

# Instrument Pilot

The PPL/IR Europe Magazine

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Nyhavn, Copenhagen  
See report of PPL/IR Europe trip  
to Roskilde, page 12



## By Paul Draper

The recent announcement of the UK's House of Commons Transport Committee Inquiry into the remit and work of the UK's Civil Aviation Authority (CAA) shows something is afoot and that has to be good if it means that some important issues affecting General Aviation (GA) can be addressed. What I hope we shall achieve is a full and proper review into the workings of the CAA and a determination of whether it is now the appropriate body to regulate and oversee GA in the UK in its present format. Such a full ranging inquiry would surely be a good thing for us all, including the CAA. Aviation has changed so much in recent years that it does seem appropriate to start questioning some fundamentals.

The CAA was established by the Civil Aviation Act 1982 with subsequent amendments and they have a "Sponsorship Statement" that covers their main objectives as:

*"...to secure that British airlines provide services which satisfy all substantial categories of public demand...an economic return to efficient operators on the sums invested in providing the services and with securing the sound development of the civil air transport industry in the UK; and to further the reasonable interests of users of air transport services."*

This remit is heavily weighted towards protecting the UK airlines and the public's use of them. There is no specific mention of the need to secure the future of, or otherwise protect GA (including many small and medium-sized enterprises); shouldn't there be a specific obligation in this respect?

So why has this inquiry come about? There have been some considerable recent threats to GA and we have written and responded, or are so doing, on most of them, including Mode S, Costs and Charges Review, GA Strategic and Regulatory Review (now just started), foreign registered aircraft (admittedly DfT (the UK government's Department for Transport) but will affect the CAA), airspace changes, EC route and terminal charges proposals, common requirements, Single European Sky Implementation Programme and European Aviation Safety Agency (EASA); all of these will impact on the CAA especially EASA where the CAA is now acting as agent to them on many matters and will increasingly do so as EASA's sphere of influence spreads.

Not only have we responded on these issues but we have also been co-operating with our fellow members in the GA Alliance and the Parliamentary Aviation Group ("Club"). Gerald Howarth and Lembit Opik have recently managed to ask some very direct questions of the Minister via Adjournment Debates and the pressure has been mounting on many fronts such that the House has, I believe, considered they need to look into some of the tensions that have been created.

One major issue in all of this has been the CAA's Costs and Charges Review and for which they set up a Joint Review Team (JRT) supposedly comprised of representatives of all sections of aviation but it did not include one from GA directly; British Business and General Aviation Association (BBGA) was asked to look after GA's interests despite

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# MEMBERSHIP RENEWALS

*It's that time of year again! 1st January 2006 is the latest you should renew your membership, but why not do it right now so you don't forget?*

This issue of *Instrument Pilot* has your **personal data record** attached to it. You can use this form to renew your membership and update your data as necessary.

**However, we would much prefer you to renew and update online through our web site at [www.pplir.org](http://www.pplir.org).**

Since we cannot attach data sheets to electronic copies of *Instrument Pilot*, you will get your data sheet separately in the post if you do not receive the printed *IP*.

## **Renew now? Who, me?**

Virtually **all** members should renew on 1st January, regardless of when they joined. If you joined this year, you will have paid only from the month you joined through to the end of December. The only exception is if you join in December, in which case you will already have paid for 2006.

If the box next to "I have already paid for 2006" on your data form is **not** checked, then you need to renew by 1st January 2006 at the latest.

If you do not want to renew, please do us a favour and let us know. We do not assume that you don't want to renew just because you don't pay. Far too many forget or delay for one reason or another but do eventually renew. So we will continue wasting your time and ours until we know for certain that you *intend* not to renew.

## **How to pay**

You can return the data form with the credit card details filled in or a cheque attached. Please send only Sterling cheques drawn on UK banks. *Please do not* send cash. And *please* print credit card numbers clearly. Many hours are wasted each year trying to decipher indecipherable digits, and having to

contact members for clarification when we guess wrong.

The *very much* preferred renewal method is **on line**. Our membership renewal page is reached by clicking *Membership services* on [www.pplir.org](http://www.pplir.org). The use of this page is entirely secure and really does save your hard working, unpaid Membership Secretary and Treasurer a lot of work.

## **Direct Debits and Standing Orders**

Our bank won't allow us to do DDs. Apparently we are not to be trusted, and besides, we don't have enough transactions for DDs to be practical. Standing orders and repeat credit card authorisations, which we have done in the past, proved an administrative nightmare for a number of reasons and have been discontinued.

Renewal is therefore now by cheque or credit card – **preferably online**.

## **Database updates**

It is important that you keep your membership data up to date. The most important is your address (including email) so we (and other members) know how to contact you. We have lost members in the past because they forgot to tell us about address changes.

The other data on the form, such as where you fly from, what you fly, how much you fly etc., is also important. We use it all in various aspects of our work, and members use it to find other members with common interests. This important membership benefit relies on everyone keeping their data current.

You can do that by returning your data form with your changes clearly marked, or on-line via *Membership services* at [www.pplir.org](http://www.pplir.org).

## **Membership and Air Crew Cards**

Members who pay on time will receive their new card before the old one expires on 31st January. If you have supplied a passport photo, you will receive an *Air Crew* ID card. Without a photo, you will get a membership card.

**Ole Henriksen**  
[memsec@pplir.org](mailto:memsec@pplir.org)



## **Wither the CAA**

Continued from **Page 1**

them being an association for high end business jets and turboprop owners. BBGA then made it clear they could not represent GA and filed a minority report. Along with many other GA groups we submitted a detailed response to the consultation exercise and in October the CAA published their response and said that the increases will be implemented from January 1st 2006 (full text via: <http://www.caa.co.uk/default.aspx?categoryid=850&pagetype=90&pageid=4950>).

Let's give them due credit for publishing their responses sooner than they originally forecast but in looking at the response in a little more depth it does seem somewhat of a whitewash. Some charges are to be reduced from their original proposals but they do not state if that reduction applies to future years after the initial three year period of introduction.

In relation to GA they conclude:

"5.2 The responses to the consultation have been carefully considered and analysed in an open minded way. Particular consideration has been given to representative organisations from all parts of the aviation industry.

5.4 Charges for the General Aviation Scheme will increase by 3% (previously 8.4%) with the exception of parachuting whose charges will remain at the previous year's level."

They importantly also do not accept that the JRT was flawed nor do they accept GA was not properly consulted.

"4.1.2 The representation was balanced across all sectors and more than fairly represented GA in terms of costs passed to and income generated from that sector. The General Aviation scheme contributes £0.2m - 0.3% of CAA's income, whereas the large AOC operators contribute £27m, nearly 40% of CAA's income. At the outset of the review it was agreed that BBGA liaise with and brief the GA community."

Such a statement is almost unbelievable in the face of the evidence. They are now also introducing an excuse that representation be based upon costs to GA as a percentage of their income! That ensures the airlines will always have the greatest representation and the opportunity to win whatever case they put forward! Is that fair representation? I think not.

So, why wasn't a Regulatory Impact Assessment (RIA) carried out by the CAA in relation to these new charge proposals? They have consistently argued that one is not required as the charging scheme is in place and the new charges are merely revisions to existing pricing structures.

However, the Government's Cabinet Office web site guidance information states:

**"RIAs must be completed for all policy changes, whether European or domestic, which could affect the public or private sectors, charities, the voluntary sector or small businesses.**

An RIA is needed whenever options are being considered or where costs or benefits could accrue. This

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# IFR Flying in Europe

## Part 2 of a 3 part in depth summary

By Peter Holy

### Getting NOTAMS

For VFR this is absolutely essential because one can fly around without ATC control, and one can stumble into stuff like temporary restricted areas (TRAs).

With IFR it's different. The UK is unique in that it allows IFR outside CAS, even without radio contact, and when doing that it is obviously as important to get NOTAMS as for VFR. Elsewhere in Europe, and in UK airways, IFR is usually under radar control (exceptions being at the start and end of a flight which sometimes are done without a radar service) and ATC will not knowingly vector you into some prohibited area. So, while both en-route and departure/destination NOTAMS are still a legal requirement, the en-route stuff becomes much less relevant and in all honesty most IFR pilots don't bother with it. The departure/destination NOTAMS remain very important because e.g. one can discover that the glideslope is inoperative which results in an increased DH, or a runway can be closed, etc.

One can get NOTAMS from many places but the standard UK source is National Air Traffic Services (NATS) who run [www.ais.org.uk](http://www.ais.org.uk) which offers a unique feature (for a free website, anyway) of a narrow route briefing where the route is entered in the standard FP format. As per ICAO agreements, this site is not authorised for briefing for flights which lie entirely outside the UK; they have to say this otherwise everybody would use the best free website (which is exactly what happens on the internet anyway!) and overload it. The reality is that the NATS website should be good for any flight between international airports. It has to be because if one had an aircraft with a 15000nm range one could fly to any international airport direct from the

UK. I know for sure that the French intentionally withhold NOTAM data for their non-international airports (series D NOTAMS) from non-Schengen NOTAM data subscribers (such as the UK), presumably on the grounds that nobody from those countries can legally fly direct to a non-Customs French airport anyway. Oh well...

