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Bristol Wings

Newsletter of the LAA Bristol Wing

October 2011

NEXT MEETING - Alternative Engines

Our next meeting will be held on **Wednesday 5th October** when we will hear from Ian Tadd about the developments in aircraft engines.

Over the years a number of different combustion engine configurations have been tried for aviation ..... the result: the flat four, inline, V and the radial came to dominate at various times in the past 100 years, while other configurations fell by the wayside.

While he will touch on a couple of configurations Ian's focus will be on a recent attempt to revive one of these long forgotten engine configurations as well as the history of earlier attempts.

We'll start to gather together from about 7.30 in Room 7 and any visitors are very welcome to come and join us for what promises to be an interesting evening.

Almen A-4 barrel engine

Just one example of an axial engine

Inside this issue:

LAST MEETING

Steve writes:

We had our AGM last month and those attending will recall an interesting debate about Bristol Wing becoming an LAA "CLUB". This means we get free insurance but at the expense of some autonomy and they get to see our books. The decision by 9 votes to 8 was to become a Club with agreement to confirm this once full documentation is available. Of course the Wing is loyal to LAA no matter what but this step closer the LAA reinforces our commitment to the association.

Many thanks to Gordon who celebrated his 25th year as our treasurer and Dave Hall has taken over the role of NC representative. Alan is our new librarian, Mary continues as our newsletter editor and you are stuck with me for another year.

The minutes of the meeting are reproduced with this newsletter (for members only). .

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Where to go...

Free landing vouchers for October in:
Flyer Magazine: Bagby; Beverley, Cambridge, Holmbeck Farm (Bucks) and Membury.
Pilot Magazine: Haverfordwest, Netherthorpe, Old Buckenham and Shobdon

Try to keep the number of your landings equal to the number of your take-offs

RAeS Bristol branch

Date: Thursday 22nd September 2011
Subject: Desert Operations for the Sea King ASaC Mk 7
Speaker: Lt Rob McKee -Royal Navy Merlin HM MK 2 Avionics and Mission Systems Senior Engineer
Venue: Room 1 BAWA, Southmead, Bristol
Times: Refreshments at 18.00 for Lecture start at 18.30pm

Snippets

Classic Flight Flying Club—Coventry

You may be interested to know that The Classic Flight at Coventry, is now open as a flying club.
The following aircraft are available to anyone who has an interest in flying them:

Auster	Cessna 152 Tail dragger	Robin 200	PA28 Warrior	Maule
Chipmunk	Percival Prentice	Piper Arrow	PA44 Seminole	Pembroke
DH Rapide	Jet provost	Jet Provost 5	Vampire	Meteor

Please feel free to call Duncan (details below) if you would like to visit, even on foot. They are based at Coventry Airbase, free landing fees if you would like to visit.
Contact: Duncan 024 7688 2616 07812 138620 www.classicflight.com www.airbasecoventry.com

File a Flight Plan Day launched ahead of Olympics

A unique, one-day event will take place between 10:00 and 15:00 on Saturday 12 November 201 which will aim to get as many GA pilots as possible thinking about flight planning, ahead of next year's London 2012 Olympics. Any pilots wishing to fly though the Restricted Zone, being put in place over the capital and surrounding areas during the Games, will need to file an accepted flight plan with air traffic controllers before they can take to the skies. For more information please click on the link below:
http://www.caa.co.uk/application.aspx?catid=14&pagetype=65&appid=7&mode=detail&nid=2043

Filton Airfield ....

From Monday 3rd October 2011 Filton opening hours will change to: Monday – Friday 06:30 – 19:00 Local

.....and a Public Consultation

Following the announcement that Filton is to close, South Gloucestershire Council will be holding a series of public exhibitions about the airfield during October. The Council wants to listen to what local people have to say both about the proposed closure and potential options for redevelopment.

Staffed exhibitions _ Drop in exhibitions will be held at the following locations and times:
Monday 3 October- Cribbs Causeway Business Centre, Hollywood Lane, BS10 7TW - 3pm until 7.30pm
Tuesday 11 October- Patchway Locality Hub, Rodway Road, Patchway, BS34 5PE - 3pm until 7.30pm
Monday 17 October- BAWA, Southmead Road, Filton, BS34 7RG - 3pm until 7.30pm.

