



Newsletter

December 2014

It's been a strange month - lots of reasons not to fly because of the weather but there again, there have been absolutely lovely calm days. I did get to fly my brother's 2 metre Spectra. It takes you back to an earlier time when models flew so sweetly. When you shut down the power, it seems to almost stop in the air wobbling just a little as it responds to those invisible air currents. Push the nose down and it picks up speed. It's only a rudder/elevator model but the response to the rudder is perfectly adequate. Now this type of model may not be everyone's cup of tea - for me, it's great. I used to spend hours and hours flying gliders - fast ones and slow ones and I still love them more than I can ever get to love normal powered models. Gliders are graceful.

The power provided by that Turnigy glider motor proved more than adequate and the 11" x 6" prop seems ideal. I'm very grateful to John Higgins who not only launched the model but also gave me much welcome and valuable advice as I trimmed it out. I hope that model will last many more years.

I went down last Sunday afternoon - superb calm sunny day. A good few members were down. Jason and Jake were flying their WOT 4 - rolling circuits, inverted, high alpha approaches - you name it and that was what they were doing - it was lovely to watch. I so envy their skill.

The Orange transmitter I mentioned last month finally arrived. I firstly powered it with 4 rechargeable AA batteries but found that they had to be really forced in - not good!

I then programmed the set to receive LiPo power and fitted a 450Mah 2S LiPo which fits perfectly in the battery compartment. It's nice and light and so ideal for indoor flying. The set up is the same as that on the Spektrum DX6i but made that much easier because of the larger back lit screen. Everything works just as it should and I've now flown 2 hours of indoor flying with it. After 2½ hours operation, the LiPo required 266 milliamps to recharge which makes that 450Mah LiPo just about the perfect size.

Important Notice

Any member who has not paid his 2015 membership fees will not be allowed to fly at the field after 31st December 2014.



December 2014

Gas Turbines

Photos and Article by Dave Swarbrick

I started flying turbine powered models almost 15 years ago, back then quite a few of the engines were home made using car turbo parts and no electronics to regulate the engine. We had weird and wonderful ways of doing all this manually with bi-pass pumps and throttle valves. Starting the engines was a work of art but you soon acquired the knack of regulating the start gas and glow plug temperature. The engine was spooled up with a speed 600-700 motor on a wand and if you got them to start at all it was an achievement.

Fairly quickly people started messing about with FADEC /ECU controllers,(Full Authority Digital Electronic Controllers.) these were a massive leap forward in engine management, early ones only looked after the pump-start and temperature settings but soon they had developed full auto-start capabilities linked to the throttle stick on your TX, they also had a readout which showed what the engine was doing in the start-up phase, the engine management system is quite sophisticated in that the unit uses the RPM sensor and thermo-couple to keep the engine within certain safe parameters,. At start up the RPM and Thermo-couple have to achieve certain levels before the fuel pump will start to deliver fuel to the engine this works very well, for instance if the temp. gets too high (800deg.C) the Fadec will start to slow down the pump until the temp. reduces, if it does not reduce the fail safe cuts in and stops the pump, the engine then goes into cool down mode.

Many other safety factors have been introduced over the years and all have helped make turbine operation much safer. Some engines manufacturers gave you a small gas tank to fit inside the model which would give you 2-3 starts on one filling, these were seen to be a bit dangerous as some of these small tanks could rupture or leak filling the fuz. with gas and the resulting fireball soon had flyers moving away from this type of installation.

The modern engines are now almost fit and forget providing you use good quality Kerosene/Diesel/Jet A1 with a high quality oil at approx. 5%. Most engines have a 25 hour service interval, you can check this on your FADEC it gives you number of starts and number of minutes run. Bearings are the main reason for servicing although some engines will go on for several more hours before they need changing.

