Newsletter

May 2019

June looks to be a busy month for the Club with The Cleveleys Classic Car Show at which we enjoy a prime spot for showing off the Club together with the added bonus of the BMFA flight simulator.

This is on Sunday 9th June. Thanks go to John Prothero for getting us such a good show position.

You then have the Weston Park Model Show on the 14th - 16th June.

Following this, we have our Club Fly In on Saturday 22nd June. Last year, we had superb weather for both events.

This EDF Vulcan flown by one our visitors to the 2018 Fly In.

May 2019

A VIEW FROM THE HEDGE. (By Will Sparrow)

I don't know if it's down to climate change or merely the state of the hedge's seaweed but the weather seems to be all over the place at the moment – one minute your chocolate eggs (chocolate eggs? You lot are weird! – Jim Sparrow) are all melting in the hottest Easter weather for years, the next we are all back to rain and gales with storm Hannah removing all the blossom from the trees. Still, we are almost into summer now so we should be getting plenty of ideal flying days coming our way. Let's hope so.

With the advent of May, the first of the evening flying sessions took place. My attention was demanded once a tiny, electric-powered missile took to the skies. This device was blink-and-you-miss-it fast but, fast as it was, it wasn't fast enough for its young owner! The lad left muttering something about more cells and kilowatts whilst we, in the hedge, set about preparing ourselves with a strategy for future sonic booms.

The first May Day Bank Holiday turned out to be cold with not that many members present (it is a well- known fact that modellers feel obliged to sit in traffic jams or go shopping at Bank Holidays – WOO). I glanced over towards the assembly table as one of those ubiquitous, twin-boom jets was having its wings hammered on (!) When the model, after much humping of kit and lengthy preparation, finally taxied out, things, somehow, did not seem quite right. My mate, Jim Sparrow, put his finger on it, "…that model reminds me of an elderly duck". Indeed, the model's back wheels where pointing outwards at rather odd angles. Undeterred by the model's odd ground-handling, the intrepid pilot throttled up for take-off. With a mighty roar, and a smell like your granddad's blowlamp, the model leapt forward; it veered to the right, then to the left, then to the right as it gathered speed. Finally, the take-off was abandoned but the end of the strip was fast approaching… The model scythed into the oil seed rape like a T-Rex entering a wood! A couple of stout fellows managed to pull the model out of its entanglement. The back wheels were now at even stranger angles and the nose-leg was hanging off. Later in the day I espied a very nice "Vans" large-scale model being unloaded in the car park, but I was not able to wait to see it fly – being Bank Holiday I had promised a cousin to visit his hedge and do a bit of shopping: I was already running late.

Tuesday, 7th May provided a freak event: an afternoon with next to no wind, dry conditions and a sky that indicated plenty of thermal activity. The local gulls were circling on high – one or two of them wearing oxygen masks! A couple of modellers had turned up with gliders in a bid to outdo the gulls. One had the measure of the conditions and achieved great height and long duration – I could swear that I could see the sheen of ice on its wings when it finally

A View from the Hedge Continued/...

landed – the other model did not do so well, being in the early stages of trimming. This day also saw a nice, yellow (crop coloured?) biplane venture out to grace the skies. Glow-powered and a flash-back to the 80s, it provided us hedge-dwellers with a whiff of nostalgia. It's nice to see something a bit different.

The following Sunday, after a slow start, saw many members enjoying a beautiful day. My interest focused on a nice, scale-ish, high-wing model resplendent in blue and cream. The owner had forsaken the oily route and had installed an electric power system. Wisely, the modeller had entrusted the first flight to experienced hands. After a few circuits the little model made "a funny noise" and sounded most unwell. The motor then stopped. Experienced hands then performed a perfect dead stick landing right in the middle of the strip. The cause of the strange noise soon became apparent: the motor had completely parted company with the airframe and was only present because the holes in the cowling were not big enough to allow it through! No real harm was done but had the motor dropped out… The chances of finding a motor in the crop would be vanishingly small and the model, deprived of its nose weight, would almost certainly have crashed. A narrow squeak but with a happy ending!

