Newsletter

April 2015

Spring has sprung and it is at last getting that bit warmer. I fly electric only and I'm finding that some of my LiPo's have lost their sparkle and have reached the end of their useful life. I was talking with John Higgins about LiPo disposal and he told me that the recommendation as regards LiPo disposal has changed. I've always discharged the cells and then dropped it/them into a bucket of salt water for a couple of weeks before disposing them with my normal black bin rubbish.

Bob Smith has written an booklet entitled '**THE SAFE AND EFFECTIVE USE OF LITHIUM POLYMER BATTERIES IN MODEL FLYING**' under the BMFA banner. He writes:-

Disposal of used lipo batteries. *When a lipo reaches the end of its useful life it should be disposed of in a responsible manner. The unfortunate aspect of this is that the definition of ideal disposal is very unclear. One thing that must be stated is that* ***the widespread suggestion that disposal should be preceded by degradation in a bucket of salt water is not now recommended****. This process adds Lithium salts to the water, and the disposal of this through our normal drainage systems is likely to affect the work of our Water Authorities, who use Lithium as a trace element when locating leaks. At the time of writing, the best available disposal procedure is via the local authority Environment and Waste department, but not through the weekly collection. Most authorities have a web-site where you can find the location and other details of their waste re-cycling collection system and this usually includes a collection point for spent batteries.*

The lipos you wish to dispose of should firstly be discharged to a minimum voltage. In this case you can afford to drain them as near to zero volts as possible. Do this in a controlled manner using a suitable resistance matched to the battery so that neither the battery nor the resistance overheat. DO NOT attempt to discharge the battery by shorting the leads for reasons previously covered. Once the discharge is complete, the batteries should be placed in a stout cardboard box or similar, bound with tape, labelled with "SPENT LITHIUM BATTERIES FOR RECYCLING" and transported to the local authority Household Waste Recycling Facility where there will almost certainly be a location specifically for such items. There is also the National "Battery Back" Scheme under which battery retailers are obliged to accept returned spent batteries from their customers, and model shops are included in the scheme. If you wish to take advantage of this arrangement it would seem sensible to confirm that your local shop takes part in the scheme. The procedure is clearly less convenient if your batteries have been purchased by mail order.

So there you have it - strangely, the BMFA Handbook still says that you should dispose of LiPo's in a bucket of salt water! I will nevertheless follow this new advice for future disposal. So I have now purchased my replacement LiPo's - ordered them from HobbyKing one morning and got them the very next morning - great service!

We have been approached by a company who train commercial multicopter/UAV pilots. They have a branch based in Blackpool. They need a suitable field to carry out the final flight assessment. The would be pilots have their first day learning all the legal requirements and theory. The second day they must produce their operation plan and present proof of their insurance and present all their paperwork to the course examiners. All of this is carried out at their Blackpool training facility.

It is for the final day that they need to come to the flying site where they will be given their flight task. They are under the control of their examiners. They then have to carry out a short flight after assessing the flying area and writing an acceptable flight plan.

They are not allowed to practice flying - they just fly their pre-programmed route at their pre-programmed height which takes around 12 minutes actual flying time. There could be up to three trainee pilots taking the test at any one time which would therefore affect our flying by about one hour. They would bring one batch of three members in the morning and, if they have further trainees, three more in the afternoon. One of us would accompany them at each visit.

This could happen once each month. What we as a club would potentially get out of this would be a very welcome fee which could be the equivalent of having ten or more new members but without the field usage that ten members would be likely to take. For this reason, we are considering allowing them to use our filed on a trial basis. It would only happen during the normal working week and between 9am and 5pm but at times specified by us. There are lots of 'ifs and buts' to all this because it depends how popular their course is as to whether the arrangement will be a success but potentially it could be really good. We know that organisations such as the TV companies, the Police and Fire brigades are making more and more use of these things.

We'll be discussing it further with you all at the next social evening 6th May.

And now for something completely different. I've bought myself a new (2nd hand) camera body. It's much tougher than my Nikon D90 - it's weather sealed and is a magnesium bodied semi pro body. It's very much heavier but very much better balanced with the long zoom on it. It's obviously early days but the pictures on the next couple of pages were taken with it. At least this will last a whole lot longer than the D90 could. Thanks gentlemen for doing all those low fly pasts.

Scene at the Field

Lee Connor's Beast looks impressive

This is Justin's Ripmax Spitfire - why did Ripmax stop selling these - such a good model.

