



NEWSLETTER

www.northwesternstrut.org.uk

FEBRUARY 2010

Chairman's Message

After a very snow covered January Strut Meeting – the one that didn't happen - we get back in our stride. For the February Strut Meeting we have a very exciting one that you will not want to miss and this time it's the AGM for you to enjoy. I know you don't want to come to the AGM 'cos it may mean you get a job to do. Well, you never know the outcome of these actions until you try them and then you may well be surprised how much satisfaction there is in the doing. So come along and though I cannot promise you won't get a job I don't think there is much that we are missing – at the moment.

There is one problem that we have to overcome and that is the Jodel and the workshop in which we are building it. On the Jodel front I am very disappointed in the progress that it has been making recently. We have two very dedicated members of the team but there is a lot more to go at before the airframe can be considered complete. To this end I am calling a group meeting of all those who have an interest in the Jodel to map out the way forward and how to manage the project. There is already a list of work that needs to be completed. It is a great opportunity for everyone to get involved and it will be these people who get the first to realise its potential. Therefore the group meeting will be set for 11.00 hrs on Saturday the 13th February. The meeting will start in the clubhouse at Barton before going to the workshop for further analysis.

Looking further into the year I am hopeful that we can get a fly-in this year as well as the usual BBQ. With the beach being denied to us by the local council we have had to suspend these activities and I always think it behoves a Strut to have at least one such event in a year. Also, I have been approached by a local group leader that is looking to hold a "teach-in" and flying session. After the Committee have worked out the logistics for this event I shall be asking for volunteer pilots to help out. So keep this in mind and when required do your best to answer the call.

Now let's look forward to a good year of talks and evenings.

Safe flying

Cliff Mort

*Strut Nights are usually on the **SECOND TUESDAY**
in each month at **THE BROWN COW HOTEL**,
319 Worsley Rd, Eccles, M30 8BW*

NEXT STRUT NIGHT **TUESDAY 9th FEBRUARY**

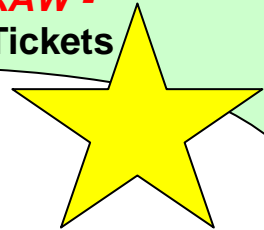
ANNUAL GENERAL MEETING 2010

Your Agenda is on the last page of this Newsletter

Starting at 20.00 hrs. at The Brown Cow Hotel

TO BE FOLLOWED BY THE GRAND DRAW -
Don't forget to bring your Grand Draw Tickets
You may be a lucky prize winner!

[We're watching a DVD after
the AGM business is finished]



AIRCRAFT SCALES FOR HIRE

For hire – an electronic weigh scale for aircraft, presently out of calibration, but will renew if required. Weighs one wheel at a time, whilst other wheels levelled on shims (35mm thick). Range 500kg in 0.2kg steps, so will weight an aeroplane up to 1000kg.

For availability and price, please contact Martyn Coles, 0771 480 4087, or mail@martyncoles.flyer.co.uk

STRUT EVENTS – FUTURE PROGRAMME 2010

Tuesday March 9th	Judy Leden – The Da Vinci glider
Tuesday April 13th	Bob Jones - Ballooning Around the World
Tuesday May 11th	Pete Ronfell – Building the ‘Sting’
Tuesday June 8th	Members’ Flying Evening – venue tba

NATIONAL & INTERNATIONAL EVENTS 2010

April 8 th – 11 th	Aero 2010	Friedrichshafen, Germany
April 13 th – 18 th	Sun ‘n Fun	Florida, USA
May 1 st – 2 nd	Microlight Trade Fair	Popham
June 19 th – 20 th	Cotswold Air Show	Kemble
July 17 th – 18 th	Royal International Air Tattoo	RAF Fairford
July 17 th - 18 th	Cholmondeley Pageant of Power	Cholmondeley, Malpas, Cheshire
July 24 th – 25 th	Sunderland Air Show	Seaburn & Roker sea fronts
July 19 th – 25 th	Farnborough International Air Show	Farnborough
July 26 th – 1 st Aug	Oshkosh Air-Venture	Oshkosh, Wisconsin USA
August 13 th -15 th	Devon Strut S.W. Regional Fly-in	Dunkeswell
Sept 3 rd – 5 th	LAA National Rally	Sywell

People in the news.....