The mid-week flying opportunity of the 15th May brought forth a huge number of members seduced into action by the superb weather. Many flights were made and enjoyment reigned supreme… until one of your number decided to try to sell an old glider to the assembled multitude. Unfortunately, the multitude seemed not the least bit interested. The weight of rejection seemed to have a profound effect on the owner of the poor, unfortunate glider who proceeded to smash the innocent aerodyne to pieces! Now, seeing events like this both shocks and saddens us hedge folk. Heaven knows what impressions your newer members took away with them. (Sad. Oh so sad. So very sad – Donald T Sparrow). We are all hoping that the summer season sees a return to peace, calm and goodwill.

The following weekend, I had been told, had been pencilled in as "Hut Refurbishment Weekend" and, sure enough, a dedicated cadre of members turned up early on Saturday morning almost before I had got settled on my viewing twig. They were going at it hammer and tongs; the carpark fringes were tidied, the hut exterior was pressure-washed and the veranda was sprayed with fresh, brown paint. Even when the brown paint spray equipment shot a jet of brown paint up one member's arm, jollity pervaded the scene. The next day members descended on the club hut like a swarm of locusts so that, in short order, the exterior became a fresh shade of green. One member was so impressed and captivated by the smell and the colour that he thought it best to tip half a can of the green paint over himself so that the experience of the refurbishment could stay with him over the next week. Such is the spirit of your members!
WS

May 2019

Rob Wardale Pioneer of early model Turbines.

I was absolutely fascinated by Rob Wardale's experiments with the early jet engines, no one else was on the scene locally and Rob was one of the leading lights on turbines in this country.

In truth without Rob infecting me with the Jet bug, I would have never ventured into this area of aeromodelling, I learned so much from his trials and tribulations. He would have turbine failures, compressor wheel failures, but next week he was back with as he put it a few adjustments.

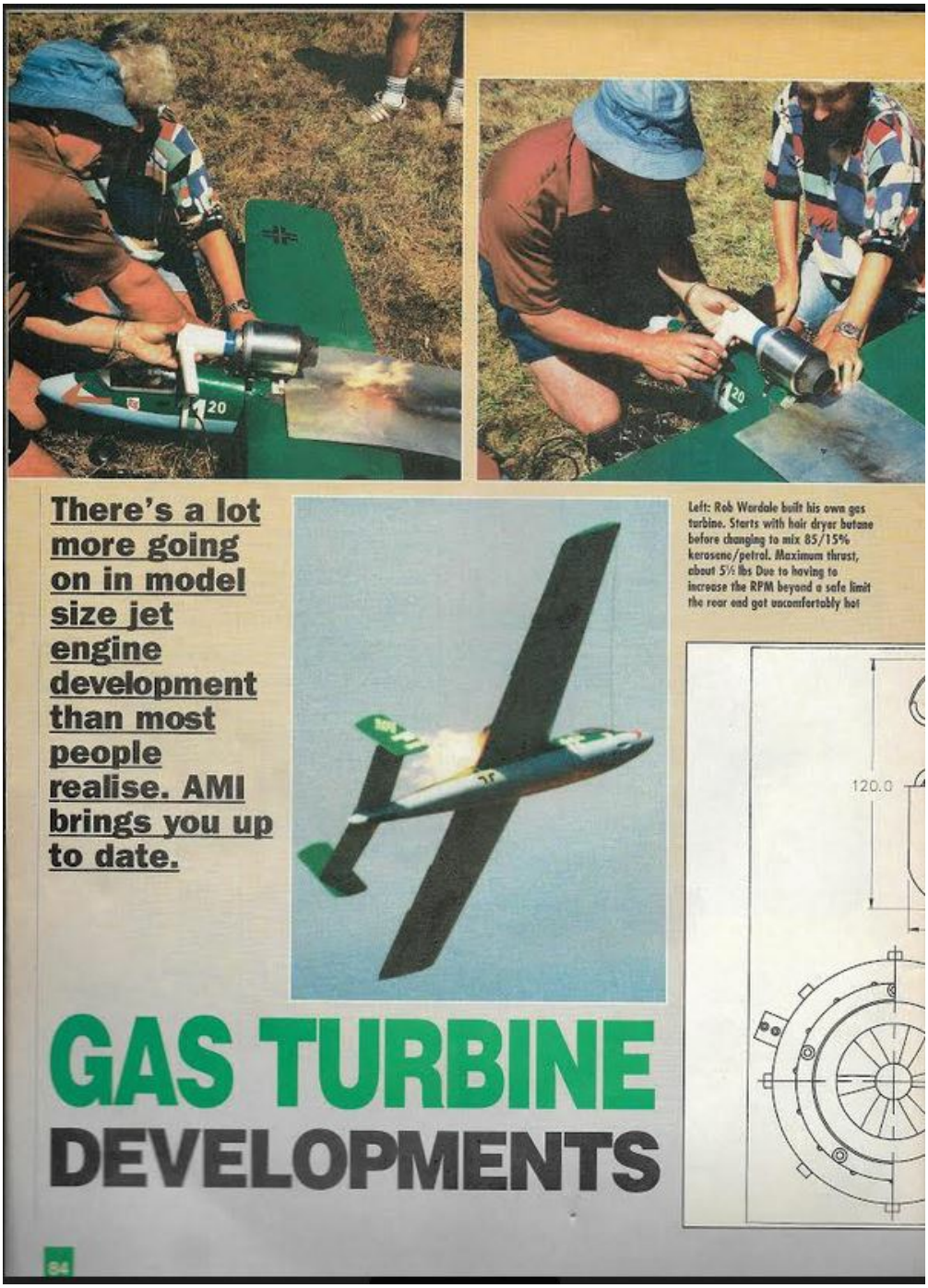
It must be remembered that Rob built absolutely everything and I mean everything. The compressor wheel was made of plywood braced with carbon fibre, the turbine wheel was handmade by sawing and twisting the blades and the whole lot including the shaft was then balanced. Rob produced the entire engine on a Boxford lathe. He used a model car speed controller to control the fuel pump which was a standard fuel pump from a flight box! The engine design was by Schreckling and Rob built a Salamander semi scale model of an early German jet, the model proved to be very successful

