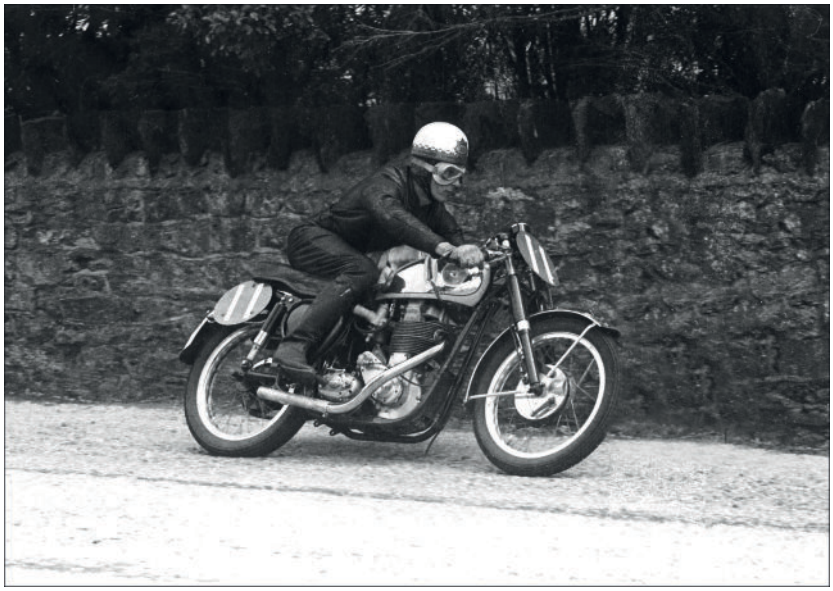
Newsletter

August 2017



It is very sad news to hear that Tom Anyon has died. I knew Tom from my Fleetwood Club days. He was always helpful and was in fact the BMFA Area Chief Examiner for the North West Area. Although his later life was plagued with heart trouble, in his younger days he was a keen motorcycle racer and it is a picture of him in his heyday racing his 500cc BSA Gold Star at the Southern 100 that I would prefer to remember a well enjoyed life of a good friend. When I find out details of his funeral, I will let you all know.

I guess the weather this month hasn't been what you would expect for August and I'm sure that has curtailed some of your flying. Nevertheless, the shows go on and Dave, Jason and Mark with their various helpers made their annual trek to Elvington. Dave sent me some pictures taken by a guy who was using a massive 150 - 600 zoom lens. This lens is very heavy indeed - the body and lens will have been weighing almost 8½lbs. Apparently the photographer kept having to rest it on something throughout the day - no wonder!

Heavy, it may have been but look at the quality - brilliant.

Mr Swarbrick on lift off

Some of the motley crew standing next to Jason's Panther

I really missed going to Elvington this year. My Knee replacement is healing and it's slowly getting more movement - sufficient now to be allowed to drive again and in fact this morning the Physios' have discharged me. They are quite brutal those guys but it's the only way that you get back the movement.

Very soon I'll be back to indoor flying at least and I so look forward to that.

Lost Model Woes

Article by John Higgins

Many of you will have heard that I lost my beloved CAP 21 in the field of maize on the eastern side of the hedge. The cause of the crash is still a mystery – the worst kind of crash. The irony of the situation was that my radio "Loc8tor" system had given up the ghost only the week before the crash. In all honesty, I doubt that it would have been of much use; the range is only about 100 feet or so, and that is with a direct line of sight. With a model in the maize and the searcher in the maize… well, draw your own conclusions.

When incidents of this kind happen, I am always amazed (no pun intended!) by how club mates rally round to help. On the day of the crash, half a dozen of us spent a fruitless hour and a half ploughing through the maize until I called a halt to the quest as a hopeless endeavour: in the maize one cannot see for more than a metre in any direction! Later in the week a drone search was organised – helpful club mates again. The model was eventually found (at least, its wreckage was!) on the following Thursday as a result of being located by the drone. I am extremely grateful to all the folk who helped with the search and to those who contacted me offering further help – you all know who you are – and especially to fireman Steve for his organisation of the drone search and more than generous help in the recovery phase. A club, like ours, is more than just a group of members: we are very fortunate to be a part of it.