They are particularly interested to hear what you think about the following questions and it would be helpful if responses were structured in this way:

1. Do you accept that the closure of Filton Airfield is the only realistic option? Yes/ No
2. If No to 1 above, what would you suggest as a way to keep the Airfield viable? Do you have any information to support this?
3. If Yes to 1 above, how do you think the Airfield should be reused/redeveloped? What would you wish to see included in the redevelopment?

Please respond by email to planningLDF@southglos.gov.uk or by post to: South Gloucestershire Council, Spatial Planning Team, PO Box 2081, South Gloucestershire, BS35 9BP. Deadline for comments: **Monday 24 October 2011**

LAA News

Graham Newby has been elected as the LAA National Committee Chairman. He would like to ask all of you for ideas you may have on how to improve the LAA. Graham's email is: grahamnewby52@googlemail.com

Quiz

Last month we had a couple of pictures:

One from Graham..

What was it?

Answer: Bücker Bü181 Bestmann

Once again our Quizmaster Trevor sent in the correct answer and also we received the right one from Alan George

And Steve's photo:

Name the aircraft and also where was the photo taken?

Answer:

Aircraft is the Supermarine S.6A Schneider Trophy racer

Photo taken at Southampton Aviation Museum.

And Steve has given us this link http://www.spitfireonline.co.uk/popup/exhibit12.html for further information

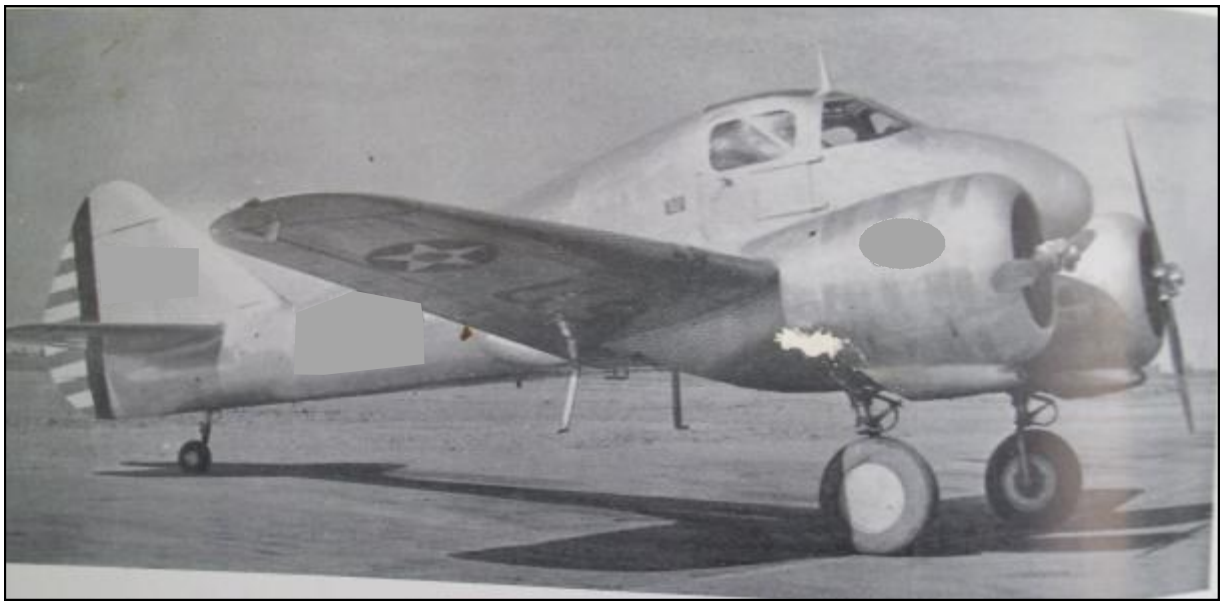
Correct contributions for answers once again from Trevor Wilcock and Alan George. Alan just beat Trevor by getting the location correct whereas Trevor's suggestion wasn't!

This month's picture quiz

Hopefully all clues have been 'covered up' so .....

One point for correct spelling, one more for each of the designations and another one for trying!!

(Everyone has a chance this month because Trevor is away—so go ahead and try.....!)



PRACTICAL ADVICE ON INSTALLATION AND MAINTENANCE OF YOUR PROPELLER

Many thanks to Graham for the following article translated from the French EVRA Propellers website

PROPELLERS for aircraft, ultralights, powered paragliders, autogyros, air cushion vehicles, wind tunnels... ;JAR-Approved manufacturer of aeronautical products; JAR 21Approval No. G009; UEA No. 382

We have manufactured propellers since 1957. The primary material is wood in a strong glass fibre sheath. We too are pilots and users of our products, and have always wanted propellers of great reliability. To this end, in 1960 we instituted a number of improvements in all stages of manufacture.

