Newsletter

February 2019

I got down to the field a couple of times this month - firstly to meet up with Justin to test out the new camera and yesterday to get some more pictures for the newsletter. Justin took his big petrol powered SBach on that first day we met up and did loads of low passes for me to get the camera sorted. It works quite differently to my old camera and is not yet as easy to use.

However difficult I found it, when I got home and processed the images, I was very happy.

It looks so good now with a pilot in the cockpit

The colours no longer have to be processed in - the new imager is loads better and the sharpness and very fine detail is very satisfying. Thank you Justin - it was a thoroughly enjoyable morning. Unfortunately, after his second flight, the throttle servo stopped functioning so Justin switched off the ignition (it's a petrol motor) from his transmitter and dead sticked it back to the runway for a perfect 3 point landing.

So, back home, I tweaked my settings a little further and ventured forth once more to the field Sunday afternoon.

The Chipmunk flown by Brian

Jim flying his Sebart WindS

Yet another scintillating flight by Mark with his Inverza 33

The Beast

I just love this colour scheme - who says that a WOT 4 is ugly - this one isn't!

The BMFA Definition Concerning Club Insurance

Last month I tried to clearly explain the situation regarding the BMFA insurance when you rejoin the Club. Mark Conlin kindly sent this to me in answer to the question - it's worth reading:-

Club Membership and Insurance

Q: When I join BFRCMS, when does my insurance start and when can I fly at the club field?

The official answer from the BMFA is as follows:

"BMFA insurance cover commences from the moment you pay the BMFA element of your Club joining fee to your nominated Club official; you do not have to wait for receipt of your BMFA membership card. The most important factor is that the club have collected the fee and have formally registered you as a paid-up member of your Club."

In practice, however, there are two scenarios that our club need to protect themselves against.

1) membership fee is paid to the committee but the member declares that they have paid their BMFA fees themselves

2) membership fee is paid to the committee but the member declares that they have paid their membership to another club

In both of these scenarios the committee will check the BMFA database to ensure that their insurance is valid. If their insurance is not valid at that time, it's feasible that their BMFA insurance is being processed but hasn't yet been formally acknowledged by the BMFA.

Fundamentally the onus is on the member to prove to the committee that they are insured to fly.
For the first scenario this may be a little difficult if the member has sent a cheque in the post. Electronic mechanisms would instantly be visible to us on the BMFA portal assuming we have been supplied with the correct BMFA number, email address and date of birth.

For the second scenario where insurance has been paid to another club, formal electronic communication from that club to confirm that they have received the members insurance payment and are processing it would suffice.

If the committee has no way of independently verifying that you are insured to fly, then you should not be flying at the club field!

We hope you appreciate that this is for the protection of the club and it's flying site.

A VIEW FROM THE HEDGE. (By Will Sparrow)

Good flying days are rare at this time of year; even rarer if they occur on a Sunday. However, on one Sunday in late January the weather gods smiled on Weeton and a beautiful flying day presented itself. Plenty of members (eventually) turned up to revel in the thrill of model aviation. Needless to say, I was bright-eyed and bushy-tailed and eager to get in some serious viewing. The models themselves, with just a couple of welcome exceptions, were all the ubiquitous foam Wot4s. Now all these models flew well but the design does seem to have a design flaw – the foam battery hatch has a habit of falling off in flight. This isn't a problem if the hatch from your pride and joy happens to fall off when you are flying over the strip and you have an eagle-eyed helper at your elbow but, if you are flying at some distance or if there is a bit of wind blowing, then you do have a problem. These little scraps of nothing-very-much are really good at hiding themselves! Foam Wot4s have been on the market for years now and must have sold in their thousands so you would think that spare hatches were readily available: think again. Since so many hatches are being lost, the stock of spare parts has dwindled to less than a trickle; these hatches are now rarer than hen's teeth or rocking-horse droppings! One of your entrepreneurial members has solved this supply problem by 3D printing an exact replacement. He has even designed the part to be in two halves so that it will fit easily into a standard envelope for posting to a desperate recipient. Just think, a solution to a world shortage invented in Blackpool. You should all feel very proud.

