

# Instrument Pilot

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## EDITORIAL

Mode S - You must have it by 31<sup>st</sup>  
March 2005..or perhaps not! 1

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Sea 'plane base? ~ Southern California's Santa Paula airport is almost washed away due to heavy flooding. See Intel Reports, page 5

## Mode S - You must have it by 31<sup>st</sup> March 2005..or perhaps not?

By Paul Draper

PPL/IR Europe contributed to the debate about Mode S back in 2002/3 and in particular tried to get changes to the speed limit at which it became necessary to have "Enhanced" (EHS) rather than "Elementary" (ELS). We did not entirely succeed and the limit became 250 KTAS, causing a problem for some members whose aircraft slightly exceeded that speed. However, hopefully they will be able to argue that they should not have to fit it because their airframes were unsuitable or incapable of taking the kit or the costs of installation were disproportionate to the airframe value. In such event, and if the "Exemption Cell" agreed, they would (only) have to fit Elementary.

### AIC

The CAA AIC 105/2004 was published on November 11<sup>th</sup> and declared the requirement for Mode S in mandated airspace (some en route and the London TMA to start with). But this created more questions as to applicability than it answered, partly because Eurocontrol had highlighted at its earlier ATM/CNS Consultancy Group meeting on 29<sup>th</sup> September that there were problems in the fitting of Mode S Elementary as operators could not comply by 31<sup>st</sup> March 2005. There were also problems reported with the ground radar installations. Accordingly, they extended the transitional arrangements such that the final date for fitting would be 31<sup>st</sup> March 2007.

The CAA stated this was not a change to mandates or a slippage. "All it does is extend the period to improve the situation for operators who have to fit EHS as well and to reflect the reality of delays in SBs etc being issued". Furthermore on December 1st, I was

advised:

"1. For GA a/c under 5,700 Kgs and 250 Kts using TMA and doing lots of airwork – safer to fit Mode S Elementary soonest.

2. For GA generally (under 5,700 Kgs and 250 Kts) CAA recommend you fit Elementary as soon as you can reasonably do so.

3. For GA as 2 above but on the fringes of the London TMA and requiring only occasional crossing access, one can await further news (in January) but the fitting will be required by latest 31<sup>st</sup> March 2007. Aircraft will not be required to have a formal exemption in such case.

4. For GA as above needing a new transponder between now and 31<sup>st</sup> March 2007, fit a new Elementary Mode S.

5. Mainland Europe have proposed to defer the need for GA as 2 above to have Elementary until 31<sup>st</sup> March 2007."

### Transition Arrangements

In January 2005, Eurocontrol issued a "Specimen Aeronautical Information Circular (AIC) - Recommended Text of State AIC-IFR". This document dealt with "Modification of Transition Arrangements" including, inter alia:

1.1 This AIC, covering **IFR flights as General Air Traffic (GAT)** provides information on an extension to the published transitional arrangements for the carriage and operation of Mode S airborne equipment in the airspace of Belgium, France, Germany, Luxembourg, the Netherlands, Switzerland and the United Kingdom. It is the outcome of an agreement reached between EUROCONTROL and the State

“  
The transition period has been extended and the final date for fitting is now 31st March 2007  
”

## Mode S Requirements

Continued from Page 1

authorities to modify the final dates for aircraft compliance....

2.1.1 For aircraft issued with a first certificate of airworthiness in an ECAC State, or elsewhere, prior to 31 March 2004, the final dates for compliance with ELS functionality are:

a) Mode S transponder. Where a Mode S transponder is already installed, it **must** comply with ICAO Annex 10 SARPS, amendment 77, as a minimum, with effect from **31 March 2007**,

b) Mode A/C Transponder. For the purpose of IFR flights as GAT, existing SSR Mode A/C transponders **must** be replaced by Mode S transponders, in accordance with Notes 1 and 2, above with effect from **31 March 2007**,

2.1.2 Aircraft issued with a first certificate of airworthiness in an ECAC State, or elsewhere, on or after 31 March 2004 should already be compliant or, with immediate effect, be made compliant, with the requirements of Mode S Elementary Surveillance....”

In the light of what seemed to be a clear recommendation in January and early February for “deferral” of the requirement to fit Elementary until 31<sup>st</sup> March 2007, I again

enquired of the CAA as to the position and was advised:

“There is a change to the European Mode S Elementary Surveillance (for IFR/GAT in excess of 5,700 kgs/250 Kts) in that their transition period has been extended to overlay that of Enhanced Surveillance which is the first phase in UK. This was only very recently approved by PC and does not in reality change things in the UK....

....This is not a deferral; it is merely an extension of the transition period for the central European Elementary surveillance requirement which came into effect from 2003/4 for IFR/GAT etc so that it now matches the transition period for Enhanced Surveillance. The impact for those aircraft below 5,700 kgs and 250 Kts which would be required to fit ELS to fly in EHS airspace is not really changed as they would have enjoyed the similar transition period to EHS where they had a justification.

However, we are drafting an update because of the confusion which others have generated and this will also be posted on the CAA website and probably to aviation press in advance of AIC publication.”

The UK is still requiring Mode S to be fitted by 31<sup>st</sup> March 2005, unless you have justification for not doing so and the Exemption Cell agrees (there is also an

exemption for aircraft requiring access for less than 30 hours per annum but all aircraft will require it by 2008). However, Eurocontrol are recommending an effective “deferral” of the final date to 31<sup>st</sup> March 2007. The State is of course the decider and we understand France has already announced the latter date (See Rémy Bouin’s report on page 13).

### *No Simple Answer*

Confused? I am for one. So the question, for aircraft less than 5,700Kgs and 250 KTAS wanting access to the London TMA, remains and is quite simply “Are we able to leave the fitting of our Elementary Mode S transponders until a final date of 31<sup>st</sup> March 2007 or not?” For some reason it seems very difficult to get a simple answer. It may be that by the time you read this the position will have been clarified; I hope so! But, those of us who have already fitted the new kit will feel somewhat annoyed that they have probably done so two years early! And I won’t even begin to mention the lack of a traffic information service (as increasingly available in the USA) for that’s a whole new subject; but as it could display on our GNS 430s and we all have to have Mode S by 2008, that would be a real incentive to fit it!



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## *SES Route charging, Mode S/T, Galileo and VFR levels finally settled?*

By

*Alan Toogood*

**M**uch relief was felt by several campaigning groups this week when all outstanding matters that were of deep concern to general aviation pilots and organisations were settled. The chivvying of so many separate organisations was achieved by UK Prime Minister Tony Blair’s office, prompted personally by Tony, an accomplished NPPL flexwing pilot and Cheri, a qualified sports and stunt parachutist who are being pushed by Pegasus Aviation as to the final avionics fit for their Pegasus Quantum 503, due for delivery in three weeks.

According to the UK’s Department for Transport spokesman Donald Asmee, the

en route charges for flights from October 2006 will be 2 SDR per kilometre flown. (The SDR (Special Drawing Right) is an artificial “basket” currency used by the IMF for internal accounting purposes and by the EU for various purposes such as compulsory minimum insurance levels that are being implemented under EC Regulations 785/2004 which come into effect on 29 April 2005. The SDR value yesterday was 0.8529 Euro, 1.2377 UKP and 0.1746 Malaysian Ringgits).

The 2 SDR/Km value is an initial charge and with provision to amend it as soon as the 2006/7 collection costs are ascertained. Good news is that, parachutists and gliders

will be exempt from charging unless they install Mode S and use LARS. Gerry Nemo of the Amateur Parachuting Guild said. “It is a great victory for our members’ campaign. When Mode S for us was muted by the JAA for assessing route charges on a vertical plunge it made us really angry.”

Everything else that flies will be caught in the charging web including solar and pedal powered craft that will be required to carry Mode S with the en route charging encryption chip that will use the 7-bit code that many experts wondered why it was left unused when Mode S was first proposed in 1995. Now we know.

# Getting your Aircraft Maintained in the Future

By

Jim Thorpe

EASA has published a draft of its proposed charges. The two areas most likely to impact on members are the costs of approving a minor modification and the charges imposed on small maintenance organisations. The latter while not of direct interest will naturally find their way into your bills. However to explain this more fully it is necessary to consider some of the forthcoming changes in the way maintenance companies are approved and supervised.

## EASA Fees

The basic EASA system seems quite fair. There are fixed fees for each service and an hourly charge rate for less well-defined activities. However the fixed fee is subjected to a coefficient, which varies according to the value or size of the business or aircraft.

For example a minor mod on an aircraft below 2000kgs attracts a fixed fee of 375 Euros but surprisingly the coefficient is zero hence I take this to mean the service is free as opposed to about £60 at present. By comparison, the largest aircraft has a multiplier of 2.

To understand the fees applied to maintenance organisations we need some background. Approved maintenance organisations at present come in two varieties JAR 145 (Now EASA 145) and M3. M3 is a purely UK approval. In broad terms, the only privileges of a JAR 145 organisation are the ability to work on aircraft carrying other European registrations and on UK public transport aircraft working under an Air Operators Certificate. Either sort of approved organisation is able to recommend to the CAA the issue of the Certificate of Airworthiness which must be renewed at three yearly intervals.

Under the new system neither

organisation will be able to do this. C of As will last indefinitely but there will need to be a regular maintenance review carried out by a new breed of organisation known as a Part M subpart G organization. M3 organisations will have to apply to become Part M subpart F organizations.

## Maintaining a 747

As those of you who have not already lost the will to live will have realised, this means that either your maintenance company will have to hold two approvals or you will need to deal with two organisations. This makes perfect sense if you are maintaining a Boeing 747. The first organisation (who may well be the airline) assesses the maintenance needs of the airframe partly by examination but mostly by considering the written material, maintenance schedules, life limited parts etc. They then issue instructions to one or more approved engineering organisations which actually do the work. This work, either by physical examination or by review of work sheets and documentation is then accepted by the commissioning part G company.

Now you ask; how does this apply to my Cherokee that is looked after by a one-man band working from a farm strip? Well for the moment the detail is not clear to anyone but what is pretty certain is that compliance is not going to be straightforward and certainly will not be cost free.

Returning then to EASA charges and assuming your engineer has become subpart F and subpart G approved and his business turns over less than 700,000 Euro he will pay 1500 Euro a year for part G and 9000 Euro a year to be part F approved.