Footnote: My (deceased) CAP 21 was 23 years old and was on its second engine, second set of radio and third set of wheels. It was a pleasure to fly and was an ideal "heavy weather" model; I will miss it. Looking on the bright side, the wreckage will not find its way into a cow, via the combine harvester, and I still have the engine and servos and other useful bits… I now also have room in my hangar for another model!
JH

A VIEW FROM THE HEDGE. (By Will Sparrow)

Like many of you reading this missive, I like to get away from the home environs, once a year at least, and have a complete rest and a change from the everyday pace of life. Of course, "getting away from it all" also means getting away from all the things that one likes doing on home turf – which, for me, means giving up watching you lot enjoying yourselves with your model aeroplanes! I look forward to my holidays, not to get away from you lot, but to know that after being pampered and looked after for a couple of weeks in a distant hedge, I will enjoy viewing you from this hedge all the more. I'm sure that I have missed lots of interesting things while I have been away (Rest easy, Will, you haven't missed much at all! - Jim Sparrow), but I suppose that I can live with the loss.

As you read this, summer is, to all intents and purposes, over and, if you are one of those members who have been waiting for an ideal flying opportunity, you have missed the boat! The nights are drawing in, and winter is just around the corner. Don't you all wish that you'd got out more and done a bit more flying? Is staring at a little screen for six hours a day really that appealing?

So what has there been to view from my twig during the lazy, hazy days of summer? Well, just before my period of R&R, I'd been entertained by a solitary member doing his thing and enjoying a mid-week session, when another member arrive (You mean there are two of them?! – JS) with that lovely, scale electric twin. The original modeller was just about to depart, but decided to stay to watch the twin take to the skies. We were not to be disappointed; the model flew beautifully, in a scale-like manner and pulled off a greaser of a landing. A little later, with modeller 1 departed and another enthusiast arrived, the twin took to the air a second time. All went well until it was time to land. Let me digress a little: there are two chums in aviation who are your best friends – height and speed. It doesn't matter if we are referring to a jumbo jet, a humble sparrow or a model aircraft, height and speed are your friends. The twin was a bit too low and a bit too slow as it made the turn onto finals, to the east of my hedge. It is traumatic to be "unfriended" by your two best friends at any time, doubly so if you are a twin just turning

A View from the Hedge Continued/...

onto finals! This most benign and gentle-flying of aeroplanes dropped its right wing and crashed into the field just behind my hedge. The pilot instantly cited pilot error as the cause of the crash. There was quite a bit of damage to the model but most critical areas were unscathed; I'm told that repairs are currently in progress. Perhaps you are all too used to flying ultra-light ARTFs with their almost idiot-proof handling? Heavily-loaded scale models are not from the same mould!

I find viewing models crashing a rather upsetting experience and my heart goes out to the stricken owner when such events do occur. However, it is a fact of life that models do crash and, humans being humans, you will all, sooner or later, be the one with the long face and the stressed wallet. The trick is to learn from the mistake (if you made one) and not to repeat the experience. With this in mind I will describe one more sad incident. A beautiful Sunday morning saw a large, twin-boomed sport jet lined up ready for take-off. As it broke ground it was obvious that something was not quite right; the model went in like a pile driver, just the other side of the railway line. A ball of orange flame and a pall of thick, black smoke marked the crash site. The rescue squad ran for the cars in order to access the scene. By the time that they got to the crash site there was next to nothing left of the model – the fire had consumed almost everything; radio, servos, tyres, all were sacrificed on the pyre. The model had recently been fitted with different radio receivers and, somehow, the aileron servos had become reversed. The pilot had performed the usual pre-flight checks but had seen what he expected to see not what he actually saw. Humans do make mistakes… and none of you are immune. Please spare a poor sparrow any more anguish and take extra care in future.