A rare snippet, courtesy of the Wise Old Owl, came my way only the other day. As you know, when it comes to things scientific, I'm a bit of a duffer (you can say that again - WOO) but I found this latest bit of research, done by you humans, intriguing. By all accounts, the power of great minds is being focused on the Zebra fish. This little chap has the potential to not only repair his fins, if they should become damaged, but he can also repair his heart muscle should it become damaged. The mechanisms are being investigated for possible human applications – heart surgery and transplants could become a thing of the past. The WOO told me that the idea has been taken up by the Chinese hobby companies and that it won't be long before you modellers will be able to put your crashed model away in your shed and then find it perfectly repaired the next time you come to take it

A View from the Hedge Continued/...

out. The Owl also told me that the word gullible had been removed from the dictionary. When I expressed great surprise the Owl shuffled off, chuckling to himself with his tongue firmly wedged in his cheek. I'll never understand that old guy.

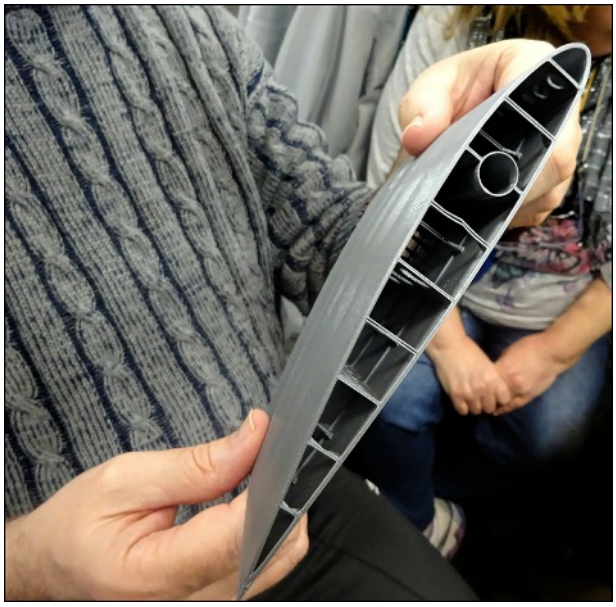
I've often overheard you all talking amongst yourselves (let's face it, I'm a nosey sort of bird!) so I have a fair idea of what's going on in the world of model aeroplanes. I gather that modern kits can be really well-engineered, designed by robots and perfect in every way. All the parts fit together like the pieces of a jig-saw puzzle. In many cases a plan is not required. With kits such as this model making becomes easy and, above all, quick. However, if your choice of model is to be built from an old, pencil-drawn plan or from an ancient kit, modern simplicity is replaced by hefty doses of frustration. Parts don't fit and lots of things refuse to line up… Modellers have been known to need psychiatric help when dealing with such a project. One modeller, of long standing, was heard to comment "fitting those plastic fairings was like trying to pull a rubber glove over your favourite armchair!"

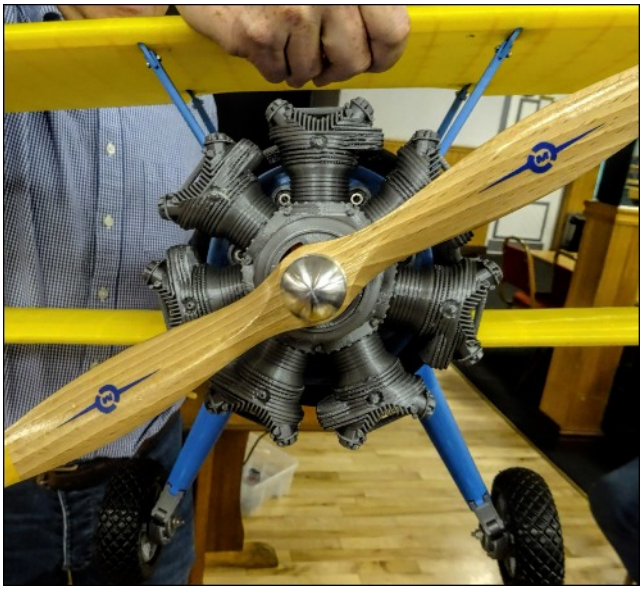
In the hedge we've noticed that the days are lengthening with stalk and twig all springing into life. The feathered community also feels the sap rising. Many birds are starting to sing their spring song (we sparrows are excused, of course – sparrows don't sing) and many a cock has a twinkle in his eye. The longer days, higher temperatures and drying winds all mean that nature is preparing the flying field for you all to enjoy. I'm already looking forward to watching you doing just that.
WS

The 3D Printing Evening

I regret that I had to miss the evening but I had these photos sent to me from the evening.