One shortcoming of the AIS website is that it does not support airway references within the route. This is no worse than having to convert an airways route into a series of DCTs for loading into one's GPS, but it helps explain why most pilots flying airways never get en-route NOTAMS.

### Weather

This is just a quick bit on weather related planning for IFR.

For a pilot legally limited to VFR, weather is horribly limiting. In the UK, the IMC Rating (privileges, in short, are those of an IR but UK only and below Class A) opens up the options quite drastically, but they don't teach the pilot a lot of tricks on weather planning. The JAA IR (which I haven't done) is reputed for containing a vast amount of theoretical material on how weather works. However, no interpretive skills are going to be of any use if one cannot get the data; I think that what is really needed

is a selection of good accessible (nowadays this means the internet) weather data sources from which one can rapidly build up a picture.

At this point, it's worth examining the often quoted phrase "official weather data". UK

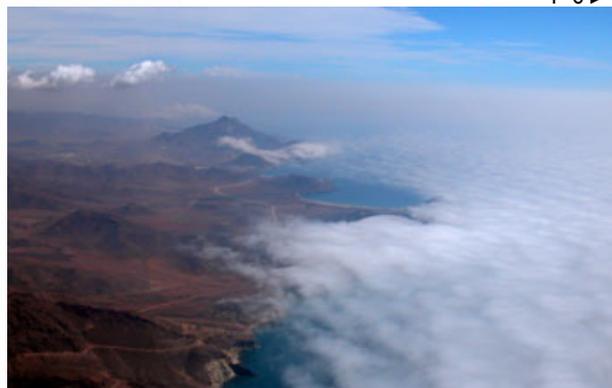
ANO (2005 version) Article 52(a) merely states "the latest information available as to the route and aerodrome to be used, the weather reports and forecasts available". It's reasonable to assume that a TAF, where available for the destination, meets this requirement but I have not found any regulation which lays down what is or isn't "official" and other weather data should meet the requirement too if reasonably current.

Perhaps the most obvious place for UK weather data is the UK Met Office (UKMO) [www.metoffice.co.uk](http://www.metoffice.co.uk). Personally I prefer Avbrief ([www.avbrief.com](http://www.avbrief.com)) as they provide a better compilation of data for Europe.

There is no doubt that the best short-term weather data comes in TAFs and METARs. TAFs are produced by full-time professionals. And METARs are obviously accurate! The Met Office Low Level forms 214 and 215 are also good - even if 215 does tend to show a variety of weather and one can take one's pick! The European versions from Avbrief are 414/415. The SigWX charts perform a similar function to 215, for Europe, with the information very usefully limited to FL100-FL450.

The problem for any pilot wishing to go away for a few days or more is that no "official" data is available more than about 24 hours ahead. There are only the MSLP charts (5 days ahead)

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*Fog moving into Malaga*

“  
Enroute  
Notams  
become  
much  
less  
relevant  
and in all  
honesty  
most IFR  
pilots  
don't  
bother

”

## Toys for the boys ...(and girls)

By Alain Toogood

Like it or not, Mode S will soon be here and the airspace will be full of aircraft painting data on radar screens. However, it won't just be multimillion euro radar systems that will be watching; the owners of Kinetic Avionic Products SVS-1 real time virtual radar will have the same information on their PCs or laptops.

You may be thinking that this is one for the anoraks but this is one cool gadget and if there is one thing that pilots have in common it is the wish, if not need, to have the latest gadgets. There are some seriously useful applications for this kit; for a few hundred pounds all airfields, from Farmer Thorpe's strip to small commercial airfields that could never dream of owning primary or SSR equipment can be Mode S receiver equipped. The safety implications alone make it 'must have' equipment.

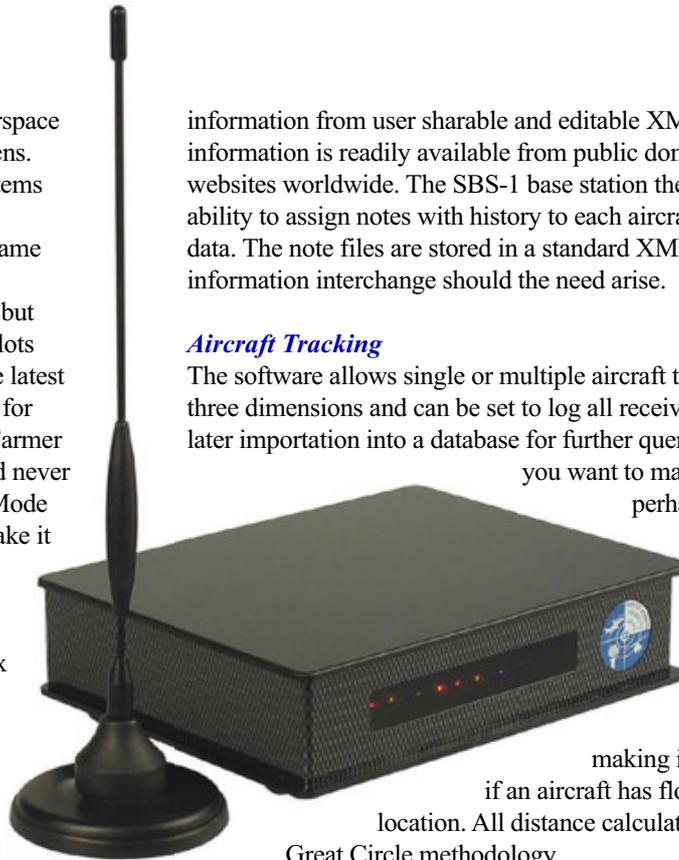
### What's in the box?

So what do you get for your money? A little black box (receiver), an aerial and some software. The receiver apparatus connects to your PC via USB 1.1 or 2.0. Ethernet / 802.11b wireless with USB versions will also be available. An external magnetic mount antenna and external low voltage power supply are provided. The SBS-1 is designed for portable use and can be powered directly from a suitable laptop PC via the USB port without the requirement for an external power supply. Additional tuned antennas, mounts and extension cables are available.

Plug in the aerial, receiver and install the software and instantly you have a radar screen on your PC. The software allows you to track and display Mode S and ADS-B equipped aircraft in real time. This provides functionality including the identification of aircraft by callsign, altitude, speed and other parameters when transmitted. Using the received aircraft's unique Mode S hex code it retrieves manufacturer, ownership, configuration and other background



*Not just one for the anoraks - the SBS-1 has real safety implications*



information from user sharable and editable XML datafiles. This information is readily available from public domain aviation websites worldwide. The SBS-1 base station then provides the ability to assign notes with history to each aircraft as well as image data. The note files are stored in a standard XML format to facilitate information interchange should the need arise.

### Aircraft Tracking

The software allows single or multiple aircraft to be tracked in three dimensions and can be set to log all received data to disk for later importation into a database for further query manipulation. If you want to mark your house or perhaps a hill or mast

the application allows for waypoints or points of interest to be entered and displayed on the vector scope making it easier to determine if an aircraft has flown over or near a location. All distance calculations are made using Great Circle methodology.

Aside from being damn fine fun on a wet unflyable weekend there are sensible applications. Airfield circuit and ATZ management is an obvious one but think of the big brother advantages for flying schools. If Johnny Neophyte rattles off on his first solo cross country on a heading of 030 when he should be flying 300 the instructor can spot it right away and pass some helpful abuse. Solo circuits could be evaluated in a similar way. There's more on the SBS-1 at <http://www.kineticavionics.co.uk/index.php>. The complete kit of SBS-1 hardware and software is available from all the usual pilot supplies retailers at £500.00.



# Pilots' Talk

## Dates for your diary

### **PPL/IR Europe 2006 AGM – 6th May 2006 (perhaps inc. the 7th)**

The AGM will be on 6 May 2006, possibly at Oxford, and as always, will be complimented by interesting guest speakers and offer the opportunity to catch up with old friends and make new ones.

### **Sicily 17-21 June 2006**

We already have about 15 aircraft and 30 people which is about the limit for the hotel / airfield. However it's a long time yet to departure and people's plans change so please don't hesitate to express your interest. It may even be that the response on this occasion warrants a second group on a slightly later date. If you might be willing to take the lead for a second group let me know. This would involve minimal work since all the planning will have been done and the first group will have discovered any snags.