The same Sunday saw the first flight of a new trainer-type model. "Nothing new in that" I hear you say. In this case you would be wrong. This model was from a donkey's years old kit that had been lying around, unfinished for, well, donkey's years! What's more, it had been completed, in part, by a junior member. When was the last time you heard of a junior member – or any member, for that matter – building anything? The model was resplendent in purple and yellow and checked out really well. The modeller even forgave the engine for widdling fuel all down his leg! After the early-day trauma, it was nice for me to view a success story.

A View from the Hedge Continued/...

August has seen the jet stream squatting, like a malevolent toad, over the Atlantic (some large pond way to the west, I'm told) and bringing us a supply of strong winds and lots of rain (the Wise Old Owl tells me that August is one of the wetter months of the year). It was all the more surprising then that a flyable Sunday should materialize out of the murk. Admittedly, there was a strengthening wind blowing from the west, but the day was okay for flying provided that you got to the field early. Like most birds, I was up early and stationed on my favourite viewing twig. All was going well until a nice petrol-powered model, nicely set up on its base leg, suddenly turned left instead of right and spiraled in: the cause of the model's behaviour was a mystery. Now, I don't know if you are aware of the fact, but, behind my hedge, many acres of maize are growing. This stuff is being grown for forage and is sown randomly, rather than being sown in rows. In the vast, green wilderness there are said to be long-lost tribes and ragged soldiers who are unaware that the war is over – there is now also a much-loved turquoise and white model aeroplane! Half a dozen good men and true spent a fruitless hour searching for the stricken model before the search was abandoned. I even flew over to see if I could spot anything but I too drew a blank. If you lot force me to witness any more tragedy I think that I'll need to go into therapy!

Wednesday evenings are still proving popular as a flying time for those of you who have to work for a living (we sparrows don't have to work, tee hee!). The Wednesday evening after the model was lost in the maize saw the appearance on the field of one of those new-fangled drones complete with an operator who was determined to record the finding of the model as his first "search and rescue" drone triumph. By this time the wind was getting up and the pictures that the drone produced showed no sign of the model. Undeterred, and with a real sense of determination, the drone man vowed to return on the Thursday morning to resume the search. You can imagine the anticipation in the hedge; even sparrows with only a passing interest in model flying had their interest piqued by the application of all this alien technology. Sure enough, with a couple of members present, and the wind light, Thursday morning saw the drone lift off, its progress followed by a dozen or so eagle-eyed sparrows (you're a sparrow, Will; you have sparrow-eyes – WOO). The first drone flight drew a blank. The miraculous machine was then re-programmed to fly a search pattern, taking a photograph every second. The photographs were then to be downloaded to something called a laptop, where witchcraft was to be employed to stitch the individual photos together to form a panoramic view

A View from the Hedge Continued/...

of the area. We all relaxed on our twigs whilst all this was going on. A loud whoop from the direction of the hut made us all jump. Was good news in the offing? Yes, the model was located and could clearly be seen over 150 metres from the strip. (You modellers think that you are "just the other side of the hedge" but, believe you me, you are much further away than you think). The drone operator, being a trained fireman and thus used to search and rescue missions, insisted on retrieving the model so as not to put the aged owner, now present, at any risk. What a gentleman! I flew over, in my usual, discreet manner, to have a look at the findings: the model was a complete wreck, but, at least, it was found and bits of it might well be seen on the field again as part of a future project. Having said that, the little plastic pilot had a look of sheer terror on his face and may never fly again!

I hope that you all enjoy the last remnants of summer and **please** stay away from the maze that is the maize!

WS

Justin sent me this picture - I'd call that 'Little & Large'

Flaps

Article by Brian Holdsworth

Within limits, lift is proportional to the airspeed squared, the angle of attack and the shape (profile) of the wing section. It is also proportional to air density but models generally operate over a limited height range so that variations are small and may be ignored for most purposes. Similarly, it is proportional to the wing area, but this is fixed for a particular aircraft and so is only relevant during the design process. If the angle of attack becomes too great, the airflow becomes turbulent causing the lift to reduce as the angle is increased further - this is referred to as the stall angle. While usually associated with low airspeeds, stalling can occur at any speed if sufficiently provoked, such as in a steep turn, when the stall can be violent with the aircraft flicking into a vertical descent, which could be inconvenient, especially if low!