It looks really fascinating what you can do but I bet it requires a high degree of computer





These are just a few of the pictures you sent in. It's almost unbelievable what this new technology can achieve.

Heat

Article by Brian Holdsworth

An I.C. engine operates within a restricted temperature range. Too cool, and the fuel does not vaporise resulting in rough running. Excessive temperatures are damaging, with the unwanted temperature cycles adversely changing the nature of the metal. The temperature rise is relative to ambient, so that an engine may seem fine in cold weather but overheat badly during a heat wave.

Typically, a higher idle speed will be required while warming up. A richer mixture may also be required. This was evident with older cars where a choke in the form of a hinged flap partially blocking the carburettor intake was used to restrict airflow, increasing the amount of fuel added to the air drawn into the cylinders; it was linked to the accelerator to produce a faster idle. This was usually implemented in the form of a rod on the dashboard, pulled out for cold starting and gradually pushed back during the first few miles. Modern cars with fuel injection behave similarly, with the technology monitoring temperatures etc. to automate the process.

Model engines are generally set to run quite rich, so rarely need a choke for this purpose, but most benefit from the throttle being opened a little above idle until sufficiently warmed. Some petrol and four-stroke glow engines incorporate a choke manually operated by a rod extended outside the cowling, but this is mainly to help pull fuel through the lines where access is often too restricted to allow the usual "finger over the intake" technique.

If over-heated, partial seizing can occur, where the engine slows noticeably, often with some smoke from burning oil and a harsh exhaust note. The surfaces of the internal moving parts will be damaged with bits separating in severe (terminal) cases! The incorporated cooling fins near the cylinder head are generally sufficient for static running fully exposed on a test bench with the propeller wash producing sufficient cooling airflow over the head. Petrol engines generally have more or deeper fins than their glow equivalents to help dissipate their greater heat. Glow fuel has a high oil content (10% to 20%) and this removes a significant amount of heat through the exhaust in the form of hot oil, which can produce a considerable mess! Petrol engines would not run properly with such a high oil content so typically use 2% to 3%, which is adequate for lubrication, but extracts little heat, especially as much of the oil is burnt leaving only a few carbon-laden

Heat Continued..

Article by Brian Holdsworth

drops. Installations where the cylinder head is fully exposed have few problems, but any form of cowling is likely to restrict the airflow, and many cowled engines show this problem, particularly during ground running where overheating can quickly develop.

In general, the cowling outlet area needs to be about double the inlet area. This allows for the expansion of the air due to warming and the additional air introduced through other gaps such as those round the propeller driver. Without adequate area to allow the heated air to escape, the cowl becomes an oven! If a full-size aircraft with an air-cooled engine is examined, it will be seen that the cowling fits closely round the cylinders, often with suitably positioned baffles to direct the airflow. The rear edges of the cowling are flared outwards, which generates turbulence allowing the hot air to escape, avoiding the oven effect. In many models, the cowling is considerably bigger than the engine, which means that most of the inlet air bypasses the engine fins and so has no cooling effect.

Partially blocking a large inlet with fine metal mesh or similar can help, with the additional benefit of obscuring the engine. Suitably positioned baffles would route the air towards the fins, improving the cooling effect. If the engine is tightly cowled, wrapped round most of the cylinder with only a little gap, so that the air has to pass through the fins, cooling can be very effective with only a very small inlet area needed. A past example of a control-line team racer with a diesel engine, which are very sensitive to temperature, had a very tight cowling wrapped round the cylinder head with the inlet almost blocked by the carburettor intake but a large outlet; this was very effective and ran well, though static running needed to be minimised as it warmed up quickly.

Many petrol engines have their air intake at the rear, which can cause problems where the air is excessively warm within the cowl. Adding a scoop to route air towards the intake may seem helpful, but is liable to affect the cooling airflow over the engine, which could worsen the problem. Some early glow engines were rear-induction but this had several problems, and the more convenient front induction has become standard for two-strokes. Four-stroke engine have their intakes at the rear, but their intake airflow rates are relatively low, reducing any problems.

