November 2015

Newsletter

Protect the Winter Crops

If you are unfortunate enough to allow your model to come down in any of the fields surrounding our flying field, please give a thought to the winter crops. Please try to keep to the lines between those crops - don't trample all over them. It is too easy these days to alienate our neighbours and that is something we always want to avoid.

We are aware that a RAV 4 has been seen driving at speed through some of these fields - if you see this guy, do not attempt to approach him/her. If you've got a mobile phone with you, phone Dave Swarbrick and he'll inform the Police.

Our Trip to Cosford Royal Airforce Museum for the LMA AGM

This beautiful picture of a Harrier Jump Jet was taken by Jason using my D300s

Last Sunday, a few of us from the B&FRMS attended the LMA AGM. As always, we were then able to wander around the museum. Because most of the planes are now crowded into purpose built hangers, it is difficult to take pictures.

I was quite knackered so I handed my camera to Jason and asked him to take some pictures. Jason is a really good photographer and he came up with some decent pictures. - I've tried to obscure the distracting backgrounds with a bit of arty stuff.

This is another of Jason's shots.

The Nacelle of an Avro York - it looks so battered and utilitarian.

Bonfire Night at the Field

Article by Dave Swarbrick

The forecast leading up to our annual bonfire night get together could not have been worse, oh you of little faith, the evening of Saturday the 7th Nov. turned into a dry and warm night from about 4.00pm onwards, the wind was from the west and not very strong.

Most of the club stalwarts were present, you know the ones, they always turn up, they always help, they are a good crowd to be with and what's more they bring excellent food to share with everyone.

The revelers started to arrive at about 5.00pm with big pots of soup, hotpot, chicken, beef stew, plus cakes and pies.

I am getting a little bit ahead here as the week before John P. Jim S. and myself were busy

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tearing down an old cabin from one of John's friends. This all went into a giant horsebox that John had borrowed, this was all off loaded at the field in preparation for the bonfire other people had turned up with old pallets and bits of trees so we were looking good for a decent event.

The skies cleared all the clouds went away leaving a lovely starry night, so at about 6.00pm we lit the fire, the wet wood soon dried in the intense heat of the flames and all was looking good for a great time.

Mark Conlin organises the fireworks and again this year they were fantastic. Jason, after last year's successful night flying demo, had made two models with internal lighting and he and young Jake gave a brilliant demo, if you have never seen these models at the shows then you are missing a treat. Jason then followed this with a large Wot 4 XL complete with lights and fireworks, and as this was going on Mark was trying to shoot him down with ground based rockets and flares.

The fire was a success the flying and fireworks was a huge success, the food excellent, (thanks everyone). The only thing as someone said "Where are the members". The reply was who cares "They are not interested in the club." Maybe "Strictly come Dancing" has more appeal.

We will see you next year, or not. We will all be there.

A VIEW FROM THE HEDGE. (By Will Sparrow)

Well, modellers all, it's that time of the year again; the clocks have been put back and the jet stream has positioned itself ready for winter, the barometer seems to be set anywhere but fair and the mercury is starting to fall… But, be of good cheer, if you have done plenty of flying over the earlier part of the year, you will have lots of happy memories to fall back on. Memories that may, perhaps, be already stimulating your creative juices and making you look, longingly, at your building board with a view to building models new. Be like us hedge-dwellers, think of all the good times past, regret their passing, ignore the bind of ever-shortening day and look forward to the good times to come. As Dylan Thomas-Sparrow once put it…

"Good men, the last wave by, crying how bright
Their frail deeds might have danced in a green bay,
Rage, rage against the dying of the light."

Poor old Dylan is, alas, no longer with us; he was musing on poetic thoughts, his head in the clouds, when a cat nabbed him!

Before the light started to die with a vengeance there was plenty of good viewing to be had from the hedge. One fine Sunday morning saw a bevy of petrol planes being brought out to play. Now, as you well know, these beasts can sometimes prove a bit reluctant to start – especially if they have not been flown for some time. I watched with interest as one such model was flicked until it had no option but to start! A relay of brave flickers donned the flicking glove and fell to the task with relish; as one resolute soul fell exhausted and was carried off to recuperate by his club-mates, another worthy took his place. What fun you were all having! You're all really fortunate to have such a helpful spirit within your club.

That little electric glider, you know, the one that looked properly trashed when it crashed in the potato field, was seen flying, good as new, on a nice, calm day not so long ago. It never seems to amaze me what some of you can do with a tube of glue!

A VIEW FROM THE HEDGE Continued/…..