The woods: We use carefully selected best quality French beech, supported by quality assurance by the Wood Technical Centre. We work with meticulous care and careful seasoning process to guarantee shape stability during the lifetime of the propeller.

The adhesive : We use best quality polymer glues that suffer no deterioration with age or humidity.

Profiling: by machine that consistently and accurately reproduces identical propellers to the same specification.

The sheath: We have researched materials since 1959, and in our experience the best is composite glass fibre STPAé. In addition, our experience has enabled us to select resins with particular qualities.

Leading edge shield: The propeller blade leading edges each bears a shield which protects and conserves the profile precision which is the sole guarantee of performance.

Checks: During fabrication a constant check is maintained under the supervision of the GSAC or DGA, and is recorded in the paperwork sent with each of our propellers.

Several thousand of our propellers are in use. You are one of the users, but please allow us to offer you some advice.

The propeller is a vital part of the aeroplane. A propeller problem may result in a forced landing and may eventually provoke vibration that damages the aircraft. It is essential that the propeller is correctly installed, in conformity with our instructions. Regular checks can permit discovery of problems before they become serious.

STORAGE

Wipe a thin film of oil on the propeller leading edge and store on a flat insulated surface (see paragraph 3/1).

INSTALLATION

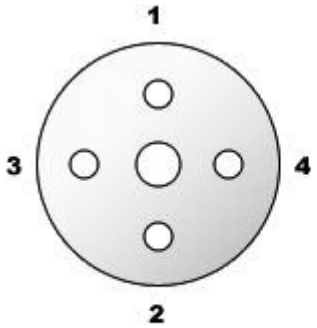
The propeller fixtures and spinner are not manufactured or supplied by EVRA.

Initial checks

- Check the engine and aircraft manuals to check that the engine and aircraft fittings to the propeller are correctly configured.
- If necessary, enlarge the holes in the propeller hub to accept the bolt fixtures.
- Check that the draw-bolt threads are clean and in good condition and can be tightened by hand alone. Eventually, clean the threads using an appropriate finishing tap.
- Also check the bore of receiving the draw-bolts or fixing bolts are free of all debris. The draw bolts must slide and turn effortlessly by hand. Wipe each draw bolt with a greasy rag. If necessary, the bore may be cleaned with an expanding reamer of the same diameter of the draw-bolt. If no reamer is available, repeatedly insert and remove a pre-used draw-bolt through the propeller boreholes; the aim is to skim excess paint from the borehole sidewalls.

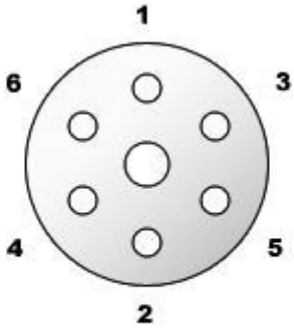
Procedure for tightening the bolts

After having correctly presented the propeller to the attachment points specified by the engine or aircraft manufacturer, proceed to tighten the bolt fixtures in accordance with the sequence shown below:



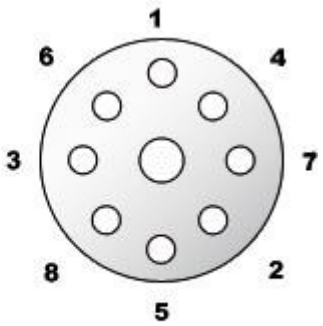
4 TROUS

4 Holes



6 TROUS

6 Holes



8 TROUS

8 Holes

The bolts must be tightened in the order shown above and to the torque values detailed below

The torque tightening value is progressively applied in three successive stages. At each stage, the torque is advanced by one third of the nominal final value.

Torque Value

(Bolts are not supplied by EVRA. The values quoted below are for AN bolts.)