The profile and degree of surface roughness have a considerable influence on this stall behaviour. Some airfoil sections demonstrate an abrupt transition, which is generally undesirable for model use due to the greater difficulty for a model flyer to recognise the onset of this condition, as compared with a pilot sitting in a full-size aircraft. However, an abrupt stall can have advantages for performing spins, snap rolls etc - compromise!

The angle of attack is the angle between the oncoming air and the chord line, which is the straight line between the leading and trailing edges of the section. It is the centre-line for a symmetrical section, where the upper surface is a mirror image of the lower surface. For an under-cambered section, where part of the lower surface is concave, the chord line may be partly outside the section. In level flight, the angle of attack will be the same as that between the chord line and the ground. If descending, the angle between the aircraft and the ground may seem small but the actual angle of attack will be greater due to the vertical velocity component, and this can lead to stalling if not recognised. Many sections quote a stall angle of about 15 degrees but this refers to full-size usage and, at model sizes and speeds, this will generally be more like 10 degrees, but less abrupt - a rare example of some model advantage!

Drag is rarely beneficial and considerable steps are taken for its reduction, especially as it is proportional to the airspeed squared. It may be divided into three main groups.

Parasitic drag is caused by the passage of the airflow over the structure and includes sources such as skin friction, propeller wash and turbulence generated by surface

Flaps - 2 Continued/...

Article by Brian Holdsworth

irregularities. Undercarriage legs and wheels can produce significant drag, which is why retractable units are used for higher speeds in spite of their complexity and weight penalty. An open cockpit can generate a lot of drag and the turbulence has a considerable effect on the airflow over the fin. Radial engines have bulky cowlings, which can produce a lot of drag, with the generated turbulence affecting tail plane and fin performance. It can vary significantly with the angle (pitch or yaw) to the oncoming airflow.

The cross-section (frontal area) of the fuselage, wing and tail can generate considerable drag, since the airflow has to split to move round the structure. This is referred to as profile drag and its characteristics can be important during the design process when comparing different configurations. For most analysis purposes, it can be combined with parasitic drag.

Induced drag is inevitably produced by the generation of lift. It is non-linearly proportional to the lift and is produced by the bending of the airflow and consequent turbulence. Many wing sections have been developed, claiming to optimise the lift/drag ratio for various airspeeds etc.

The section needs to be thick enough to allow sufficient structural strength to be achieved, together with being able to contain equipment such as undercarriage mountings, especially if retractable. For full-size aircraft, fuel tanks, guns etc may need to be accommodated. In general, the trailing edge needs to have a fine taper to smooth the merging of the upper and lower airflows behind the wing. Structural considerations usually mean that this has to be thickened somewhat from the ideal. Some supersonic aircraft, particularly those with delta-shaped wings, have a blunt trailing edge with square angles, which is intended to reduce transonic flutter. This tends to provoke flutter at lower airspeeds, but the compromise may have to be made. Due to this flutter potential, model usage of thick trailing edges is unhelpful even with its simpler construction. At lower airspeeds, a blunt, rounded leading edge provides better lift but produces more drag at higher airspeeds. For supersonic aircraft, very thin sections with sharp leading and trailing edges are often used at the cost of poor low speed performance requiring flap usage for landing, when flap failure may make the aircraft impossible to land safely.

A few aerobatic aircraft such as some of the CAP and Extra series used a wing section,

Flaps - 2 Continued/...

Article by Brian Holdsworth

which is essentially a semi-circular leading edge with straight lines to the trailing edge. This was intended to improve entry into spins and snap rolls etc. for the schedules of that time. If used in a model, the section often demonstrates its effectiveness by flicking into the ground even with apparently adequate airspeed! The original IMAC aerobatic competitions for scale models required the use of the same airfoil section as that of the full-size aircraft, even though this problem had been highlighted - only after several crashes at public events did sanity prevail and variations are now permitted, including different airfoil sections and enlarged control surfaces, which would be essentially invisible in flight. Some fun-fly models, such as the Funtana, use this type of section and may not last long as a result.