I can remember the day in the picture as if it was yesterday. It was a hot summers day and I had invited my good friend Captain Ian Wall (Chief Pilot Bond Helicopters) along, he was intrigued by the concept of a home built miniature turbine. As Rob applied the hair dryer to the front of the turbine to get it spinning, I casually mentioned to Ian that the compressor was actually made of plywood braced with carbon fibre. As the engine sprang to life, I turned to Ian to make another comment only to find that he had disappeared - I spotted him some yards away peering from around the corner of a van! I went over and said "Its running" he said "I know that's why I'm here, have you any idea of the forces that are involved in a jet engine? it's got a wooden compressor for goodness sake and you're stood next to it!" Ian was very knowledgeable and then went to great lengths to explain how Jet engines worked and the forces that are involved – it didn't put me off.

Rob took off and unfortunately had another failure as can be seen in the flying shot with the ball of flame coming out of the rear of the engine, but true to form was back the next week with a few modifications!.

The picture shows Rob starting his engine with a hair dryer with me holding the heat shield (and yes I still have the shirt).

The pictures are from an old now out of circulation magazine from 1995!



Article by John Prothero

May 2019

My PT19

Article by Carl Brotherton

Many of you who saw the pictures that of my Fairchild PT 19 in last months Newsletter would be surprised to find that it is not made from foam. Indeed it could be ruining my reputation as being addicted to both foam and electricity.

What is more, the model is a kit. Not laser or a router cut set of self assembly parts. No it originates from a time when even the oldest club members were still in nappies. Imagine that when I purchased the kit, it was already "old school", hard to believe that I had hair, my cutting edge radio was a 27 Mg ,Waltron Super clubman. The kit purchased in Orlando, at Graves Models for $12.

Perhaps a bit more detail with respect the kit is in order, it was the equivalent of the BAE Tornado, in that it could be built to do everything. Everything being "Free Flight"," Control Line" and of course "Radio Control". Although RC, not as we know it, this was for rubber band single channel (SC). Just like a Tornado it probably did all of these things without excelling at any one. But just as in Star Trek *"If we're going to be damned, let's be damned for what we really are."* In essence a cheap kit, designed and first marketed when even Airfix models were way in the future.