Scene at the Field

Jason enjoying his WOT4 FoamE

Wing commander Higgins with his Sebart Sbach

Model Restraints

April 2015

Article by Dave Swarbrick

With regards to model restraints, yes it is a good club rule to restrain your model, I know because I got it through the committee when I was safety officer.

I think care should be taken with some of the newer or more recent designs that have been produced for lightness and extreme flight. They tend to be powerful engines both IC and electric (Scotty's big Slick model is a good example) It was 3 meter wingspan with a 150cc engine and weighed in at less than 7kg.)

It was a very light but strong structure, but restraining that by the tail plane as is common practise could have been quite dangerous if the engine had been taken to full throttle and held by only the tail plane.

A few years ago when some of us flew 1/3 scale aerobatic models with at the time large engines of 60cc the models weighed 10+ kg and were built like brick outhouses and we saw then tail plane damage from this method of restraint. With a large model it is best to restrain it with a competent helper who is not afraid of the engine or model. I think the problem with John's scenario is that the guy just got anyone to hold the model other than a capable helper.

I know posts or strap restraints are good for most models and you should use them, but things change and what was ok on small or average sized models does not mean that they are safe for all models.

Dave's advice follows the problem which John Smith outlined in last month's newsletter:-

'An expensive electric model was being checked out,the model was being restrained by a non modeller the throws checked and engine run up, this was a big model with a £130 prop i.e. CARBON, as the throttle was opened the guy who was supposed to hang on panicked and let go, the model nosed over and chipped that expensive prop. What lesson have we here. USE RESTRAINTS LIKE IT SAYS IN THE BOOK. How many are guilty of not doing so. It says ALL models, but its good for trade!'

NiMh Batteries

April 2015

Article by Brian Holdsworth

Nickel Metal Hydride (NiMh) batteries are widely used and are generally reliable, though sensitive to charging errors. It is noticeable that receiver/servo batteries are more troublesome than those used in transmitters, perhaps due to the widely varying demands from the servos. Due to their flat discharge curve, monitoring the voltage is of little use to determine charge state; even after a complete discharge, the voltage recovers quickly and remains high under load for a short time before collapsing. As for all re-chargeable batteries, some capacity is lost with each cycle; thousands of cycles are claimed, but practical experience suggests that hundreds would be more realistic allowing several years usage.

Due to their contents being somewhat hazardous, the original Nickel Cadmium (NiCad) batteries were phased out many years ago, and became illegal to manufacture and sell. Any still being used should be replaced immediately as being long past their time! They remained in widespread use since they showed little voltage change during discharge, better than other types, and so were well-suited to radio control applications; they were also tolerant of over-charging.

AAA cells are available with relatively high capacities but these are intended for long-duration, low-current applications and are not appropriate for radio control usage since they cannot deliver the required currents - as some have discovered! The current capability is determined by the physical cell size, not the capacity. The standard AA cells seem adequate for most users up to 4/5 standard servos, but Lithium cells with their higher current capability would be better for larger models using a UBEC or similar regulator to avoid their higher voltage causing problems.

There is a long-standing myth regarding "memory effect" of NiCad cells which suggests that successive shallow discharges results in capacity loss which can be corrected by cycling. This has been perpetuated by being mentioned in many manuals, and probably originated in attempts to explain the poor battery performance in some early satellites, though the actual problem was inadequate charging. There is a characteristic with most battery chemistries where frequent usage seems helpful, effectively stirring the chemicals; prolonged inactivity (months) can temporarily reduce the effective capacity and current handling capability which some may identify as "memory effect".

NiMh Batteries Continued..

Article by Brian Holdsworth

Another myth suggests that NiMh self-discharge is a problem with claims of 30% loss within weeks. This was the case for the earliest examples but was overcome before they became widely available so that they now perform at least as well as the original NiCad. Neither retains charge very well after a few months which is why lead-acid is still preferred for applications such as emergency lighting.

Both demonstrate a form of "super-charge" after charging giving higher voltage and hence greater output power capability which decays quickly; this can be equivalent to as much as 30% but is due to a very different effect. Inevitably, this higher voltage would adversely affect the receiver and servos resulting in erratic operation until the voltage reduces. A delay of a few hours between charging and usage will avoid these undesirable effects - charging immediately before use is thus not recommended since it can also cause other effects including early failure. It was particularly apparent when NiCad batteries were charged at high rates (3C) with a peak-detect charger, and was very useful in providing an additional boost for take-off which often made the difference between success and failure for early electric flight applications, encouraging field charging immediately before flight.