All maintenance organisations need EASA approval

## No C of A Fee

The latter cost, which does not exist at present, is substantial. However since you will not need a three yearly C of A the present fee of around £800 will disappear. However the new part G organisation will have to recover its costs somehow so they will need to charge you for your maintenance review. Without getting into too much detail these maintenance reviews will be more frequent if an aircraft is not maintained by the same company so there will be a strong disincentive to change companies.

The exact impact of all this will probably not emerge for a year and my interpretation must be taken with a pinch of salt. However for what it is worth, this is my guess as to the future.

- 1) The days of the one man engineer without a fixed base are over.
- 2) The days of the one-man operation with a fixed base are probably over.
- 3) There will be a minimum size of business which can carry the administrative overhead, say three engineers and one office person.
- 4) A new type of organisation may emerge which manages light aircraft on behalf of owners but does not do much actual work themselves.
- 5) Costs will increase significantly but not dramatically.
- 6) The prudent owner will need to review his needs, try to make an informed decision as to the best provider and then stick with them.

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Maintenance reviews will be more frequent if an aircraft is not maintained by the same company

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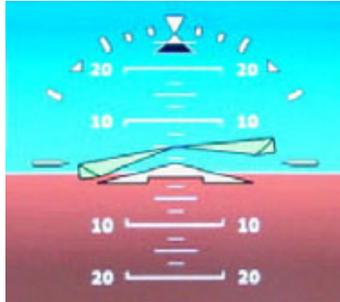




Compiled by  
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## Manufacturer Developments

Cirrus Design, manufacturers of the SR20 and 22 high end singles, have announced that they sold 733 aircraft during 2004. This is more than double 2003 sales and puts Cirrus on a par with *Cessna* as the largest producers of piston single aircraft, Cessna delivered of 654 piston singles in 2004 but did not reveal sales. It is probable that both manufacturers 2004 figures were positively inflated by a one off tax break on US sales which closed at the year end. Nevertheless Cirrus have produced an impressive penetration of the market with a single fuselage design – indeed they have likely created a new market by virtue of the modernity of the SR20/22 design. As evidence of this Cirrus have also announced further development of the avionics package by addition of an V Bar Flight Director option.



**Diamond Aircraft**, Vienna based manufacturer of the DA-40 Diamond Star and DA-42 Twin Star, has had a less happy close to the year following a spat with diesel engine manufacturer Thielert. Diamonds decision to suspend deliveries of diesel powered variants follows a dispute with its powerplant partner over technical issues, including cylinder head corrosion

seen on some engines and product development strategy. Diamond say they hope to select an alternative diesel supplier soon, perhaps from the automotive sector. Meanwhile, they are advancing certification of a Lycoming powered DA-42 in an effort to get US deliveries under way.

Slightly higher up the spectrum, Colorado based **Adam Aircraft** missed their intended year end FAA certification of the A500



Teledyne 550 powered push/pull pressurised twin but are pressing on with completion of first customer aircraft and expect an imminent clearance, which will be followed by a US tour. Adam have also recruited former 4 Star General and Presidential candidate Wesley Clark as a director - they clearly see homeland security applications for both the A500 and its Williams FJ33 powered sister ship, the A700 and are bringing in the big guns to help sell.

## Ageing Aircraft Issues

With most GA types and many of the more sophisticated variants now advancing in years (in the US the average single engine aircraft is over 30 years old), managing and supporting ageing aircraft is a recurring theme. In the US the *FAA* has had cause to issue further directives in respect of the Cessna 400 series. On 20<sup>th</sup> February this year the *FAA* issued an emergency AD requiring checks on forward, aft and auxiliary wing spars of the 402C and 414A, following identification of cracking and, in one case, failure of a spar cap. Readers will probably recall the grounding last year of the T-34 Mentor fleet following a structural failure during aerobatic type manoeuvres. Given their unusual usage profile, the FAA now regards the T-34 as the “canary in the coal mine”, pointing to other potential issues in advance of these showing up on less stressed types. The FAA is concerned about the potential for undetected defects in other types and presumably we can expect further action soon. This will presumably affect the many N registered aircraft operated in Europe and will also translate to the European safety environment. On a more positive note, the *UK CAA* has taken two useful steps to help ensure the supportability of older aircraft. Firstly they have agreed to permit the use of parts manufactured originally of military use to be fitted to civil registered aircraft subject to provisos around access to original design and production data and fitment by a JAR-145 organisation. Secondly, they have conceded that suitable organisations may supervise the manufacture of parts by unapproved subcontractors. This practise is widespread in the mainstream commercial aircraft industry but not previously applied in support light aircraft. *de Havilland Support Ltd* have been instrumental in obtaining these concessions but they may well improve support to other types.



## Air to Ground Comms Survey

*Eurocontrol* has commissioned the Netherlands National Aerospace Laboratory, NLR, to conduct a survey of communications “occurrences” in order to provide data within a European context (much of the previous work in this area has been done in the US). The survey targets both aircrew and ATCO experience and focuses on occurrences such as; call sign and frequency change confusion, sleeping VHF receivers, phraseology, blocked transmissions and interference. The survey period will have completed by 31st March but results will be used to inform safety improvement recommendations as part of the Single Pan-European sky initiative.



## US GA Accidents Down

Early figures from the NTSB suggest that 2004 was the least accident prone year for US GA since recording began in 1938, with overall accidents down 8.4% and fatal accidents down by 11.4%. The numbers of instructional accidents were even better, overall down by 11.7% with fatal instructional accidents halved to only 8. There is no news yet on how these figures look as rates against activity but the trend looks encouraging.



## More GA Charges?



**UK AOPA** is fighting a move led by airlines, primarily **British Airways**, to transfer **CAA** regulatory charges to the non airline sector on the basis of ending an alleged cross subsidy. If the transfer was to be applied in full, operators of sub-15 tonne AOC aircraft could see charges rise by a total of £4.5m and GA could be hit by an additional £1m of charges. AOPA believes that this would further damage these already struggling activities, citing a 30% decline in year on year GA activity and a 40% reduction in student pilot numbers over the last decade. AOPA points out that the airlines case is flawed on several counts, principally that GA does not receive tax breaks such as tax exempt fuel and that the CAA costs which these charges fund are probably unnecessary, particularly in view of the transfer of regulatory responsibility to EASA. UK AOPA, which was not allowed to participate in the review team discussions, is calling for a judicial review of the CAA scheme of charges.

## New Garmin iQue3600a

For those of us who still need removable GPS for the cockpit and want a versatile unit for multiple applications, Garmin have recently introduced a Palm OS based PDA with integrated GPS known as the iQue3600a. Whilst there is nothing new is much of what this unit does the manufacturer claims that with a large colour display (360 by 480 pixels) and a newly patented mechanical interface (big buttons!) the iQue3600a is very compatible with the aircraft environment. The unit has an integral aerial if required and can accept Jeppesen aviation data and other mapping via SD type memory card. All the normal functionality of a PDA is retained. Expect the iQue3600q to retail for around Euro1,000.



## Noise Curfews Resisted

It seems that the US is not immune to poorly thought out attempts to legislate for noise curfews. The US Congress has been presented with a draft bill which seeks to establish night restrictions on operations. The legislation would have established a commission to recommend restrictions on over flight of "populated" areas during "normal sleeping hours" - without apparently defining what these terms mean. It seems that the sponsoring representative is from NYC and has been a long time proponent of a curfew for La Guardia airport. It does not look however as if the legislation will get far. US AOPA maintains that use of noise abatement techniques and other local agreements make for better controls than federal legislation.



## It couldn't happen here.....

As many readers will know, the US flight service station (FSS) network provides various flight support services to non airline traffic, most notably the on demand telephone briefings by invariably well informed and courteous specialists. FSS has historically been available to all pilots and is free at the point of use. The FAA has recently decided to outsource the provision of FSS services across the US - I hear you sigh in expectation that this must mean either lower service levels or charges (or both). In fact whilst the winner of the competition, Lockheed Martin, is indeed required to show reduction in cost to the FAA they must also demonstrate improvement in service levels to pilots and the service will continue to be provided without charge to users.

## It hopefully won't happen here.....



Santa Paula airport in southern California is home to around 300 aircraft, including many classics, experimentals and a well regarded museum. The airfield is situated next to the Santa Clara river. Unfortunately, SoCal has had a lot of rain recently and over the course of a few days in February the swollen river has eaten away, not only at large areas of the parking apron but also the runway, which has been seriously damaged. US AOPA is now assisting the airport with identification of funds to allow rebuilding.



# Pilots' Talk

## Compulsory levels of third party insurance now imminent

You should be aware that *Regulation (EC) No 785/2004 on insurance requirements for air carriers and aircraft operators* comes into force on the 30<sup>th</sup> April 2005. In addition to the third party requirements of Article 7 listed below, Article 6 requires the following minimum insurance cover: Passengers at 250,000 SDRs<sup>1</sup> per passenger<sup>2</sup>, baggage at 1,000 SDRs per passenger and cargo at 17 SDRs per kg.

### Article 7 Requirements

| Cat | MTOM (Kg)              | M SDRs |
|-----|------------------------|--------|
| 1   | Up to 499 <sup>3</sup> | 0.75   |
| 2   | 500 – 999              | 1.5    |
| 3   | 1,000 – 2,699          | 3      |
| 4   | 2,700 – 5,999          | 7      |
| 5   | 6,000 – 11,999         | 18     |
| 6   | 12,000 – 24,999        | 80     |
| 7   | 25,000 – 49,999        | 150    |
| 8   | 50,000 – 199,999       | 300    |
| 9   | 200,000 – 499,999      | 500    |
| 10  | 500,000 +              | 700    |

The minimum combined single limit (CSL) liability cover for each aircraft will be calculated as follows:

- 3rd Party for relevant category (see table)
- + 250,000 SDRs x maximum number of passengers carried on that aircraft
- + 1,000 SDRs x maximum number of passengers
- + 17 SDRs x kilograms of cargo carried.

<sup>1</sup>. SDRs are Special Drawing Rights. This is an international reserve asset created by the IMF. It is valued in terms of a weighted basket of four currencies (US dollar, yen, sterling and euro). As at 20 March 2005, one

SDR equals GBP 0.80 or EUR 1.15.