I know that many think i just threw it together as supplied. Not so, yes, I threw it together, that is true, but not as supplied.

A number of changes were necessary, Firstly it was designed for IC. This meant there was no access to inside the Fuz, for all the necessary gubbins that comes along with cutting edge technology, of electric power. I assume the SC builder was supposed to do their own thing.

The first issue was the amount of dihedral, which was significant, even when reducing to scalish amounts, there is still quite a lot. This caused issues with formers in the Fuz, to an extent that does not now seem possible. Compounded by the centre section of the wing being built into the Fuz. Also the massive amount of dihedral had previously been the cause of "Dutch Rolling" on a Vic Smeed, Playboy i had built and converted to RC and electric. Fine for FF where the model just take care of itself, a different matter when RC and not just drifting with the wind.

My PT19 Cont/d..

May 2019

Article by Carl Brotherton

The wing was open structure, which was amended to fully sheeted, requiring all the wing ribs to be trimmed. There being no spars to talk about, Pine spars were also installed. I did stick with the UC arrangement, a mistake, as after a few flights the wheels moved back and forth by a full 3 inches, when just being held. This has been modified to Beech beams, from Saint Anne's DIY. Now the wire is not stiff enough, which makes for interesting landings. Still needs fixing, one day perhaps.

This bit is a bit boring for some and is perhaps best ignored. Probably the most significant change to the wing is in the area of the Leading Edge. As seems to be common for the era that the kit was designed the entry at the LE, was very low down. This resulted in a high camber profile. The max Coefficient of lift would be at a modest air speed. With high drag if the airspeed were to increase. From the view point of today's RC model a good range in airspeed without a massive sensitivity to drag related to airspeed is desirable. To that end the entry point of the LE was raised, reducing camber. Given that in broad terms that in general the max CL and AoA for stalling are much the same for many sections, we are really talking about producing a drag bucket that is broader. There is another consequence of raising the leading edge, the 0-0 line of the airfoil has been raised, increasing the AoA. On that basis the trailing edge has been raised to make the 0-0 line coincident with the tailplane. The objective being to move to a situation where modest lift and drag is generated, without any down trim on the tailplane, at average speed. Agree or disagree that is what i did. The difference is FF models were often required to fly at modest airspeed, doing lazy circles, drifting down wind, where the modeller did not want to follow the model for miles or have to undertake a cross country run. Where as I needed to contend with a typical howling gale from the Irish Sea (as far as a soft Mancunian is concerned), and also wanting to land in the field I took off from.

Which brings me to the ailerons. The kit as supplied was not intended to have any. Although usefully the drawing was marked with the outline of the scale ailerons. So that is what has been incorporated. I did very briefly consider what impact such big surfaces would have on the servo. But given that the force seen is dependant on area and V^2 and my model would not be a pylon racer, i stopped worrying. The same goes to possible flutter, as this is greatly influenced by the CG of the surface. The wider the surface the further back typically will be the CG. Again i stopped worrying, I have only seen gliders in a dive and the Ripmax Spitfire rudder suffer from flutter. Although with gliders it is probably aeroelasticity.

My PT19 Cont/d..

Article by Carl Brotherton

The CG as drawn was intended to be a long way back for both FF and RC. RC I guess was mainly FF, with intermittent interference by the operator. Even the CL, CG, was a long way back. Given the large Tailplane and adequate moment arm the CG was moved to 30% of average chord. Where it seems fine. I did consider calculating the static margin to obtain a feel of the degree of longitudinal stability, now a days I do not know what it means, so I did not bother.

As for the motive power, or the lack of it , caused me problems, although not so for John Higgens, our intrepid test pilot (no, not mug). John quickly established if the model crashed, that was my problem, there are no guarantees, when trying to fly others quality builds (by my standards). The model was initially underpowered, showing up by a surprisingly heavy left swing when starting the take of run. When straightened up, at the moment of take of the model would yet again swing heavily left and drop a wing. I reconciled myself to a short lived model, as I found flying a model not far from the stall nerve racking. John suggested more power, lots, lots more. On that basis a motor that pulled much more watts was installed. Now take offs are not the event they once were. At the end of the day i must thank John for his fortitude, patience, and good advice in taming a little monster.

