

April 2018

# Newsletter

Strange month, this month. When the weather was really good, Judy and I were 'somewhere else'. I had been so looking forward to putting the Super 60 in the air but that wasn't to be. It always seems strange to me that things you arrange sometimes months ahead turn out to happen just when the weather (and wind) turn good. Enough moaning - at least the Veron Deacon has reached covering stage. That glider motor from Hobby King fitted like a glove after a bit of judicious 'Dremelling' of the engine compartment top block. What would we do without those lovely Dremel tools? I've decided to install a closed loop to control the rudder and the covering will be Litespan.

Speaking of coverings, John Higgins sent me this concerning Solarfilm:-

*Just out of interest, it is still possible to obtain Solarfilm products directly from them. I've just taken delivery of a large roll of Solartex - I really did not want to have to go back to nylon and dope! Have a look at [www.solarfilm.co.uk](http://www.solarfilm.co.uk) for all the details. They tell me that there is enough stock for 12 months supply on almost everything. The sales are only to modellers direct and not to the trade. Flyer readers might be interested.*

Thanks for letting us know John.

Another John - this time, John Prothero has been at his villa in Florida and you'll be seeing his report of of what sounds like an absolutely amazing airshow he was lucky enough to get to out there. He said that he camera had started to play up so he forked out for a new cheapo digital camera. This thing cost him about £150 - just look how good his pictures are. These are absolutely fabulous photos. It's a SONY DSC WX350 - an amazing bit of kit! That photos has not been sharpened by me in any way.

Thanks John for the pictures - and your interesting report.



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## A VIEW FROM THE HEDGE. (By Will Sparrow)



Easter is that time of year when you all seem to be obsessed with guzzling chocolate eggs – an activity that I have never understood, but deep-rooted in ancient pagan rites, I believe. For us in the feathered community, however, eggs have an entirely different context. It's the same every year, as soon as Easter comes around all the hens start becoming distracted and giggling for no apparent reason, the cock sparrows start to have a twinkle in their eyes and start looking at the hen sparrows in a new light (stop giggling on that twig there!). The nesting season is fast approaching. As long-term readers will remember (he should be so lucky! – Jim Sparrow), I'm regarded as the hedge FSG (Feathered Sex God) by just about every hen sparrow in the locality. I've really no idea why this should be, but I'm assured that it is so. (It is true... and none of us understand it either – JS). Why I, as a, shall we say, mature (more like moth-eaten! – Wise Old Owl) sort of bird should deserve this accolade really is a mystery, after all, it now takes me all day to do what I used to do all day! Still, as long as the hens are happy then so am I.

Sunday, 1<sup>st</sup> April was a beautiful flying day and lots of members turned out to take advantage of the benign conditions. The ground was still a bit on the soggy side but once the models freed themselves from the muddy suction of mother earth the sky was there to enjoy. I did notice the presence of one or two members whom I had not seen since last year. It's often said that flying a model is a bit like riding a bike; you might get a bit rusty, but you never forget. I was pleased to see that members who recognized the probable presence of rust on their thumbs had the good sense to have someone stand by them as they took their first flight of the season. Everybody had an enjoyable time, there were no crashes and, despite the date, no one made a fool of themselves!

A few days into April, on a lovely, sunny, light-wind weekday I was semi-dozing on my viewing twig; there were only a couple of members out enjoying the day, so the activity was hardly frenetic. All of a sudden, I was jerked from my reverie by the sudden appearance of a fast-moving dot that was approaching the strip from the northwest. The "dot" was emitting a high-pitched buzzing noise: it was a drone! The interloper buzzed just past the western edge of the strip at low level – lower than fifty feet, I would guess – and disappeared from my view



## A View from the Hedge Continued/...

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behind the trees, heading towards the road. I immediately took off, so as to get up high for a better, bird's eye view, but I could neither see the drone nor anyone who might have been operating it. Was it a rogue drone that had escaped its master? Was it being illegally flown from a nearby location by someone who had no idea of the law or cared little for it? I have no means of telling but once settled back in the hedge I must confess to feeling some unease.

As a rule, all forms of model flying hold some degree of interest but it is only occasionally that something out of the ordinary presents itself (and I don't mean a flying witch or a foam fish!). One fine Sunday morn a chap, whom I had not seen before, (a new member?) turned up with a little, foam, V-tailed glider. Nothing new there, one might say, but when the throttle stick was moved, a small ducted fan mechanism emerged from a hatch in the top of the fuselage. Further movement of the throttle stick started the fan, the model took off from the ground and proceeded to put on a spirited display of aerobatics; thrust was there in plenty. Pulling the throttle stick back stopped the motor and the last bit of stick travel retracted the fan unit. The model, now in glider mode, did a nice approach over the hedge followed by a faultless landing on the strip. This jaded bird was very impressed. Self-launching gliders are not new, but arranging for a large propeller to stow itself back in the fuselage is not easy to achieve. Ducted fans, on the other hand, are small and hide themselves easily. As I say, I was impressed.

