BLACKPOOL & Fylde RADIO CONTROLLED MODEL SOCIETY
BRITISH MODEL FLYING ASSOCIATION
LOTTERY FUNDED
AWARDS FOR ALL

Newsletter

July 2015

On the radio this morning they said that it has been the wettest July on record - also, it has been the windiest for the past two decades. Right now, it's p____g (precipitating) which the boring people will philosophically look at the drumming rain and say that it's good for the garden. Sod the garden - we should surely be entitled to something resembling a summer.

In spite of all this, there has been some good flying weather - but not much. I have now replaced the motor in my Multiplex FunCub. The Turnigy glider motor is the biggest they do and it pulls 45 amps. I also bought a 60 amp YEP speed controller which is one of the controllers they recommend for the chosen motor. Now, unlike some of you very clever guys, a speed controller is simply something I fit between the motor and the receiver - it also brings in the power from my LiPo. I was a little disconcerted when I took it to the field. I connected the LiPo and took the model to the pilots box from which I would taxi out. When I opened the throttle, initially, nothing happened. Then, after a significant pause the motor started to increase speed till it had wound up to the throttle setting on my stick. Very weird, anyway, I taxied out in an erratic manner, lined up into wind, fed in the power and again waited for it's wind up ritual before it took off. It became immediately obvious that I had a lot of power to play with (too much power) but the erratic way this new YEP speed controller was working was just a little unnerving.

Brian Holdsworth and John Higgins were at the field so, when I'd landed, I asked them for advice. These are of course the clever people and they soon sussed out that the speed controller was set up for helicopter which needed a slow start to protect the gearbox. Thanks gentlemen for all your valuable help and advice - it was very much appreciated.

I sent off for a programming card (which comes without any instructions whatsoever), checked on YouTube and was then able to follow the procedure to convert it to aeroplane setting. I flew it last Wednesday evening and wow, that model has never flown before in such an exciting fashion. It is definitely well overpowered and the wings do flex now in fast flight. I'll re-set the end point on full throttle to about 60% and it should be just a bit more sensible.

The Wiggo project is under way and I am expecting delivery from Balsa Cabin to be able to start the construction. I've increased the span to 54" - I felt that the 35" span was just a bit small. I want it to be a fun general purpose model - not too light so that it can

fly in a bit of wind. A 54" model can fit easily in the car fully rigged. I will treat this one to some good servos for a change.

Dave invited me down to the site to take some pictures of his new quarter scale Hangar 9 Piper Cub. What a model! It looks superb and it flew beautifully.

Power Sets Part 1

Article by Brian Holdsworth

In this context, a powerset is a combination of battery, speed controller (ESC), brushless electric motor and propeller required to power a model aircraft. To achieve the required performance, the thrust produced by the propeller is that required to overcome the drag generated by the airframe at the desired airspeed with a sufficient margin for take-off etc. If electrifying an aircraft intended for an engine, the propeller size quoted (preferably for a four-stroke/petrol) may be used and a motor/cell count combination selected to drive it at the appropriate rpm.

Airframe drag is very complex and essentially impossible to estimate. The thrust generated by a propeller and the power required to drive that propeller are equally complex. Fortunately, there are some very simple guidelines which have been shown to produce satisfactory results. These are the "Watts per Pound" values and 100W per pound (loaded battery voltage multiplied by motor current divided by flying weight in pounds) is satisfactory for most applications.

Slow flying models may only require about 80W if reasonably low drag but a WW1 biplane with its rigging and consequent high drag will need more. About 120W to 140W seems appropriate for aerobatics with maybe 160W for 3D usage. Depending upon its speed, 160W+ would be appropriate for a racer. Ducted fans are inefficient and are flown at high speed and require 200W+. WW2 fighter types are often flown fast suggesting about 150W, maybe more for those with radial cowls producing high drag. Multi-engine types benefit from greater propeller efficiency reducing the figure to about 90% for a twin or 80% for four-engines. Larger sizes (1kW+) have increased efficiency also reducing these guideline figures.