As for the kit manufacturer, it was Sterling, a long gone supplier of cheap kits. Models of this era often require a lot of rework, for RC, if not to be confined to good weather or late evening flying, where the model just does it thing.
Hmm must sort that UC, one day perhaps!

Fascinating article Carl - I love the lines of this model

Servo Specifications

May 2019

Article by Brian Holdsworth

An ideal servo follows its input demand exactly regardless of the applied load within its implemented limits of transit speed and maximum torque. In practice, the output position will differ from the input demand by a small error determined largely by the implementation characteristics.

A servo is implemented by an electric motor driving the output arm via reduction gearing with a feedback potentiometer, driven by the output shaft, defining its position to the amplifier, which uses any difference from the input demand to drive the motor to reduce that difference. As the difference approaches zero, the drive is reduced via a process known as damping so that the servo slows to a stop near zero error with practical constraints meaning that some difference will remain. If over-damped, the servo slows too soon and creeps towards the required position. If under-damped, the servo slows too late, overshoots and has to return towards the required position where several cycles may occur, as the servo oscillates around that position resulting in jittery operation. Damping is a very complex implementation problem and analogue servos are usually slightly over-damped, minimising damaging oscillations, but resulting in a soft neutral which generally has limited practical effects; digital servos are inherently under-damped so that a small input change results in excessive output movement making controls over-sensitive to small inputs, often requiring the use of significant exponential to reduce the effects.

The reduction gear ratio is a compromise between torque and speed with some servos available in high-torque and high-speed versions where the main difference is this gear ratio. The physical size of the motor and its consequent inertia means that the limiting transit speed for a standard servo (~45 grams) is about 0.25 seconds; mini servos (~18 grams) about 0.15 seconds; micro servos (~9 grams) about 0.12 seconds. Many servos try to achieve higher speeds, using lower gear ratios, resulting in jittery operation due to inadequate damping. Where gyros are used, the underlying requirements need a very fast servo response (< 0.1 seconds) for satisfactory operation and some small high-speed servos are available with low gear ratios intended for applications such as helicopter tail rotors, but have significantly lower torque ratings than a simple gear ratio comparison would indicate; they are very jittery in operation. Servos intended

Servo Specifications Continued.....

Article by Brian Holdsworth

for specialised applications such as retracts or sail winches have very high gear ratios giving high torque with transit speeds of several seconds.

Inevitably, smaller servos have smaller and weaker gear teeth, which impose an upper torque limit for a given size. They also have smaller, lower-torque motors with a higher winding resistance, which has the useful effect of reducing maximum current. However, a large analogue servo will generally draw less current than a small servo at output torques within the capabilities of the small servo due to the greater efficiency of the larger motor. The difference is less for digital servos since consumption is dominated by their inherent dither. Typically, standard servos have up to 5 Kg.cm torque, mini servos up to 3 Kg.cm and micro servos up to 2 Kg.cm. Where a servo specifies significantly lower figures, it may be due to higher speed or the implementation may be sub-optimal - usually the latter! Moving the servo, while applying a load to the output arm, can identify damaged gear teeth where the servo moves unevenly.

Flutter, where one or more control surfaces, or even the wing or tail, oscillate violently in the airflow, is often difficult to detect and can be very damaging. A significant amount of effort is put into full-size aircraft design and flight-testing to limit its occurrence, since it may only occur once due to the resultant crash! The causes are complex, but excessive gaps in control surface hinge lines increase the vulnerability to flutter, as do flexible linkages and structures. Excessive wing/tail twisting under load is common with many ARTF's, and foam tail planes are particularly vulnerable, even with stiffening carbon rods; an indication of such flexing may be seen where considerable control throws are required to achieve adequate response, with a soft response around neutral (similar to exponential). Damage such as cracking and loosened hinges can occur and even metal gears can be stripped, removing control, which would not be good! Sometimes, it can be heard in flight as a low-pitched buzzing sound, and it is often provoked by a high-speed dive, when closing the throttle and gently pulling out of the dive may be sufficient to stop it. Immediate landing and careful inspection may identify any resultant damage before catastrophic failure. Fitting servos with higher torque capability would have little effect upon flutter potential, although often claimed.

Servo Specifications Continued.....