The bearings are very sophisticated pieces of engineering, they are called ceramic angular contact bearings, these are very high speed bearings, what it means is that the inner race is tapered so that it allows the main shaft to float end to end very slightly, this end float

December 2014

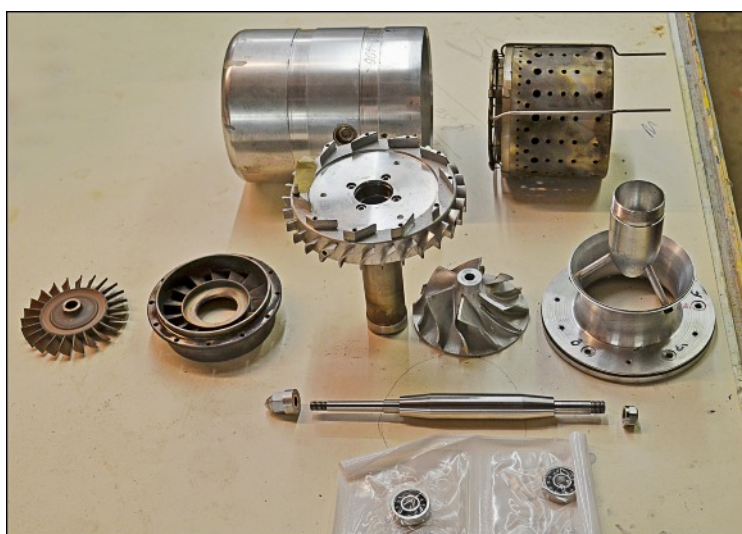
Gas Turbines

Photos and Article by Dave Swarbrick

is taken up by either a spring or a wavy washer, and this set up gives you pre-load on the main shaft, they are also able to come apart and be re-assembled. When you think that some of the smaller engines run at 170,000 rpm and the very small engines which are approx. the size of the smallest Coke cans run at 260,000 rpm without slippage, the quality has to be perfect. They cost around £45--£60 depending on size.

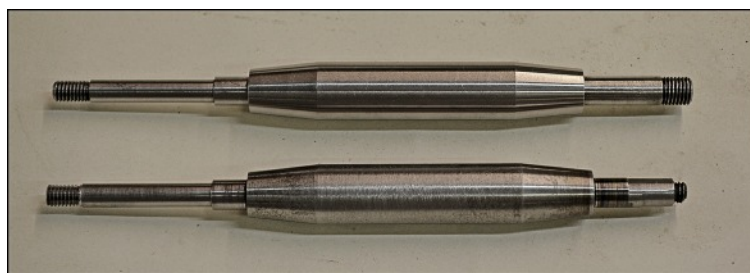
All of this comes to a problem I had a couple of Sundays ago, we had had a good days flying when on my last flight my engine a Jet Central Rhino (38lbsthurst) suddenly stopped dead in flight, the model landed dead stick with no problem, it's amazing how good a 40lb model glides. On inspecting the engine it appeared to have seized solid. On checking the terminal the engine had done just over 30 hours running, I knew that it must have been getting close to a service and had planned to do it this winter.

I removed the engine from the airframe on Monday and started to investigate the problem, this quickly showed itself as a broken main shaft just behind the rear turbine wheel, after disassembly the engine was inspected for any other damage but none was found in fact the inside of the engine was virtually the same quality as a new one. The front bearing was perfect and the rear bearing was showing signs of wear, I decided to change both bearings for new ones.



Main Parts of the Engine

I contacted Jet Central in Mexico on the Monday afternoon for a new shaft, rear nut, and two bearings. They informed me of the price and delivery charges. \$60 just for delivery, the whole cost was £250.56p The new main shaft is slightly different to the