We are delighted to be able to tell you that **Cliff** has been awarded a Bronze Medal by The Royal Aero Club. The nomination was made by the LAA and the presentation of the award will take place at the RAF Museum at Hendon on 27th April, possibly by the President of the RAeC, HRH The Duke of York, KG, KCVO.



William Samuel Evans – the designer of the popular Evans VP-1 and VP-2 - there is to be a fly-in at Brighton on Sunday 7th March in memory of William 'Bud' Evans, on what would have been his 97th birthday. 'Bud' died last July. All aircraft are welcome – particularly homebuilts.

Picture: VP2 at the City of Norwich Aviation Museum, Norfolk



You may have seen the BBC's *Top Gear* programme on November 29th last. Clarkson and Hammond were having their usual 'digs' about caravan owners and caravans on the road. **James May** took to the skies to prove that 'caravans could fly'. To achieve this, Lindstrand Hot Air Balloons of Oswestry modified one of their standard hot air airships and incorporated a structure to carry a Freedom Caravan Microlight Discovery. The design complied with CAA standards and the filming took place at Cardington in Bedfordshire.



The registration number is G-TOPG (what else!!)

Jobs to get on with when it's not flying time !

Propeller Maintenance

Propellers endure high stress. The blades travel at speeds in excess of 500 mph while enduring 10 to 20 tons of centrifugal force acting to pull the blades from the hub. While this is happening, the blades are slowly eroded by sand, rain, and the occasional small stone. Props even get man-handled on the ground when pulled on to help park the aircraft. Then, they go largely ignored when it's time for routine maintenance or when reaching the recommended time between overhauls. Props get no respect!

Props deserve better. After all you can practice engine-out landings to your heart's content, but it won't do you much good if you and your propeller part ways in flight. The vibration resulting from a propeller blade failure can easily tear the engine from its mounts, rendering the aircraft uncontrollable.

Preventive Maintenance

Every pre-flight checklist should include a careful inspection of the propeller. Nicks and chips from rock strikes are easy to see and should not be ignored. Even small areas of damage can represent stress points that can lead to cracks or corrosion. It pays to be vigilant and attend to small areas of damage before they become big ones.

Making minor repairs to propeller blades is not a particularly challenging task and there are various references for understanding blade repairs. However, dressing prop blades is not legal preventive maintenance, and it's definitely not for novices because technique is very important. Every blade has dimensional limits that restrict the amount of metal that can be removed during repairs before the propeller become un-airworthy.

It's easy to remove aluminium from a propeller blade and impossible to put it back. Therefore, you need to proceed with caution, using the following basic steps:-

- Using a hand file, carefully remove the damaged material until you reach the bottom of the nick, chip, etc. None of the original damaged surface should be left, but the minimum material should be removed to accomplish this
- Dress out the repaired area, making a smooth transition into the surrounding material. The general rule is to dress out the repair to an area 10 times the depth of the damage. For example, if you have to file down 1/8th inch to get to the bottom of a nick on the leading edge, you must dress out the repair 5/8th inch on either side of the centre of the repair for a total repair span of 1 – 1 ¼ inch. Try to maintain the original airfoil shape, blending the repair into the surrounding area.
- Remove file marks with an emery cloth until the surface is smooth. Then inspect the area carefully, using dye penetrant to reveal remaining marks or cracks
- Treat the repaired area with Alodine (or similar UK product) and paint to protect against future corrosion
- Use emery cloth to smooth leading edges as necessary and apply a thin coat of oil to help resist corrosion

Maintenance on constant-speed propellers hubs is far more complex and, other than routine lubrication, should be performed only at a propeller maintenance facility.