### **14° EAST, Salzburg–Cape Town –Salzburg, 14 Jun–27 Aug '06**

The 14 degrees east tour to Africa is on between July 14 and Aug 27 2006. ([www.14east.org](http://www.14east.org)) It is possible to do sections of the tour either outbound or inbound. I am keen to participate and have paid a partial deposit but I cannot spare the time for the whole trip. At least two other members are doing the whole trip. If anyone wants to discuss any possibility, whether or not you have an aircraft, please make contact. One idea is to buy something cheap but serviceable such as an old Aztec and simply sell it in South Africa and fly home commercially. If there was a serious problem en route it could just be sold for spares. This is not to imply that the trip is dangerous; it's just that finding a suitable aircraft which the owner will trust to other pilots he or she does not know is not that easy. [jim@tredunnoch.com](mailto:jim@tredunnoch.com)  
*Jim Thorpe.*

## **Progress with proposals to simplify the JAR IR**

As previously reported, the JAA have been looking for some time at simplifying the training required to obtain an Instrument Rating. Anthony Mollison, our PPL/IR Europe Training Specialist, has been working closely with Pam Campbell of IAOPA to pursue this objective. Supporting the need for change has been Fergus Woods, JAA Licensing Director, who spoke this year at our AGM in Guernsey. A meeting was convened at JAA HQ in Hoopddorf during the last week of October, and chaired by Pat Lander, the UK Chief Flight Examiner.

The outcome of this meeting is that we are now one step closer to a Theoretical Knowledge Syllabus which will be concentrated far more closely on matters directly related to non Public Transport IFR flying e.g. a detailed knowledge of ICAO and the Chicago Convention will no longer be required!

Also on the table is a more flexible approach to the flying, with an initial Basic Instrument Flying Module likely to be introduced. It is probable that these important changes will be put into effect during early 2006. PPL/IR Europe also wishes to push for other changes, such a simplification in knowledge examining with electronic testing at remote locations. A full report will be available in the next edition of Instrument Pilot.

## **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; **4<sup>th</sup> March 2006, 3<sup>rd</sup> June 2006, 9<sup>th</sup> September 2006 and 2nd December 2006.**

The workshop is subject to a minimum of four confirmed delegates four weeks in advance (and to a maximum of six delegates). 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 strongly recommended for continuation training by the PPL/IR Europe Executive Committee as contributing to flight safety.

## **FAA moves to end Mode-S exemptions**

The FAA has withdrawn its decade-old proposal to rescind its requirement for Mode-S transponders and, consequently, plans to end the hundreds of Mode-S installation exemptions currently in effect. Beginning March 1, 2007, the FAA has proposed that it will no longer allow exempted Part 121 and 135 operators to fly without a Mode-S transponder. No new exemptions would be granted after that date, though Mode-A or -C transponders could continue to be used until they can no longer be repaired, after which they would have to be replaced with a permanent Mode-S unit. When the FAA in 1996 proposed to rescind the mandate to install Mode-S transponders (except on aircraft equipped with TCAS II), the agency was inundated with requests for exemptions, as operators anticipated the Mode-S requirement would be withdrawn. (*Aviation International News Alerts*)

## IFR Flying in Europe

Continued from Page 3

which show the pressure and fronts and require skilled interpretation and guesswork for anything beyond the obvious like “here’s a warm front; that’s low cloud, high tops, drizzle and it will clear slowly”. For large airports one can get long TAFs which are usually OK for a decision whether one might fly the following day. However, for locations for which no nearby long TAF exists, or for further ahead one has to go elsewhere, and the most common data is GFS (Global Forecasting System). GFS is a global weather model run by the USA.

A Google for “GFS weather” digs out countless websites that provide gateways into GFS, with a huge variety of presentations. A lot of these are run by/for the US Military and it’s funny to note that one can enter airport identifiers like EGKA but not LFBZ (France is not in NATO).

One must be a little careful with the countless amateur weather websites, as they may present ordinary data (TAFs and MSLP charts) which is a lot older than what’s available from UKMO or Avbrief. In Europe, the national weather providers like to charge a lot of money for data, so there is a big incentive for providers to get it from somewhere abroad instead. I have used some services which return a TAF in an SMS message, only to find that occasionally it was 2-3 days old!

My favourite GFS site is NOAA ([www.arl.noaa.gov/ready/cmet.html](http://www.arl.noaa.gov/ready/cmet.html)) and I choose MSLP, 2 metre temperature (which also shows the DP), accumulated precip, total cloud cover, wind speed and wind flags. There are many other results one can pick; e.g. the 3D temperature as a specified millibar level gives a graph of the temperature up there, over time. One has to be careful in the way one mixes different results in the same run; the 2D and 3D don’t appear to be compatible.

It’s been said by some UK weather experts that the UK Met Office weather model is more accurate than GFS. Certainly, GFS does not model local effects such as fog and sea breezes. On the basis that weather forecasting is (quite obviously in my

view) more accurate in *what* happens than in *when* it happens, a good tactic is to use the UKMO MSLP charts for timing information (look at the positions of any fronts, particularly) and use GFS for filling in the detail. Ultimately, when looking a few days ahead no forecast is likely to be accurate but this is a lot better than nothing.

This site: <http://weather.uwyo.edu/upperair/sounding.html> in Wyoming (of all places!) is also very useful for Skew-T diagrams. For Region, select Europe; for Type of Plot select GIF: Skew-T, and you get what amounts to a METAR map of data gathered from met balloons which go up every 12 hours. The generated diagram shows the profile of temperature and dew point versus height and this gives an immediately obvious (and accurate, at the time) figure for the cloud base and cloud tops, freezing levels, etc.

The Dundee satellite station ([www.sat.dundee.ac.uk/auth.html](http://www.sat.dundee.ac.uk/auth.html)) is one of many sites offering satellite images of various earth regions; great for seeing where the cloud cover is.

### Icing

I am not getting into the “what constitutes known ice” debate here because to take that strictly one would not even touch a cloud if the temperature is below 0C, which is unrealistic as it would practically prevent winter IFR, or any IFR at airway levels, in any aircraft not certified for “known ice”. The reality is that flight in stratiform cloud is ice-free at least 90% of the time, so the issue becomes one of managing the risk and having exit options.

My tactic is to scrap any flight where the forecast or actual 0C level lies

below the en-route MSA - unless there is clear information on cloud tops which enables the flight to be done VMC on top. This procedure does prevent flights in the winter where the cloud layer is several thousand feet thick and the bases are below the MSA - that is just the price one pays for not having an aircraft with all-over de-icing.

This raises the question of how to find out cloud tops. Often, one can look up and see that the scattered/broken layer (stratiform assumed here) is obviously 1,000-2,000ft thick and one can safely climb up through that, especially with a de-iced propeller. Otherwise, one often faces a situation something like this: MSA=2,000ft, base=2,000ft, 0C level=4,000ft, tops=?? and if the tops are at 5,000ft that is OK (only 1,000ft of cloud to climb through) but if the tops are at 8,000ft that is not OK! Of the “official” data, only Form 215 contains any indication of tops, with varying accuracy as tops are hard to forecast. It is possible to derive cloud tops from GFS data but I haven’t found a site that does this. The only accurate tops data is the Skew-T met balloon data but they are generated only at 00:00Z and 12:00Z; the former is at night which is usually very different from daytime, and the balloon launch sites are well apart.

A huge amount has been written on icing. Some useful snippets: Icing is unlikely in stratiform cloud below -15C i.e. about 7000ft above the 0C level. In cumuliform cloud it can happen down to -25C. The areas where icing takes place are relatively small in vertical extent so a 2,000ft climb or descent is likely to stop further accumulation even if the

“ I have used some services which return a TAF in an SMS message, only to find that it was 2-3 days old! ”



IFR at last!



*Clear to the eye but unless there's electrical activity may not show on the Stormscope*

OAT remains below 0C. If you are in rain and the OAT is showing +1C then watch the OAT like a hawk; the only way will be **down** as the ice build-up from freezing rain will be **rapid** and there better not be any terrain down there... Speed helps: (the following is at 5,000ft and 0C, approx mach heating figures) 0.5C at 100kt IAS, 3.3C at 150kt IAS, 6C at 200kt IAS, and it's pretty obvious that a jet doing 300kt IAS may never ice up because its airframe will be 14C above the static air temperature (SAT). It's surprising how quickly the ice melts and falls off when transitioning from a 95kt climb at -1C to a 170kt descent; the OAT rises to +2C almost immediately due to aerodynamic heating. Note that the OAT probe temperature is a lot closer to total air temperature (TAT, this is SAT corrected for TAS) than it is to SAT; almost anything sticking out in the air stream will experience a similar sort of heating to the wings and other bits of the airframe. I religiously use the TKS prop de-ice whenever in IMC below +1C but working out the TAT figures shows that it must be a lot harder to ice up a prop than the airframe. I've often picked up a few mm of rime ice and my view is that rime ice is nothing to be afraid of provided one has escape options; usually a descent below the 0C level.

