

April 2016

Newsletter

We have just come back from a wonderful week in the Isle of Man. Incredibly, we had sunshine every single day and it was warm. Enjoy it as we did, I couldn't help thinking that I was actually missing some very good flying weather back home!

I had however enjoyed a morning's flying with the Fun Cub before I left - the field was rather wet and the model needed a good wash on it's return to base. That model has such a wide flight envelope - drop the flaps and you can almost hold it still in the air, raise those flaps and you can fly it like a normal sports model. It isn't fast, it was never meant to be, but it is a very rewarding model to fly. Mine has now has over 16 hours flying (about 150 flights) and it's never yet crashed. (Stupid thing to say!!)

I saw on the news that some irresponsible idiot had actually hit a BA passenger plane at Heathrow with his quadcopter. Why can't the powers that be, simply impose exclusion zones around airports with significant fines for anyone flying within those zones.

Many of you guys will know Brian Sheard who has been a member of our Club for very many years. He has finally hung up his twiddling fingers and has very kindly given to the Club a couple of his remaining models. He would like to donate the proceeds raised by selling these models to boost Club funds.

The first one shown is the Galaxy Gazelle. This is complete with I.C. Motor - just add your own prop and radio gear. I remember one of these at one of my old clubs - it flew beautifully.



This next model is the Precedent HiBoy - Jason tells me that he learned to fly with one of these. This is a 62" wingspan absolutely ideal trainer. Both of these models are 'proper' built up models and should last for years - unlike the modern ARTFs'.

I will try to arrange to bring them to the Social meeting next Wednesday.

A Mini Table Saw

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You Tube is for me, a constant and excellent reference point. It is thanks to one of the contributors to You Tube that I have been able to transform one of my power tools into something both safe and really useful. The power tool I'm talking about is a cheap Chinese mini table saw available on EBay.

I made an offer of £50 which was immediately accepted and it arrived after a few days. It has a 90 watt motor, a nice cast iron body and a decent work



table - albeit tiny. It seemed ideal for modelling - it has a 5/8" depth of cut and the 4" dia saw blade gives a really fine finish.

The motor on the saw runs very quietly and is dead smooth - nice to use. The cut it gives is silky clean whether cutting ply or balsa.

The little fence thing they supply however should be consigned in my opinion to the bin - it is so slack in its groove that really, it doesn't function as it should. It was one of the You Tube videos which showed me how to overcome this problem. I also removed the riving knife and guard because the riving knife just would not align accurately with the saw blade.

This guy on You Tube makes dolls houses - he therefore has lots of repetitive 90° cuts and exact angle cuts. His method is to make up jigs using ply sheet with 3/8" runners glued to the underside which accurately run in those table grooves - you now have a sliding table with the saw blade having made an accurate cut slot. Glue an accurate 90° fence (I used some old 1/4" hard balsa for this) at the base and you now have a workable jig. You can easily make adjustable jigs with that accurate slot line already made by the saw. Because I do a lot of stick building, the saw has become my most used and favourite tool.

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A VIEW FROM THE HEDGE. (By Will Sparrow)



There has been a good deal of apprehension and disquiet in the hedge of late. Let me explain. Many years ago, when I was naught but a chick, I remember my great grand-pappy sparrow telling me that in the distant past there had been animosity between the members of our hedge and the members of a distant hedge, way to the east, beyond the Great Dyke. By all accounts squabbles had broken out and many a bird, on both sides, had limped home minus a few feathers! The conflict was finally resolved when birds of good intent, on both sides, decided that cooperation between our hedge and the hedges on the other side of the Great Dyke was preferable to knocking ten bells out of each other. The system worked well; we had many an exchange visit, we traded berries, grubs and nesting materials: all animosity melted away. Then things started to change, imperceptibly at first, rules and regulations started to filter through to our hedge from afar; all traded berries had to be a certain size, nesting straws had to be of the specified length and flexibility. We might have given the odd shrug, but we just got on with hedge life. Some sparrows, from distant hedges, moved into our hedge, but we just got on with hedge life. Recently, however, something has happened that has given rise to our present state of apprehension and disquiet. In the largest hedge, well to the east, a flock of migrating starlings has decided to settle and, if rumour is to be believed, once they are naturalised, they intend to move to our hedge. Sparrows and starlings have many things in common, but our avian cultures are very different and we are not sure if we could cope with the changes such an influx would bring. Recently, we had a visit from a respected sparrow from a westerly hedge far, far away who lectured us on what we should do. I'm sure that he meant well, but he put quite a few sparrow's backs up I can tell you! In the hedge the debate ebbs to and fro... should we stay in the HU (Hedge Union) or should we leave?