- <sup>2</sup>. Or in respect of non-commercial operations with aircraft with MTOM of less than 2,700 kg, not less than 100,000 SDRs per passenger.
- <sup>3</sup>. Pursuant to Article 2.2 (g) aircraft and micro lights with a MTOM of less than 500 kg used for non commercial purposes or used for local flight instruction which does not involve the crossing of international borders whilst requiring insurance as set out above are not required to meet insurance obligations so far as war and terrorism are concerned.

Refer to the Regulation for more detail – the full wording is on [http://europa.eu.int/eur-lex/pri/en/oj/dat/2004/l\\_138/l\\_13820040430en00010006.pdf](http://europa.eu.int/eur-lex/pri/en/oj/dat/2004/l_138/l_13820040430en00010006.pdf)

Your insurance broker should be contacting you with details of the extra premium you will be required to pay but increasing from £1m to £3.5m should be around £500 a year extra.

## Refresher workshops exclusive to PPL/IR Europe members

A great opportunity to update and enhance your IFR knowledge and skills, and particularly suitable for those who have recently gained their IR. Practical sessions covering such topics as flight planning, dealing effectively with ATC and in-flight problems, CRM aspects (managing the flight), safety matters, updates and an opportunity to practice in the latest type of simulator. Expert advice and guidance from experienced pilots/instructors, with back-up support available. Workshops will be held on the following Saturdays, 10:30 to 16:00



hours; May 7th, Jul 2nd, Sep 3rd, Nov 12th. Workshops subject to a minimum of four confirmed students four weeks in advance (and to a maximum of six students). Cost (including VAT) £150.00 - payable at time of booking. These courses are run on a 'not-for-profit' basis and take place at Professional Air Training Ltd, Bournemouth Airport. Arrive by car or air. For further details and booking: Tel. +44 1202 593366. Fax. +44 1202 574020. E-mail [info@pat.uk.com](mailto:info@pat.uk.com)

These workshops are recommended for continuation training by the PPL/IR Europe Executive Committee as contributing to flight safety. A review of the workshop attended by one of our members will appear in the next edition of *Instrument Pilot*.

## CAA Charges set to increase substantially

The CAA proposes huge increases in charges to GA. There is heavy pressure from the airlines who believe they cross subsidise GA to the tune of £7.5m p.a. Licence fees for PPLs, annual certificates and aerodromes will rise and AOC operators will face large increases. More information as it becomes available. (Paul Draper)

## Keep a blinking good look out

The human eye focus adjusts itself so the distance a pilot is looking at gradually reduces and small objects in the sky disappear as the eye focus retracts. Steady fixation favours disappearance - but blinking and gaze shifts induce the re-appearance of objects that have disappeared. This is called the Troxler effect. (Norman Butcher - Sky Watch)

## Test your RT skills on this download



The editorial office received this email:  
Dear Pilot,

The Dutch National Aerospace Laboratory (NLR) is performing a study that should clarify a number of aspects of how well R/T is understood. EUROCONTROL funds the study. The NLR wants to invite pilots to take part in this study.

The experiment runs on your own PC and takes about one hour. All results will, of course, be treated anonymously. After running the experiment the software can be removed from your computer easily. No traces will remain and the software is guaranteed free of computer viruses! Requirements: Windows PC with internet/e-mail connection and loudspeakers. The package has a size of about 7 MB and may be downloaded from <http://www.nlr.nl/projects/lclb/>; you can also contact us (see contact information at the bottom of this page). Then we will send you a CD-ROM containing the software package. Once finished, the results will be coded, pasted on the desktop of your computer, and prepared for transmission to the NLR via your own e-mail program.

For more information, or a CD-ROM with the software package, please contact us at the address below. Thank you in advance for your professional contribution!

Rolf Zon  
Nationaal Lucht- en  
Ruimtevaartlaboratorium (NLR)

Do give it a go. It's really good fun once you work it out and succumb to actually reading the instructions to know how to respond. The first 'task'; simply following RT instructions is almost stressful but as you are sat in front of your PC instead of being in the crowded airspace that the scenario puts you in, it's enjoyable. Thoroughly recommended although I had

to re-boot afterwards as my start menu at the bottom of the screen had disappeared.  
(David Bruford)

## Wing upper surface ice accumulation alert



As reported in the last issue of *Intelligence Reports*, a US National Transportation Safety Board Advisory has been issued as a result of a recent takeoff accident that has generated much discussion about the effects of wing upper surface ice accumulations; the National Transportation Safety Board has long been concerned about the insidious nature of the effects of small amounts of ice accumulated on an airplane's upper wing surface. The Safety Board's preliminary investigation of the November 28, 2004 accident involving a Bombardier Challenger 604 in Montrose, Colorado, (additional information regarding this accident can be found on the Safety Board's Web site at <http://www.ntsb.gov>, accident number DEN05MA028). This has revealed that atmospheric conditions conducive to upper wing surface ice accumulation existed at the time of the accident (airplane performance issues, including the possibility of upper wing ice contamination, are being investigated).

For years most pilots have understood that visible ice contamination on a wing can cause severe aerodynamic and control penalties; however, it has become apparent that many pilots do not recognize that minute amounts of ice adhering to a wing can result in similar penalties. Research results have shown that fine particles of frost or ice, the size of a grain of table salt and distributed as sparsely as one per square centimetres over an airplane wing's upper surface can destroy enough lift to prevent that airplane from taking off. The Safety Board has commented on the hazards of upper wing ice accumulation in

several previous aircraft accident reports; some excerpts from these reports follow:

### Wind Tunnel Research

According to wind tunnel data, a wing upper surface roughness caused by particles of only 1-2 mm diameter, at a density of about one particle per square centimetre, can cause lift losses of about 22 and 33 percent, in ground effect and free air, respectively.

Research has shown that almost imperceptible amounts of ice on an airplane's wing upper surface during takeoff can result in significant performance degradation. Therefore, the Safety Board has urged pilots to conduct visual and tactile inspections of airplane wing upper surfaces in past safety recommendations (including Safety Recommendation A-04-66, which was issued to the FAA on December 15, 2004). For additional information, see [http://www.ntsb.gov/recs/letters/2004/A04\\_64\\_67.pdf](http://www.ntsb.gov/recs/letters/2004/A04_64_67.pdf).

### Difficult to Detect

Ice accumulation on the wing upper surface is very difficult to detect. It may not be seen from the cabin because it is clear/white and it is very difficult to see from the front or back of the wing. The Safety Board believes strongly that the only way to ensure that the wing is free from critical contamination is to touch it.

Accident history shows that non-slatted, turbojet, transport-category airplanes have been involved in a disproportionate number of takeoff accidents where undetected upper wing ice contamination has been cited as the probable cause or sole contributing factor.

The industry acknowledges that it is nearly impossible to determine by observation whether a wing is wet or has a thin film of ice. A very thin film of ice or frost will degrade the aerodynamic performance of any airplane.

The Safety Board believes that even with the wing inspection light, the observation of a wing from a 30 to 40 foot distance, through a window that was probably wet from precipitation, does not constitute a careful examination. The Safety Board acknowledges that the detection of minimal amounts of contamination, sufficient to cause aerodynamic performance problems, is difficult and may not be possible without a tactile inspection.

# ICING TACTICS

By

Robert Lough

I fly approximately 80 hours a year on airways between the UK and Continental Europe. During half of the flights I am likely to encounter a possibility of icing, and usually at some point I will have climbed or descended through a layer of ice producing clouds. This must be typical for most GA aircraft using airways in Europe as typical minimum en-route altitudes (MEA), outside mountainous regions, are between FL60 and FL110. Unless there is no cloud or precipitation, you are likely to pick up icing either in the climb (mainly in winter) or in the cruise (potentially year round).

## *Aircraft*

I fly airways in a 1973 normally aspirated Aztec E that is certified for flight into known icing. Aztecs have a very thick airfoil and a stabilator; the wing is also rectangular with no taper. What they lose in aerodynamic efficiency (about 20 knots compared with a Baron), they may gain by having relatively forgiving flying characteristics. As icing forms more easily on small radius airfoils, the thick Cub-like airfoil of the Aztec provides a small advantage in an icing encounter. Having a stabilator without an elevator also appears to provide some protection against an icing related tail stall, in particular when the tail stall jerks the elevator (and the flight controls) into a full nose down condition. The lowering of flaps increases, through the effect of the downwash, the angle of attack on the stabilator, and if there is icing this may result in a tail stall. The Aztec has a significant trim change when flaps are lowered and therefore I have on my checklist a no flaps item when there are icing conditions in the approach,

which also translates to a longer required landing distance.

In preparing this article I undertook some data searching on the US's National Transportation Safety Board (NTSB) Accident Data Base ([http://www.nts.gov/ntsb/query.asp#query\\_start](http://www.nts.gov/ntsb/query.asp#query_start)). I looked up the icing related accidents for the Apache, Aztec and the Cessna 210 (including the T210 and the P210) from 1960 through 2004. The three aircraft being high volume (over 3500 produced for each model), GA cross-country aircraft, and therefore providing a reasonable cross-section. The database produced 83 accidents that were structural icing or ground contamination related of which 57% involved fatalities (I excluded the carburetor/induction icing accidents that account for around 50% of GA icing accidents). The Aztec, despite being heavily used in Part 135 freight operations, only accounted for seven of the icing related accidents during the period, and only one of the fatal accidents. This probably reflects that most Aztecs were known icing certified (the one fatality in the type was not certified for known icing), and were used mainly in commercial operations. As a percentage of the type's accidents, icing related accidents were between 1% and 4% of accidents in each of the types studied.

While the Aztec has a good record it goes without saying that the purpose of having de-icing equipment is to expedite leaving the icing area as quickly as possible.

## *Pre-flight*

The LASORS (the UK CAA's definitive pilot's guide) provides good advice on winter flying pre-flight pointers, although I would disagree with their suggestion of melting ice

on the aircraft with hot water and leathering the area to prevent re-freezing. A better suggestion that I have come across for stubborn ice is to use a pair of hot water bottles to melt the ice, and dry the area with either a chamois or a dry cloth. I have always been able to clear ice on the aircraft with a soft brush and the morning air getting warmer. The Aztec being low wing and not having a T-Tail, helps. Having the 'plane completely ice and frost free before departure is a no-brainer. The regulations suggest you can polish the surface and operate with some contamination, but even that view is out of date given accidents where polished flying surfaces have resulted in flutter and structural damage to ailerons and wing spars.