New and Old Shaft

December 2014

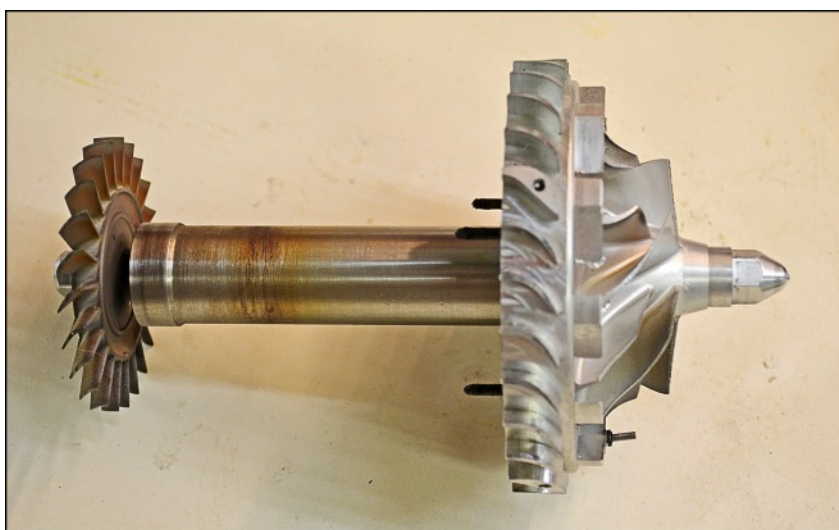
Gas Turbines

Photos and Article by Dave Swarbrick

old one in that it now has an 8mm rear end instead of a 6mm one so much less likely to break. I think that they might have had this problem before.

Money was exchanged and on the Friday morning the parts arrived, I call this very good service as on the day I sent the money I had ordered something from one our models shop in England and I did not get it until the following week.

The engine was rebuilt and run up on the test stand, it will go back into the model shortly.



Compressor/Diffuser and Turbine Wheel. (turbine wheel on left)



Outer Can Ready for Refitting



Balance Mark on Turbine Wheel



December 2014

A VIEW FROM THE HEDGE. (By Will Sparrow)



Well, it's here at last; the dreaded British winter. As if to mirror the poor weather we've been having in the run-up to Christmas, activity on the field has been almost nil. Yes, the odd hardy soul has been seen nipping out for a few quick flights when a window in the weather has, all too briefly, opened, but that is about the length and breadth of it. The view from the hedge has been as bleak as the weather and just about as interesting!

If you remember, I was telling you about the winter survival strategy that Jim Sparrow and I were going to adopt in the hope that we would manage to get through the bleak mid-winter to come. In the past I've tried migration (what an abject failure that was – small, brown birds are just not equipped for long-haul flights!) and the North American buffalo method (sit with one's back to the wind and await the coming of spring – even with nice, warm feathers that winter wind can be very penetrating). In the light of these previous-experienced, uncomfortable winters you can surely see the allure of hibernation; after all, it's what most of you modellers seem to do! So there we sit, Jim and I, ready to give it a go. We've been stuffing ourselves fit to burst (and then some more); okay, we've been sick a couple of times but we've managed to put on a few extra grams and the pair of us are now as round as a pair of robins. We've found ourselves a sturdy, sheltered twig and the Wise Old Owl, from the end of our hedge, has given us some special berries from his store – I think he called them mogadonberries or something similar – which he said would “help you both to nod off”.

Darkness is now descending on the hedge, we've got a firm perch on our twig and a stash of seeds nearby lest we should wake early from our slumbers. The owl's berries seem to be starting to take effect, so I reckon it will take a goodly amount of activity on the field to rouse me before spring. Sweet dreams modellers all, zzzzzzzzzzzzzzzz.....

WS

LiPo Safety

December 2014

Article by Brian Holdsworth

This is a subject with a remarkable amount of hype and misinformation. Until the recent security clampdowns, airlines permitted the carriage, in hand luggage, of a large quantity of LiPo's since they are regarded as non-hazardous. As for all power sources if shorted, they have the potential to start fires via sparks or over-heating of the wiring etc.

Under specific conditions, generally associated with over-charging and consequent over-voltage of one or more cells, a LiPo may ignite as a flare (not a fire as such) with consequential heat and smoke. As oxygen is released internally, it cannot be extinguished. For all fires associated with electricity or chemicals, water is a poor extinguisher choice but a "LiPo extinguisher" is merely CO₂ or powder intended to extinguish any consequential fires - not the LiPo!

Most examples of LiPo fires seen are the result of external short circuits and so are actually the plastic casing and wiring insulation burning. One deliberately induced ignition showed the destruction of the cell but with the adjacent cells largely intact suggesting that the generated heat was insufficient to ignite their plastic casing or chemicals.