### **Convection**

The other problem with flight in IMC is convection. Flying into a CB must be avoided but cannot be avoided if it is embedded in other cloud. I scrap any flight where CBs are forecast and one is likely to be in IMC much of the time. An exception to the foregoing would be where the CB bases are forecast to be at least 2,500ft AGL and there is no significant terrain; however we are then looking at flying VMC anyway.

It's best to scrap a flight where one might be passing through a cold front in IMC.

I have a WX500 stormscope but no radar. I've seen turbulence strong enough (CU/TCU most likely) to bang my head on the ceiling and throw off the headset, with nothing at all showing on the stormscope, which would show only electrical activity. On the other hand, I have seen (in VMC, from a distance) the sort of stuff that does show up strongly on the stormscope and one definitely doesn't want to go anywhere near any such group! I think a stormscope is highly desirable, and not expensive.

If turbulence is encountered, one must slow down to  $V_a$  or slower. Often, this means flying the entire distance at below  $V_a$  - particularly at night.

At a lower level of the problem, it's best to avoid prolonged flight in IMC with passengers as most people really dislike turbulence with no visual references. Sometimes this cannot be helped though, and I have found that this can be a huge source of stress. It's stressful when planning the flight to know the passengers are going to get scared and probably won't fly again



and it's much more stressful during flight when somebody gets scared but nothing whatsoever can be done about it. Flying an ILS through the bottom part of a TCU is hard enough without the passengers panicking. While the pilot must fly the aircraft regardless (and switch the intercom to "pilot only" if necessary) I am certain that many fatal accidents have been caused by this, quite pointlessly.

So the objective is to get high enough to be VMC en-route if at all possible and, if not, avoid carrying passengers that are even very slightly nervous.

Another problem, really big in the UK where few airfields have an instrument approach, is what to do about getting back down through IMC. In the UK there is no prohibition on flying below the MSA, IFR, if for the purpose of takeoff or landing. In other countries, e.g. the USA, this is illegal except on an authorised instrument approach, although over there one can fly at the MOCA, if that's one's IFR clearance, and then land visually if VMC at the time, thus enabling what amounts to a DIY IAP with an MDH equal to MOCA. It appears that this should be legal everywhere. So, how low should one go? I suspect a lot of people could tell some scary stories here. I would go down to 1,000ft AGL in OVC conditions, having done a position fix using two independent methods of which one is GPS. Accurate navigation is essential in IMC anyway; the whole concept of MSA goes out of the window without it. I have gone down to 700ft AGL in SCT/BKN conditions and that is really my limit. It's much safer to fly down somebody's ILS and then proceed VMC to the destination - if one can get it. Or a low level letdown from a military radar unit. This issue causes many intra-UK IFR flights to be scrapped during planning.



*Peter Holy has a JAA PPL (2001), night (2001), IMC rating (2002), standalone FAA PPL (2004). His FAA IR is nearing completion. He has 500hrs total time and 400hrs on type in 3 years of which about 20% is IFR. He flies a 2002 TB20 N113AC. His most adventurous trip to date was Crete in 2004.*

*Peter was born in Prague 1957 and emigrated to the UK in 1969. He has a BSc Electronics and operates his own business in industrial data communications. His hobbies are flying to interesting places, windsurfing, walking, biking, electronics / science / technology.*

## Airfield News

**ParcAberporth** in Wales continues to press its case as an emerging centre of excellence for unmanned aerial vehicle work. September saw the first flight of the Watchkeeper Hermes 450 UAV in U.K. airspace during an event at the site. The Hermes 450 is the air vehicle element of the British Defence Ministry's 700 million pound (\$1.286-billion) Watchkeeper surveillance system. The event also saw Boeing and Qinetiq form a team to look at civil UAV applications. (*Aviation Week & Space Technology*)

**Gatwick** air bridge, Surrey. Britain's first airport link-bridge was lifted into place next to the North Terminal at Gatwick Airport. It is the longest bridge to span an airport taxiway, the only other one being at Denver, USA. The bridge links the North Terminal and the new Pier Six satellite, which will cater for 11 aircraft stands. The bridge spans 128m/420ft between steel Y-shaped supports with a clearance of 22m/72ft 2in above the taxiway, based on the Boeing 747 as design criteria. The overall length is 198m/650ft comprising the 164m central section and two 17m side-spans.

The architecture was designed by Wilkinson Eyre, of Gateshead Eye bridge fame, and engineered by Arup. The central 164m section span was pre-assembled complete with travelators, glazing, cladding and services, 1.5km away on the airport boundary by structural steel contractor Watson Steel and Schmidlin the Swiss envelope fitter. It was moved across on a 120 axle series of computer-synchronised modular transports at 0.5km/h, in a critically-timed operation to miss aircraft taxi times and school holidays. It was lifted into position the following day on eight 450 tonne jacks on four corner towers. The whole assembly weighed 2,000 tonnes. The construction method was devised by Cleveland Bridge who were on the team in 2001.

The project was apparently stopped after the events of 9/11 and dropping passenger levels, but restarted last year with passenger levels recovering, but by then Cleveland Bridge were busy elsewhere. Internally the structure comprises a steel spine truss of variable depth (6-9.3m), supporting steel framing for the concrete floors. The glazed sides taper 11 degrees inwards to prevent reflection glare for the aircraft and to reduce maintenance cleaning. Internally there are four 61m long travelators to transport the 50,000 arriving and departing passengers each year, who will be able to peer down through the 10m gap between them and out of the windows to look down on the largest commercial airliners currently in service. For instance the Airbus A330, Boeing 747 and Antonov An124 have tail heights of 17.9m/58ft 9in, 19.6m/64ft 3in, and 21.1m/68ft 2in respectively. There would be a problem with the Airbus A380 though with a height of 24.1m/79ft.

**Heron Quay** London, which adjoins Canary Wharf in London's docklands, now has a plaque in place to commemorate the late captain Harry Gee's test landing of a DHC Dash 7 in June 1982 and June 1983 that paved the way for London City Airport. Reg Ward, the former chief executive of The London Docklands Development Corporation performed the unveiling ceremony earlier this year and listened whilst Docklands Light Railway (DLR) chairman Ian Brown confirmed 11am on Thursday 15th December for the first official train service from the airport.

**Luton** Airport, Bedfordshire opened its brand new first floor airside departure area as planned with managing director Paul Kehoe 'officially' cutting the ribbon at 04:30, which must be some kind of record for an airport chief, except at a time of crisis. Understandably this was an event at which not many dignitaries were invited! Work now continues towards the completion of the remaining phases of the project.

**Lydd** airport, Kent, is the latest airport to brand itself with the London name. Only 70 miles from Charing Cross - somewhat further than Southend (42 miles) and not quite as far as Manston - it is now known as London Ashford Airport. Lydd has unveiled plans to develop as a modern regional airport capable of handling up to two million passengers a year by 2014. More than £7m has already been spent on upgrading the airport, which is ten miles south of Ashford and was originally developed in the 1950s as a major aviation gateway to France. Further work will involve designing and building a new terminal building and extending the runway from the present 1,505m.

At **Nottingham East Midlands** Airport, Nottinghamshire users can now benefit from the introduction of a new Servisair/Globe executive lounge that has opened on the upper floor of international departures following refurbishment of the airport. This will be of particular interest to bmi regional business travellers flying to Brussels, Paris (CDG) and Nice. Departing business class and Diamond Club silver or gold card holders can use the 56-seat lounge which features a bar area with complimentary drinks and snacks, newspapers, magazines, satellite television plus a full business centre with internet access, desks, telephones and fax facilities.

**Southampton** Airport in Hampshire has opened a new balcony level departure lounge, featuring catering facilities and a more relaxed seating area away from the boarding gates, with views of the runway, and the Itchen Valley Country Park. One of the country's fastest growing airports, it also boasts a new Business Express product for business travellers, which includes a fast track channel through security. Wireless Internet has been installed and there is a dedicated area for users. New security equipment has been introduced, with cutting edge technology that enables bags to be screened from multiple angles speeding up the whole process.

**Southend** Airport, Essex has revealed its master plan and says that it intends to start work on a new terminal and railway station with completion by 2008. Planning permission has already been received. In essence, the airport intends to go ahead with a gradual limited build-up of passenger flights to Europe and UK cities, and to continue as an important base for aircraft maintenance and recreational flying. The airport sees itself as part of the Thames Gateway project and is evaluating its possibilities as a 2012 Olympic gateway.