First installation, new propeller:

- 6 mm bolt or ¼ inch 2 daN.m
- 8 mm bolt 5/16 inch 2.5 daN.m
- 10 mm bolt 3/8 inch 3 daN.m
- 12 mm bolt 1/2 inch 4.5 daN.m
- 14 mm bolt 9/16 inch 5 daN.m
- 16 mm bolt 5/8 inch 6 daN.m

For subsequent installation after removal for checks or repair

- 6 mm bolt ¼ inch 1.5 daN.m
- 8 mm bolt 5/16 inch 2 daN.m
- 10 mm bolt 3/8 inch 2.5 daN.m
- 12 mm bolt 1/2 inch 4 daN.m
- 14 mm bolt 9/16 inch 4.5 daN.m
- 16 mm bolt 5/8 inch 5.5 daN.m

During the tightening up procedure, it is normal to find a slight flattening of the wood around the backplate. This flattening can create a number of little cracks in the surface of the glass fibre sheath resin protecting the hub against the backplate. See section §6/2/7 for the allowable limits. It is absolutely vital to check the torque after the first hour of flight, and as regularly as necessary thereafter, but at least every 50 hours.

Propeller Tip Tracking Check

IMPORTANT: Before turning the propeller by hand, make sure that the ignition is OFF!

Check Procedure:

- Place a fixed reference point near the extremity of the propeller arc.
- Arbitrarily choose a first propeller blade.
- Place the fixed reference point close to the first blade tip.
- Rotate the propeller a half-turn.
- The second blade should track to within -3 +3 mm of the first.
- If the second blade is not within the 6 mm range, do not run the engine, but find the reason.
- A tip tracking difference of more than 6 mm may signify:
  - that the propeller has not been correctly fitted.
  - that the propeller shaft is out of true.
  - that the propeller is distorted: send it back to us for examination.

Draw-Bolt Locking Fixtures

In most cases the nuts or bolts are wire-locked with O 10/10e stainless steel lock wire. In other cases (split pints, etc.) see the engine manual.

IN-SERVICE MAINTENANCE

Apply a thin coat of Vaseline to the metal leading edge shields to prevent oxidation and repeat periodically. We recommend this procedure especially for aircraft operating in a humid climate or with high rainfall, and more particularly close to the sea.

IMPORTANT: When the aircraft is parked outside, never leave the propeller in a horizontal position.
If the propeller is fitted with a spinner, it is particularly important to monitor its condition to ensure that the spinner is not in contact with the propeller at any point.

A SPINNER IN POOR CONDITION, EVEN SLIGHTLY CRACKED OR SPLIT, CAN CAUSE A VERY SERIOUS ACCIDENT

MAINTENANCE

Regular Maintenance:
The propeller can be cleaned with a sponge and soap or detergent in water, finishing off with a chamois leather. The leading edge shield can be polished with a 000-grade emery paper, taking care not to change the surface profile.
Pre-flight inspection:
Propeller visual inspection
Check fixtures
Periodical Maintenance:
One may apply a thin oil film to the propeller leading edge metal shield to prevent oxidation.
Check the propeller torque after every flight 50 hours and during a major climatic change.

SERVICE LIFE

Our propellers have no limit as to their service life. Some may be out of limits after more than 30 years and several thousand hours of use. During service life, there may be some change.

ACCEPTABLE BLEMISHES

Leading edge metal shield

- Cracks: allowable, except in the outer extremity of the blade. (See section § 8/1 for repair scheme).
- Dents and deformation not resulting in any separation of between the shield and sheath (for repair scheme see § 7/1)
- Erosion not resulting in the appearance of a crack or perforation in the leading edge metal shield (for repair scheme see §?).
- Break-up of rivet heads at prop tips. No objection for propellers type D 9 & D 11.

Glass fibre sheath

- Fine cracks transverse to the blade.
- Surface with an orange-coloured skin; with general or localised granules.
- Markings in-line with the glass fibre weft and parallel to the leading edge shield, up to a limit of 2 cm behind the shield. (See maintenance paragraph § 7/1)
- Longitudinal crack on the front or back surfaces at the interface to the leading edge shield, including the propeller extreme outer margin caused by the alternate blade flexing.
- Erosion or slight detachment of paint on the front or rear surfaces of the leading edge shield caused by difficult meteorological conditions such as rain or hail.
- Slight impact damage caused by take-off from runway sand or gravel (for repair see section §7/1)
- Circular marks or depressions on hub front or rear, around the back-plate. Tolerance 1.5 mm. After several repeat installations, this value may reach 2.5 mm, provided that the propeller back-plate or front-plate do not puncture the glass fibre sheath or the wood.
- Swollen paint on the hub, around the manufacturer's identification and inspection marks (see maintenance section § 7/2)
- Chips, erosion or cracks in the sheath on the surface outer margin (see repair scheme)

REPAIRS AND MAINTENANCE

Other than the repairs described in this document, all repairs must be undertaken by EVRA.
We balance the propeller very carefully in our workshops and any change may unbalance the propeller, resulting in vibration.