By now, spring will have well and truly sprung and the six months or so of grotty weather should be behind us. The fields around us are showing the first green shoots of the new farming season and the good news is that this year's crop is cereal and not the dreaded maize. We have been promised that the track will be levelled too, so that you will all have easy access to the best flying field in this neck of the woods. So, it's time to put the finishing touches to your new-seasons models ready to provide me with my 2018 flying fixes. I should be back on my viewing twig shortly but, just at the minute, I have a twig full of giggling hens to attend to...

WS

## New Members

We are pleased to welcome back Steve Stuttard and Harold Dowbekin to the fold.

# Sun'N'Fun - Florida

April 2018

Article by John Prothero

On my recent visit to Florida I had the opportunity to visit Sun N Fun, one of the biggest airshows in the USA. We arrived at about 9 am and parked the car in what can only be described as a sea of cars, I parked near the entrance so that not only could I find the car again but could escape when it was time to leave.

It was a typical hot Floridian day, very few clouds with just a light breeze, so I had plenty of factor 30 sun cream slapped on, plus' my "Tilly Hat" and shades to keep the sun off.



As we entered the show went to the International visitors reception, the UK representative wasn't around so the Germans grabbed us and registered us and took our photograph holding a Union Jack.

We then entered the show proper, we were greeted by the sight of hundreds of aviation orientated stalls selling everything from headsets to classic Piper Cubs and so much more, it was difficult to it take all in.

The flying show started with a free fall parachute jump by a serving marine who had smoke on and was being circled by a Pitts Special also



*I knew that Corsairs had big props but that big!*

# Sun'N'Fun - Florida

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with smoke on. As he landed a band struck up the stars and stripes and someone sang the nation anthem national anthem, everyone faced the flag with their hands on their chests, very patriotic!

I am not going to try to describe the flying in detail but there were a few stand outs, we were about half a mile away from the flight line looking at a line up of around 20 classic Beechcraft Staggerwing biplanes all polished with in an inch of their lives. When a fast jet turned up, he did the usual fast jet demonstration, then made a very fast LOW run he must have been just under supersonic speed as the aircraft had a conical shock wave about 1/3 of the way down the fuselage. He flew past followed by a deafening ripping noise, he then climbed vertically, pulled to inverted, pulled so that he was very low, now with the undercarriage and flaps down at very low speed, then he opened the taps again and performed a dirty roll at show centre! This was followed by whoops and cheers from the crowd, Americans will high five the salad arriving, that is how easily pleased some of them are, but even I got enthused about that display.

We were then treated to a very enthusiastic display by an Extra flown by a 22 year old. I have never seen a full size aircraft flown like he flew this, lots of negative "G" manoeuvres! Including inside and outside multiple flicks, extended tail slides, which just powered out of!

I cannot describe the scope of this show, I have been to some airshows in my time but the sheer scale of Sun N Fun is breath taking you really need to spend 3 days but even



# Sun'N'Fun - Florida

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*John took some very good photos - I just chose these of the many he provided me with.*





# Batteries

April 2018

*Article by Brian Holdsworth*

The usable capacity of a rechargeable battery reduces with each cycle and the elapsed time since its first forming charge. Similarly, the ESR increases. These should deteriorate slowly so that a noticeable change over a few flights indicates a problem requiring replacement! These effects vary with the chemistry. LiPo's have a relatively high degradation per cycle so that they offer only about 100 cycles before replacement may become appropriate; however, self-discharge rates are normally very low. NiMH's claim up to hundreds of thousands of cycles, but such claims are often more advertising hype than reality, so about a thousand would be more realistic in radio control applications. Their self-discharge rates also increase, though this is not usually a significant problem unless a battery is left for several months after charging which is unwise for other reasons; the much-advertised Enerloop batteries seem no better at these high discharge rates. NiMH's will be warm after charging but, otherwise, a warm battery (of any chemistry) is an indication of a problem or usage beyond its capabilities.

The degradation rate is dependent on how hard the battery is being discharged so that restricting the maximum current draw and capacity usage can improve their life considerably. As with many electrical characteristics, limiting usage to less than 70% of a parameter helps reliable operation. The effect is particularly noticeable for NiMH's where transmitters, especially with the lower current drain of 2.4 GHz systems, give few problems, but airborne installations with their relatively high transient servo currents can be problematic.