May 2019

Article by Brian Holdsworth

Servo speed is specified over a throw of 60 degrees after the servo reaches full speed for meaningful comparisons. No load is applied, and some servos show a significant reduction in speed with even light loads. Two figures are generally given, corresponding to the lowest and highest supply voltages, and it will be noted that the speed increase is less than the proportional voltage increase would suggest. This is largely due to the mechanical characteristics of the motor and gears.

Servo torque is quoted at near-stall with two figures as above, and a servo should show a proportional increase with voltage - most do not! There is a fixed voltage drop across the amplifier, so that a 25% voltage increase should produce ~30% increase in torque. Frequently, the higher voltage is greater than the capabilities of the motor so that it is driven into saturation, limiting its output torque and increasing power consumption, and hence heat. The servo also becomes more jittery due to inadequate damping - the implementation problems of achieving adequate damping over a wide supply voltage range are extreme.

The feedback potentiometer is vulnerable to vibration and can wear quickly, especially where the servo is under-damped with consequent oscillations, or for digital servos with their inherent constant dither. Significant production savings may be made by using lower quality components - high purchase price does not guarantee high quality! A simple check is to drive the servo slowly from one end to the other looking for jitter at a particular position - taking 10 seconds or so from neutral to the stick limit, loitering around a suspect position to confirm any suspected deviation from smooth operation - in serious cases, the servo may oscillate visibly at that position. Some servos are so poorly implemented that smooth operation does not occur from new and changes in the normal jitter would identify a fault! Such jitter is likely to be caused by a dirty or damaged potentiometer track where the wiper is not making adequate contact. Problems are often around neutral since the servo spends most time near there; a problem elsewhere suggests flutter of the attached control surface, which may need investigation. A few cycles may cause the symptom to disappear, which is an indication of debris being moved towards the end of the track. This is likely to get worse, since it suggests that carbon is being scraped off the surface which will eventually result in a hole in the track. If it does not disappear, the probable

Servo Specifications Continued.....

Article by Brian Holdsworth

cause is a hole or crack which could lead to an extended open-circuit of the wiper contact causing the servo to drive hard one-way to its mechanical limit with obvious consequences. Any such damage is likely to worsen rapidly. It is more effective to perform such checks immediately after power-up following a period of unuse - movement can obscure a problem by wiping the track as above.

The amplifier is highly stressed and prone to failure, especially where excessive power dissipation causes overheating. One catastrophic failure mode causes the servo to drive to one extreme of its mechanical travel with a greater torque than normal operation, generally causing a crash. The resultant high current drain may cause a fire due to the generated heat and will drag down the supply voltage, which is liable to affect/inhibit operation of the other servos and the receiver. Another failure mode removes the drive leaving the output position unchangeable with consequences determined by the control surface position; surface blow back or flutter may occur where the gears are driven in reverse by the airflow. A variation is where the servo only drives one way with the resultant position likely to be near maximum throw since the flyer, inevitably, is likely to move the controls while attempting to identify the perceived problem.

Problems with double centring can occur, where the position varies according to the last direction the servo was driven, and often only become evident after the servo has been powered for some time. This, initially, results in an inability to trim for straight flight, but may develop into failure as above. A variation, where the servo buzzes, also results in poor centring, especially under load.

A significant number of failures occur at switch-on, so that the standard pre-flight check that all servos can move both ways over their movement range will identify many problems. Some failures only occur after the servo has been powered for some time, with consequently increased internal temperature; later, when it has cooled, the servo seems to operate normally, making fault detection somewhat difficult! These faults seem quite common even with expensive servos. Repair is not practicable, so that the servo needs to be replaced - labelling etc. of the damaged servo would be wise to avoid future confusion allowing its re-use!

Servo Specifications Continued.....

May 2019

Article by Brian Holdsworth

Some transmitters have a cycle option, intended to test the servos, where one, several or all channels are driven through their full range, which is generally of little practical use. There is an obvious danger if the throttle is cycled with an electric motor or where an engine is fitted with a starter. Some include an option to avoid this by excluding particular channels, though it is easy to overlook. Usually, the servos are moved over their maximum throw, which is significantly greater than normally used by travel and trim limits, and so is liable to strain hinges and linkages. As above, a very slow movement is preferable to detect problems.