In the winter on several occasions I have had to delay departure until ambient temperature was above freezing, as frost was reforming on the aircraft even after it had been cleared. I have not used de-icing fluids, and given that the Aztec, like all GA aircraft, would have to use Type 1, the holdover time in frost conditions is only around 10-15 minutes. Taking off in freezing drizzle or rain (where the holdover time for Type 1 fluids goes down to less than 3 minutes) in a light twin seems insane, and in fact the fatal accident in the NTSB database for the Aztec was a departure in freezing rain.

It would be interesting to know how many pilots add isopropyl alcohol to fuel in winter (approximately one quart for every 25 US gallons) to prevent water in the fuel tanks and pipes freezing. This is an issue for the Aztec which has bladder tanks, and the Cessna 300/400 series have a service bulletin on the subject. The de-ice/anti-ice items are on the pre-flight checklist winter and summer.

“

76% of icing accidents occurred in the Nov-Mar period

”

## Flight planning

In flight planning during winter months there are three areas of focus: weather, route and alternate plans. There is a web resource provided by NASA (<http://aircrafticing.grc.nasa.gov/courses.html>) entitled *A Pilot's Guide to In-flight Icing*. This is particularly good in providing several interactive flight planning scenarios for turbine commuter aircraft that highlight the need to plan to modify the flight plan to avoid icing areas.

## What are the 'winter months'?

A lot of the icing articles are entitled 'winter flying' or have 'winter flying' in the title, which in practice is a misnomer. One statistic I extracted from the data search was the frequency of accidents by month, and this is presented in the graph. Series 1 is the total and shows that 76% of icing accidents occurred in the Nov-Mar period. I also analyzed the frequency between mountain and flat regions (Series 2 and 3 respectively), and on this analysis the frequency increased to 87% for the flat region in the Nov-Mar period, although there was an accident in Maine in June in the series. As can be seen from the distribution the icing season, at least where there are mountains involved, runs from September through May, and given that you have to go as far south as Bordeaux to reach Maine's latitude, the September through May rule applies to most of Europe.

## Weather

My 1975 edition of *Aviation Weather* (FAA EA-AC 00-6A) is still a reliable guide to icing with a complete chapter on the subject. It also identifies icing potential for different cloud types on the chapter for clouds. It is quite conservative in its identification of potential icing areas, highlighting that icing can and does occur in convective clouds at temperatures below  $-40^{\circ}\text{C}$ . Where the NASA web resource advises that a 3,000 feet climb or descent in stratiform clouds should get you out of an icing area, the *Aviation Weather* advice is that icing in stratiform clouds is rarely more than 5,000 feet thick, but can be thicker in nimbostratus.

In planning I use the SigWx charts



to identify the big picture, and with the Airmet provide an indication of areas where icing is expected and an estimate of the tops. An analysis of surface and temperatures aloft provides a picture of where icing is likely to occur, with  $0^{\circ}$  to  $-15^{\circ}\text{C}$  being a high probability of icing for stratiform clouds and  $0^{\circ}$  to  $-20^{\circ}\text{C}$  for convective clouds (but note comment on icing occurring at lower temperatures in the previous paragraph). I am not convinced by the theory that the critical zone for icing starts at below freezing temperatures for aircraft able to fly at 170 knots or higher. This suggests that the temperature rise due to compressibility (around  $2 - 3^{\circ}\text{C}$  for an Aztec) helps with icing at temperatures near freezing. While this may be true for jet aircraft, where the effect may be more than  $5^{\circ}\text{C}$ , in GA aircraft what little benefit you may have from a higher air temperature will be lost in the lower pressure area over airfoils and engine intakes. The anti-icing windshield plate and heated props go on in the Aztec at  $+4^{\circ}\text{C}$  where there is cloud, and the alternate air is used in cloud below freezing. (The pitot heat is on at take-off).

The freezing level in the UK in winter seems to average between 2,000 and 5,000 feet and away from fronts, tops are rarely above 7,000 to 10,000 feet. I have always been able to depart with the knowledge that there was warm air at least up to the platform altitude for an approach. If when in cloud I found the icing more severe than expected, then it would be a straightforward return to base. I don't think I would depart with the freezing level close to ground level

unless the tops were quite low, say, a maximum of 6,000 feet, but preferably below 5,000 feet. The decision would be more straightforward if there was freezing rain or drizzle, that is, wait it out until conditions improved.

Frontal activity in the UK will easily take tops to FL180 in the winter with severe icing conditions in nimbostratus, and moderate icing in altostratus. Because the icing layer is extensive and quite thick the only options are to plan a route that avoids the worst of the frontal area (with a probable diversion of over a 100 miles), or to fly below the freezing level if this is above the minimum sector altitude (MSA). I cancelled a flight before this Christmas as a front moved in with extensive nimbostratus, and while the freezing level was quite high (above 4,000 feet) the prospect of battling 50-knot headwinds in turbulence below airways made a delay sensible.

The above would suggest that in an Aztec with known icing certification; a safe envelope is for departures in IMC where the freezing level is high enough to allow for a return approach in a warm air environment and tops are around FL80. A departure into a frontal zone, or with the freezing level close to the ground, or where the typical airways altitude of FL80 - 120 will encounter moderate to severe icing with no possibility of climbing on top does not make the flight practicable.

If there is the possibility of convective clouds then the rule is to be VMC and to avoid them. Embedded CBs in occluded fronts do occur in winter, especially in the UK, and they are no place for a light twin. In

“ Icing can and does occur in convective clouds at temperatures below  $-40^{\circ}\text{C}$  ”

# Airline pilots of the future?

Not from GA unless there are some major policy changes

By David Ogilvy

“ 86% of the UK airline pilot intake in 2004 came from people who had paid their own way ”

If the aviation industry is to cope in the longer term, general aviation must be seen as the prime provider of pilots. Although there are numerous doubts and difficulties ahead, I am endeavouring to deal here with just one; the availability of aerodromes for pilot training, without which the entire industry could enter terminal decline.

I have heard said that aerodromes are a minority concern. Yet about ten years ago, when AOPA conducted a survey of members' needs, aerodromes were considered to be second on the list of issues on which the Association should concentrate. That is unlikely to have changed as general aviation itself is still treated as that minority interest.

This must change, for almost the entire civil aviation industry relies on GA for a sustained future. The facts prove the case; in 1988, a survey revealed that 43% of all pilots entering the airlines did so via the club and private flying movement. This was widely publicised, yet ignored by people in power who should recognise the warnings. In 2001 AOPA carried out a check with UK airlines and the figure had grown to between 60% and 70%. What has surprised us all is that by late 2004 the airlines were recruiting 86% of their intake from people who had paid their own way into the system. This information was published in the October 2004 issue of *Aerospace International*.

## National Crisis

What has this to do with aerodromes? Pilots must be trained and those who are learning must be able to do so at

convenient locations. If the required facilities are not available, they will turn to other professions. Each year the situation worsens, as the number of young people seeking careers as airline pilots decreases.

What are the main reasons that are leading to a national crisis?

**Airports:** Many regional airports are discouraging GA through excessive charges and/or operating restrictions, or even by outright ejection. In some cases, notably Newcastle and Edinburgh, there are no alternatives; so many prospective candidates for the airlines are unable to train.

Although the CAA says there is no marked reduction in the number of licensed aerodromes in the UK, this overlooks the fact that fewer are available for unhampered training use.

**Government Policy:** The White Paper 'The Future of Air Transport' has been widely circulated and almost equally widely criticised, not only for its omission of any plans for GA, but it puts forward proposals for expansion of several airports based on growth in airline activity that cannot possibly occur. The Department for Transport (DfT) has asked 30 UK airports to submit development plans. This will lead to numerous expansion projects leading to more controlled airspace, further restricting GA activity.

**Predictions:** The Government's predictions for a substantial growth in commercial air traffic are based on the recent increases recorded by the budget airlines. However, easyJet's shares are in virtual free-fall, claiming 'reduced demand' as the main reason.

Ryanair's chief executive has stressed the difficulties of persuading people to fly, offering 30,000 free seats to encourage them, making published passenger figures very suspect. Although currently operating at a trading surplus the company issued a profit warning. These low-cost airlines are affecting the earnings of several airports, openly stated by Luton, Cardiff and Belfast. If we look ahead, airlines will be forced to face fuel or environmental taxes; then the present very cheap fares will be unsustainable.

**Balancing the message:** Recently the Institute of Economic Affairs held a two-day conference on airports. There was no reference to GA, so I asked for this omission to be rectified in forthcoming events. I received no reply, and a future planned function is equally lacking. This is just one example of the way in which GA is ignored through a misunderstanding of its significance in the total aviation scene.

**Local authorities:** When AOPA has approached the DfT for a policy on GA to match the proposals put forward for the commercial air transport sector, the response has been that it is for local authorities to ensure the availability of suitable facilities in their areas. Yet most elements of local government are not conversant with the needs or the significance of GA. AOPA has ample evidence of this:

- a) Berkshire County Council's Structure Plan states that White Waltham aerodrome (the only licensed aerodrome in the county) is of 'no regional significance' and is 'only a local issue'.



*Bouremouth International Airport, one of the fastest growing regional airports in Britain and one of the main locations for pilot training in the UK. Photo from the Dorset County Council website at [www.dorsetcc.gov.uk](http://www.dorsetcc.gov.uk)*

## Pilots' Talk

Continued from Page 7

### *Reduced Stall Margins*

The Federal Aviation Administration's (FAA) Environmental Icing National Resource Specialist (NRS) indicated that he was concerned that most pilots were not aware that a slight amount of frost or ice accumulation could result in a significant degradation of airplane performance. The Icing NRS stated, 'pilots may observe what they perceive to be an insignificant amount of ice on the airplane's surface and be unaware that they may still be at risk because of reduced stall margins resulting from icing-related degraded airplane performance.'

From an aerodynamic viewpoint, there is no such thing as "a little ice." Strict attention should be focused on ensuring that critical aircraft surfaces are free of ice contamination at the initiation of takeoff.