The average current drawn over a flight determines the capacity taken from the battery and, multiplied by the number of flights intended with a suitable margin added, defines the minimum battery capacity required. Transmitter usage is reasonably easy to estimate, but airborne usage is more difficult, since it varies with the servo type and control usage - in practice, it can only be estimated by monitoring the capacity returned to the battery when charging.

The peak current is the maximum smoothed current when the servos are moving under load. Again, it is dependent upon the applied load but an indication may be assumed to be when each servo is near-stalled. The figure is largely determined by the motor resistance, winding inductance and the back-EMF generated by its rotation. The current drawn when stalled may be reduced by the servo amplifier implementation, so this may not be an adequate indication. Meters are available which can give an indication of current



# Batteries Continued

April 2018

*Article by Brian Holdsworth*

drawn though applying a suitable load is not easy, especially for larger servos. Smoothing is required for meter operation but, inevitably, hides the considerable current fluctuations.

The transient current is the greatest current drawn at any time and is impracticable to measure without very expensive equipment which is, perhaps, why it is rarely mentioned but, unfortunately, this is the cause of many problems. The current drawn by a motor has a complex waveform so that its transient current will be about double that indicated by a meter due to the smoothing required for meter operation. The duration may be less than a few microseconds, but the effect on the battery chemistry is essentially the same as for a continuously applied load.

Similar effects apply to the current drawn by an electric flight motor, with a different battery generally used for each flight.

LiPo's have C ratings indicating their current capability usually in the form 20C/30C, where the first part is the maximum continuous rating and the second is the maximum for a short period (a few seconds). This second C value should be ignored and the maximum measured current limited to somewhat less than the first value to allow for the transients. For a 2200 mAHr battery, a load of 1C (2.2A) would completely discharge it in one hour; 10C (22A) would take 6 minutes. These ratings, especially those over ~40C, should be treated with caution as often more advertising hype than reality!

There is a particularly awkward failure mode where a battery suddenly seems to lose its charge. Pre-flight checks can be performed satisfactorily but, part way through an early flight in the session (often the first), the radio stops working with inevitable results. Obviously, fail-safe operation would be inhibited by this loss of power! Similarly, for an electric flight LiPo, the motor loses power or cuts out shortly after takeoff. Investigation shows a flat battery even though it had been charged earlier.

The cause seems to be crystal growth within the cell, triggered by the relatively high load current, and has an equivalent effect to shorting it without generating heat. If left for some time, the battery voltage can recover to near nominal as shown by a meter, though it would collapse immediately under load. The problem has not been seen in batteries used in transmitters, suggesting that a major cause is the high transient currents drawn by the servos or flight motor.





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# Batteries Continued

*Article by Brian Holdsworth*

NiMH's generally have well-matched cells with the unfortunate consequence that all cells are usually affected simultaneously, producing a catastrophic voltage loss. LiPo's often show considerable variations between their cells, so that only one cell was affected in the examples seen.

Unfortunately, no tests have been identified to predict the occurrence of this problem. An affected battery can often be re-charged and appear to perform adequately, including cycling, for some time before failing again. If a battery is found to have lost its charge, it would be wise to discard it! It seems to be time-dependent, becoming more likely after several years usage, suggesting NiMH replacement after two to three years. While this will result in some batteries with considerable remaining useful life being discarded, the potential consequences of this failure mode suggest that it would be worthwhile - compromise!

"False-peaking" of a NiMH or inadequate charging could give similar symptoms, since the battery would only be part-charged when expected to be fully charged. However, such battery flattening would be more likely to occur after several flights rather than the first.

For a LiPo used in electric flight, the reduction in capacity may be identified by monitoring the decline in percentage capacity remaining after flight with a suitable meter, providing the power usage per flight is sufficiently repeatable; the capacity returned to the battery would be unchanged. As the ESR increases, the battery output voltage is reduced by the greater drop from the ESR, reducing motor output so needing the throttle setting to be increased to compensate. This draws more current and also reduces the capacity remaining after flight. The capacity returned to the battery would be increased. In practice, the two effects occur together and combine to reduce performance.

At some point, the ESR may become too high to provide the desired performance or the usable capacity too low for the desired flight duration. Such a battery may still be adequate for a lower-powered model or shorter flights. Determining end of life using a percentage change in capacity and/or ESR is rather arbitrary and likely to result in discarding batteries with considerable remaining life, though good for sales!



# Batteries Continued

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*Article by Brian Holdsworth*

Meters measuring LiPo/LiFe/Lilon battery and cell voltages, generally with percentage indications, are widely available at about £10 - £15. Many seem to be the same meter with different labels and packaging. Usage after flight is recommended as a practical method of determining remaining capacity, so that flight time etc. may be limited to avoid the battery being over-discharged, which would damage it and risk the model (and property/personnel) in the resultant forced landing. Usually, they also have a J plug connector for NiMH's with warnings in their data sheets about usage.

