the throttle is opened such that a relatively stable steep climb results, needing no elevator stick corrections. Fine-tuning of this mix may be achieved by



Glider Set Up Continued....

November 2019

Article by Brian Holdsworth

adjustments to the mixer Offset parameter so that the mixing starts earlier or later, allowing some control over the transition between level and climb. Since this moves the mixing curve, the amount of mix at full throttle should be changed accordingly so that, for example, the mix percentage should be reduced, if moving the Offset towards low throttle, to maintain the effect at full throttle.

Opening the throttle on the ground with the propeller attached is best avoided since it presents an obvious danger. The easiest way to determine the required mix direction is with the motor disconnected or the propeller removed, when a fairly large value is set so that the elevator movement becomes obvious to identify the required sense. Alternately, apply a value to the mix below half throttle with the throttle closed so that the elevator moves up; remove and apply that sense to the mix above half throttle which should move the elevator down.

The effect of such elevator trim is proportional to the airspeed. This effect would be increased by the propeller wash, which will be greater than the airspeed, otherwise no thrust would be generated! A low-mounted tail plane would be within this propeller wash, but a T-tail may be outside resulting in little effect as power is applied until the airspeed increases.

For setups such as the example model where the throttle stick is switched between motor control and Crow deployment, the mixer should be switched by the same switch for convenience, since its effects would be confusing in Crow. It is impracticable to achieve perfect compensation throughout the throttle range, even where a curve mixer is available, so corrections are made for full throttle with the transition needing some control of the throttle stick opening rate.

About 3 degrees down thrust seems a good compromise, with the down-elevator mix at full throttle adjusted to be slightly too much to reduce the tendency to over-rotate. This means that a little up-elevator stick is sometimes needed to steepen the climb and limit the airspeed. As covered earlier, it seems easier to apply up-elevator rather than down. There is a dangerous condition, best avoided, where an excessively steep climb becomes unstable where the wing lift, being significantly horizontal, generates a pitching moment too great for manual down elevator to overcome, producing a clumsy loop and consequent concern over the



Glider Set Up Continued/.....

November 2019

Article by Brian Holdsworth

strength of the wings. If the throttle is reduced when this condition becomes apparent, elevator authority is reduced and a very tight flopping loop can result.

The example models are adequately (excessively?) powered so that trim corrections and operational techniques have been evolved to achieve satisfactory single-handed launch and climb handling. Differences between the example V-tail and the others with T-tails show the effects of propeller wash where the T-tail designs are more prone to over-rotation towards a loop, presumably due to their reduced elevator authority under power.

Launching is performed into wind at about one-third throttle in a level attitude. This power is sufficient to maintain airspeed and able to produce a slight climb. When a reasonable distance away, producing good visibility, the throttle is smoothly opened, taking maybe two seconds, so that, ideally, the model pitches smoothly into a steep climb requiring no elevator stick input. The throttle opening rate is determined by watching the model since too slow produces over-rotation towards a loop, while too fast produces a shallow climb with excessive speed - compromise! Subsequent climbs are best performed reasonably close to allow adequate monitoring of the resultant climb angle.

Cross-wind launches need to be avoided since the resultant rolling tendency away from the wind would be difficult to correct with undesirable consequences. For a heavy or marginally powered model with flaps available, it may be helpful to apply some camber to increase the lift, since it can be difficult to achieve the required flying speed from a hand launch - extreme examples may need additional help from bungees or multiple launchers.

During a steep climb, rudder is used to correct any tendency to yaw off-vertical, meaning that it is easier to perform the climb flying directly away for visibility. Aileron application changes the bank angle and has little effect on heading in a steep climb. Changing the heading would require a combination of rudder and opposite aileron which is not easy and so best avoided.

At the end of the climb, a transition is needed into level, gliding flight. This may be achieved by slowly closing the throttle over maybe two seconds while applying

Glider Set Up Continued....

November 2019
Article by Brian Holdsworth

a little down elevator to produce a smooth pitch into level flight. The poor visibility at the considerable height achieved can make this somewhat difficult, so some practice at a lower height would be helpful. Excessive pitch stability can make this transition more difficult since the model is more likely to zoom if the airspeed is slightly excessive. Insufficient stability could result in the model diving or remaining in a climb until the speed decays to produce a stall. Compromise again!