Enough of feathered strife! I bet you are all eager to know what I've managed to view from my trusty twig. A cold Wednesday, towards the end of March, saw a small number of your members gather to take advantage of, what looked like, the only bit of decent weather in prospect for many a day. One member was co-opted to test fly a very nice, petrol-powered Yak (named after a Tibetan ox?). All went well until the landing; the bold test-pilot just missed the edge of the strip, albeit very gently, causing the Yak to



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A VIEW FROM THE HEDGE continued/....

shed its undercarriage. I know that these artf models are lightly constructed, but this one raised the bar more than a notch. I managed to get a look. This model's structure was 95% air, 4.9% match-wood ply and 0.1% glue! The substantial undercarriage was supported by very thin brittle-ply, held in place by 3/16" sq. balsa stringers. The owner resolved to make a proper job of fixing the undercarriage, to good old British standards. I look forward to seeing this model again; it really was a pretty sight in the air.

Good Friday's flying was marred by the crash of yet another jet. The engine stopped when the model was inverted and then the model went a long, long way down wind. I had to hop up to my top-most viewing twig to keep the model in sight. The inevitable crash was on the eastern side of the Great Dyke, a good ¼ mile away, making retrieval of the wreckage of the totalled model, a bit of a challenge. The start of the flying season is always a risky time for your poor models: make sure that you check them over carefully after any winter lay-off and, while you're at it, squirt a bit of oil on any rusty thumbs!

Now that we are well into April, the weather is starting to become more conducive to model flying – we can forgive April her occasional blast of hail and flurry of snow! Like fish rising to the fly, your members have been forsaking the comfort of their sofas and the warmth of their sheds, dusting off their models and charging their batteries in celebration of the start of the flying season. Sundays have shown excellent turn-outs and much flying has been done. I've noticed a good few shiny new models as members have done their duty in boosting the economy of far-away Cathay. Apart from the flying, the odd amusing incident has been viewed from this twig. Imagine the scene: a large, silver, high-winged model is being readied in the pits. Much flicking and starter-whirring takes place but the reluctant petrol engine shows its stubborn side by refusing to start. This scene is played out for what seems like an hour (but was probably much longer!) until a helpful member asks "shouldn't that plug-cap thingy be connected to the plug?" I know that I shouldn't laugh... but I just couldn't help myself.

WS



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What Went Wrong?

Article by Brian Holdsworth

What went wrong?

When an aircraft falls out of the sky to become a crumpled heap on the ground, there is an obvious desire to identify the cause so that future repetition may be avoided. Sometime, the cause may be obvious but frequently a range of possibilities must be considered. These may be divided into Structural Failure, Radio Problems and Pilot Error with some overlap. Prevention is obviously advantageous, and some problems can be avoided (or at least minimised) by precautionary actions.

Radio Problems

Radio problems cover aspects of the functioning of the transmitter, receiver, power supplies, servos and other electrical items. Essentially, the servo positions differ from those intended by pilot action on the transmitter controls. They may be divided into two main groups termed hard and soft.

Hard

These may be summarised as where the problem is permanent and caused by faulty items requiring replacement. Broken wires and bad solder joints may have intermittent effects where they seem to function normally until sufficiently disturbed by heating, vibration etc. Many electronic failures occur as power is applied and should be detected by pre-flight checks exercising all servos etc.

Transmitter electronic failures are rare. Folding aerials are vulnerable to rough handling causing intermittent connections, especially if not properly supported internally. Toggle switches have broken in use, but were usually weakened by previous misuse. Manufacturing issues such as intermittent power switches and bad connections, particularly in RF boards, have been reported.