Strange as it may seem, a very light coating of snow or ice, light enough to be hardly visible, will have a tremendous effect on reducing the performance of a modern airplane.

### *Impact of small amounts of ice*

Despite the accident and research evidence indicating that small, almost visually imperceptible amounts of ice accumulation on the upper surface of a wing can cause the same aerodynamic penalties as much larger (and more visible) ice accumulations, recent accidents indicate that the pilot community still may not appreciate the potential consequences of small amounts of ice. For example, see the final report on the 10 October 2001 accident involving the Cessna 208, N9530F that occurred in Dillingham, Alaska; also see the final report on the 4 January 2002 accident involving the Bombardier Challenger 604, N90AG, which occurred in Birmingham, England.

It appears that some pilots believe that if they cannot see ice or frost on the wing from a distance, or maybe through a cockpit or cabin window, it must not be there - or if it is there and they cannot see it under those circumstances, then the accumulation must be too minute to be of any consequence. Despite evidence to the contrary, these beliefs may still exist because many pilots have seen their aircraft operate with large amounts of ice adhering to the leading edges (including the dramatic double horn accretion) and consider a thin layer of ice or frost on the

wing upper surface to be more benign. However, as noted, research has shown that small amounts of ice accumulation on the upper surface of a wing can result in aerodynamic degradation as severe as that caused by much larger (and more visible) ice accumulations.

### *Power Through*

It is also possible that many pilots believe that if they have sufficient engine power available, they can simply "power through" any performance degradation that might result from almost imperceptible amounts of upper wing surface ice accumulation. However, engine power will not prevent a stall and loss of control at lift off, where the highest angles of attack are normally achieved. Further, small patches of almost imperceptible ice or frost can result in localized, asymmetrical stalls on the wing, which can result in roll control problems during lift off.

The Safety Board notes that there are circumstances in which upper wing surface ice accumulation can be difficult to perceive visually. For example, depending on the airplane's design (size, high wing, low wing, etc.) and the environmental and lighting conditions (wet wings, dark night, dim lights, etc.) it may be difficult for a pilot to see ice on the upper wing surface from the ground or through the cockpit or other windows. Further, frost, snow, and rime ice can be very difficult to detect on a white upper wing surface and clear ice can be difficult to detect on an upper wing surface of any colour. However, it is critically important to ensure, by any means necessary, that the upper wing surface is clear of contamination before takeoff. That is why the Safety Board recently issued Safety Recommendation A-04-66, urging pilots to conduct visual and tactile inspections of airplane wing upper surfaces.

### *No amount is safe for take-off*

The bottom line is that pilots should be aware that no amount of snow, ice or frost accumulation on the wing upper surface can be considered safe for takeoff. However, history has shown that with a careful and thorough pre-flight inspection, including tactile inspections and proper and liberal use of de-icing processes and techniques, airplanes can be operated safely in spite of the adversities encountered during winter months.

## Left just not right

A Bellanca lost directional control on landing. The pilot reported that 'The more I added right rudder the more I went left'. During the subsequent investigation the pilot sat in the aircraft to demonstrate what happened and the FAA inspector noticed that the pilot sat at an angle such that his right foot was on the co pilots left rudder pedal. The same pilot has had a similar accident just six months previously. (FAA accident listings)

## DON'T work out the costs of flying

Inspired by the new EC Regulation 785/2004 that comes into effect on the 29 April 2005, one member wrote in to muse over the fact that he now needs a £3.5m liability limit and that the *additional* premium amounts to around £500 a year. Further, he reflected that his annual aircraft insurance costs based on flying 60 hours a year amount to a crushing £60 an hour.

Before I committed to aircraft ownership the guy that I was buying in with stressed that I should **never** work out the cost per hour. 'Tis almost unique in any hobby that with aircraft ownership the less you do (fly) the more it costs (per hour) and the only way you can argue that it's justifiable is to fly 500 hours a year, then, in comparison with other forms of transportation (providing you add in the fictitious four of you that are always on board) there is no cheaper way to get to Guernsey/Le Touquet/Scillies. You have to quote these places of course because the £5 return Lands End to London/Birmingham/Sheffield coaches don't go over water.

The financial realities of aviation are so depressing that I recommend the head-in-the-sand attitude to these costly toys. If you can't afford it you will know soon enough when you are constantly hungry and a bailiff takes the keys to your house off you. That's the time to conclude that the costs of continuing to fly are unjustifiable. (Raif Burvodd)

## And don't even glance at the invoices...

How can the replacement of a backup battery (like the ones that you have in a watch) for a KLN94 GPS cost £402.57? (Chris Bosher)

## Airfield Updates

At **Brooklands** in Surrey, Daimler Chrysler UK has acquired 155 acres of green belt land at Brooklands (airfield) containing land including the area encompassing the runway. Planning permission has been granted for development including a Heritage and Technology centre for Mercedes Benz, a business unit and an 80 bedroom hotel. Work has already started on the old taxiway at the northern end of the former runway. The central area is to be grass with a driving track. The southern end is to be landscaped as a community park. An aerial photograph of the airfield with an outline of the development area is available at [www.brooklands.org.uk/news/Mercedes](http://www.brooklands.org.uk/news/Mercedes)

The Brooklands Aviation and Motor Museum is not part of or affected by the development, except that it has had to move its aircraft (VC10, Vanguard and Concorde) from the taxiway on the development site to new land adjacent to the museum. (*The Brooklands centre is well worth a visit for aviation or car enthusiasts - Ed*)

**Durham Tees Valley Airport** is the new name for what was Teesside International (aka Middleton St George). The new name is part of an ambitious three year, multi-million pound redevelopment plan by the airport and its strategic regional partners to build on past successes and reinforce its position as one of the UK's fastest-growing regional airports. The airport is about ten miles from Middlesbrough and nearly 30 miles from Durham. <http://www.teessideairport.com>

**Heathrow Airport** is to gain a new control tower as high as Big Ben, allowing the world's busiest international airport to handle an extra 30 million passengers a year. A 900-tonne section of the tower was rolled more than a mile across the airfield on remote-controlled 144-wheel hydraulic flatbeds. The 32m piece of the tower, which was built elsewhere at the airport to minimise disruption, was successfully rolled into position next to Terminal 3. The structure,

which will stand 87m above the runways, will be more than double the height of the existing control tower.

**Llanbedr** in North Wales was to witness the very last Jindvik flight on the 27th October 2004 but the weather stopped it. Three flights took place on 26th October with the 17:00 being the last in brilliant sunshine.



The two Alpha jets went to **Boscombe Down** leaving the base devoid of any operational aircraft. The last airworthy Meteor flew there the previous week. On the ground are a Phantom, Canberra in very poor condition, two in very good condition and a Meteor in a real mess! The Jindvik will be destroyed and the place is now dead and closed for good. **Valley** will miss it badly as its very long runway was constantly used for touch and gos and practice approaches with Hawks around all day. The old Communal Site, WAAF quarters, Officers' Mess and Sick Quarters remain in civilian use.

At **Sherburn-in-Elmet**, Yorkshire, the restaurant in the club house has been revamped and worthy of a visit.

Airfield developments in **South Cambridgeshire** heralded a six-week period of public consultation on the South Cambridgeshire "Local Development Framework". A key factor in the plan is the need to absorb 20,000 new homes in the district over the period 1999 to 2016. A new high-density urban extension to the east of Cambridge, known as **Cambridge Airport** and could provide 12,000 new homes. It is proposed that the first phase of development encroaches from the north to Newmarket Road, engulfing the Marshall's North Works site and the associated car showrooms. The Airport could continue to operate during this phase of the development. A study will be carried out into the relocation of Cambridge Airport, including use of the Imperial War Museum airfield at **Duxford**. Further development to the west of Cambridge, centred on the former **Oakington** airfield, is already proposed in the Structure Plan. This development, known as Longstowe, would

comprise 8,000-10,000 dwellings. The Structure Plan requires that the development start in 2006 and that the first 6,000 homes are completed by 2016. The finalised Local Development Framework will be issued for formal public consultation in June/July 2005. (*Airfield Research Group*)

## The Royal Aero Club Trust Annual Report for 2004

The 2004 report included news of the trust's Flying for Youth Programme. During 2004 the trustees awarded 11 flying bursaries to young people to assist them to progress from a basic level in any air sport to a higher level of skill and competence. Sponsors of these bursaries included: Metropolitan Police Flying Club, Lawyers' Flying Association, Royal Society of St George Charitable Trust and the Royal Aero Club Trust.



There were also flight simulator bursaries awarded to personal computer pilots. A major objective of the trust is to encourage youngsters to become involved in all forms of recreational and leisure activities in the air including air sport. According to the report "Many young people still perceive air sport and its related leisure activities to be expensive and elitist and consequently an adventure activity beyond their wildest dreams. To dispel this notion the Trust offers bursaries to provide real or hands-on experience of flying as well as activities such as parachuting and designing, building and flying model aeroplanes and rockets." During 2004 eight Flight Sim Bursaries were awarded to Personal Computer FlightSim pilots aged between 16 and 21. Sponsors of these bursaries included: the magazine PC Pilot, the London Air Show and the Royal Aeronautical Society.

During the year several attempts were made to encourage youngsters and organisations such as schools to help create websites for young people. The object of such sites is first and foremost to stimulate the interest of youngsters in air sport and recreational activities in the air. The sites also provide youngsters with information about all forms of air sport and leisure activities and where they would be able to participate in them. The sites should create greater interest among youngsters and as a

result it is hoped that more young people will become active members of RAeC organisations.

### Launch of 2005 bursaries

The Trust has now launched the 2005 Bursary Scheme and the closing date for applications is 31 May 2005.

The Trust will award a number of bursaries, each of up to £500, to suitable candidates who wish to advance from one recognised level of air sport to the next higher level.

Applicants must be permanently resident in UK and aged 16-21 years at the time training will take place. Training will be conducted at approved Clubs, Associations or training establishments based in the UK. For more details contact the Trust Administrator: Richard Crabtree OBE, Tel/Fax: 01729 840108 (direct line). e-mail: [administrator@royalaeroclubtrust.org](mailto:administrator@royalaeroclubtrust.org) or go online: <http://www.royalaeroclubtrust.org>.