Propeller Leading Edge Metal Shield
A slight impact or scratch does not render the propeller unserviceable.
Nevertheless, some types of impact damage or traces can deform the profile and alter propeller efficiency. The shield is a light alloy, and is best re-shaped with the help of two hammers and lightly squeezing the metal and finishing off with a very soft file.
Traces of erosion can be polished out with 000-grade emery paper.

Sheath
Damage to the glass fibre sheath can be isolated by the application of:

- cellulose varnish or
- - cellulose paint or
- - Araldite glue or
- - Liquid polyester or
- - Cellulose filler or
- - Polyester filler

Wood
Any damage to the wood, even if partial, requires the return of the propeller to our factory.

WHEN TO REPLACE OR REMOVE

Propeller Leading Edge Metal Shield

- - Cracks: cracks situated in the last section (sections marked by notches in the shield) at the blade extremity, and cracks whose edges are defoliating more than 0.4 mm, one matching another. See the remarks on page 8.
- Impact damage: Any impact resulting in shield deformation and resulting in a raised edge of more than 0.4 mm from the normal surface sheath along the leading edge shield.
- Erosion of the leading edge metal shield including the appearance of cracks or tears in the shield.

Glass fibre sheath

- - Blisters larger than 2 cm in diameter including a discontinuity in the profile.
- - Blisters in the sheath following a zone parallel and up to 2 cm from the shield margin. (see section § 7/2 repair scheme)
- - Transverse tear between 07R and R, generally caused by an inopportune shock during the course of manipulation and having caused a rupture in the wood.
- - Rupture of the sheath associated with a blow to the wood (see maintenance scheme section §7/3)
- - Vibration when in use: EVRA propellers are balanced on a static rig in the workshop to a tolerance of less than 1 g and using an optical sight to assure absolute flying comfort. If any vibration is apparent, find the reason.

NOTE :

The shield is sub-divided into sections to simplify exchange. The last section is located between the tip of the propeller and the and nearest section.

INCIDENTS

In case of an incident, the propeller user or owner must contact EVRA as soon as possible.
We recommend use of the appended incident reporting form (Fiche d'Incident).

LIABILITY

EVRA will accept no responsibility in the event of negligent maintenance or failure to follow the instructions in this manual, or impact with another hard object.

A prop requiring a little maintenance!

WHO ARE WE?

A column dedicated to finding out more about who belongs to the Bristol Wing.
This month we talk to : ***Graham Clark***

Current Day Job/Past Career

Technical journalist, technical translator. Still enjoying the job, but now part-time.

Why Aviation?

As a small boy I broke my leg and was sent by my parents to drive my grandparents nutty at their home in Wendover, near RAF Halton, where my grandfather had been a technical instructor prior to his retirement. He put me in the pushchair, and we passed through a lane with a view to the airfield: "That's a Spitfire, that's a Hurricane, that's a Mosquito..." The seed was sown.

First Flight – in What, Where and When?

Auster (I think), Sandown, Isle of Wight, 1949. Five Bob.

How long in the Bristol Strut/Wing? :

20 years (approx.)

Total Number of Aircraft and Hours Flown :

Approx. 30 types, Approx 2,000 hr (power & gliding)

Favourite and Worse Type Flown :

Favourite: Jodel D9.

Worst: Dornier 27.

Current Aeroplane :

Robin DR1051M1 Sicile Record. Engine: modernised 105 hp Potez 4E20.

Best Aviation Moment and Flight :

Rental aircraft flight from Los Angeles around Grand Canyon rim to Grand Canyon Airport; and return.

Any Aviation Heroes - if so who and why?

Francis Chichester, Jean Batten, Charles Lindbergh: for feats of solo long distance navigation with no radio, no flight plan, the simplest of navigational aids and a shoestring budget.
Louis Bleriot for showing it could be done!
Jean Delemontez, for the Jodel wing design;
Battle of Britain fighter pilot Geoffrey Wellum (author 'First Light') and the men and ATA women of his generation.
Henri Mignet, the first true home-builder.

Any 'Hairy' Aviation Moments - if so – any lessons learnt? :

Yes. Flew an incorrectly rigged Tiger Cub biplane, and nearly killed myself.

Lesson learned: never fly an aircraft somebody else has rigged.

Aircraft Wish List – to fly or own

I would love to fly a D9 again. Absolutely delightful handling and full air-con.

Any Advice For All Pilots :

If in doubt, don't. Live to fly another day.