**Turnhouse**, Edinburgh, a former military base which now forms part of Edinburgh International Airport, is to be developed by the site owner BAA Plc. Turnhouse closed in 1996 after defence chiefs decided it was surplus to requirements. There were short-lived proposals put forward for the site in 2002 to transform it into an accommodation centre for up to 1,000 asylum seekers, now no longer a requirement. Plans have been unveiled to develop seven large industrial warehouses as part of a business park aimed at attracting delivery and air-freight companies. In another development Flyglobespan, which claims to be Scotland's largest airline, is now offering a daily Edinburgh-Geneva. (*Airfield Review*)

## Airfield Notes

*We have recently introduced a new service in IP and on the website giving information about airports likely to be of interest to group members. There is no suggestion that these notes are comprehensive. They are not intended in any way as a sole data source and we aim for the minimum of duplication of detailed information readily available elsewhere. However they are written by pilots with recent experience of how things work in practice and we hope they will smooth your arrivals and departures be they VFR or IFR. We hope that members will contribute information on airfields they know so that the resource can grow quickly. If you visit somewhere and find things have changed please pass on an update. - Jim Thorpe*

This month we include details on two destinations, Bournemouth & Jersey, which provide an interesting comparison. Both are holiday destinations and mix commercial and GA. Bournemouth is Class D whereas Jersey is Class A and yet Jersey comes out clearly on top with regard to GA support and is an object lesson in how GA and commercial operations can coexist alongside one another.

### Bournemouth EGHH Last update 19/9/05 VFR

The Bournemouth CTR (Class D) is overlaid by the Solent CTR from 2000 feet (as are large parts of the surrounding area) so clearance will be to enter/leave the zone not above 2000 feet. Joining instructions are usually downwind, although sometimes a base join will be given, left or right hand dependent on the approach direction and runway in use.

The SE and SW Visual Reporting Points (VRPs) Hengistbury Head and Sandbanks are easily spotted. The NW and NE, Tarrant Rushton and Stoney Cross are far more difficult to locate. Both are ex-WWII airfields now largely regressed back to their former existence, making them tricky to spot for a first time visitor. For Tarrant Rushton look for an isolated black aircraft hangar; the last of the buildings remaining from its WWII heritage. Stoney Cross has no buildings left at all and totally overgrown runways set against the surrounding grass areas of the New Forest – perhaps best to enter the VRP in the GPS. A full list of all UK VRPs can be viewed or downloaded from <http://www.caa.co.uk/docs/64/vrp.csv>

Other than that, the approaches are

straightforward and open, there is no high ground to worry about although sea mist on the coast can, on rare occasions, roll back on land enough to cover the airport while just a mile or two further inland can be bathed in wall to wall sunshine. If forecast, it's best to have an inland alternate just in case. Expect orbits once in the circuit – see general comments that follow.

### IFR

With NDB and ILS procedures to both runways and an elevation of only 38 feet, if cloud is low enough to require a diversion you will struggle to find anything else local offering better. Radar is invariably available throughout the usual operating hours.

### Arrivals

Approaching from the East or South airways controllers will hand you over to Solent who have come in for some “stick” in the letters page of some aviation magazines from VFR pilots accusing them of being ‘uncooperative’. You will not find this IFR; they are always efficient and professional, although often very busy. They will, in turn, arrange the handover to Bournemouth. Approaching from the West or North is more problematical as this will be through the open FIR. Weekdays, Yeovilton can be relied on for an unfailingly helpful service, otherwise it is Exeter or Bristol with an early handover to Bournemouth and, with both of these, the distances involved mean that cover can be less than ideal at the margins. Once in the Bournemouth CTR you will be vectored, but again see the general comments that follow – you may not get a straightforward approach.

### Departures

No published SIDs but joins South on N866 are almost always via THRED, not NEDUL. For Eastern and Northern departures SAM is an obvious joining point although, in practice, when going East, Bournemouth hand you over to Solent who will invariably give you an immediate “Route direct GWC” If you are looking to join L9 for, say Ireland, or N864 north towards Liverpool, BCN might appear a logical airway join but Brussels will not accept it due to the distance. The answer is to file DCT BRI DCT BCN or alternatively go via ADSON. For South West destinations or N864 southbound you have the same problem. Filing DCT EX will be rejected; DCT GIBSO DCT EX however will be accepted.

### General

In June of this year the number of commercial flights out of Bournemouth virtually doubled with the result that GA has become even more marginalized, with VFR arrivals orbiting in the circuit to make way for IFR and Commercial traffic being pretty much the norm. As an IFR GA arrival you may still find, even when closing the localiser, you get vectored to make way for a commercial. Such action will usually be accompanied by an apology from ATC for doing it but it still rankles.

For all non-Bournemouth based aircraft PPR and handling is now mandatory. (Contact Bournemouth Handling on 01202-590888) While this puts up the cost still further at least it does ease things on the ground in that they will file flight plans, arrange refuelling, taxis etc. However, whilst they are, in theory, available throughout the airport opening hours, a ‘gotcha’ is that they only work nine to five unless they have prior notice of an early or late movement. Turn up unannounced at 7 am for an early departure and you will be in for a long wait! You will therefore need to let them know of planned arrivals/departures outside of office hours at least the day before. If you are unable to do this for any reason you can book out VFR or IFR by phoning the Tower on 01202-364150. This is frowned upon but they will take it. However, if you are looking for an airways departure and you aren't one of the lucky few with the latest mobile technology and access to the Austrian online flight planning service, (for details see Jim Thorpe's article in Instrument Pilot issue 50) you will need to get to a fax machine and send the flight plan yourself. If you don't have your preferred number, Heathrow will accept it on fax number 0208-7453491 and if you want to confirm its safe arrival telephone them on 0208-7453163. Should you also require fuel, you can still ‘beat the system’ by phoning Shell on 01202-575037 or Esso on 01202-594000 but, be aware, they can be very busy first thing in the morning refuelling early commercial flights and flying school aircraft. A wait of half an hour for the bowser is not unusual.

Landing fees (including handling) up to 1,000 Kgs - £29.79, < 2,000 Kgs - £59.57, < 3,000 Kgs - £89.36.

Parking: First two hours free, then £10.00 for every 24 hours. There is also a £5.00 (ex VAT) admin charge for handling overseas aircraft.

# Engine Rebuilds and Top Overhauls

By Jim Thorpe

I have recently become involved in the running of a company which rebuilds aircraft engines. As part of the process I have gained a much fuller understanding of the issues surrounding engine rebuilds and thought the members might find this insight useful.

The legal background is that aircraft engines have a life. Actually the manufacturers specify this both in terms of hours run and calendar times. Since this is aviation nothing can be simple so different countries interpret time differently some using a meter to measure every second the engine runs while others use log book times based on airborne hours. Some countries regard the manufacturers recommendations as mandatory, others regard them as advisory and some regard them as mandatory for public transport operations but not mandatory for private use. This latter approach is that taken by the UK and the USA hence many engines in private use run 'on condition'. This can be perfectly satisfactory if people are reasonable, however not everyone is. Last year I had dealings with an engine which was immaculate on the outside but inside had not been properly rebuilt since it emerged from the factory in 1946. The 'dip and strip' approach to rebuilds as the Americans call it does happen. It has been said that EASA will remove this concession and the manufacturers' recommendation will become mandatory. Indeed some maintenance organisations are already arguing that since there is no longer any difference between EASA public and private category C of A documents this is already mandatory. That generally means that engines must be overhauled irrespective of hours run every 12 calendar years.

One might argue about the most appropriate time limits to adopt but what is definitively true is that engines wear out whether they are used or not. There are a whole range of corrosive chemicals generated inside the engine and the molecular structure of the metals



*Lycoming engine ready for installation*

from which the engine is constructed also degrades with time use and abuse.

## **Engineers**

When, for whatever reason, the engine does need to be rebuilt the people who can rebuild it are limited by law. In the USA any engineer with the basic A & P licence (Airframe and Powerplant FAA licensed engineer) can do this. Whether this is desirable or realistic is another matter but A&Ps can and do carry out rebuilds albeit usually acting as assemblers having subcontracted many parts of the process to specialist companies. In the UK this privilege was extended only to holders of a rare licence, the D licence. Even highly qualified maintenance engineers can only work on the top end of engines, they cannot split the crankcase. Very few UK engineers historically held this D licence and even fewer were actually active in offering a rebuild service. Under the EASA rules due to come into effect in two years this qualification will no longer be acceptable and all engine rebuilding within Europe will be done in EASA 145 approved workshops. Note that although your normal maintenance facility may have 145 approval this does not mean they can rebuild engines. The 145 approval is very specific as to the tasks for which it is approved. It is unlikely that general aircraft maintenance facilities would invest in circa £500k of equipment not to mention the skills needed to reliably rebuild an engine.

## **Definitions**

The final element of the legal jungle is the meaning of rebuilt, remanufactured, zero timed etc.