Receiver electronic failures are rare, though aerials are vulnerable to damage resulting in intermittent connection.

Servo failures are common. Broken gears and output arms along with loose servo mounts are often the result of flutter or mechanical knocks. A damaged gear may jam the gear train fixing the output at its current position with high current drain but, the

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What Went Wrong Continued/...

Article by Brian Holdsworth

control surface is often left near neutral due to the blowback of the surface by the airflow. The amplifier is highly stressed and vulnerable to overheating and consequent failure or erratic operation. Some problems may only become apparent after a period of use when the amplifier has warmed so that the servo may seem to operate normally when cool which can make detection difficult! A significant failure mode, generally fatal, is where the servo drives to one extreme of its movement with greater torque than for normal operation; high current is drawn which is likely to affect the operation of the receiver and other servos and may ignite a fire due to the heat generated. Other failure modes are where the servo does not drive one or both ways; the consequences depend upon the resultant control position but, even with dual servos as frequently used for ailerons, are likely to be fatal unless at neutral. The feedback potentiometer is liable to wear rapidly resulting, initially, in jittery operation around the damaged position; this is likely to worsen until the servo drives to one extreme as above. A "dual neutral" condition may occur, sometimes only when warm, where the servo neutral varies according to the direction of its last movement; this, initially, results in an inability to trim for straight flight but may develop into failure as above; a variation where the servo buzzes also results in poor centering especially under load.

Mechanical switches are vulnerable to wear resulting in intermittent power disconnection and consequential loss of power. Replacement along with the battery every two years or so should be considered.

Batteries can fail due to a cell becoming short-circuited internally but this is rare. A discharged battery will obviously result in loss of adequate power, usually due to lack of charging or insufficient battery capacity for the actual usage. There are several battery conditions which result in capacity loss or excessive voltage drop under load and most are age-dependent so that periodic replacement (2 years or so) should minimise problems. Dual batteries may be worthwhile for larger models with higher power demands (and more significant potential consequences of a crash), but it is easy for the additional complexity to make the problem worse! Similarly, using a separate receiver supply instead of an ESC BEC supply has only marginal benefits.



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Article by Brian Holdsworth

In the event of loss of power, the radio failsafe obviously has no effect and servo drive is lost, so that control surfaces may be blown back towards neutral by the airflow with an increased chance of flutter. ESC's and jet engine controllers should shut down due to the absence of the receiver channel pulses, but an engine would continue to run at its current setting so that an ignition cutoff may be appropriate for petrol engines.

Soft

These occur under specific operating conditions which can make identification difficult, since functioning can seem normal when those conditions are not present. Usage may need to change or higher performance items used. Radio interference, receiver design issues, over-heating, inadequate power supply and servo performance come into this category.

Permanently connected extension leads need an additional restraint on the connector to avoid disconnection under vibration etc. Some electronic components, especially those in power regulators and ESC's, will shut down if overheated to avoid cascade failures of other components; frequently, they only resume operation after cooling and cycling the power supply off and on.

Transmitter errors are rare. Usage of the wrong model memory is pilot error, as are inappropriate user settings for mixers etc. which may produce unfortunate results when switches are operated. A flattening battery should have been monitored and identified before the low voltage alarm and shutdown occurs. Looking away from the model at the display has the obvious potential for difficulty in finding the right model afterwards! Some power switches are very close to the stick trims and so are vulnerable to switching off when intending to adjust a trim. No electronic equipment performs well when damp and transmitters are particularly vulnerable if rain wets the aerial, effectively shorting the radiated signal, or drips through the sticks onto the circuit boards underneath to cause erratic operation.

Loss of signal will result in loss of control due to the receiver entering Fail-Safe, closing the throttle and freezing the other functions. External interference is rare, and most

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problems will be due to operational errors where the transmitter aerial is pointed at the model or poor receiver aerial placement produces inadequate reception in some attitudes. Dual receiver aerials should be installed, away from metal items, at right angles to each other and separated by at least 4cm; similarly for slave receivers. In particular, receivers and aerials should be away from electric motors and speed controllers which can generate significant interference even with 2.4.