The typical applications requiring a pitch speed of about 60mph will be considered. Higher speed applications use high Kv motors together with high cell counts and high pitch propellers to give the required pitch speed.

Power Sets Part 1 Continued/...

Article by Brian Holdsworth

The actual current draw of an electric motor may be measured using a power meter - preferably by someone else! Ground running, especially at full power, should be minimized since considerable heat is generated with no airflow to dissipate it so that overheating may easily occur. Static measurements can be misleading since propeller blade stalling may become evident at pitch speeds over about 70mph. The values quoted in modeling press reviews can be somewhat erratic and those in ARTF manuals and on supplier websites are often inappropriate resulting in overloading, overheating and early failure - more sales! Care is needed when comparing propellers since it is easy to assume that a different propeller drawing more current produces more thrust - for instance, using an i.c. propeller instead of the electric equivalent will draw about 50% more current but produce the same or lower thrust.

Programs calculating current draw, thrust etc. for various motor/propeller combinations are available of varying quality but that from "drivecalc.de" seems reasonable with an English version available for free download. The user interface can be frustrating, being reluctant to allow changes to some parameters and not updating the calculated values when some changes are made. However, the results seem sufficiently accurate being derived from theory and actual measurements, with provision to enter additional motor data. Values from this program, confirmed by actual measurement in some cases, are used in these notes.

The APC-E propeller range seems convenient to consider since they are widely available and of reasonable performance up to about 14x7. Higher rpm or larger sizes are likely to overstress the plastic used requiring the use of wood or carbon which are expensive and vulnerable to damage, particularly cracking which can be difficult to identify.

Power Sets Part 1 Continued/...

Article by Brian Holdsworth

A motor being considered may not be in the database but a sufficiently close entry can usually be found. The critical values are the motor Kv, diameter and weight - due to physical constraints, motors differ little so these parameters effectively define the current and power handling capabilities and should give adequate results.

Four strokes are limited to about 10,000 rpm and give good performance in spite of their lower power output compared with equivalent-sized two strokes which generally need to run at 11,000+ rpm; this is largely due to their use of larger propeller diameters with better efficiency at the lower rpm. It seems convenient to load an electric motor to about 9,000 rpm which may be achieved with a Kv of 1000 for 3 LiPo cells (750 for 4 cells, 500 for 6 cells etc); this would unload in the air towards 10,000 rpm. To achieve the pitch speed, a propeller pitch of about 7 inches would be appropriate with diameter to provide the load. Lower Kv values for a cell count would require greater pitch which can result in torque effects being more apparent - for instance 900Kv on 3 cells would require 8 inch pitch.

For higher power levels, it is more efficient to increase the cell count and hence voltage rather than just increasing the current. Thus 300W would be 3 cells and a 1000 Kv motor, 500W 4 cells and 750 Kv, 1000W 6 cells and 500Kv etc.

For all electrical and electronic equipment, the removal of the generated heat is a problem and this can be very significant for the motor and ESC becoming acute over about 1000W. Typically about 25% of the input power becomes heat and 250+W is not easy to dissipate!

To come:- examples, performance with over-size propellers, heat considerations etc.

A VIEW FROM THE HEDGE. (By Will Sparrow)

We all love doing the things we like doing best and, since you are reading this, model flying must feature near the top of the things you like doing best of all. As you know, I love watching you modellers flying your models, I love observing your successes and your occasional mishaps, I like to marvel at your skill and dexterity and am always amazed how you manage to overcome all the little pitfalls that your wonderful hobby dishes up. Even though we love doing the things we like doing best, even the most committed amongst us (you really ought to be committed! – Wise Old Owl) benefit from a break; we need a change of air and, with a bit of luck, a modicum of pampering. I believe that you folk call such breaks "holly-days", although any connection with an evergreen shrub is beyond my feeble comprehension. You lot are a bit difficult to fathom at times!

