Newsletter

August 2015

It's that time again - another month has wizzed by and I am again pressing the keys. It has for me been a very interesting month since it included my favourite show - the Elvington LMA. To me, that show just gets better and better - some shows sort of fade, Elvington is certainly not one of them!

This year I rented a lens for my Nikon and it proved to be so much better than the telephoto lens I've been using that I just had to buy one. This new lens allows me to use very much lower ISO which in turn gives higher resolution to the pictures. As a result, it means that I can use the lens at much larger apertures which blurs the background in a very pleasing way.

This year at Elvington was a really beautiful half scale Klemm fitted with a 5 cylinder 420cc radial which sounded so very realistic. I've always loved the Klemm - the design is so typical of aircraft of the '30's. This model had a wingspan of 6.5 metres - no wonder it looked so realistic.

He had fitted miniature cameras to the wings and fuselage - look at YouTube and you'll see the in-flight footage.

Back to the show - on the Friday evening Dave set up one of his highly entertaining 'Quiz's. I think he took the p__s out of pretty well everybody in sight! It was a typically good humoured evening enjoyed by all. It was held in the beer tent (marquee) provided by Steve Pontin-Warltier and who was serving the beer? - our own John Smith. Great night guys.

The next day was glorious all day - sunny all day with a few fluffy white clouds. Dave took his Panther - that's a model I never tire of seeing. This year he flew with another guy who had a much smaller Panther - they put on a really good display together.

I have no idea how many hours this model must have clocked up now but it looks so good - this was taken on his landing approach. Dave also took his Raptor. I'd seen this model during construction but I'd never seen it actually fly. It was well worth the wait - Dave had told me that he was thrilled by it's performance and at last, I now understand what he meant. It also looked really good in the air.

The Raptor - looks like it means business and boy, did that thing perform. It was very fast and yet could be slowed right down for landing.

The other model which Dave took was his quarter scale Hangar 9 Cub which was flown by Jason. It's a beautiful aircraft and looks 'big' in the air.

This is Jason's Boomerang looking resplendent in the afternoon sun.

Mark Conlin gave his usual highly spirited performances with his Viperjet and his Avanti S.

So there you are - the Blackpool Club certainly provided a very valuable contribution to this show. Well done too, to the helpers, Jake and Dave working together with the pilots as a well oiled team.

The result for me personally is that I now own one of these superb lenses - I've tested it and it works just as well as the one I hired. Happy days!

The Navion did a display (full size)

The full size Vulcan displayed for the last time at Elvington LMA

A VIEW FROM THE HEDGE. (By Will Sparrow)

August is a crowded month for us hedge dwellers. You see, at this time of the year, with the nesting season all but over, our hedge has reached what is known as “Peak Bird”. The hedge is throbbing with new life and bursting with lots of new finches, tits and, of course, sparrows. Over the following months the crowding seems to lessen as new birds leave to make their own way in life (leaving many a hen with “empty nest” syndrome), some old birds fall off their twigs for the final time whilst others fall victim to the furred, feline assassin or the dreaded sparrowhawk. On the input side, we do get a few birds from far afield migrating to the hedge and, as long as they fit in with our ways, traditions and customs, they are made very welcome. One such recent arrival, a very pleasant-natured blackbird, brought with him a bit of unsettling news. He had heard, apparently, that thousands of crows, rooks and jackdaws had left their distant lands to the south and were massing just over the water, on the other side of the Ribble, and were dead set on swarming in and taking over hedges such as ours. I find this stuff a bit difficult to believe, but the news has left quite a number of birds in this hedge with a sense of disquiet and foreboding.

Just as July was having her final blow out, I viewed a scene from the hedge which I have not witnessed for many a long day: a new model was to make its first flight! “So what?” you might say, new models making their first flights are hardly news. Models are bought, assembled with the screwdrivers provided and pointed at the heavens on an almost weekly basis. This new model, however, was different. You see, it had been designed by the modeller, built by the modeller and finished by the modeller. He’d made a really good job of it too – not only had he manufactured his own foam wing (the traditional sort, veneered in wood, not the wobbly sort seen so often nowadays) but had also cut his own decals and stuck them on himself! With its Lipo loaded, the little model was hand-launched by a seasoned old member, well-trusted in such tasks, and pretty soon was whizzing about the sky in a spirited fashion. The fun was curtailed after only a few minutes when the motor stopped and the model was forced into making an arrival just short of the strip. The only damage was a broken prop. Despite this set-back, the smile of satisfaction on the pilot’s face was a picture to behold. More of you ought to try this approach, you really should.