Any type of battery will become very hot and so liable to cause a fire, if overcharged at high current - the obsolete NiCd was very vulnerable when peak-charged. It would seem that the only way that a user is likely to provoke LiPo ignition is by selecting the wrong battery type, setting too high a cell count on the charger (detected by most chargers if balancing is enabled) or by charging a battery still hot from extreme usage, especially at 2C or 3C which some claim to handle. Field charging is not recommended!

LiPo sacks are claimed to contain a LiPo fire, which would seem to breach the Trade Descriptions Act! In the unlikely event of such a fire, all these can do is to concentrate the generated hot gases into two jets from the flap sides increasing the likelihood of igniting surrounding items. Such sacks are designed to protect important documents such as passports, certificates etc in the event of a house fire or similar, which is a very different situation.

The advice for storage in a metal container is even worse! In addition to being a mechanism for shorting

LiPo Safety Continued....

December 2014

Article by Brian Holdsworth

inadequately shielded connectors, containing a source of heat increases the internal pressure until something gives! The resultant jet of very hot gases would have a significant probability of igniting any surrounding items. The plastic foam often used as a lining is flammable, releasing toxic gases. This is not a safety improvement!

BMFA have changed some of their advice, with little publicity, but retain their recommendation for metal containers with a hole (about 2mm diameter) to relieve the pressure so producing a concentrated hot jet as above.

It seems that some commercial organisations have been recommended to use a fireproof safe for LiPo storage. There would be no indication that a fire had occurred with consequential high internal pressure. These safes are intended to protect their contents from external fires and have robust, sealed doors which could cause personal injury when opened after a LiPo fire!

Before disposal, batteries of all types should be discharged to avoid their potential, if shorted, for starting a fire by

sparking or over-heating. Rubbish tips are often flammable due to paper, cardboard etc together with methane from the decay of organic matter. Collecting many batteries together for recycling has potential problems since it is inevitable that some batteries will be discarded in a charged state with unshielded connectors - even without paper etc. in the container, plastic burns! It is likely that such collections will end up in landfill anyway since, of the generally available battery types, only lead-acid batteries contain enough metal to be worth recovering; the only recyclable material in a LiPo is the metal in any attached wiring and connectors.

Some suggest discharging a battery by immersing it in a salt solution which is likely to take weeks! Similarly, using a light bulb could take a long time due to the low current. Also, it is difficult to determine when the battery is fully discharged.

A dangerous recommendation from BFMA (now withdrawn) was to cut into the battery under water with a knife. This shorts out the battery with the resultant heat causing spitting of hot or boiling water which is obviously hazardous and

LiPo Safety Continued....

December 2014

Article by Brian Holdsworth

several incidents have been reported. If this was recommended in America, the lawyers could be busy! Releasing lithium into the sewers can interfere with leak detection since some industries add lithium salts to stored hazardous liquids to aid detection of any spills.

An effective technique is to use the charger discharge option. Select the otherwise unused NiCd battery type and set discharge at 0.5 amps which is the maximum that most chargers will support for a 3 cell battery (at 10 volts) - the actual value will be proportionally lower at higher voltages. Set the cut-off voltage to 3 volts per cell and discharge - it will be quicker if the battery has been used! Repeat, reducing the cut-off voltage by 1 volt each cycle and finally down to 0.1 volts (the lowest voltage most chargers will support). It will be observed that the battery recovers after each cycle and can deliver a significant amount of power before the voltage drops to the cut-off level. The battery may puff up and a slow discharge seems advisable to minimise the internal pressure though rupture is unlikely. When fully discharged, short the connector and leave for several hours before discarding in household refuse.

When charging a LiPo, set the current to 1C with the appropriate cell count and always use balancing. Some chargers default to unbalanced charging on power-up and require balancing to be manually enabled. A simple check of whether balancing is enabled is to leave the balance plug unconnected when the charger should refuse to start charging and display an error.