Meters measuring motor current are available, but their usage can be problematic. Ground running needs to be minimised to avoid motor and ESC over-heating, which is likely within a few seconds at full power. The readings can be misleading if the propeller blades are near to stalling, which becomes likely for pitch speeds over ~60mph - i.e. most! Ducted fan blades will be stalled on the ground and their flight current considerably higher - maybe double! Downloadable programs are available to calculate the current draw for cell count, propeller and motor KV combinations although the specified KV values are not always accurate...!

LiPo's demonstrate a characteristic where the battery puffs due to excess gas within the cells, which can increase its depth noticeably. This gas generation within the cell seems to be expected, and some suppliers state that up to 15% increase is likely, suggesting at least 20% size margin should be allowed in the installation so that it would still fit! NiMH cells include a vent in their metal cases so that excess gas can be released, but a vent can allow atmospheric moisture to enter which would be unwise for lithium chemistry. Thus, lithium cells are sealed and their plastic cases stretch under gas pressure, producing the puffing seen. Some batteries, often Lilon and LiFe, enclose their cells in a rigid case, which can hold the pressure, but this increases size, weight and cost.

Puffing should only become evident after 30+ cycles. A visible change between the start and end of a discharge is an indication of problems and suggests that the battery should be discarded immediately. Such a size increase would also strain the Velcro straps commonly used to retain the battery in the model - a loose battery would be liable to batter its way out of the model with obvious consequences. Eventual puffing towards a circular cross-section looks alarming and can cause installation difficulties, but does not seem to be an indication of future failure - the plastic cell cases are impressively tough!

# Scene at the Field

April 2018



*John Higgins flying his Sebart Katana immaculately - everything he did was so smooth and precise*



*Allan Bates with his highly impressive 'Beast' - very exciting.*

April 2018



*My maiden flight with the Eflite Pulse - thanks to Allan Bates took this picture on my camera.*



*Carl Brotherton flying his lovely Albatross - in my opinion the prettiest WWI design.*

April 2018



*This is David Kirkbride's Kyosho trainer just after rotation.*

*Justin's Magnum flew very very fast powered by a JEN 57 on a 9" x 10" prop*



*The launch*





## Club Instructors

April 2018

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

## Evening Flying at the Field

Evening flying at the field commences from Tuesday 1st May through till 30<sup>th</sup> September to Tuesday, Wednesday and Thursday evenings till 9pm. Wednesday evenings remain as Training evenings. On Tuesday and Thursday evenings, electric only after 8pm - no I.C.

## Upcoming Events/Shows

**Sunday May 20<sup>th</sup> Fly In at the field BBQ, Music - Minimum proficiency BMFA 'A' certificate, 'B' certificate for Jets.**

**Sunday 10<sup>th</sup> June Cleveleys Classic Car Show - B&FRCMS will have stand once more in a prime position - the BMFA are letting us borrow their Flight Simulator which may attract new members to our Club.**

**June 15<sup>th</sup> - 17<sup>th</sup> Weston Park Model Airshow**

**Sunday 24 June is the Club's 60<sup>th</sup> Anniversary - more details will follow concerning the celebration of the date. If the weather is crap - that date may be moved to 1<sup>st</sup> July.**

**July 7<sup>th</sup> - 8<sup>th</sup> Cosford Large Model Airshow**

**Sunday 2<sup>nd</sup> September Competition for the Aero Show and Scale Model Trophies**

**August 11<sup>th</sup> - 12<sup>th</sup> Elvington Large Model Airshow**

**September 1<sup>st</sup> - 2<sup>nd</sup> Much Marcle Large Model Airshow**



Sponsored by the BMFA



# Fly In 20th May 2018

Superb grass flying Strip

BBQ

Music

A great Day Out



Come and join us at the Blackpool & Fylde RCMS 'Fly In' at our Weeton field. Flying commences at 10am. Whether you fly a WOT 4, a scale model, a jet or a large model, you will be welcome.

BMFA insurance and a minimum of a BMFA 'A' or 'B' for jets. LMA guys with LMA proficiency certificate.

50% Discount Membership Fee for new members joining on the day



*Flying site at Singleton Road, Weeton, PR4 3NB*

*Contact Allan Bates on 07807 227656 or*

*Email on [adbates67@gmail.com](mailto:adbates67@gmail.com)*

*Visit our website [www.blackpoolmodelflyers.org.uk](http://www.blackpoolmodelflyers.org.uk)*

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*Allan Bates flying his Beast on Saturday - what a display - brilliant*