Heat Continued..

February 2019

Article by Brian Holdsworth

Jet engines route cool inlet air between their casing and the burning fuel within so that the case should remain reasonably cool. The tailpipe will become very hot and some heat shielding for the rear fuselage may be needed. The exhaust is extremely hot and must be kept away from the structure - some early full-size aircraft had problems in this area. A major reason for the success of the De Haviland Venom and Vampire series was their twin boom layout, which produced a minimal airframe and good, short airflow through their low-powered centrifugal engine with the hot exhaust routed well clear of the tail. The same reasoning explains the popularity of a similar layout for model jets!

Electric flight motors generate impressive power for their small size. Efficiencies are quoted as up to ~80% but 70% would be more realistic. For example, a small motor might draw, in static running, about 28 amps from a 3 cell LiPo which corresponds to about 300 watts, with about 100 watts needing to be dissipated as heat. A 100 watt incandescent light bulb has to dissipate a considerable portion as heat. It has a considerably larger surface area than a motor, fully exposed to the ambient, but incautious touching of its surface after a few minutes of operation will show that it becomes very hot indeed! Fortunately, a motor generally unloads significantly in the air so that it draws maybe half the static current. This characteristic does not apply to ducted fan motors, which may draw more current in flight, due to the fan blades being stalled during ground running.

If the windings get too hot, the solder joints may be weakened or even disconnected if the solder melts. The insulating coating on the enamelled wire can melt or burn so that adjacent turns short together, generating further heat as the motor burns out, releasing the magic smoke! Magnets have a characteristic where they suddenly lose much of their magnetism permanently if subjected to temperatures above a critical value. Motors used in extreme applications, such as pylon racing, where they are often operated beyond their limits, may overheat sufficiently to damage their magnets, reducing performance permanently - such motors may be described as having "gone soft".

There are holes in the front and rear of the motor case to allow cooling air to be routed over the windings where the heat is generated. These windings are tightly

Heat Continued..

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Article by Brian Holdsworth

packed to allow many turns in a small space to improve the performance. The heat from the inner windings is trapped by the immediately adjacent outer windings producing near-perfect insulation from the outside air. This makes it difficult to determine internal temperatures unless sensors are built into the windings during manufacture.

A typical installation includes a spinner, blocking most of the access for cooling air to enter the motor through the holes provided in the case. Scoops routing air over the outside of the motor have little effect since the heat is within the windings, which are well insulated from the outside surfaces, particularly in the commonly-used outrunner configuration which has the magnets wrapped around the windings. The metal in the windings and core, together with the case, acts as a heat sink absorbing considerable heat during operation, releasing it to ambient over a period afterwards. For relatively short flights (less than ~10 minutes) with roughly equivalent cooling periods between flights, they seem able to withstand the abuse! Longer flights can be awkward due to the difficulty of dissipating the heat. Inevitably, larger motors, with corresponding higher power and heat, may take longer to cool between flights, since their surface area does not increase linearly to their diameter etc.

Club Instructors

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

Social Evenings

Held at the Marton Institute, Oxford Square, Blackpool FY4 4DR

7th March Flight Sim Night

3rd April Safety Talk

Club Events

22nd June Fly In

11th July BMFA Scale event

Scale and Aero Show Trophy Event - TBA

Shows 2019

14th-16th June	**Weston Park Model Show**
8th - 9th July	**Cosford LMA**
10th - 11th August	**Elvington LMA**
31st August - 1st September	**Much Marcle LMA**

In Conclusion

One last point - the gate to the Club car park was left open. **It must be locked when the last person leaves the flying site.**

May this wonderful Spring weather continue and continue to attract so many of the members to the field. That last Sunday, the field was packed with members - absolutely brilliant. I noticed the instructors being kept very busy indeed!

Thanks as ever to all of you who have spent your precious time scribing your excellent articles for this newsletter and for all the pictures you have sent in. It's all really appreciated.

Finally, an apology to David Kirkbride - I attributed his lovely ME109 to Carl Brotherton. Sorry.

I wish you as always happy and safe flying.

An excellent shot sent in by John Prothero of his friend Lee Connor with that dirty great Beast.

Another low pass by Justin with his very pretty Sbach.