Regular readers (Does he have any? WOO) will remember me mentioning the problems of seeing those beautiful, thermal-soaring gliders when they manage to hook good lift and climb to amazing heights. I love watching these graceful birds (!) but if I take my eye off one for a moment I have great difficulty in relocating it. I suspect this might have been the case recently when one of your

A VIEW FROM THE HEDGE Continued….

number was distracted – just for a moment – by a fellow modeller. It's not easy to gauge emotions from my distant perch in the hedge but I know a worried look and a pair of clenched buttocks when I see them! Luckily, the eagle-eyed modeller managed to regain visual contact and all was peace and tranquillity once more. The same day, a fine Saturday morning, saw a small electric model take to the air. Normally, this would not peak my interest as small electric models are hardly rare on the field. What did make me concentrate, though, was the possibility that this might have been the same model that tried to assassinate me a few weeks ago! I couldn't be sure of the model's providence but it was flying in the same erratic manner, just on the edge of the stall, as the winged Ninja of vivid and terifying memory. This time, however, the model ignored me and decided to crash in the corn field. Despite the efforts of the search party, it refused to be found. I have since been told, by one of our feisty new hens, Mathilda ("call me Mattie") Sparrow, that a later search party found the model and carried it off to be repaired.

My mate, Jim Sparrow, nudged me into wakefulness the other day as he had spotted a new model being assembled in the car park. I could see why he was excited; this model was a sleek, high-winged, cabin type with a petrol engine. It was a decent size, too and looked as if it had the makings of a decent glider tug. I flew over and perched on the top of the hut in order to gain a better view. The model was carefully carried out to the pits and showed its appreciation by widdling petrol all down the owner's leg! Once in the pits it soon became apparent that all was not well; there was a lot of fuel pouring out of the model's cowl. Once the cowl was removed the problem became all too apparent – part of the silencer had fallen off during a previous engine run and the hot gases escaping had burnt through a fuel pipe. I can see why your club insists on the presence of fire extinguishers when petrol models and turbines are being flown! I felt sorry for the poor modeller as he returned his model to the car park; not only did he not get to fly his beautiful model, but he had to return home smelling like a petrol pump attendant. Ah! The joys of modelling!

Whilst I'm still musing on the joys to be had on the unleaded side of your wonderful hobby, I've noticed that even some of you ardent embracers of the electric arts have reverted, albeit fleetingly, to petrol power. The joys of spending twenty minutes in strenuous prop flicking, coaxing a reluctant engine into life, must be great indeed; so much more rewarding than merely plugging in a battery and taking off, don't you think? The owner of one large-scale, petrol-powered beauty, that must have taken many hundreds of hours to build and finish, was asked by a club mate, "Did it come out of the box like that?" The owner, smiling sweetly, replied that the model came as a large pile of wood. I'm not sure that he was believed!

WS

UNLEADED AND UNHINGED

Nowadays I do most of my flying courtesy of the mighty electron but, ever so often, I like to get out and exercise my fleet of petrol-powered aeroplanes. I've had the opportunity to do a good bit of oily aviating recently and my petrol stocks were consequently running low. Not a problem, as a visit to Tesco was in the offing.

The scene now switches to the Tesco car park: with the car loaded with shopping, off we went to the petrol station. I put my petrol can on the ground and removed its cap, I opened the car's filler flap, removed the cap with its "you-will-find-it-impossible-to-drop-me" lanyard and placed it in the holder, so thoughtfully provided by the maker. I proceeded to put exactly 5 litres of petrol in the can and then filled up the car. Refuelling done, I put the cap back on the petrol can, stowed it in the boot, got back in the car and headed for home.