Variable control of the motor from the throttle stick seems to have considerable advantages, at least for general usage. Using a slider, where available, may be sufficiently convenient, though some practice may be needed due to its unfamiliarity. The potential danger of looping under power means that launching



directly into a steep climb at full power could be problematic, especially as visibility would be poor, looking directly up. Even with suitably adjusted delays, switched operation seems a bit too fraught for comfort, though experimentation may produce satisfactory results. Of course, any problems would be reduced with a more marginal power installation, but near-vertical climbs can be satisfying!

No side thrust was incorporated to simplify construction, although two degrees or so would be desirable. The effects were relatively small for the T-tail examples but this V-tail example shows a tendency to pull left, presumably due to its greater exposure to the propeller wash, and visibly flies slightly sideways, right wing down, under power, so that a little right rudder can be helpful, especially near the end of the climb. A throttle-rudder mix could be used to limit this effect, setup similarly to the throttle-elevator mix above. Unfortunately, another mixer was not available!



November 2019

Club Instructors

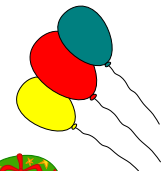
Jason Reid, John Higgins, Chris Vernon, Mark Conlin, Brian Holdsworth, Jim Sheldon, Paul Cusworth, Andy Harrison, Justin Goldstone, John Prothero

Upcoming Events

Wednesday 5th December **Annual General Meeting** to be held at the Marton Institute commencing 8pm.



Thursday 19th December *Quiz and Hot Pot Evening*



2020

Wednesday 8th January *3D Print evening*

Wednesday 5th February *Indoor Quad and small helicopter Slalom*

Wednesday 4th March *String along and bring a video evening.*

Wednesday 1st April *Back to basics - Safety Talk*

In Conclusion

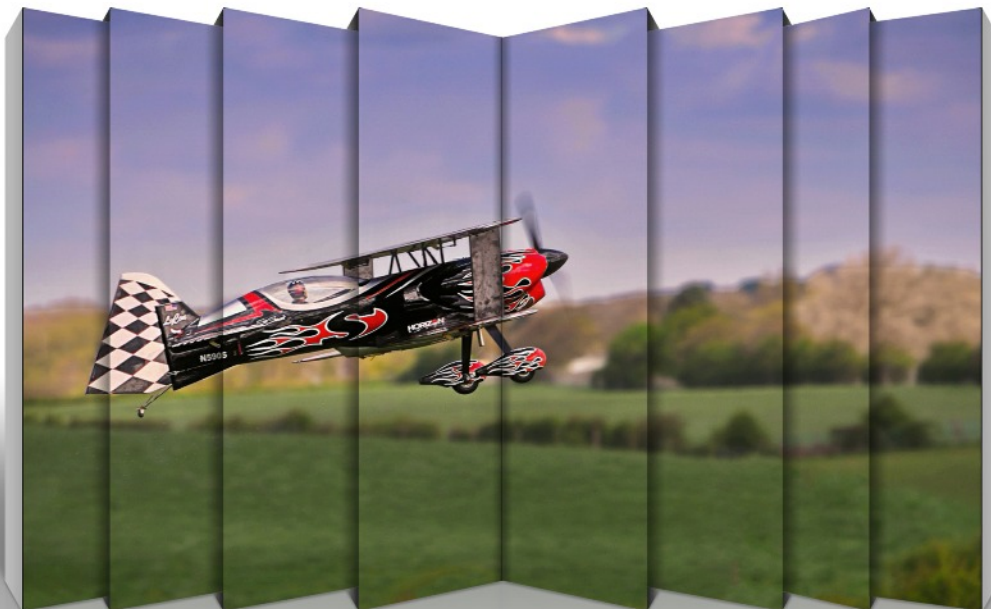
November 2019

First of all I thank all of you kind members who have put pen to paper throughout this year. You have supported this newsletter and made my job a simple one.

Please don't forget that Steve Warburton is selling on behalf of the Club those four OS 19s'.

Your next newsletter will be at the end of January - Christmas/New Year is a time for relaxation.

I wish you all a **Very Merry Christmas** and a **Prosperous New Year**.



A friend of mine came round and showed me how to do this.