Lift is generated by the path over the upper surface being longer than that of the lower surface, increasing the pressure below the wing pushing it up, and reducing the pressure above to suck it up. Generally, most of the lift will be generated by the upper surface. Fabric covering on full-size aircraft has to be sewn onto the upper surface structure to absorb these forces. Under-cambered sections would require the lower surface to be sewn to keep the covering in place when on the ground, but this is generally done anyway to avoid potential problems from turbulence etc. lifting the covering. Essentially, the air has to bend round the section and the amount of lift varies with the degree of bending. If this bending is too abrupt, the airflow will be unable to follow, causing turbulence, reducing lift and increasing drag.

At zero angle of attack, the air splits when it meets the leading edge at the chord line. For a semi-symmetrical section, the greater part of the surface is above the chord line so that the upper surface is longer than the lower, generating lift; the angle of attack is thus negative for zero lift. At a greater angle of attack for all sections, the air meets the leading edge below the chord line, increasing the length difference so increasing the lift. Similar effects apply for negative angles where, except for symmetrical sections, the lift is less with greater drag than for the corresponding positive angle and with a lower stall angle. At small negative angles, particularly for under-cambered sections, parts may be generating positive lift when others are generating negative lift!

This bending of the airflow to generate lift means that the air in front of the leading edge is rising before it meets the wing, referred to as up wash. This increases the effective angle

Flaps - 2 Continued/...

Article by Brian Holdsworth

of attack, but this is allowed for in the section characteristic data. At low airspeeds (up to about 150mph), a rounded leading edge is beneficial with the maximum thickness of the section at about 30% of the chord producing a smooth airflow transition. A thick section produces good lift with relatively low drag. The effect of flaps on this type of section is marginal for their complexity and weight, but they may be fitted to improve short field operation with their drag permitting a steeper descent.

A consequence of the up wash generated by the lift is that a symmetrical section does not generate zero lift at zero angle of attack! As the angle of attack is reduced, the lift reduces but, due to the up wash, there is still effectively an angle at zero angle of attack generating some lift, requiring a negative angle of attack before zero lift is generated; that negative angle would then cause negative lift to be generated. Theoretically, conditions exist at zero angle of attack when no lift would be generated, but the state is unstable and any disturbance disrupts the airflow so that a more stable state results with some lift being generated in one direction or the other. Due to the inevitable irregularities in the wing surface, especially at the leading edge, some areas may be generating positive lift while others are generating negative lift. An aircraft is rarely required to generate zero lift, but the effect can sometimes be apparent in a vertical climb or dive.

Tail planes generally operate at low angles of attack and, at smaller sizes, flat plate sections with a rounded leading edge can be more effective than thicker symmetrical sections, since this instability effect is reduced.

Fins generally operate near zero angle of attack and can be vulnerable to this instability, resulting in what is graphically described as "fish-tailing" where the aircraft is prone to yawing each way, sometimes in a slow oscillation. This characteristic is sometimes alleviated by adding a dorsal fin to smooth the airflow disturbed by the cockpit canopy etc. The fashion of adding "canalisers" (a mini-wing behind the top of the cockpit canopy) to current F3A aerobatic models is claimed to improve fin airflow and rudder response.

At higher airspeeds, the airflow finds it increasingly difficult to separate before meeting the leading edge, producing high drag and turbulence in an effect referred to as compressibility. This becomes apparent over about 150 mph and can be significant by about 250 mph, becoming problematic over about 400 mph. For these higher airspeeds,

Flaps - 2 Continued/...

Article by Brian Holdsworth

the leading edge may be sharpened and the maximum thickness reduced and moved back to 50% chord or more; these are sometimes referred to as laminar flow or low drag sections. The inevitable compromise is lower maximum lift, abrupt stall characteristics and poor low speed performance often requiring flap usage to reduce landing speeds to practical levels. Performance can be very sensitive to slight irregularities in the surface requiring considerable manufacturing and maintenance effort to achieve the intended performance. The reduced thickness has structural implications with difficulties in containing equipment.