The Sherlocks amongst you will already have spotted my omission – I had not replaced the car's petrol cap. The "you-will-find-it-impossible-to-drop-me" lanyard is designed for a purpose and that purpose is not to resist the slipstream created by a spirited drive down the A583! I noticed the open flap and the absence of the petrol cap as soon as I got home. Another lesson had been learned (re-learned?). The need to concentrate at all times does not just apply to our activities on the flying field.

You'll be pleased to know that the local BMW dealer had a petrol cap in stock – a snip at only £19.80!

John Higgins

Power Sets Part 2

August 2015

Article by Brian Holdsworth

A common pitfall in selecting a brushless outrunner motor is to assume that the quoted power capability is appropriate for the intended usage. Motors are generally rated for a range of cells but the power capability is largely defined by the heating of the windings which is determined by the current, not the supply voltage. Thus a motor rated at 400W on 4 cells would only be able to handle 300W on 3 cells. These power values are usually quoted for short durations (~10 seconds) and are of limited use.

Implementation constraints mean that motors of a given physical size vary little in their construction. Thus the size generally determines the power handling and weight. An X mount and propeller adaptor are generally supplied but not included in the size or weight. Some propeller adaptors are bolted onto the rotor end, while others are clamped onto the shaft, which can usually be loosened and knocked through to the other end of the case, reversing the orientation. These mounting variations need consideration for a particular installation.

The Kv rating determines the unloaded speed for a given supply voltage - for example, 1000Kv on 3 cells (loaded 10 volts) would run at 10,000 rpm. Internally a motor contains magnets around the rotor whose diameter, number and length determines the torque produced by the rotating magnetic field created by the windings. The physical size of the windings matches the rotor size and the strength of the magnetic field produced is determined by that size, the applied current and the number of turns. A combination of these parameters defines the Kv value.

Helpfully, most budget ranges use outside diameter and length together with the Kv, which implies the weight and capability. For example, 3536/1000 has diameter 35mm, length 36mm, Kv 1000. For other conventions, the datasheets need to be consulted to identify the capabilities.

AXI uses the internal rotor dimensions together with the number of winding turns, For example, 2814-16 approximates to the 3536/1000 as above.

Hacker uses a base number for the diameter, together with the number of turns and a letter indicating the length. For example, A30-16M approximates to

Power Sets Part 2 Continued/...

3536/1000 as above. The length code has vague logic being S(Small), M(Medium), L(Large) and XL(e**X**tra **L**arge) so that the datasheets are still needed. Larger motors use A40, A50 etc. with different values for the length codes.

OS uses the rotor diameter and magnet length with the Kv; for example, OMA3810-1050 approximates to 3536/1000 as above

EFlite associate the motor size with an I.C. engine capacity. For example, Power 10 is approximately between 3536/1000 and 3542/1000. As motors are flexible in their propeller requirements and cell counts, this is of limited use and causes confusion if modelling press reviews are representative.

The older Turnigy motors use the 3536/1000 format or I.C. engine capacity and seem to have relatively low efficiency. The new SK3 range, claiming higher quality materials, use the 3536/1000 format and seem better though more expensive.

The performance of the budget ranges seems generally similar to that of the brands. However, the motors supplied with many RTF models are poor (matching their inadequately-rated ESC and jittery servos!). More brand than budget motors have been seen with manufacturing defects (loose magnets, lumpy bearings), though for a very small sample size. As the brands are significantly more expensive ...?! For 1KW+, few budget motors are available - the market is small and heat dissipation is a significant problem.

Pitch speed is an important parameter and a simple ratio is [Kv * LiPo cell count * propeller pitch > 20,000]. Lower values may be appropriate for slow-flying models or a relatively unloaded motor with its consequently higher rpm. Higher values would be needed for a fast-flying model.

3536/1000 :- 3-4 cells, weight 105gm, maximum current 25A, peak current 30A, power 450W. On 3S, 9x6 200W 19A, 10x5 235W 22A, 10x7 300W 27A, 11x5.5 320W 30A, note that the 11x5.5 is on the power limit and the 10x5 pitch speed is low though helped by the low loading and consequential higher rpm. On 4S,

Power Sets Part 2 Continued/...