Never try to charge a LiPo if the charger aborts due to a low cell voltage. It is possible to raise such a cell voltage by trickle charging to allow the charger to operate, but the other cells would then be charged into an over-voltage state and balancing would offer little protection. Such a low cell voltage indicates an unrecoverable problem and the battery should be discarded.

Physical damage such as crushing is likely to have damaged the internal structure resulting in shorts etc. Practical experience suggests that, if continued usage is attempted, it will give poor performance within a few cycles and so should be discarded.



ASMR - and all that

December 2014

Article by John Higgins

ASMR, or, to give it its full name, Autonomous Sensory Meridian Response, is a phenomenon that has been around for a good few years now but has only recently started to enjoy a new popularity. The phenomenon is said to produce a pleasurable tingling sensation in the head, scalp and other peripheral regions of the body (!) in response to visual, auditory or tactile stimuli. There is no scientific evidence that the phenomenon exists at all, but there are lots of people out there who are convinced of its pleasurable and relaxing effects.

How is the stimulus administered, I hear you all ask? Well, if you go to YouTube you will find dozens of answers. The secret seems to be to watch a clip of something really mundane, usually with a commentary delivered in a soothing, whispery voice. Good examples are typified by "Cows eating pumpkins in the snow" and (my favourite) "Folding towels". (In this last clip, a woman gently folds towels on a table whilst telling the listener what she is doing in the obligatory soothing whisper – the video clip lasts 18 minutes!) Now, all of this set me thinking...

We all build models for the sense of achievement and to provide relaxation, right? To add to these simple pleasures why not add a bit of tingle factor? One rainy afternoon I gave it a go: I squeezed out a two cm length of epoxy from tube "A", all the time whispering a commentary covering the unscrewing of the cap and the necessity to squeeze, firmly, from the bottom of the tube. I then slowly put the cap back on tube "A" before repeating the process with tube "B". Gentle mixing followed before the prepared epoxy was applied to two pristine pieces of wood. There then followed ten minutes of total silence, broken only by the gentle, relaxing sound of rain on the workshop window, as the long wait for the cure took place....

You can watch this twenty minute video and experience a bit of a tingle if you go to:-
www.youtube.com/watch!amireallythisgullible=chkxy

Social Evening

December 2014

Our first Social evening Wednesday 7th January at the South Shore Tennis Club, Midgeland Road, Blackpool - bring along your new models or anything else that Father Christmas gave you.

Shows for 2015

LMA

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

Other Shows

Weston Park International Model Airshow	19 th - 21 st June
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In Conclusion

December 2014

So, we end another year and it's been a pretty good one. We certainly can't complain that we had a bad summer. The AGM enjoyed some 'lively' discussion and many of the issues raised by members need to be resolved.

John Higgins was presented with the Scale Trophy which he won with his Corby Starlet.



Chris Vernon being presented with the Aero Show Trophy which he won flying his Sukhoi.

Thanks very much to Mark Conlin for these pictures.

Well ladies and gentlemen, that's it for this year. I would like to thank again all you guys who have contributed to this newsletter. Those photos Dave took of his motor are absolutely excellent.

The next newsletter will be published at the end of February. I wish you all a very Happy New Year.

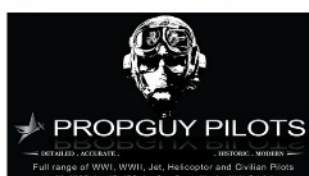
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Carbon spinners from 3 - 6 inch

Alloy spinners from 1.5 - 6 inch

FLOWMAX FUEL SYSTEMS

Nitro/Glow Fuel - Petrol - Smoke Fluids - Jet A1/Kerosene

Flowmax Fuel Systems tanks will tolerate of all know Petrochemicals so whatever the modelers requirements it can now be accommodated whether it be Nitro/Glow, Jet1A/Kero, Smoke fluids or Petrol of course.



The manufacturer uses the latest and first grade Aerospace materials, all tanks are pre-assembled, sealed and pressure tested for ease of installation and optimum performance. Each Tank Kit comes with a foam mounting pad, Velcro strap and 1 meter of the appropriate tubing for complete and trouble free installation.

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