The cells include a vent to relieve excess pressure in the event of over-charging or excessive discharge. "Black-wire" corrosion of the negative wire was a frequent problem with the original NiCad button cells due to their vents being at the negative end of the cell so that any venting released corrosive chemicals over the wire encouraging corrosion. It is a similar effect to that affecting the positive wire for lead-acid batteries as used in cars etc. where it has been overcome by the application of a suitable grease. NiCad chemistry is alkaline so that the negative wire is affected. NiMh is less alkaline so that the vulnerability is reduced - but not eliminated. The blackening spreads along the wire from the battery through the plugs and switch, and has been seen to reach the receiver and attached servos, corroding the circuit boards. It can increase the wiring resistance but the effect is very intermittent so that it is essentially impossible to detect by resistance measurement. If the wiring insulation is stripped back, the negative wire may be seen to be blackened; crystals may also be seen on the cell end by the tag. No reliable tests have been identified - in particular, cycling with capacity monitoring is unlikely to be helpful. Sometimes, an indication may be seen when examining the battery connector where the negative socket may

NiMh Batteries Continued..

Article by Brian Holdsworth

be darker than the others; this simple check is worth performing, particularly at the beginning of the season, but, unfortunately, lack of visible darkening does not guarantee no corrosion! All too often, the first indication is when sufficiently high resistance in the wiring causes radio shut-down and loss of control; often, the equipment performs correctly afterwards. Very few examples have been seen in transmitters suggesting that usage is a factor. It is an electro-chemical effect but the causes are not well understood. Damp conditions increase the vulnerability, so that storage in stable dry conditions is recommended which is desirable for other reasons. It may also be wise to unplug the battery if unused for a significant time - if only to minimise the consequences.

Sometimes, a condition develops resulting in a significant short-term loss of capacity. This may show itself when radio failure occurs a couple of minutes into the first flight of the day with subsequent investigation identifying a flat battery. No indication is apparent until some charge has been taken from the battery, so all seems fine during pre-flight checks. The cause is thought to be internal crystal growth, triggered by the discharge, shorting the cells. It is very erratic in occurrence and so is nearly impossible to identify by testing. Experimentation suggests that the effect surfaces at least a week after charging but often within two weeks; the subsequent charge seems to clear it with normal functioning until the next time! The literature suggests that this is a known characteristic and is probably a major reason for the general advice to charge the night before flying, which seems to avoid the effects. However, if the condition is seen, replacement would seem wise!

Batteries are supplied in a partially charged state and are best trickle-charged at C10 (100mA for a 1000mAHr battery) for the first 18 hour charge as usually stated on the label; this over-charge forms the chemicals into their desired state for optimum performance.

Unlike the obsolete NiCad's, NiMh batteries are vulnerable to over-charging which can reduce their capacity and increase the possibility of problems. Trickle-charging overnight (8 hours) at C10 before use is generally preferred; higher rates increase the heating and are more liable to result in over-charging. Rates below C20 are not appropriate since the chemistry may not be sufficiently activated - this was the cause

NiMh Batteries Continued..

Article by Brian Holdsworth

of problems when higher-capacity batteries became available and were charged using the original 50mA chargers. As for most rechargeable chemistries, prolonged storage in a partially-discharged state seems to provoke problems so that charging would be helpful if unused for more than about a week after usage. Similarly, trickle-charging for a few hours every month or so during prolonged storage may be helpful.

Peak-detect charging at about C2 (500mA for a 1000mAHr battery) for 4-5 cell batteries seems to work, but is not recommended for the typical 8 cell Tx battery; in a similar fashion to LiPo's, the cells can become unbalanced so that one cell may be dropping after its peak while another is rising to its peak which confuses the charger delaying cutoff and overcharging the battery; this becomes more likely with more cells. A similar effect may be seen if a battery is peak-charged without usage too soon after its last charge - at least a day should be allowed for the "super-charge" to decay. Futaba transmitters include a diode in the charging circuit so that peak-charging is erratic at best without disconnecting the battery, which is awkward since the connector can be difficult to remove. At the end of peak-charging, the battery will be noticeably warm which is not ideal for a long life! There is a tendency for NiMh cells to "false peak" terminating charging early; this has been seen to occur a few minutes after starting the charge when about 30 minutes was expected - checking duration and returned capacity should identify any occurrence. About 200mAHr of a charge is absorbed rather than replacing capacity so that usage can be difficult to determine from the capacity returned; if such data is required, discharging after use is the only practical method and determines the information actually required - how much is left.