Article by Brian Holdsworth

8x6 370W 26A, 9x6 420W 30A; the pitch speed is considerably higher with reduced propeller efficiency and hence relatively lower thrust.

3536/1400 :- On 3S, 9x6, 390W 38A at 11,500 rpm. On 4S, 8x6 720W 53A at 15,000 rpm (overloaded). The high pitch speed results in propeller blade stalling and low static thrust with the current draw likely to increase in flight. The E2K pylon racing formula defines a Turnigy or Overlander motor, 4S2200 and 8x6 (RAM I.C. version to handle the high rpm) resulting in spectacular performance for the short flight time needed to complete the course, but the overloaded motor has a short life as the magnets fade and the windings char!

Few 3536 motors are available with Kv below 1000 due to physical constraints, though some are included in RTF's and demonstrate poor, unreliable performance.

3542/1000 :- 3-4 cells, weight 140gm, maximum current 30A, peak current 35A, power 500W. On 3S, slightly higher power values than for the 3536/1000, since the bigger motor is less loaded, resulting in higher rpm generating more thrust. Bigger propellers may also be used :- 11x7 370W 35A. Higher performance would be achieved with a 3542/750 on 4S :-11x7 450W 33A; 12x6 520W 37A. Note that less heat would be generated for the 11x7 on 4S than on 3S due to the lower current, though the rpm and hence thrust is significantly greater. The 12x6 is pushing the limit, relying on unloading and hence reduced current draw in flight.

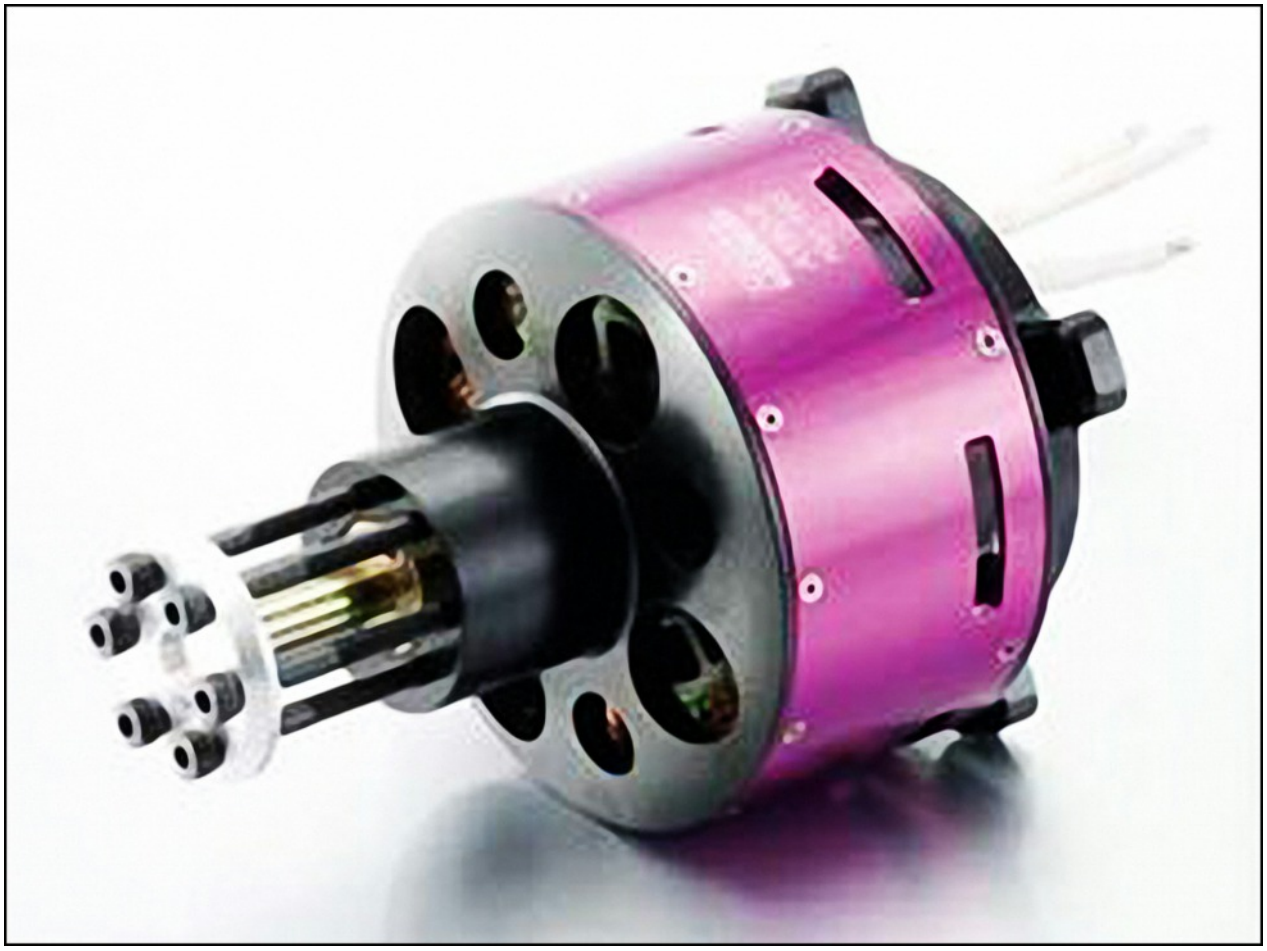
Higher cell counts give increased performance but there are considerations.