### ISPRAWL



A thread from the Eurocontrol AIS AGORA web site provided some amusement (*well to me at least - Ed*). It started with the question from a Cedar Bo: "What does the designation ISPRAWL mean in a TAF report?" Natxo Knörr Borrás investigated: "Dear Bo, I was interested because I have never seen such an ensemble of characters in a TAF. In the end I found that it is a TAF for Providenia Bei (Russia) in the Bearing Sea (American pilots use it very much) and means something like "The duration of the forecast repeats itself or amends". In these cases, Russians use Latin signs. Hope that helps you. Best regards Natxo Knörr Borrás. COM/AIS/ARO LEPA.

And the icing was put on the cake by Peter Smits: "I was also very curious so I contacted some Russian friends, because it's Russian. In some TAFs you can see the words: Example: UHMD 062123Z 0621 2306 OR 01005G10MPS 9999 FEW030 POWTORNO ISPRAWL SROKA PROWIDENIQ. The meaning of the words: POWTORNO ISPRAWL SROKA PROWIDENIQ, is according to

my contact: they wanted to say that the date of the TAF was corrected. Therefore they re-issued it.

Best regards, Peter. <http://www.flyingineurope.be>"

### Report from Belgium by Dirk De Jonghe

The runway at EBKT (Kortrijk) has been resurfaced; the new designators are 24/06, length unchanged. Minima for IFR approaches have been increased to 2400m visibility because the runway lighting is not an approved type (leftover from the military). Visiting pilots must now use the self-briefing room on the first floor of the tower building and no longer have personal contact with tower personnel. This is because the Belgian CAA decided that this was a security risk and no longer wants the tower personnel to handle administration.

One of our Belgian members, Bert Maes, decided to upgrade his A36 with a normally aspirated IO520BA engine to a turbonormalized intercooled IO550B Superior engine. The STC was accepted without any problems by the Belgian authorities, probably because it was one of the last requests before the handover to EASA. From now on anyone considering this upgrade anywhere in EASA-land will find it much easier because the STC was accepted previously in one of the member states.

The modification was very elaborate; new higher power engine, turbo and intercooler, new Super Scimitar propeller, high capacity internal oxygen tank with six outlets, gross weight increase of 400 lbs to 4000 lbs max. A more in-depth report to follow. Just to confirm to you that (following Eurocontrol proposals).

### Report from France by Rémy Bouin

France's DGAC has announced in its November newsletter that Mode S is postponed until March 31<sup>st</sup> 2007 for the following reasons:

1. Hard economic times for operators
2. Ground infrastructure not yet ready (Mode S radars to be installed by 2007)

See Eurostuff on page 16 for more details. Ed.



### Icing Tactics

Continued from Page 9

the late spring on occasion I have gone through towering cumulonimbus clouds at FL90, with tops of around FL110, and while it only took two or three minutes to fly through them, the de-icing boots were working overtime. Next time I will request a climb or diversion and keep clear of them.

On a long cross country you are likely to cross part of a front, although you hopefully have planned to avoid the bulk of it and crossing at its weakest using the shortest route across (i.e. not flying parallel to the front). It is not unusual to be in the clear at FL90 but having to climb to FL120 or above to keep clear of cloud nearer the front, or as you travel closer to the low. Oxygen availability therefore is part of the icing tactics.

### Orographic lift

Using the data set for my short study reveals a fatality rate of 79% in the mountain states, compared to 38% for the flat states. The accidents in the flat states were 56% in the approach and landing phase (with quite a few related to obscured windscreens), while only 13% of the mountain states occurred in the approach/landing phase. However, 79% of the mountain accidents were in the en-route phase. There is probably an equipment bias in the data set as a lot of the mountain accidents were Turbo 210s without known icing certification.

The message is clear. Icing near mountains, and in particular on the windward side of the mountains, is probably more than any GA aircraft can cope with. Icing levels can easily reach FL180 and beyond, while the freezing level remains below the MEA or for that matter, MSA. Unlike stratiform clouds, the icing level where orographic lift is involved cannot be out climbed by changing altitude 3,000 feet or 5,000 feet and most accidents in mountainous regions where icing was a factor appear to end in an unrecoverable loss of control.

I have taken the Aztec across the Alps, the Pyrenees and the Guadarrama mountains near Madrid. In addition to checking that winds aloft are forecast below 30 knots, the tops have to be forecast to be below the planned cruising altitude. Across the Alps where the MEA is typically FL140 and above, I have avoided icing, although have picked

# Greek Islands Trip

## 17-26 June 2005

This is a more demanding trip than we have traditionally organised. Early indications of interest would be appreciated. The aim is to spend a week in and around the Greek islands. We have been offered assistance by Panos, one of our Greek members. This gives us the opportunity to see some of the lesser known islands. Our dates happen to coincide with a Greek AOPA flyout and we propose to meet them for a social event.

### **Mikanos**

We intend to base on Mikanos where Panos has a summer home. This is about 1700 NM by airways from Central England. Those with oxygen can route through Germany and the fringes of the Alps to the Venice area. Those without need to route via Lyon to the South of France. Cannes, which now has an instrument approach, is a likely overnight stop. It is an efficient airfield with a hotel on the field. From here in general terms the routing options are three fold:

- 1 Down the Mediterranean coast of Italy.
- 2 Across the top of Italy to Bologna and then south down the Italian Adriatic coast.
- 3 Across Italy to Croatia and then South overland via Thessaloniki and Athens.

The assumptions are that desirable legs are about 500 NM and that over water legs should be minimised. Routing via the East coast of Italy saves about 100NM over the other two routes and minimizes over water legs. (Croatia/Bosnia/Albania is more direct if approached high level via Germany and Austria). There are some airways with a minimum level of FL110 but this is unavoidable in Italy. Fuel availability is a potential issue but we intend to resolve this with the help of our Italian members. Italy has something of a 'here be dragons' reputation in the aviation community for its bureaucracy and lack of avgas. This acts as a disincentive to pilots to travel farther afield towards Cyprus, North Africa, Turkey etc. We hope to establish a couple of relatively painless routings and fuel stops on this trip that will be useful to members in the longer term.

At this stage we are being deliberately vague

about en route overnight stops but the intention is that we would organise one outbound and one inbound. Exact decisions will depend on the capability with regard to speed, range and altitude of the majority of the aircraft. For variety it would be nice to route one way along Italy's Med coast and the other way along the Adriatic. Likely locations for overnight stops are Cannes, Elba, and one of the islands off the Croatian coast. Venice is another possibility but at present the GA airfield is partly closed for major redevelopment and may or may not reopen in time.

### **Draft Program**

Friday: Overnight at Cannes or Pula  
Saturday: Continue en route with one organised fuel stop to arrive at Mikanos late afternoon/early evening  
Sunday: At leisure  
Monday: Fly out to Kastelorizo SE of Rhodes just off the Turkish coast (250 NM)  
Tuesday: Optional local fly out  
Wednesday: Fly out to Lesvos to meet up with Greek AOPA party (200NM)  
Thursday: Boat trip and traditional meal  
Friday: At leisure  
Saturday: Return via different routing to organised overnight stop  
Sunday: End of tour depart for the UK

This should represent about 30 hours flying for a 120KT aircraft. Hotel accommodation will be pitched at three star standard. It is quite hard to sort out the details at this stage since most of the island hotels are closed for the winter. The intention is to price on the basis of bed and breakfast plus a couple of group meals. This would cover 7 nights in the Islands and



Photo: Jacques Descloitres, MODIS Rapid Response Team, NASA/GSFC

2 nights en route. Airport transfer will be included. Last year in Sardinia we shared a number of hire cars. This seemed to work well and, subject to demand, we will do this again. We expect costs to be in the £1,300 to £1,500 range per person based on two people per room. Some single rooms will be available at a supplement. With the benefit of local knowledge we will suggest a restaurant for each evening meal and pre book but individuals can opt out if they wish. All group meals are to be paid for on the night with the bill shared equally on a per head basis. This is a strict rule for all shared costs such as excursions, cars or whatever.

We would expect to coordinate flight plan filing, weather briefings etc and generally try to make the admin side as easy as possible. If anyone can offer a spare place on their aircraft or conversely needs a lift by all means let us know and we will try to match people up. Suggestions, requests or advice are welcome.

Please note that we need a decent number of aircraft to make this trip worthwhile. Spread the news and encourage others to participate. Non-members are welcome as long as there is one PPLIR member per aircraft.

At this stage we are just looking for expressions of interest not commitment. Please give number of people, aircraft speed, range and if you are able to fly high level. Let us know if you have any preferences or ideas. On the basis of the level of response we expect to firm up arrangements by mid to late March.

To register your initial interest please email Jim Thorpe at [thorpej@solutions-childcare.co.uk](mailto:thorpej@solutions-childcare.co.uk) or refer to full contact details on page 19.



## Future Airline Pilots

Continued from Page 10

- b) The recently adopted Surrey Structure Plan includes a policy which states 'development of any new airfield, aircraft landing site or the reopening of any disused airfield will not be permitted'.
- c) Medway Council owns Rochester but has refused to offer more than a short-term lease to the new operators, which is a strong disincentive to serious investment.
- d) North Weald, owned by Epping Forest District Council, is no more secure. Other sites owned by local authorities are equally vulnerable.

## National Infrastructure

Aerodromes are part of the national transport infrastructure. A local authority should not be in a position to prohibit people to become pilots any more than they should be allowed to decide that there will be no education facilities for dentists or teachers.

Just two authorities (of which AOPA is aware) see the value of such facilities and recognise the economic advantages of having GA aerodromes: Scarborough Borough Council and Dumfries and Galloway Council both have plans for new sites in their areas. However, these are rare cases of constructive thinking.

The main problems that must be addressed are:

- i The commercial air transport industry relies heavily on general aviation for a supply of new pilots. Fewer people are coming forward – and it is becoming increasingly difficult for those who do to train in the vicinities of their homes or workplaces. (BA alone requires about 450 new pilots each year and, although they tend not to recruit directly from the flying schools, they do so via other operators, whose gaps then need to be filled from GA sources.)
- ii A growing shortage of available aerodromes and a lack of understanding of the training need by some regional airports.
- iii The proposed expansion of several airports together with the inevitable increase in controlled airspace will impose further restrictions on GA.