Lubrication of the propeller hub is very important because it keeps the mechanism operating smoothly, and changing the grease will help eliminate contaminants that can cause corrosion. However, it must be done according to the manufacturer's exact instructions and only with the specified grease.

Always leave constant-speed propellers in a horizontal or, in the case of three blades, in a "Y" position to avoid water from collecting on the hub. Regular oil changes are also very important in aircraft with constant-speed props. Since engine oil provides the power source for controlling propeller pitch, ensuring that the oil is clean will reduce the chance that the propeller and governor will have problems caused by sludge or water contamination.

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Wood propellers are truly works of art and should be treated as such. They should be inspected regularly for damage and de-lamination. Pay particular attention to the metal tips, looking for loose screws, rivets or solder. The varnish coating serves a critical role in protecting the propeller from moisture damage and should be carefully maintained. If the propeller is removed for any reason, the bolt holes and hub bore should be inspected for elongation and damage. Then the holes should be treated with a moisture preventative such as asphalt varnish.

The compressible nature of wood requires that the torque on the propeller bolts should be checked regularly. If moisture enters the wood, it can swell and then become loose after drying out. Typically, propeller torque should be checked 23 hours after installation and every 50 hours thereafter.

Finally, regardless of the type of propeller that you have, perform a propeller tracking check. This is a fairly simple procedure that any owner can do. Begin by removing one spark plug from each cylinder so that the propeller can be easily rotated. Next, rotate one of the blades so that it's pointing down and place a wooden block under the blade tip, marking the exact spot that the tip passes over on the block. Finally, rotate the propeller, checking the other blades to ensure that the track is within 1/16th inch of the mark. Any variation beyond 1/16th inch is a cause for concern. It may be caused by a bent blade and should be inspected and repaired by a propeller maintenance facility.

Propeller Overhauls

Aircraft owners often follow the advice of their wallets when it comes to preventive maintenance. This is especially true with regard to the manufacturer's overhaul recommendation for propellers.

Many owners of fixed-pitch propellers are unaware that a TBO exists at all for their propellers. Some recommend that fixed-pitch propellers be overhauled every seven years or 2,000 hours, whilst others only use 2,000 operating hours as the TBO. These overhauls are important, both for safety and performance. Stresses build up in the outer surfaces of the blades that can be relieved by resurfacing the blade and treating for corrosion. However, another important benefit of the overhaul is the inspection and correction of blade tracking and pitch.

It's surprising to see how many fixed-pitch propellers turn up at the overhaul with significant pitch and track issues. In one case, a seemingly "good" propeller turned out to have one blade set to 2-inch greater pitch than the other. There was literally a "climb" propeller on one side and a "cruise" prop on the other. How much smoother that engine must have seemed following the prop overhaul!

Overhaul of a fixed-pitch propeller is also an excellent opportunity to make pitch changes to optimize propeller performance for your aircraft and the type of flying you do. If you check the type of certificate for your aircraft, you are likely to find a range of pitch settings that are allowed for the aircraft. They are identified in "inches" of theoretical forward movement during one rotation. There will usually be a least one "cruise" pitch setting and one "climb" pitch setting. As a rule of thumb, every inch of pitch change will reduce or increase the resulting engine rpm at the same power setting by 30-50 rpm.

When changing the pitch of a propeller, you should keep in mind that all fixed-pitch propellers have a limit to the amount that they can be bent. This limit is cumulative and is commonly limited at 8 inches. For example, if you start with a propeller pitch of 60 and increase it to 66, you can only bend the propeller pitch 2 more inches, in either direction, for the life of the propeller. Keep this in mind when buying a used propeller.

If you do decide to have your propeller re-pitched, you may want to witness the process for yourself. It's certainly not something for the fainthearted, though. Re-pitching is a remarkable battle alternating between brute force and delicate measurement. First, the technician marks a series of points, known as stations, which are measured out from the propeller hub. Then, a highly accurate protractor is used to measure the exact angles at every station along the propeller blades and these are then compared against the specs from the propeller manufacturer.