Frequent cycling is not advantageous, but a cycle can be helpful after storage at the beginning of the season or to determine remaining capacity after usage. Typically, batteries last at least two years before a significant reduction in capacity becomes apparent; experience suggests that the rate of capacity loss increases rapidly once started. The cutoff point recommendation in the manuals should be ignored and set at ~1.1 volts per cell (4.5 volts for 4 cells, 9.0 volts for 8 cells) to avoid damage by over-discharge. While this may indicate a lower capacity than that specified, it is more realistic since, at these levels, the battery voltage is beginning to drop noticeably. Futaba transmitters set their battery alarm threshold far too low at 8.5 volts which would only leave about a minute to land before loss of control!

NiMh Batteries Continued..

Article by Brian Holdsworth

Battery age since first charge is a significant factor in these problems and replacement every two years should minimise their occurrence. The switch should be replaced at the same time since it tends to wear rapidly; also, if black-wire corrosion has started and spread into the switch wiring, corrosion of the new battery wiring has been seen within a few months. All cells in a battery seem equally affected by any problems suggesting good quality control during manufacture, in contrast to that for LiPo's.

Fancy Flying in Corfu - Here's an Offer

We have received an offer from Spiros who runs the **RC Hotel on the island of Corfu**. He wrote to Dave Swarbrick the following:-

'I would like to offer a week holiday (Bed & Breakfast) for two , which you can raffle towards the club finances.

Also for this season the first 5 members of your club who book to stay with us they will have a 100 euro (approx 70 pounds) voucher (expires 20/11/15) which can be spent while they are here.'

Anyone interested in taking up this offer, come to the social meeting - we'll stick your names into a hat and draw out the lucky winner. It's got to be a great way to improve your flying skills. In the meantime, have a look a their website on rchotel.com.

A VIEW FROM THE HEDGE. (By Will Sparrow)

March definitely came in like a lion and went out … like a lion! April, not to be outdone in the roaring stakes, reported for duty with 50 mph gales and lashing rain. However, the month was only a few days old before good flying days started to present themselves in ever-increasing numbers. I was really looking forward to the Easter weekend – since this has always seemed to mark the start of proper, summer-orientated flying activity – and, after a rather limp start, (Saturday provided a good flying day, but only two or three modellers turned up) things started to pick up. On the Sunday I made myself really comfy on my favourite viewing twig, focused my gaze and waited to be entertained. I had a bit of a long wait! You see, the weather gods had decided to dish up a hefty dose of mist. I could see a mile or so horizontally but the cloud-base (mist-base?) was only about thirty feet. This was confirmed when my mate, Jim Sparrow, out for his usual, early-morning fly-about, found himself above the mist, became disorientated and, flying in the wrong direction, spent the morning in Staining! You modellers, ever-eager to get on with flying, were more circumspect than Jim and it wasn't long before a few electric models were probing the flight envelope. After what seemed an age, the mist started to disperse and more flying took place as more and more of you started to arrive; by early afternoon the field was busy. One new model that caught my eye was a large, petrol-powered Extra 300, out for the first time. The owner spent some time adjusting the model and running up the engine. The model had a smoke system that was really effective; so effective that one of our hedge hens had a violent coughing fit and fell off her twig! I watched in keen anticipation as the model roared off on its maiden flight. A couple of heart beats after it left the ground the engine stopped dead. The poor pilot only had one option, that of maintaining a safe airspeed and keeping the wings level before the inevitable heavy landing in the rough. These over 7 Kg models, made from "brittleply" and glued with just a whiff of cyano, are not designed to survive landings in rough terrain unscathed. As far as I could tell (I risked a bird's eye view), the damage did not seem too bad – certainly repairable. I'm sure that I will see this model again. The rest of Easter Sunday passed, as it should, with lots of modellers enjoying lots of flying. One modeller was in such a euphoric state that he went home without his model box and transmitter. Luckily, he returned an

A VIEW FROM THE HEDGE Continued…..

hour or so later, having discovered his loss, and before the remaining members had got round to raffling his transmitter!

The mid-week weather, as April progressed, continued to provide some splendid flying days. On one such day I was enjoying a quiet daydream or two on my twig, lulled by the soporific purr of electric motors, when my interest was piqued by the arrival in the pits of a large, all- composite, petrol-powered aerobatic model. The flier was a young dude, complete with space-age sunglasses and accompanied by his wealthy father. The model was fired up, took off and proceeded to perform the sort of high-energy, gut-wrenching acrobatics that require great skill to perform but (to this bird at least) are not, shall we say, elegant to watch. Just musing, I often think that heavy, fast models, of all kinds, have a lot in common with players of bagpipes – they are better observed at a good distance from people!