One model I hadn't seen before, seemed, if I was not mistaken, to be about to undergo its first flight. The model, a beautiful pattern plane, lined up into wind, its youthful owner could be seen crossing all his fingers as his father advanced the throttle. He need not have worried; the model flew just as a good model should, the colour scheme contrasting ideally with the blue sky. Once the lad had managed to prise the transmitter from his sire's grasp he too was able to impress all of us watching from the hedge. Big smiles all round were the order of the day.

We were also treated to a return visit of that large, petrol-powered, high-wing model that, on a previous visit to the field, was found to be missing part of its silencer. This time the model had been re-fitted with a large can silencer underneath the fuselage. The exercise proved to be very successful with the model purring around the sky with more than enough power. Done properly, petrol-power need not be anti-social. My mate, Jim Sparrow, was also impressed and said that the model's wonky fin was hardly noticeable from most angles!
It is often said of me that I am really just a big chick at heart: I just love things like Christmas… and Bonfire Night! The club bonfire event is always something I look forward to. I noticed preparations being made well in advance of the day itself. Come the day, the pile of wood was commendably high. You were very fortunate with the weather too. For days, and right up to the evening of the 7th, we had had nothing but rain and gales but, on the evening of the 7th itself, the gale abated and the rain ceased. The fire blazed as members started to arrive, clutching fireworks and items for the buffet. I couldn't get a close-up look – I don't have a night rating so have to remain firmly a-twig in the hedge when darkness falls – but numbers attending did seem to be a bit down this year, compared to previous years. Before the fireworks started we were treated to a display from a pair of brightly illuminated models. This pair put on a display that had us clapping our wings in appreciation. Later on, when the fireworks started, we were impressed even further by a flight from another illuminated model. This model looked like one of those big Wot 4s, but what (Wot?) made this one different was that it was fitted with lights that would not have looked out of place as part of the famous illuminations. The wonder did not stop there, however. Not only could the lights be made to change their sequence in flight but the model was additionally equipped with wing-tip mounted fireworks! To say that this model put on a cracking display would be an understatement: the hedge was well impressed. I'm told that folk in the village reported seeing a UFO over the fields and that the sightings were to be featured on the local TV programme. Yes, if you missed this club event you really did miss a treat. You are very fortunate in having people in your club who are prepared to take the time and trouble to organize such splendid events. I trust that you are all suitably grateful.
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Power Sets - 3

Article by Brian Holdsworth

It is apparent from modelling press reviews and ARTF manuals that many use propellers presenting loads which seem to exceed their motor and ESC capabilities by a considerable margin. Frequently, a smaller propeller would perform better due to its greater efficiency. This is particularly apparent for many Sebart ARTF's though some of their recommendations have been reduced with unchanged manuals.

Motor specifications define maximum and peak current capabilities. Maximum is the greatest sustained current before overheating and consequent damage in the form of weakened magnets and/or charred or burnt-out windings - adequate (unspecified) motor cooling via airflow through the cooling holes provided is assumed. Peak is the maximum short-term (typically ~10 seconds) current before overheating - as this is defined from cold without other usage, it is of limited use, though some seem to assume that it can be exceeded for significant periods and frequently pay the penalty!

It is difficult to determine the temperature of an outrunner motor since the windings are insulated by the case. In particular, touching the rotor gives little indication unless the windings are very hot when it is likely to be too late to avoid damage! Probably, the most effective indication is touching the cross-mount which is bolted to the case where the windings are mounted, though this is of limited effectiveness and often inaccessible. The finger touch rules apply - warm OK, hot marginal, too hot to hold likely to cause damage and too hot to touch probably damaged!

Generally, the greatest current is drawn on the ground and reduces significantly in the air if the pitch speed is only a little greater than the flying speed since the power drawn is proportional to the difference. As ducted fans have a very high pitch speed with blade stalling during static operation, their current draw often increases in flight with consequent potential for overheating - this also applies to "racer" types using high pitch speeds.

Especially for aerobatic types, it is common for excessive power to be implemented so that take-off only requires half to two-thirds throttle and full throttle is generally not used during normal operation. Under these conditions, satisfactory (arguably improved) performance may be achieved using over-sized propellers which would overload the motor/ESC if run on the ground at full throttle - obviously, such ground running would

Power Sets - 3 Continued/.....

Article by Brian Holdsworth

be undesirable! Unloading in the air would, hopefully, reduce the current below limits - exceeding maximum current at the highest throttle setting used in flight is likely to shorten motor/ESC life.