## Proposals

It is one matter to list the difficulties and another to propose solutions. Here are some suggestions to use as a possible basis on which to build:

- 1 All people in positions of power or influence in Government and in the transport industry need to realise that the status quo will lead to a crisis.
- 2 Training facilities must be available within easy reach of people's homes or workplaces. If existing airports are unable or unwilling to provide scope for these, new dedicated GA aerodromes must be established and the airports that eject GA must not be allowed to object in principle (I have evidence of this occurring in the past). If central government sees fit to make predictions and proposals for action in relation to its air transport industry, equally it must shoulder some responsibility for ensuring that the necessary supporting facilities, e.g. aerodromes for pilot training, are available.
- 3 The planning procedure for an aerodrome needs to be established and simplified, with central government establishing a pattern. It is not acceptable for a County Council to be allowed to ban all new flying sites or forbid expansion of existing GA airfields, nor is it practicable for a non-elected Regional Development Agency to dictate use of land, over-riding locally-known needs and interests.
- 4 If the airlines enjoy freedom from taxation on fuel, a similar concession should apply to pilot training. This has occurred before and I was involved in its administration through the Association of British Aero Clubs and Centres (a predecessor of today's AOPA). It was not a difficult procedure.

## Conclusions

Fundamental to the whole future of UK aviation is the supply of new pilots coming from GA and is heading towards an avoidable crisis. I have mentioned this in various articles and reports in the past few years, but to no avail. No one who hopes for a healthy future for Britain can afford to ignore the warnings: this must start with action by central government.

*David Ogilvy OBE FRAeS is President of AOPA UK and a Vice-President of the General Aviation Awareness Council. During the past 16 years he has been involved in more than 450 operational or planning problems at UK aerodromes.*

## SES Route charging, Mode S/T, Galileo and VFR levels finally settled?

Continued from Page 2

### Galileo GPS and Mode T

Also announced by EASA was the commissioning of Galileo in 2009 when all European aircraft will be required to fit Galileo GPS and Mode T (the later being the method of assessing use of the Galileo receiver and reporting automatically to EASA's finance unit). Galileo charging is expected to be in the region of 5 SDR/Km.

The US FAA announced this week that the dispute over N registered aircraft being charged for Galileo when the US DoD has provided GNSS free for twenty years is over following the agreement that N registered aircraft will be exempt. However, to agree this, US Congress has drafted a resolution that from October 2009 aircraft will can only stay on the N register if they are truly US based and only fly out of US airspace on ICAO flight plan routes and return within 36 hours and are US based for at least six hours before any further departure is made. Otherwise, according to US DoD spokesman Leslie Groundem. "Aircraft will have to register in the country where they are really based and not abuse the privileges of our register and free GNSS."

### Flight Level Zulu

Finally, EASA issued a statement that FLZ will be set at 1,000 feet QNE. This means that VFR traffic will be entitled to use unregulated airspace between 501 feet QFE (to comply with ICAO low flying rules) and 1,000 feet QNE, otherwise the flight will be IFR and require an instrument rating. As military aircraft use the airspace from the surface to 1,000 QFE it makes it pretty dodgy for VFR traffic. Worse still are the days of high, (or is it low pressure?) when the QNE approaches the QFE, the vertical corridor for VFR aircraft may be as thin as 10 feet which is ridiculous when you consider that even a basic C172 from the bottom of the wheels to the top of the VHF aerial is 11 feet. On those days, we assume, only VFR aircraft with retractable undercarriage will be legal to fly.

*Is any of the above true? Not a word, except the subjects, but they might become so; so take an interest in all these impending matters of doom. Get behind AOPA and PPL/IR Europe in actively negotiating with the powers that be so that you never have to read these words in any other world but mine.*



**By**  
**Jeppe Sørensen**

## Mode S deferred in Europe

Rumours have had it for some time that Mode S was going to be deferred. Now it is not rumour any more – the deferral was officially announced in mainland Europe at the end of January, although this is not the position as currently known in the UK (see Paul Draper’s article on page 1).

Mode S has not been popular with GA aircraft owners and the deferral may be received with mixed feelings. Some aircraft owners have installed Mode S transponders recently, some are in the process of having a new transponder installed and some have followed a “wait and see” strategy.

Let’s look at some facts. A model AIC has been proposed from Eurocontrol and based on this, an AIC from your national CAA should be on the way out to inform you. If it has not arrived yet, you can have a look at the German AIC at: [http://www.eurocontrol.int/mode\\_s/Documentation/aic/German%20AIC%20IFR%20%203%20\(05\).pdf](http://www.eurocontrol.int/mode_s/Documentation/aic/German%20AIC%20IFR%20%203%20(05).pdf)

The headline is that for Mode S Elementary Surveillance (ELS), the transition period is extended from 31 March 2005 to 31 March 2007. For Mode S Enhanced Surveillance (EHS), required for aircraft with MTOW above 5,700 kg or maximum cruising TAS above 250 Kts, the time schedule is the same as for ELS. Some minor variance and exemptions apply for airline fleets, but the most interesting point is that exemption granted to EHS non-capable aircraft will carry no time limit once they have installed ELS. This applies to many business class aircraft that require EHS but will not be able to fulfil the Mode S Enhanced requirements due to analogue avionics.

The AIC warns people in favour of the “wait and see” strategy that they should not wait and see until the spring of 2007. The AIC says in bold letters: **“2.3 Operators of aircraft that are not subject to Enhanced Surveillance requirements, should note that unless an aircraft qualifies for special flight status, or, is to be withdrawn from service, no exemptions from the requirements of ELS for IFR/GAT flights in Mode S designated airspace will be permitted after 31 March 2007.”**

So qualify for ELS, do a few test or ferry flights; or scrap the old aircraft.

### UK Mode S Installs

Number of aircraft on the UK Register that have been allocated a Mode S code as identified by the CAA database:

| No. | Aircraft class * | Weight | Weight Range (Kg) |
|-----|------------------|--------|-------------------|
| 5   | FWL              | B      | 1 – 750           |
| 291 | FWL              | C      | 751 – 5,700       |
| 133 | FWL              | D      | 5,701 – 15,000    |
| 247 | FWL              | E      | 15,001 – 50,000   |
| 666 | FWL              | F      | > 50,001          |
| 2   | FWSLMG           | B      | 1 - 750           |
| 1   | FWSLMG           | C      | 751 – 5,700       |
| 2   | H                | B      | 1 - 750           |
| 63  | H                | C      | 751 - 5700        |
| 22  | H                | D      | 5,701 - 15,000    |

\* FWL = Fixed wing land; FWSLMG = Fixed wing, self-launching motor glider; H = Helicopter

## P-RNAV NAV-Database Approval Process



The P-RNAV project has been on hold for some time as the requirement for approval of the navigation database cannot be complied with by the database providers.

The issue might have disappeared with the introduction of EASA. The new EASA rules and regulations clearly describes the requirements for obtaining approval for producing products that go into aircraft – a complete aircraft or parts and appliances. But specialists in legal matters concluded that an up-date of a navigation database cannot be considered to be a product in the sense as EASA rules (Part 21). Indeed using the Part 21 framework would imply recertification of the aircraft just to update the database.

Certification of local authorities would not be practical in the European context. Though quality assurance by the industry would be preferred some sort of approval was needed.

The result is the Letter of Acceptance (LOA) for organisations that translate, format and/or integrate information that originates from State aeronautical information services (e.g. AIP) into electronic databases for airborne navigation systems. It is a set of rules and requirements for a quality control process that will be handled by EASA and whereby a company be approved for compiling and distributing navigation databases. It is not the data in the database that is approved but the process of producing the database. The concept of LOA is similar to the way the FAA handles the same issue and hopefully we will see progress in the acceptance of database suppliers.

Two types of the LOA are set up: one for producing a generic database and one for producing a database for a specific navigation system. By the way, the data that goes into the navigation database originates from an approved source – the AIP that your local CAA or airspace provider produces.

While waiting for the issues regarding P-RNAV to be sorted out some airspace service providers have started using the P-RNAV concept. To avoid the verification issue some of these procedures don’t use waypoints with vertical position below MSA.

## Passenger rights

Regulation (EC) No 261/2004 of the European Parliament and of the Council of 11 February 2004 established common rules on compensation and assistance to passengers in the event of denied boarding and for cancellation or long flight delays.

Many PPL/IR pilots have another option using their pilot’s rights – i.e. fly yourself. When considering Commercial Air Transport or fly yourself, recent years have opened new possibilities – new airports, many more low cost fare routes to popular destinations etc. These advantages have been hampered by cancellations, overbooking and delays. If these disadvantages disappear, then why fly yourself?

Well lets see if they disappear or if it is just good intentions. There are still many destinations not served by airlines and when compared to the advantage of jumping the line-up queues and the freedom and open planning, there are many more reasons to fly yourself.

## Upstairs- Downstairs?

Airline passengers seem to have the attention of politicians and rule making bodies and for good



reasons. In addition they represent very many voters too.

People working in general aviation or flying for business or for fun may feel that they live downstairs.

This was the order of things until an American president showed who is on top. Major European airports were closed for normal traffic, the airspace and highways closed for everybody in order to let Air Force One fly in and out and diplomatic cars pass through.

The newly introduced European passenger rights say that airlines won't have to pay compensation if the reason for delays or cancellations was due to "extraordinary circumstances". One wonders if a presidential visit is to be considered as "extraordinary circumstances".

## CAT grows



When looking at regulatory trends we see that almost all attention is directed towards Commercial Air Transport (CAT). Eurocontrol barely recognise the existence of General Aviation. They arrange a yearly seminar to explain to the General Aviation community the effects of new rules and initiatives, but the rest of the year works for the airlines and from an ATC airline perspective. EASA is very much in the same boat though certification and maintenance legislation and rules were made by the Transport Directorate of the EU Commission and based upon JAA concepts.

Well you can't expect it to be otherwise my friends will tell me. CAT is big business. And they are right. The latest statistics prove that CAT is increasing significantly and it seems to be in for continued growth. GA on the other hand is at a stand still or slowly dying. So harsh economic realities dictates the rules we have to live by.

One might argue the other way around that having to obey the rules that are only made for the airlines is costly and takes the life out of General Aviation. And making rules and regulations that also take GA into account would not just benefit GA but also be an advantage for the growth of CAT in the long term.