Another addition to the ranks of the mid-week fliers was your esteemed chairman, who ventured out with a nice, red, petrol-powered MX aerobatic model. I thought that he had had a wasted trip because I could see that he had no transmitter… but how wrong can a simple sparrow be? A fellow modeller had arrived sporting an identical model, identical, that is, apart from the colour and motor – this one was lime green and powered by electricity. The models were both flown using the same transmitter from different model memories. I've heard of buddy- boxes before but this certainly put a new slant on an old theme! By all accounts the chairman had sold his old transmitter and was waiting for his new super-duper Tx model to arrive from far-off Cathay. A case of a very slow boat from China, methinks. Both models flew impressively well… with the red one, its pilot appreciative of the relaxed atmosphere pervading the field at the time, winning in the landing quality stakes!

In all the time that I have been viewing your antics from the hedge I have seen many strange things in the sky. I've seen models with wonky tails, models held together with sticky tape and models with "banana" fuselages but, just the other day, I saw a sight that was a new one for me… and it wasn't even a model. I was sitting on my twig, casually watching a member practising for his "B" certificate, when I spied a pair of swans, flying low and approaching from the east. (By the way, these "over 7 Kg" birds

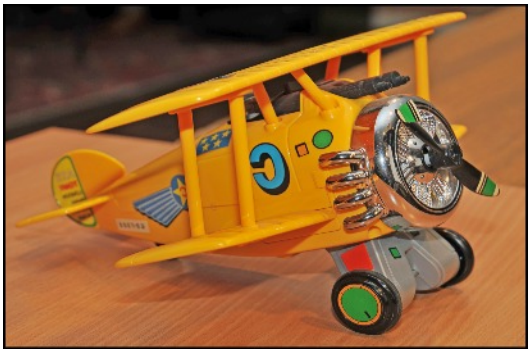
A VIEW FROM THE HEDGE Continued…

have to take their own "B" certificates, soon after they have fledged, before they are allowed to fly unsupervised). Now, I'm always impressed by the grace and elegance in flight of these majestic birds; the lead bird had all these attributes in spades… but his wing-man had a pronounced crank in his neck! Perhaps he had flown into something solid and unyielding or maybe he had just been hatched like that, who knows, but he certainly looked weird. Aye, one sees many strange things from the hedge…

WS

Dave's Talk on Passing Your A & B Certificate.

The evening was very well attended - we even had 4 or 5 members from the Fleetwood club in attendance. As ever, Dave passed on his valuable information in a way only he could have presented it. He went through each and every manoeuvre in absolute detail aided and abetted by his funny little electric powered biplane which he calls 'Tommy' This silly little aircraft is electric powered - when it's prop is running the thing shakes about in an interesting way. When Dave takes it through it's manoeuvres the 'engine' stutters as it goes over in a loop or roll. This little thing has character in spades! But what a way to teach - it's little things like that which help you r e m e m b e r . Great talk Dave and appreciated by all who attended.



Social Evening

Wednesday 6th May Jason Reid will be giving a talk on Field Safety.

Shows for 2015

LMA

East Kirkby Model Show	1st - 4th May
Strathaven Model Show	26th - 28th June
Cosford Model Show	18th - 19th July
Elvington Model Show	8th - 9th August

Other Shows

Weston Park International Model Airshow 19th - 21st June

IF ANY OF YOU HAVE INFO OF ANY OTHER MODEL SHOWS WHICH I HAVEN'T LISTED ABOVE, PLEASE LET ME KNOW AND I'll PUT IT IN.

In Conclusion

The Wednesday evening flying will be starting in just a few more days and this year I am resolved to making that a definite date each week - weather permitting of course. I've decided that I've become far too choosy about what weather conditions I want to fly in. When I was learning, I never thought twice about how much wind there was but I do admit that I used to crash a few!

Something that Dave has said constantly is that these ultra lightweight foam models are rather restrictive and when I think back to the 70's, most models were at least twice as heavy as they are today. They of course were far less affected by wind - on the other hand they never handled as beautifully as they do today. 'Things' have moved on so very much and best of all, basic models are no longer expensive. I've just pulled out a couple of trainers - both have flying weights of around 5lbs - they even look nice and the prices that Hobby King sell them for is incredible. You have to factor in the cost of the motor but what value! Thanks as always to Dave Swarbrick, John Higgins Brian Holdsworth and never forgetting our tame feathered friend for your valuable contributions.

And so for this edition, I'll stop wish you all happy and safe flying.

Nice one to learn with

General purpose sports model