Some seem to assume that a motor draws increasing current indefinitely as the propeller load increases, but this is only the case up to slightly greater than the specified peak current. The windings generate a magnetic field proportional to the current until saturation occurs. Above this, increasing current only generates heat. This has the useful effect of limiting the rpm of an over-sized propeller and hence the current since its load varies (roughly) with rpm cubed. Effectively, increasing the throttle above that producing saturation has reduced effect, limiting rpm and hence overloading. However, this also limits the maximum pitch speed and efficiency is reduced with consequentially increased heat due to the resultant high current. In practice, the motor/ESC should handle slightly over-sized propellers, provided the throttle used in flight remains below the level provoking saturation - inconveniently, that level cannot be determined in practice until distress is indicated via smoke signals!

While motor efficiencies of 80% are often quoted, 70% would be more realistic. This means that ~30% of input power generates heat which is a significant amount, especially for higher powers. The only cooling is via air through the motor holes provided, with an air exit needed, larger than the inlet area. Unfortunately, a typical installation hides the motor in a cowling with a spinner blocking air access into the motor; sometimes scoops are implemented to direct air over the side of the motor which will have little effect. The windings represent most of the motor weight and act as a heat sink capable of absorbing a significant amount of heat; long flights present a problem since sufficient cooling provision would be needed to remove the heat at the same rate as it is generated. Since this stored heat can only dissipate slowly on the ground, ~5 minute delay between flights is suggested to allow cooling - longer for large motors or in hot weather.

The heat sink in most ESC's is only a small, thin metal sheet with the complete unit encased in an insulating heat shrink sleeve. Some larger ESC's have finned heat sinks open to ambient air. Although inconvenient, the ESC should be mounted via its uneven surface, leaving the flat area (the heat sink) exposed to maximize cooling. The heat is

Power Sets - 3 Continued/.....

Article by Brian Holdsworth

generated in the driving FET's which are not bonded to the heat sink, limiting their heat transfer; budget ESC's, especially those in RTF's, are often optimistic in their current specifications and some branded units are suspect! Fortunately, with sufficient margin and cooling provision together with a delay between flights, they seem generally reliable.

The current drawn by a motor is complex and meters show an approximation. A suitable margin should be allowed used over the indicated maximum motor current to determine ESC requirements, so allowing for the significantly higher peaks. For example, 30A indicated would suggest a 40A ESC, 50A a 70A ESC etc. Since heat (proportional to current squared) is the problem, a greater margin may be appropriate for higher currents or over-size propellers. The only disadvantages in using a higher current ESC than apparently needed are its increased size, weight and cost.

Battery usage should be kept below ~70% to allow a margin for unplanned overshoots and higher consumption in windy weather etc. This would mean that, for powered flight duration of 7 minutes, average current should be less than 6C - proportionally less for longer flights. This suggests that maximum current should be limited to about 12C otherwise the available duration of maximum power usage would be too short to be useful. Note that if a battery feels more than slightly warm after use, the current drawn is exceeding its capabilities due to inadequate C rating or age deterioration. Power consumption and hence motor/ESC heat generation is very sensitive to flying style - for a particular model and flight duration, 30% may remain after pattern aerobatics but 50% after cruising flight while 3D may exhaust its battery.

If usage is higher than these figures, the options are less vigorous throttle usage, shorter flights, larger battery and/or a more efficient motor/propeller combination.

The Club's Social Calendar for 2015/16

2nd December AGM. Subs can be paid for the coming year.

16th December Hotpot and Quiz Night. Do please come to this last evening of this year. The 'Quiz' is a very light hearted affair - it's better than going to a comic show! You even get a lovely free Hot Pot supper.

6th January. Jason will give a talk about those impressive **night flying models** - followed by '**Choosing the Right Adhesive**'.

In Conclusion

Congratulations go to Mark Tomlinson who passed his BMFA 'A' certificate for quadcopter.

We invite members to put questions to the committee for modelling questions. We would need your questions in writing at least one week before the social evening so that any investigation work can be carried out and a realistic answer be given. The first meeting in February would be on the 3rd February. So, if you could get questions together on or before 27th January - send them to me p.cathrow@sky.com, I'll pass them on immediately.

I missed the bonfire night - the flu bug I was suffering from yet, again came back with a vengeance - I've just never known such a nasty bug. I think I'm clear of it at long last. On the night of the Bonfire, I had lost my voice and my throat was 'on fire'. No it wasn't man flu!!

Thanks to all you guys who have yet again contributed to this newsletter. John Higgins, Brian Holdsworth, Dave Swarbrick, Will Sparrow and to Jason and John Prothero for pictures.

As ever, I appeal to all of you, this is your newsletter and it's a wonderful hobby - share your experiences, share your knowledge. Please, please contribute to this publication.

See you all at the AGM.