Back in the Day!

We had about four or five models flying at the time. I noticed a Ford Anglia Police Car and a Police Dormobile Van pull up.

Out stepped several Police Officers. I paid no attention and just turned and watched my mate flinging his model about.

I was suddenly aware that one of the Police Officers was stood next to me. Before I could say anything, he just started walking towards my mate (who was flying the model) with his hand raised shouting "HALT". He had black and white stripped cuffs, so he must have been on or going on point duty (waving his hands at passing cars).

A Police Caution for Control Line Flying

Yes you read that right I once got a written Police caution for flying a control line model, to be honest so did about 30 others.

This was all back in the day when clubs were divided up by interest - Free Flight, Control Line; Radio Control was very exotic in those days, this was in 1961!

So the control line groups in the Manchester Area from a number of different clubs started to meet up at different venues, this really gathered pace and soon we were about 30 strong flying everything Combat – Stunt mostly and of course general Sports models. I was flying a Frog Talisman on the day in question.

So we all met up on some playing fields in Moston Manchester, we had people form Oldham, Whitefield, Bury, Rochdale, Ashton Under Lyne to name a few.

The field that we ended up on was in the middle of two roads with houses on each side, the houses were about four football pitches away in each direction.

So I had just flown my trusty Frog Talisman powered by a D.C."Quickstart Sabre" and I had just launched my mates Wabra 2.5 powered Razor Blade similar to the model above.

Article by John Prothero

Back in the Day Cont/d...

Article by John Prothero

I quickly grabbed him by the arm and said "I wouldn't do that if I was you" he said "Stop you are interfering with a Police Officer going about his duty" (In an Police Officer type voice). Once more he walked forwards shouting "HALT". This time I did nothing, my mate hadn't seen him and the lines made contact with his raised arm causing the model to swing inwards violently, fortunately the lines slipped off his hand and swept over him knocking his helmet off. My mate re-established line tension and control. I said to the officer "he can't land until it runs out of fuel" how long will that take he said, I said "Just a couple of minutes". The Officer said he must be able to stop the engine, he's revving it up to fly it" I said "No its pre-set before we launch once it's in the air we have to wait until it runs out".

At this point my mate grounded the model by flying so low that the prop struck the ground stopping the engine and glided the model round for a couple of laps. Not the best thing to do as this can easily damage the model and doesn't do the engine any good long term.

P.C. Plod then said to us, you have just assaulted a Police Officer and interfered with a Police Officer going about his lawful duty (Once more in Police Officer stereo typical voice). At that moment we were joined by a Female officer who was a sergeant, he said that he was considering charging us she said "Just take down these boys' particulars officer".

We were then told to pack up and not return, a few weeks later I received a Police caution, which said that if I flew a model aircraft on those fields again I was liable for prosecution

Below is a typical Stunt Model.

Now what has all this to do with the price of fish? I hear you say.

I just wonder how much the people making the new legislation understand about our hobby!

Club Instructors

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

Shows 2019

9th June	**Cleveleys Classic Car Show**
14th-16th June	**Weston Park Model Show**
6th - 7thth July	**Cosford LMA**
10th - 11th August	**Elvington LMA**
31st August - 1st September	**Much Marcle LMA**

Club Events

22nd June Fly In

21st July BMFA Scale event

Scale and Aero Show Trophy Event - TBA

May 2019

In Conclusion

Thanks to each and every one of you who so kindly put pen to paper to make this newsletter. I sincerely regret not being able for the time being to get to the field but I will try to get there if only for brief visits with my camera. I cannot believe that having bought the camera of my dreams that it should sit languishing in it's case The other side of this coin is that I have enrolled in various courses to learn about the latest software which I use to process my pictures - it keeps my brain active at least and I can still be at home to look after my better half.

I found the solution to my 'problem' in Phoenix RC simulator - it wasn't the software that was wrong - it was me and a stupid switch I had inadvertently moved to the wrong position on my TX.

I wish you all happy and safe flying and may this weather blossom again for June. Bye for now.

Mark flying his Giant Decathlon - he threw this model around at last year's Fly In like it was a demented Wot 4