Turbulence is generated in the airflow behind the wing, particularly at the tips where the higher pressure below the wing moves to equalise the lower pressure above the wing, producing spiral airflow in the form of a vortex at each tip. This wake is so significant that a considerable separation (up to several miles) has to be maintained between full-size aircraft, especially when landing or taking off. A small aircraft too close behind a larger one, such as an airliner, can become uncontrollable if it enters this wake, and some have been flipped over by the vortex and crashed. Even large airliners have suffered damage from wake turbulence, especially if the pilot takes inappropriate recovery action. A few years ago near New York, the fin was ripped off an Airbus by over-enthusiastic rudder usage after encountering wake turbulence, killing all onboard together with several on the ground.

The airflow behind the wing is descending and turbulent. This is referred to as downwash and, in a conventional configuration, can have a considerable effect on the airflow over the tail plane behind the wing. Consequently, most aircraft position the tail plane higher than the wing, to be above the downwash and most of the turbulence, with some adopting a T-tail configuration in spite of its considerable structural problems. The worst tail plane position is level with the wing, since it would be operating in the turbulent air. At smaller sizes, the tail is closer to the wing increasing these effects, causing much of the model performance differences from their full-size equivalents - scale effect in operation.

The canard configuration with its "tail plane" in front of the wing avoids problems from the disrupted airflow behind the wing with considerable potential benefits. However, the tail plane disrupts the airflow over the wing, which can be very significant, making the aircraft vulnerable to unrecoverable stalls and spins. Few full-size aircraft have used this

Flaps - 2 Continued/...

Article by Brian Holdsworth

layout, and many of these have been grounded after fatal crashes!

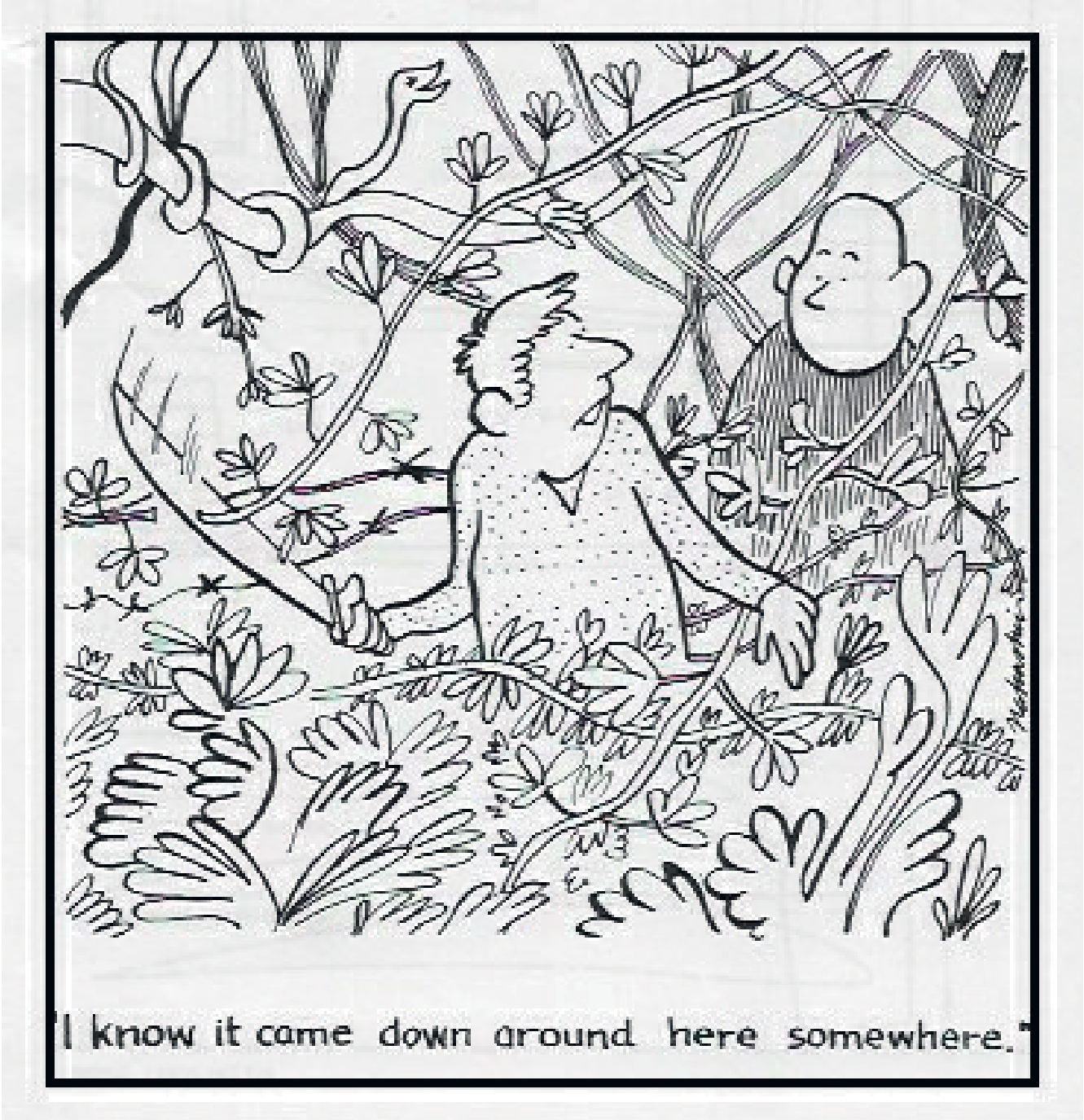
Up wash, down wash and the differential passage of the airflow over the section, together with consequential turbulence, are inextricably linked to generate the pressure gradient over the wing, producing lift and drag.