Rebuilding and remanufacturing have no real difference in meaning. Some companies

tie these terms into whether service limits or new limits are used but there is no consistency. Service limits are dimensions and fits specified by the manufacturer as acceptable in enabling an engine to be returned to service. New limits are, as the name suggests, the limits to which a new engine is built. There is no real safety issue here but if you are having an engine stripped down it is desirable to rebuild to new limits in that if you start from the worst extreme of a service limit it is possible that the engine will require further work before it has run out its recommended life.

Zero timing is something that only the factory can do. Other rebuilders use the term but this is not correct. What they do is return the engine to service in accordance with the manufacturers approved overhaul procedure legally fit to run its full new life of 2000 hours or whatever. However the engine retains its old logbook and will be known as being on its second or third or whatever life. One of aviation's many myths are that a zero time engine is best. Actually it can be significantly worse. What happens in the factory is that engines arrive for rebuilding and are stripped down and their parts, after cleaning and checking, end up in bins as serviceable, repairable or scrap. When the engine is rebuilt the parts are simply drawn from the serviceable bins or new stock. Hence your engine, which might have been a first run unit, can emerge with a whole mish mash of components some of which are new and some of which might be considerably older than the parts on your original engine. This even extends to weld repaired crankcases. There is nothing intrinsically wrong with this practice it is just that the marketplace erroneously attributes value to the original manufacturers work and of course the manufacturers make

## Engine Rebuilds and Top Overhauls

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no effort to dispel the misunderstanding.

A factory new engine means what it says. It is new with all new components. It would be nice to believe that this also means something special in the way of quality control but there is some evidence that this is not the case. In the US owners determined to have the best possible engine have them stripped by independent shops, have dimensions checked, rework done where necessary and then reassemble without log book entries to ensure warranty cover. (I do not imply endorsement of this practice) I do not suggest that the factories would put out engines where there was a safety issue. However take an example where the valve guides and the valve stem are not truly parallel. This will cause increased wear and poor performance a few hundred hours down the line when the warranty period has long gone but is probably not a safety issue. Another 'gotcha' with the factories is the core exchange policy. The practice is to charge you several thousand dollars pending receipt by the factory of your old engine. Depending on the trading climate the factories have, over time, been both very lax about accepting anything or very picky indeed. Stories abound of people sending back a reassembled mixture of worn out parts. Equally more recent stories abound of refunds being refused for engines which were fundamentally sound. All I would say on this is that the factory policies are much tighter now than in past years and unless your block and crank are in good condition you are likely to lose your deposit.

### Ground Run

Factory engines and engines from larger rebuilders are ground run prior to shipment. This is desirable although it adds significantly (perhaps £1000) to the cost since it takes considerable time to set the engine up on what is an expensive test rig. Don't however think that this means that the engine will be set up ready to run in your

airframe. Many, and perhaps all the rigs, do not duplicate your airframes induction system and turbocharged engines may not even be run with the turbocharger in place. What this process does do is ensure that there are no really exciting bangs or major oil leaks associated with starting up the new unit. Depending on how many hours running time are allowed it may also go a long way to completing the critical running in phase of the new engine. It is perfectly legal to test an engine in the airframe



and the manufacturers specify a procedure for this. It can be done with a so called club propeller, a shortened wooden affair which is less dangerous than the real thing and aids cooling. (These club props are also used on the less sophisticated test rigs mounted on trucks and the like to absorb power.

More sophisticated rigs apply load through a dynamometer where the engine power is absorbed by a water turbine). Most engines however just go back in the airframe with the normal prop and it is very important indeed that the running in process is carried out correctly. Both Lycoming and Continental have service bulletins which cover this but respected organisation like the Cessna Pilot Association also publish procedures which are even stricter.

### Components

As a slight diversion here it amazes me how many people spend £10k to £20k on a new engine and then economise on the associated components in the engine compartment. Poor baffling can quickly reduce the life of an engine. Engine mounts almost always benefit from replacement. Hoses have a mandatory life but anyway unless they are almost new it is surely sensible to replace those which are scarcely accessible except when the engine is out. Also think about throttle cables, alternate air cable, turbochargers etc. I know this adds significantly to the cost but it is false economy not to replace, or at least thoroughly check, these parts while they are

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### Jersey EGJJ

Last update 26/8/05

### VFR

More correctly SVFR as the Channel Islands CTR is Class A. The necessary SVFR clearance and PPR can be obtained by phoning Jersey on 01534-745814 and, of course, you will need to file a flight plan.

When travelling from the South Coast of England the shortest sea crossing is via the Bournemouth or Southampton area, but a direct routing from these is limited to a maximum height of 3000 feet due to N866. For those uncomfortable doing a 60 mile crossing at relatively low level there is a high level recommended VFR route based on the 005 radial from SAM to MP. However, this does depend on D036 being cold and raises some navigational complexities if Guernsey or Alderney is your destination due to the prohibited areas at Cap de La Hague and Cap Flamanville. For Jersey you can route direct MP to JSY without fear of being taken out by one of the French SAMs alleged to be located at the nuclear power plants within these prohibited areas! If, however, you decide to route at low level below N866 you would be well advised to check the latest NOTAM before departure for the current VFR routings as the 'old' routing via Cap de La Hague will ruin your whole day.

From whichever direction you are approaching the Jersey Zone, give them a call five minutes before the boundary and they will give you a squawk and a height at which to enter. If that is going to put you IMC, request a different level, otherwise exercise your IR or IMC, cancel VFR and switch to IFR – yes an IMC is recognised for the Channel Isles, but not of course France. So if the level they give you is going to put you IMC you can't go there until inside their boundary! You will most probably be told to route direct but, at a later stage, you may well be given vectors to assist ATC in 'slotting' you in between arriving commercials. Either way you can expect a straightforward arrival; presumably an orbit to allow spacing is a possibility but it has never happened to the writer who has visited on many occasions.

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# Roskilde

## Land of Vikings and raw fish!

Words by Jeff Pearce  
Photos by Sally Turner



*Nyhavn, or New Harbour. Once a seedy and notorious area of the old city, Nyhavn now throngs with visitors who dine at the trendy restaurants lining the banks of the canal*

“ The Viking Ship Museum contains original partly reconstructed Viking ships ”

We all met up at the Hotel Scandic in Roskilde on Friday, late afternoon as planned, for a briefing from Jeppe Sørensen on the programme for the weekend; before adjourning to the restaurant for an excellent meal with that traditional Danish starter course – raw herring. To be more correct, marinated herring; but in appearance it certainly looked raw. For the benefit of those readers with sensitive digestion, we are pleased to report that, despite appearances, it was surprisingly good to eat, although in part, this was possibly helped by the copious amounts of wine being consumed at the same time!

Our long suffering waiter served us the meals, took and delivered the drinks, whilst also running the bar outside the restaurant, and for all we knew may have been cooking the meals as well. Despite this feat of dexterity that would have been the envy of Don Partridge, (hands up all those old enough to remember this one man band, one hit wonder from, was it the 70s?) our meals were delivered timely and well presented although some amusement was had by the fact that he appeared to have been trained at the Basil Fawlty

*Bishop Absalon, founder of Copenhagen*



School for Hoteliers as any requests for extras, e.g. after dinner drinks, were uniformly met with an apology on the grounds that the facility had just closed, the person responsible had just gone off shift or possibly returned home to Barcelona. In any event we had had a heavy day with another planned for Saturday so an early night was called for.

Saturday dawned to fluffy clouds, blue sky and just the right temperature for the day's programme – warm enough not to require coats but not so warm that you worked up a sweat with walking around the sites. Breakfast at The Scandic Hotel could prove difficult for those of an indecisive nature due to the vast array of food on offer. Various types of cereals, breads, rolls, Danish pastries, fruit, yoghurts, fried bacon, sausages, cold meats, cheeses and eggs, scrambled and boiled were all in evidence as well as, wait for it – raw fish. Despite the pleasant surprise of the previous evening's starter course, none of our party made a rush for the raw herring as a breakfast option although some of the 'local' guests did. For my money, raw herring as a breakfast culinary delight ranks right up there with the Spanish breakfast delicacy of toast soaked in olive oil. Although I have now seen both eaten for breakfast I remain convinced that were I to try either, my digestive system would react violently and with full justification.

### *Roskilde Cathedral*

Having made ourselves replete with our preferred breakfast options, a brisk walk to Roskilde Cathedral

helped to alleviate some of the 'calorific damage' done at breakfast. On the way a marching band in full regalia met us. We all thanked Jeppe for going to so much trouble in laying on a band for us but he insisted it was purely a co-incidence; nevertheless it got things off to a good start. We then spent an hour at the cathedral, which has been the burial place for all the Danish Kings and Queens since Harold Bluetooth in 986. With so many Royals buried in one place the Cathedral could almost be considered as a mausoleum for the royal family but was no less interesting for that with much intricate carvings in stone and wood which repaid closer inspection with a level of detail that was fascinating.