Sparrows are fortunate in having very extensive family connections and widespread social networks, so I was pleased to accept a long-standing invitation from a distant cousin to spend a week or so as a guest in his hedge. He had promised me a comfy twig, plenty of berries and a couple of nubile young hens to serve my every need. How could I possibly refuse? When I say that my cousin is distant I'm not joking. It took me a full day to make the journey in four long sparrow-hops and then I had to put up with the inevitable delays at "hedge security" – by all accounts there had been a bit of local trouble with those pesky bearded tits. To cut a long story short, I had a wonderful time; I was well looked after, the food was good and those nubile hens… attended to my every need. At the end of my stay my cousin, Severus Sparrow, pronounced me "mentally de-toxed" and ready to enjoy what I like doing best with renewed vigour. He cautioned, however, that I should pace myself and, perhaps, ration the viewing from my hedge. I could see the sense in what he was suggesting and I resolved to only observe model flying on days beginning with "T" – a sort of summer resolution, I suppose.

Well, that's enough of what I have been doing so, back on my twig, I've been able to have a gander at what you've been up to. The weather of late has not been kind to model flyers so the view from the hedge has been a bit limited. One day, however, something both strange and interesting happened; one of your larger members, noted for his total dedication to jets, turned up with… a propeller-driven model! Had jets been forsaken? Had

A VIEW FROM THE HEDGE Continued/……

a seismic shift taken place? Was the grass never more to be scorched? The model in question was a large, blue and white Piper Super Cub. China's best was, apparently, almost ready to go, straight out of the box and was complete with petrol engine already plumbed in and all stickers pre-stuck. The model certainly looked nice but suffered a bit of a problem when a landing light became unstuck. The model also experienced the dreaded "dead stick" and landed in the long grass – it seemed to be little the worse for the experience, though. The engine problem was traced to a kinked fuel pipe (Chinese plumbers!) and, once cured, the model flew again minus its cowl which, for me, diminished the Cub magic just a bit. I hope to enjoy viewing this model again once it has been properly sorted. Conditions conducive to thermal soaring have been as rare as sparrow's teeth this year, but a recent day looked, to me, to hold some promise. Sure enough, I noticed a glider, one of those long-winged beauties, being assembled in the car park, its arrival timed to perfection as the mowing contractor was just finishing his stint. The thermals were not as plentiful as I had hoped, but they were to be found (I wish that I had one of those bleepy things which tell one where to look!). Thermals generally get stronger the higher a model goes and this model was high and in lift. As it circled under a cloud I could see it getting smaller and smaller as it climbed ever higher. It's a good job that you modellers have eyesight every bit as good as mine! Getting out of strong lift can be a bit of a problem (a seagull acquaintance of mine once told me that he was, on one occasion, going up so fast and climbing so high that he thought his feathers would freeze off!); put the nose down and these slippery models quickly accelerate to the point where they self-destruct! What're needed are airbrakes. This model had airbrakes and, in short order, a dot had become a model again. My great grand-pappy sparrow once told me that modellers used to build (their own) models from little sticks and tissue and power them with rubber bands. I found this a bit difficult to believe but, if true, you modellers have certainly come a long way.

By now you must be wondering how I am getting on with my resolve to limit my viewing to days beginning with "T". I'm pleased to report that I'm sticking to the resolution religiously (sparrows don't do religion – WOO)… I only take a view from the hedge on Tuesdays, Thursdays and… Today!

WS

Is It Just Me ?

July 2015

Article by John Higgins

Long ago, when I was just a lad, we model aeroplane enthusiasts (we all seemed to be model aeroplane enthusiasts in those days) used to get our information and inspiration from the hallowed pages of *Aeromodeller* and *Model Aircraft*. These learned, monthly magazines, reportedly printed on William Caxton's original printing press, were eagerly awaited and contained a mine of useful, inspirational material; hints and tips were to be had by the boatload, the monthly plans were always something we would like to build and the technical articles were pitched at the level of an intelligent reader. So, how do modern magazines compare?