A picture I took at last year's Elvington LMA - Dave Johnson's Beautiful Victor

The Dreaded Maize

August 2017

I've been hearing about the giant Maize crop at the Eastern end of our flying field. I haven't seen it of course but what members have told me, it's really not good news when models 'land' within it's clutches. And then I received an Email from Steve Warburton with this attachment - I just had to put it in!



List of our instructors.

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

Items For Sale

VOLTSPLANE 52" Semi-scale low wing monoplane built from a kit. It is a well flown nice flyer (Illness forces sale) only **£85.00.**

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Well flown / Nice Flyer **£65.00**

EMP C3548/790 Out Runner Brushless Motor
ESC (unknown make)
Overlander 2200 mAh 3s Li-Po
Spektrum 5200 RX
4 Hi-Tec HS82M Mini Servos

For any of the above contact Les Childs on 01253 622013

In Conclusion

It's been a strange couple of months for me. I am really grateful to all you gentlemen who contacted me for a chat. When I do get down to the field again, I think I may just have to re-learn to fly again. I know it never leaves you but it takes time to get back the confidence. I have missed more than anything the indoor flying - your reactions need to be so fast to safely carry out manoeuvres and even to fly safe circuits.

I have right now on order 6 micro servos which will go into two newly constructed indoor models. It's fun making up your own models in Depron - each time changing the wing shape, the size of the ailerons etc. and so satisfying when those mods have achieved a better flying model.

I have so missed the shows this year - it's my one source of the type of photography which I love to do but when I'm properly on my feet, I'll get down to the field and take some there.

Thanks to John Higgins, Brian Holdsworth, Will Sparrow, Steve Warburton and to Dave Swarbrick for the Elvington Pictures. Thanks to Justin for sending me picture of his damaged autogyro. I'm not one to stir it of course but he blamed our Safety Officer for this.

Congratulations go to Tim Walton for passing his BMFA 'A' certificate.

In the meantime enjoy this wonderful weather - it just seems to get worse. The other night we had the mother of all thunderstorms.

Ah well that's it for this month - I wish you all happy and safe flying.