### *Viking Ship Museum*

Then it was on to the Viking ship museum for a guided tour and an explanation as to how so many Viking ships had been found in the same place; in shallow water in Roskilde Fjord. In addition to the original partly reconstructed ships, they have also completed a number of full reconstructions, one of which offers the unique experience of sailing trips in the adjacent fjord. The site of a distant Viking ship in full sail approaching may not have caused panic and alarm amongst the English in our party, but it was nevertheless a very evocative site.

### *Tivoli*

We then dined at the excellent Snekken Restaurant, which is adjacent to the museum. The meal started with no less than three types of cold fish, confirming

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## Engine Rebuilds and Top Overhauls

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accessible.

So, back to your engine. You will generally be considering this expensive purchase for one of six reasons.

- The engine has run its allotted span of anything from 1400 to 2400 hours depending on type and model.
- Your engineer has discovered some problem usually metal in the filter or low compressions.
- You, the pilot, have noticed some operational change such as high oil consumption or low compressions.
- You have had a prop strike.
- There has been a frightening bang of some sort.

Three of these reasons are fairly definitive the other three are less so. If you have serious quantities of metal in the filter you almost certainly need a full strip down to find out why. It is also worth mentioning that you should never accept a flushed oil filter or a flushed CSU on your rebuilt unit if you find metal in the engine. If metal was in the engine it was elsewhere and flushing components never works. You need a new oil filter and rebuilt CSU or they will simply act as reservoirs for the metal which will over time find its way back into your nice new engine.

### Prop Strike

If you have prop strike, no matter what the circumstances, the engines need stripping. No it doesn't matter if it was at idle or only hit mud. It's not designed for this sort of load and there are several critical components which can and do break. 'Dialling the crank' (putting a very accurate gauge externally on the crankshaft to see if it runs true) is another aviation myth since bent crankshafts are only one and not the most common of the possible problems. There is a more complex decision which is whether to simply have a strip inspection, fix any problems and return the unit to service or have a full rebuild. This will depend on the engine's hours and history. A rebuild involves the replacement of several expensive mandatory items irrespective of their condition so it might be perfectly proper with a low to mid time engine to save money and just return the engine to service having fixed only those items which need fixing.

### On Condition

If your engine has reached its calendar time then the decision is more complicated. If you are on private category then (subject to new rules) you can continue 'on condition'. Here you might need to consider the value of the aircraft, how long you intend to keep it and the history of both that model of engine and your particular example. You probably need to listen to informed advice to make the best decision. Your regular engineer may not be the best source of advice, not because he is ignorant or has ulterior motives, but because aviation is bursting with myths and half truths. If the engine is one of the smaller less highly stressed units and you fly mainly VFR you might be inclined to carry on. If it is a larger engine, particularly if turbocharged and you fly in IMC then you might be more inclined to remove it. In either case you would take account of the age of the unit and its service history.

### Top Overhaul

Compression checks are at the heart of one of the great myths. Alone they are a pretty useless guide to the health of your engine. Continental have recently completely changed their compression check procedures and they now include an internal boroscope inspection of the cylinders. This is not to say that low compressions should be ignored but they need to be seen in the context of other evidence particularly higher oil consumption. This is perhaps the moment to consider top overhauls as opposed to rebuilds. Certainly most of the trouble with both major makes of engine comes from the cylinders, the so called top end. Cylinders can be removed individually while the engine remains in the airframe so replacing them, while far from cheap, is much less expensive than an engine out rebuild. Cylinders are probably the topic for an article of their own but let me say that it is unlikely that the cylinders of any turbocharged engine will last the calendar life of the bottom end and that rebuilding any cylinder (as opposed to replacing with new) whose age is not definitively known is likely to be a poor decision.

So assuming you are in Europe and the engine has to be replaced; what are the options? We have talked about the factories. My inclination is to avoid them unless there is some specific advantage. For example a very expensive airframe

### Pilots' Talk

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#### IFR

With ILS, VOR/DME, NDB/DME approaches to two runways, there is something for everyone here, and obviously full radar cover. From the zone boundary expect a STAR clearance.

#### Arrivals

There are a number of STAR arrivals dependent on the direction from which you are coming. Most are very straightforward; a tired IR pilot wanting to put his new found skills to the test need have no fears of a complicated arrival procedure. Invariably ATC will 'pick you up' when you get nearer and supersede the STAR with vectors for the final approach.

#### Departures

Again there are a number of SIDs. Filing a flight plan direct to the relevant zone boundary point e.g. DCT ORTAC will be accepted but you will still get the relevant SID and normally fly it in full unless they need to vector you to keep you clear of other traffic. Again, either way it is straightforward.

#### General

It has to be said, Jersey really have got it right when it comes to mixing GA and Commercials. ATC seem able to seamlessly fit GA arrivals/departures in between the considerable number of commercials and, once on the ground, all parking and handling is dealt with by Jersey Flying Club who have an excellent Bar & Restaurant with a panoramic view of the runway and staff who are always very helpful. A fax machine is available to fax flight plans to ATC, a TV monitor constantly displays the local Channel Islands airfield conditions and a computer terminal with Internet connection is available for you to gather all the information you might need. With 72 hours free parking, a landing fee for light singles of £12.00, providing you take on fuel and, with Avgas at less than 79p/litre why wouldn't you? It is that rare phenomena, a busy commercial airport which genuinely welcomes GA and has found a way of integrating it into their operations in a way that positively encourages GA. As a result the number of GA movements has increased dramatically in recent years and understandably so. If you haven't been, you really should. With all the 'gloom and doom' in the aviation press these days it is a real pleasure to visit a busy commercial airport with a positive attitude to GA and a vibrant, active GA community as a result. The climate's better too!



# GALILEO UPDATE

By David Bruford

It is reassuring to read that some sensible comments are being made about the European white elephant that is the Galileo satellite system. The *European Aviation Community Feedback on the Galileo Mission Requirements Document (MRD) V6.0* revealed the following comments:

- a. ICAO has rejected the encryption of data on many occasions as it provides no safety benefit while putting a key management burden on all users. This will be very difficult to manage in a Civil Aviation environment. In particular, ICAO noted that key management, key denial, key distribution, receiver complexity, functionality, the provision of a fail-operational service and the threats to States' monitoring capabilities were all areas of concern associated with encryption.
- b. The encryption of all or part of the navigation data brings no security advantage. Indeed, the MRD itself recognises that encryption would only be used to ensure revenue generation and has not identified any benefit to the user community.
- c. There remains a risk of failure to correctly decode encrypted data even if the key is available. If the integrity signal is required for flight critical operations, failure of the decryption could have safety implications. Introducing such a risk through the application of encryption for purely commercial reasons would be difficult to defend in developing a safety case. Aviation would therefore be obliged to seek alternative means for assuring integrity of operation.
- e. Finally, no encryption service can be wholly transparent to a user if the user is required to purchase and employ an encryption key.

Yet more comments of good sense come from Peter Waldinger of Deutsche Flugsicherung GmbH (DFS). DFS is responsible for air traffic control in Germany and 100% owned by the Federal Republic of Germany. Peter states, in an email to George Paulson of Eurocontrol. *"From DFS point of view the motivation behind the setting-up of the Galileo system is mainly a political and strategic decision by Europe, and not primarily triggered by the interest from aviation. When providing comments towards the stakeholders in this programme, such as ESA (European Space Agency) or the Galileo Joint Undertaking, Eurocontrol should be careful not to identify itself as a driver for the development of Galileo. On the other hand, we recommend that the aviation industry in Europe in general and Eurocontrol in particular remain open towards the possible technical implementations of the Galileo signal and services and provide the available experience out of EGNOS to help to make Galileo a European success story as need.*

*In consequence, we propose that Eurocontrol in their comments to the "Galileo Mission Requirement Document" should avoid any closing statement concerning the potential uptake of Galileo services by aviation. We recommend that Eurocontrol continues to harmonise a position of all aviation stakeholders towards the*



*use of Galileo signals and services. Such activity could build on the previously published 'Common Aviation Position' developed by Eurocontrol."*

## Life Saver

Meanwhile the white elephant's prehensile trunk searches desperately for buns of information that could provide the Galileo project with just one justifiable *raison d'être* by recycling the life saving abilities of a European satellite system over a totally reliable and longstanding American system.