## Skywatch to restructure

"The voluntary Sky Watch organisation – <http://skywatch.org.uk> is to upgrade its organisational structure and training. Under the new regime each Unit will set up and operate a training programme endorsed by National HQ. Units will not be classified as operational until the endorsement has been given. Monitoring of standards will be ongoing and Units will provide training in accordance with the Sky Watch Operating Manual and must carry out at least four training exercises per year. To remain 'authorised', pilots must

participate in at least two exercises per year. Pilots operating on an individual basis will be "linked" to their nearest Unit for liaison, training, exercises and monitoring. Each Unit and independent pilot must declare the area to be covered by air observation and indicate the regularity that the area will be flown.

A name change recommended by the Trustees for a clearer description of the organisation's activities has been rejected by the Members. Sky Watch has expanded from its original "look out" role, to air search, fire spotting for the Fire and Emergency Services and as a resource to Emergency Planning Officers for natural and man-made disasters. The Trustees recommended a change to "Auxiliary Air Service", but although Members felt there was some merit in this, their overall view is that the original name "Sky Watch" should be retained because it is established and well respected and likely to become even more established in the future.

*Any volunteers for setting up European branches? - Ed.*

## While the snow is falling

Even if you feel confident when flying IFR, you will experience weather that limits your ability to move around in the airspace. For some time we have experienced bad weather - not just cold weather but severe icing conditions.



This winter the high pressure in Russia made a divided Europe – the west having relatively mild weather and the central and east having very cold weather. Which side of the front you are located at determines your perspective – freezing rain or clear days where your visual range is mostly limited by the altitude you are flying at.

This time of the year is rather dark at northern latitudes so you might wander off dreaming of the sun and nice flying conditions. Nowadays you can even dream in front of your computer screen and look at nice web sites like the one from Malta Flying School: <http://www.maltaflying.com/> or the new Internet magazine <http://www.skycontrol.net>.



But hopefully the time looking at nice pictures is limited and soon spring will come and we can go and do some real flying.



# THE PPL/IR EUROPE CONFERENCE AND AGM 2005

As previously announced, Guernsey member Phil Rigg has arranged this year's AGM, combined with a conference on EASA to be held at Guernsey on 14 and 15 May 2005. We are pleased that Fergus Woods from JAA will be attending and will address us on the 'New World of EASA'.

An outline of the Conference is shown on the right. You will see that we are planning a 'partner's programme' for the Saturday afternoon (subject to numbers) so please bring along your better half and make a weekend of it.

The cost of the conference will be around £65 per head and will include teas and coffees, lunch on both Saturday and Sunday, hire of conference and other room facilities, all transport from/to aircraft and from/to hotels, a tour of the Island and most importantly the dinner and drinks reception on Saturday night. In fact the only extras will be your hotel and landing fees and drinks with your meal on Saturday evening. We have special rates available at three selected hotels (according to your budget) and discounted landing fees (£10 for single, £20 for twin).

Please email me the booking form details below to secure your place and enable us to plan adequate facilities. I would ask that you send a £35 per person deposit to me along with the booking form and book direct with the hotel of your choice (quoting PPL/IR). Recommended hotels are shown below.

I look forward to hearing from you soon.

Ian Chandler, [meetings@pplir.org](mailto:meetings@pplir.org)  
+44 795 781 2523



## THE NEW WORLD OF EASA GUERNSEY – CHANNEL ISLANDS

14<sup>th</sup> – 15<sup>th</sup> May 2005

### OUTLINE PROGRAMME

#### Saturday - 14<sup>th</sup> May 2005

- 10:00 – 11:30 Arrivals at the West Grass Parking Area  
Shuttle to the Guernsey Aero Club  
Landing Fees & Customs General Declarations  
Arrival - Tea/Coffee & Biscuits
- 11:30 – 12:30 Welcome and Topical Update session
- 12:30 – 13:30 Buffet Lunch
- 13:30 – 18:00 The New World of EASA with Fergus Woods from JAA. Hosted by the Guernsey Aero Club  
Channel Islands Air Search  
(including a tour of the facilities & aircraft)  
PPL/IR Europe Annual General Meeting - 2005
- 13:30 – 18:00 Historical St. Peter Port  
A programme for partners
- 19:00 – 22:30 Formal Dinner at the St. Pierre Park Hotel  
preceded by a drinks reception hosted by the Guernsey Tourist Office

#### Sunday - 15<sup>th</sup> May 2005

- 09:00 – 11:00 Meeting Sessions at St. Pierre Park Hotel  
(including talk on Air Racing)
- 11:00 – 13:30 Sight-Seeing Bus Tour of Island  
Departing from St. Pierre Park Hotel
- 13:30 – 16:00 Lunch and Duty Free Shopping  
Departures at the Guernsey Aero Club

| Suggested Hotels                                                                                                                                                               | Single room | Double room |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| <b>St. Pierre Park Hotel (4 star)</b><br>Hotel where dinner and Sunday sessions will be held<br>Tel: +44 1481 728282;<br>Fax: +44 1481 712041<br>Website: www.stpierrepark.com | £102        | £132        |
| <b>Les Rocquettes Hotel (3 star)</b><br>Approx. ¼ mile walk from St. Pierre<br>Tel: +44 1481 722146<br>Fax: +44 1481 714543<br>Website: www.lesrocquettesguernsey.com          | £58         | £96         |
| <b>Abbey Court Hotel (2 star)</b><br>Approx. ¼ mile walk from St. Pierre<br>Tel: +44 1481 720148<br>Fax: +44 1481 728829<br>Website: www.abbeycourthotelci.com                 | £32         | £64         |

## BOOKING FORM

*PPL/IR AGM Guernsey, 14-15 May 2005*

Name / Membership No: .....

Name of partner (if applicable): .....

Address: .....

Email address: .....

Tel / Fax number: .....

Mobile number: .....

Aircraft type / reg: .....

Date / time of arrival: .....

Date / time of departure: .....

Airfield of departure/destination: .....

**I enclose a non-refundable deposit of £35 per person, or  
Please charge my credit/debit card**

Card Type / No: .....

Start Date (Switch only)/Expiry Date: .....

Security number (Last 3 digits on signature strip): .....

Signature: .....

Date: .....

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## Icing Tactics

Continued from Page 13

up icing on the climb between Basle and Zurich, or in the descent to Milan. As the Aztec is cold soaked when descending into Milan, the icing can be quite dramatic as the windscreen frosts over instantaneously when entering tops at around FL90. I ensured that the freezing level at Milan was above 3,000 feet as an approach in freezing fog might have been more than the windscreen hot plate could cope with.

In flights to Madrid I have had more encounters with icing, partly the orographic effect of the Pyrenees and the Basque mountains and partly the moisture effect of being on the lee side of the Bay of Biscay. Forecast of tops can be unreliable and on one occasion near Pamplona I had to climb from FL110 (which had been forecast to be above the tops) to FL150 to remain clear of cloud. While the Aztec averaged around 200 - 300fpm in the climb-on-top (at an IAS 130 mph which I use as the minimum climb speed in icing), the margin of safety was not acceptable. With hindsight a request for an approach to Pamplona as soon as it was obvious that the tops, and icing level, were above forecast, would have been wiser. Madrid was forecast as clear, hence the press-on-itus.

Controllers have always been very helpful in clearing me to different levels but I do mention that the request is to avoid an icing area. In the event there was a delay in getting a different level I would request an expedited level change and offer a heading change of 30°, if this did not work then I would declare an emergency. The Aztec being known ice certified gives me some extra comfort that declaring an emergency will not result in the controller throwing the book at me.

*The effect of cruising in light to moderate rime ice in November: De-icing and anti-icing are doing their job, but ice buildup on spinner is of the extent which, following the 1994 crash of an ATR72 in Roselawn, Indiana, led to warnings about ice creepback onto unprotected wing surfaces*



*Two degrees of ice: The effect of climbing through light to moderate mixed ice in February. De-icing on leading edges and anti-icing on air intakes are working well, but ice has built up on the tips of spinners*

### **Alternate planning**

Knowing where the warm air is, or where the conditions are clear, is an essential part of winter flying. Preferably the destination and the alternates, including the take-off alternate, should have ILS as this will have radar and a longer runway. Radar may come in handy if you need to descend below the MSA because you are carrying ice and the controller may guide you to an area where, with radar vectoring, there is a lower MSA, and also to expedite the approach. In the climb phase the 180° turn back to the departure airport if icing, or the tops, are worse than expected is the first tactic. Staying on top in the en-route phase, and knowing that you are able to stay on top when flying towards a low, while monitoring alternates and destination works en-route. A descent through icing needs to be planned. If the destination weather is not something you would depart into (frontal activity, freezing precipitation, airline PIREPs reporting moderate icing), then a diversion, and possibly a lengthy diversion, is required. As your TAS may be 10 or 20 knots slower due to icing, the need to carry more power, and the need for a lengthy

diversion, all suggest very conservative fuel planning. Several of the icing related accidents were due to fuel exhaustion.

### **Approach and landing**

If there is ice on the wing, or the approach is in icing conditions, then a no flaps approach may be advisable. Hence the longer runway of an ILS equipped airport being an advantage. I have never carried out an approach where there were icing conditions, although the Aztec has carried ice on the wings during the approach, which in due course melted off. (The boots will not totally eliminate mixed ice). Most of the accidents in the approach/landing phase were due to windscreen obscuration, poor visibility due to freezing fog or snow, or landing on taxiways instead of runways! The tail stall when flaps were extended did not occur in the data set.

### **Conclusion**

If you plan carefully and have a clear idea of what are the circumstances where you will cancel the flight, or divert, then a light twin with known icing certification can operate in certain icing conditions. The excess power of the second engine, and the de-icing and anti-icing equipment are there to allow you to leave the icing area-not to allow you to loiter or make the controllers' life easy.

There is more weather analysis to be done, with more alternates required than a typical IMC flight, and your route should avoid areas of icing caused by orographic lift, or frontal areas where there is embedded convective clouds or extensive severe icing in nimbostratus and altostratus. Knowing where the warm or clear air is and being able to reach it promptly is essential.

AOPA provides a very good safety briefing for winter flying (<http://www.aopa.org/asf/publications/sa11.pdf>) and this is recommended.