The maximum LiPo cell count for F3A aerobatics is 10 cells giving a maximum voltage of 42 volts. Electric shock standards specify significant handling precautions above 50 volts, especially where a high current capability is involved. Since F3A is an international standard, contest organisers could be required to impose these precautions to avoid risking legal liability in the event of an incident. The voltage limitation avoids any interpretation ambiguity! In practice, using 12 cells at 50.4 volts is unlikely to be a problem. Higher cell counts would be a different matter - 18 cells, 75 volts, could be lethal if handled with sweaty hands!

Power Sets Part 2 Continued/...

Article by Brian Holdsworth

When a voltage is applied to a motor winding, the current flow is limited by several factors. The winding has resistance, which is as low as practicable since this generates heat. As a straight length of wire, the resultant current would melt it within a few seconds. The wire is arranged as a coil around an iron core and so generates a magnetic field which opposes the current. The resultant current is referred to as the stall current and is still very high, so would also quickly melt the wire. A rotating motor generates a voltage (back-EMF) which opposes the current. This varies with rpm so that greater currents flow at lower rpm when the motor is loaded. With no load, the current is a small fraction of the maximum current. At higher voltages, more current flows and the strength of the magnetic field increases up to a limit when the iron core becomes saturated. With no further increase in the magnetic field, the wiring starts to behave like a straight length as above generating considerable heat. This determines the maximum voltage and hence the maximum cell count.



Shows/Competitions for 2015

LMA

Much Marcle Model Air Show 5th & 6th September

2015 Nats at RAF Barkston Heath 29th - 31st August

Aeroshow and Aerobatic Competition at the field

This will be held at our field sometime in September - the date is still to be fixed - I will Email as soon as I have that date.

In Conclusion

It's been a really busy month - my Wiggo is proceeding well. The wing is built and ready for covering. I hope, during September, to finish the rest of the structure and then, after really studying Brian Holdsworth's excellent articles, choose a suitable power unit.

At last, I'm getting a far better flying performance out of the FunCub - I've set up my TX to give just 70% maximum power from the motor and it now flies at a 'sensible' speed. I actually enjoy flying that model now - it's becoming a favourite.

My sister in law who gave me that lovely Airspeed Courier (when my brother passed away) has encouraged me to get it in the air - even if I crash it! It's one of those models that I could never ever have built to such a high standard so I've just had it hanging up in my cellar.

Thanks again to John Higgins Will Sparrow and Brian Holdsworth - you guys put so much into this newsletter and I'm eternally grateful.

We have three new members this month, Stephen Warburton, Harvey Myres and and Robert Ellis - welcome to you all.

So that's it for this month. Happy and safe flying.