I, for my sins, subscribe to RCM&E, Model World and Q&EFI and much of the content of these magazines is driving me nuts! Firstly, let me raise the issue of model reviews. Now, I know that magazines can only review models that are sent to them for review, and if the distributor can sell a few dozen kits (?) on the strength of a review then it is worth their while sending one to the magazines – they very often send the same model to all the magazines so the repetition gets a bit tedious. Economics being what they are, distributors are not going to be sending expensive and/or specialised models for review, so what **do** they send? The answer, as I'm sure you know, is little, foam toys! In the last issue of Q&EFI there were four model reviews; three of the reviews were of little, foam toys while the fourth was a 16" toy helicopter. More than enough to set the pulse racing, eh? July's issue of RCM&E had four model reviews… and all of them were made from… Go on, have a guess. Whilst on the subject of reviews, have you noticed that the reviewer often takes knocking on for a page to describe the box and how everything fitted in it and then a further page or two on how the model was assembled using just two screws and the sticky tape provided? One recent review decried the fact that the 27" foam Mustang under review did not have retracts. Give me strength!

Is It Just Me ? Continued/...

Enough of reviews, let's have a look at some of the other content. RCM&E, that's **Radio Controlled** Models and Electronics, recently had a feature, running to seven full pages, on indoor, rubber/electric, free-flight scale models. Now, don't get me wrong, these tiny models are true masterpieces but what are they doing in a radio controlled model magazine? This particular writer (no names, but his initials are AW) took up most of the first page telling us how he got lost on the way to the venue, found himself outside a Sikh temple and had fantasies about "sitar music, impressive beards and noble turbans"! What's he going to write about next? The free flight nationals, a model railway exhibition, a face-painting symposium? The same writer also has a regular column in the magazine. We just can't get enough of a good thing can we? Duplication also happens across the "Traplet" family of magazines, with the same contributors reporting on the same things in different titles. Admittedly, the words are not exactly the same and the pictures may show a different angle but what we have is really repetition, if not actual duplication. Whilst I'm still in "moan mode", is it just me who finds detailed, multi-paged competition reports boring? The people who were at that soaring competition in Australia already know the results: does anyone else care?

At this point you may be wondering why I bother with these magazines at all. Despite all their failings, there are some nuggets of good information still to be had and the occasional bit of inspiration still to be found and, let's be honest, since we are British, we need something to criticise and deride! Is it just me who feels this monthly angst? Am I a lone "Victor Meldrew" crying in the wilderness? Why not let the editor know your views.

John Higgins

Dave Swarbrick sent me this - it is so good!

Training Evenings at the Field

July 2015

These evenings are held till 9pm throughout the summer months - bring you models down and brush up on your flying skills. An instructor is always on hand to teach and advise.

Shows for 2015

LMA

Elvington Model Show	8th - 9th August
Much Marcle Model Air Show	5th & 6th September

Other Shows

BMFA North West Fly in at Bickershaw	9th August

In Conclusion

Elvington is just a couple of weeks away. This year, I've rented a rather better (and much more expensive) zoom lens. If it proves to give me far better and sharper pictures, I'll buy one. The one I currently use has astonished me as to how sharp a cheap lens can actually be but the focusing is not always all that easy (or accurate).

This year, we missed the Cosford LMA airshow and it sounds like I missed some fun from the reports from guys who were there. The pilots had to take off in a blustery crosswind and that's not easy. Some of the models understandably came back home in a damaged condition.

I so remember the last Weston Park model airshow I went to - it too had a blustery wind which really affected some of the beautiful Dawn Patrol models - some of them 'went in' with such force that they would need a complete rebuild.

If you guys care to buy a copy of the Quiet & Electric Flight this month, you'll find published, an excellent review written by him, on his electric powered Inverza. I say again to him, to Brian Holdsworth, Dave Swarbrick and not forgetting Will Sparrow thanks for your contributions to this newsletter.

I also this month, thank Brian for all the time he spent sorting out my FunCub - it now flies like it's never flown before. It now has a really good spin and of course with the extra power, rolls are so much faster and loops can be as big as you like. It's so lucky that Brian flies mode 1 like me.

Well, that's it for this month - next month you'll see lots of photos from Elvington.

Happy and safe flying to you all.