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Next comes the really scary part as the technician pulls out an 8-foot steel pry bar with a fork on the end, fits it over the blade, and pulls or pushes to twist the blade. The technician measures the new blade angles and repeats the operation as necessary. I can remember feeling distinctly queasy watching this on my own propeller! That said, it clearly demonstrates how strong propellers really are.



A delicate balance of brute force and careful measurement

Overhauls of constant-speed propellers are similar in nature to engine overhauls. There are many individual components that make up the hub of a constant-speed propeller and they have very close tolerances. Each must be inspected, measured and replaced as necessary to meet the manufacturer's overhaul guidelines. Owners of expensive constant-speed propellers generally know the TBO of their props and also know that, if left unchecked, small problems can become very expensive ones. Unfortunately they often pay attention to the "hours" portion of the TBO, while ignoring the age limit set by the manufacturers. The problem with this is that corrosion forces constant-speed props into early retirement more frequently than anything else. And, corrosion is more dependent on age and environment than on operating hours. This is one reason it so important to get a constant-speed propeller overhauled within the recommended TBO. If you catch a problem early, it can often be fixed. However, if the wear or corrosion damage exceeds the tolerances of the component, replacement can be a very expensive proposition.

"Inspect and repair as necessary" (IRAN) is another maintenance option. As opposed to a complete overhaul, the procedure involves disassembly, inspection, and repair on an as-needed basis versus the overhaul replacements set by the manufacturer, which may be much more stringent on component replacement. It's better than waiting beyond TBO but it can be a false economy, depending on your situation. The difference in cost between an IRAN and an overhaul may be quite close and you will still have a propeller with the same time since overhaul when you're done. Communication with the propeller shop is the key to making good decisions here. Check in with the technician as soon as he has completed the inspection, discuss the options, and make an informed decision.

Propellers deserve your respect and attention. Keep them in top condition and they are sure to provide you with years of reliable service. Keep the face and leading edges smooth and free of corrosion, and perform the maintenance recommended by the make. Also, try to avoid using them as a handle for pulling or pushing the aircraft around – that's why tow bars were invented.

Written by Jeff Simon, EAA Member, EAA Sport Aviation, November 2009

NEWS FROM HERE AND THERE

Stewart Luck tells us that the Youth Education Strut (YES) and the *Build-a-Plane Project* is still operating but is now linked with other organisations. Have a look at the Brooklands Museum website for more details.

<http://www.brooklandsmuseum.com/index.php?/education/build-a-plane-project/>

Watch where you park your 'plane! A Taylor Monoplane at a fly-in event suffered damage when a military helicopter landed about 20-25m near to parked aircraft. The light plane's port aileron, control linkage and aileron attachment mounts were badly affected by rotor wash damage, resulting in the 'plane being unable to fly. If it had not been for the prompt actions of pilots nearby, the Monoplane would have been blown over. *Pilot February 2010*

Self-certified medicals – if you fail your Class 2 medical, it is in order for you to carry on flying with a 'self-certified' medical declaration signed by your GP as if for an NPPL, as long as you limit yourself to the NPPL UK-only flying restrictions and privileges, i.e. single engine piston 'planes in day VFR only with pilot plus up to 3 passengers. *Pilot January 2010*

The crew of a Jodel D112 smelled smoke and saw a 30mm hole in the floor with its edges glowing – the cause was an exhaust modification to improve silencing. *Pilot January 2010*

Microcell lead-acid batteries are being developed in the USA which claim to provide 4-6 times the lifetime energy compared to traditional valve-regulated lead-acid batteries (VRLA). The technology replaces the lead of a traditional negative electrode with a 3-D high-surface-area microcell foam. The latest version, 3D2, replaces both electrodes with microcell foam. Whilst all this is under development for the USA military, there could be potential for other uses.

Researchers at Michigan State University are working on a project for a new engine and generator technology that could improve performance and cut costs of electric hybrid vehicles. The wave disk engine apparently uses shock waves inside a rotor instead of a mechanical seal to compress the fuel/air mixture.



Very simple – only one moving part!