Receiver design errors resulting in control problems under some conditions seem to be an increasing problem, especially where transmitter upgrades result in incompatibilities with older receivers; erratic clone receiver performance after Futaba FASST upgrade is an example. Especially with large clear cockpit canopies, overheating in hot weather can be a problem and the recommendation to wrap receivers in foam (inherited from the bulkier 35MHz sets) should be ignored - Velcro onto a suitable part of the structure away from other electrical items is effective and convenient. All electronic equipment will perform erratically in a "Brown-out", where its supply voltage drops below limits, and the effects of the resultant short-term servo freezing can be significant. Spektrum receivers seem particularly vulnerable and DSM2 receivers (now obsolete) were modified to provide an indication of any occurrence, but this was removed for the current DSMX receivers although the sensitivity is still evident. Sometimes, slave receivers do not connect after power-up with a consequential reduction in effective range - their indicator LED's may need checking before flight.

Servos are vulnerable to over-heating with consequential failure or erratic operation, and should never be used on a higher supply voltage than that specified. Vibration may cause intermittent contact of the potentiometer wiper resulting in erratic operation up to driving to one extreme. "Brown-out" can result in intermittent operation and consequentially undefined output position during the event. Sufficient output torque is required, but most installations seem greatly over-specified on paper. However, excessive wing/tail twisting is common with many ARTF's, due to their open structure, and opposes control action requiring increased control movement and hence considerably higher servo torque to produce the required response. Linkage geometry can also be inappropriate - long servo arms and control horns maximise



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mechanical advantage, setting maximum servo throws at about 90% to 100% (less than 80% or over 100% is generally disadvantageous). The practice of ganging multiple servos onto a single control surface will result in very high transient currents, since they cannot be sufficiently matched and so will fight each other. The considerable transient currents, especially for large digital servos, will drop the supply voltage at the servo due to lead resistance, especially with long extensions for ailerons and tail-mounted servos, often resulting in output torque significantly lower than the servo specification suggests. Even though this voltage may be below the "Brown-out" level of the amplifier, the considerable supply filtering generally avoids erratic operation.

Especially if clearance to the structure is inadequate, it is easy to only partially move a switch to the On position making it more vulnerable to vibration moving it to Off. It has also been known for switches to be moved to Off when launching! For more than 4/5 analog servos, electronic switches would be more appropriate to handle the high currents.

Inadequate power supply is a frequent cause of control problems, especially with large digital servos. The servo power requirements cause high transient currents and hence high voltage drops from batteries and in long wiring runs. Power regulators demonstrate particular problems in providing such peaks, and significantly higher capabilities than those generally used may be needed. Insufficient battery charging is all too common but is considered pilot error.

New Members

We are very pleased to welcome Carl Brotherton to the Club. We look forward to seeing you at the field.



Social Calendar/Shows for 2016

April 2016

CLUB SOCIAL EVENINGS at the Clarence Hotel, Preston New Road, Blackpool FY4 4HG

4th May

Jason to talk about flying safety.

5th June

Club BBQ at the field.

TRAINING NIGHTS

These will be every Wednesday evening from May 11th onwards till September at the field so if you wish to, either learn, or just brush up those skills prior to taking your 'A', (or 'B') - this is a good time to do it.

SHOWS

18th June **Weston Park** International Model Airshow

25th - 26th June **Strathaven LMA**

18th - 19th July **Cosford LMA**

13th - 14th August **Elvington LMA**

Dave asked me to print a list of our instructors.

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

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In Conclusion

That's your lot for this month. Sorry there are no photos of your models at the field - I've had a busy month and haven't been able to get down to take them.

I have been asked to make particular mention about the sterling work carried out by Steve Wartburton and Dave Neighbour on the fencing - well done guys - much appreciated.

I must stress to you the importance of coming along next Wednesday evening to Jason's safety talk - this affect all members, experienced or not.

PLEASE PLEASE come if you possibly can.

Thanks very much to Will Sparrow and Brian for your contributions yet again this month.

Now, I normally leave you photos of your models flying at the field - I can't do that this month as already explained. I leave you however with this one I shot many years ago - it's just simple foamy glider - I gave it a painting effect.