The application for saving lives by locating surface based Galileo beacons and RAIM checks are being pushed as major benefits. This compliments the 'head-in-the-sand' attitude by ignoring the fact that the US DoD GNSS system can already be used for navigation and integrity checks but also for locating distress beacons. However there is some dissent, nay, confusion from within. Ton van der Veldt is IATA's Assistant Director of Safety Operations and Infrastructure, Europe, and has issued a statement regarding the Galileo Mission Requirement Document JURG/33 and comments on paragraph 4.2 **Safety of Life (SOL) Service**. *"It is not clear which applications and operational concepts of the SOL service is proposed to serve. It is our understanding that the safety of life service is in fact providing integrity information on the Galileo constellation.*

*There are already today other methods available to provide integrity to GNSS constellations such as RAIM, GBAS, SBAS, or ABAS. Things may be clearer if the analyses of those methods for GNSS integrity are based on a list of applications together with the integrity requirement for the navigation solution.*

*Methods for GNSS integrity can be evaluated against each other to provide an understanding of the relative costs/benefits, but this must be seen in the context of agreed operational concepts and the list of applications.*

*When doing this it must be emphasized that the baseline for any cost benefit analysis is what is already available and not an assumption of un-augmented GPS. Most, if not all, of GPS equipped aircraft already have IRS and approved GPS RAIM.*

*Aviation is not stating to Galileo that they must not implement a safety of life service, particularly if there is a need for the service from other user segments. However, the need for SOL service is very much open to question by the aviation sector and the inter-relationship with SBAS integrity is not well understood."*



## Engine Rebuilds and Top Overhauls

Continued from Page 13

where the engine cost might be reflected to a degree in the overall market value of the aircraft. They are likely to be the most expensive route; they do not have good reputations for consistent product or warranty support and are unlikely to deliver the quickest turnaround. There are factory discounters to be found in US magazines such as Trade a Plane typically offering \$300 over factory trade price. They seem to deliver what they offer in terms of price and prompt delivery but remember they trade on the Ryanair basis of you pay peanuts expect to be treated like s.... if anything goes wrong. Also of course you will have to deal with your own importing and I suggest this route is only for the experienced who understand the issues clearly.

### Installation



Of course someone has to install the engine and it's wise to involve your maintenance company in your decision. You may choose to purchase through them and you might consider the small margin they make to be reasonable considering the fact that they pay for the engine weeks if not months before you will pay them and they become responsible for sorting out any problems. One classic problem is that the owner deals with the purchase himself but does not understand exactly what he is getting and when the engine arrives parts such as magnetos, starters, alternator etc are not included. If the maintenance facility does the purchase that will be their problem and the owner has only one person to deal with. Although most UK engine builders will stand by their work to a lesser or greater extent few will cover third party costs like installation and removal. Once again the owner may well be better off if he is dealing with the maintenance facility.

If in spite of the risks you do buy the engine yourself you do need to be sure that you are comparing like with like. You need to see the fullest information on what is included. In addition to the items mentioned above ask will the engine go on a test rig, will the cylinders be rebuilt or new and if new from which cylinder manufacturer? Is collection and delivery included and what sort of warranty will you get? There is no correct universal specification but this is a technical matter which it is easy to get wrong.

As explained at the beginning the regulations are changing and while at the moment there are perhaps six or seven sources of engines in the UK my guess would be that this will fall to three or four over the next few years. This is both because of the burden of regulation and because the population of appropriately licensed and qualified staff is reaching retirement age while, as far as I can see, no significant effort is being made to train replacements.

Anyway best of luck and if you need some specific advice drop me an E mail [jim@airpoweraviation.co.uk](mailto:jim@airpoweraviation.co.uk).



## Wither the CAA

Continued from Page 2

includes all changes made using alternatives to legislation, both primary and secondary. So if the primary legislation is a framework Act which will be followed by secondary legislation, RIAs need to be carried out on both the primary legislation and on each subsequent piece of secondary legislation.

Note that the RIA should be **proportionate** to the likely impact of the proposal. For example, if the proposal is likely to affect only a few firms, many firms to a very small degree, or if the costs and benefits are likely to be small, then the RIA can be quite short. Where the impact is likely to be substantial, more data and depth of analysis will be required. **Even in cases where there is no overall net change but some kind of redistribution (such as in cases where there is an exchange or 'transfer' of costs and benefits) the effects should be assessed through an RIA.**"

Note in particular my emboldened final paragraph. The CAA proposals do redistribute costs and charges from the airlines to smaller AOCs and GA so surely there should be an RIA? There is also an impact on small firms and the guidance requires an Impact Test for them as part of the RIA. I am asking our Parliamentary contacts to look into this.

Part of the problem comes from the fact there is no formal regulator for the CAA. As a public corporation it reports to the Minister at the DfT but the public has no resort to a regulator as would be the case for telephone or gas services and in many cases the DfT has to consult the CAA for its expertise rather than come to its own view.

In addition the current composition of the Board of the CAA has no representation at all from any GA sector. The members, whether appointed by the Secretary of State or appointed as non-executive in conjunction with the CAA Chairman, are currently all either of airline, Royal Air Force or public body backgrounds. This is a major failing and a reason for a lack of understanding when the CAA is considering matters that impinge on GA.

These appointments are, per the CAA Sponsorship Statement, meant to be, generally, "...following open competition" but I for one am unaware of any such appointment having been advertised in the GA press where it might be seen by potentially interested parties. Might this failing be remedied by appointing at least one, and preferably two, members to the Board from the GA sector?

Perhaps they can be even more radical? While the UK Government might understandably wish to keep full control of the commercial aviation sector via the CAA as it set out in the initial Act of 1982, I see no reason why it should not be willing to devolve oversight of the GA sector to another agency such as currently happens in relation to certain GA and specialist types of aircraft, balloons, microlights and home built craft **registered** with the CAA but otherwise **regulated/certificated** by their approved associations. Such principles could be applied to most GA aircraft of less than, say, 5700Kgs weight and create major benefits to aircraft owners without compromising safety.

The Inquiry asked for comments by 14<sup>th</sup> November and PPL/IR Europe submitted a response to them. Hopefully the Commons Inquiry will address these issues.

Paul Draper





**By**  
**Jeppe Sørensen**

## Meetings, conferences and demos

This autumn has seen a number of meetings, conferences and demonstrations in Europe on new communication, navigation, surveillance and collision avoidance systems. Lots of acronyms like ADS-B, CDTI, RNP and the like are used, but I will try to report on some of these meetings and demos without getting too technical.

The most attention has been on ADS-B, which stands for Automatic Dependent Surveillance Broadcast. Whereas old systems existed in isolation and could be seen to fulfil one role, most of the new systems are interlinked and together they form an integrated environment both from the pilot's point of view as well as for those on the ground.

### The ADS-B concept

ADS-B can be explained by the words used in the acronym:

- **Automatic** - It's always on and requires no operator intervention
- **Dependent** - It depends on an accurate GNSS signal for position data
- **Surveillance** - It provides "Radar-like" surveillance data to ground controllers and other aircraft
- **Broadcast** - It continuously broadcasts to any aircraft or ground station equipped for ADS-B.

The main components of the ADS-B system are:

- Aircraft "ADS-B Out" is one or more units in the aircraft that know or deduce aircraft data (aircraft identification, position, altitude etc) and transmits this information regularly (e.g. once every second) and automatically i.e. without being interrogated like a transponder
- Aircraft "ADS-B In" is one or more units in the aircraft that can communicate with other aircraft or ground stations on a data link
- Cockpit Display of Traffic Information (CDTI) and display of other information transmitted via the data link
- ASAS Airborne Separation Assurance System. A computer that can pass resolution advisory information to the pilot if this functionality is part of the system
- Various ground based units providing a multilateral link.

These components work together so that an ADS-B equipped aircraft can tell everybody who cares to listen about its position, altitude, ground speed, track angle, vertical speed and call sign. Based on this information ATC and other aircraft can formulate a picture of the traffic in the area of interest.

If the aircraft has ADS-B In, it can also receive other types of information like met-reports and text messages.

Within the radar coverage area, multilateration is possible by sending TIS-B (Traffic Information Service Broadcast) information on aircraft with just Mode A/C transponders to ADS-B equipped aircraft. Indeed the TIS (Traffic Information System) is a further development of this idea, as it does not broadcast but processes information to find the nearest handful of targets in relation to a particular aircraft and sends this information to the aircraft.

### ADS-B Live Trial

The Swedish CAA and EUROCONTROL had invited me to a "Live Trial & Workshop" at Norrköping Airport on the 26<sup>th</sup> of October. So your Eurostuff reporter headed off for ESSP in the dark early hours.

The weather was heavy winds and low clouds and it did not look good for the Live Trial.

The Live Trial is part of the EUROCONTROL Cascade programme that presents itself this way:

*The objective of the EUROCONTROL CASCADE Programme is to plan and co-ordinate the implementation of the first set of ADS-B applications (Package I), more Controller Pilot Data Link Communications (CPDLC) services as well as some other data link service, within ECAC in the time frame between now and 2010.*

*CASCADE runs a collection of Ground and Airborne Surveillance Application validation projects together with Stakeholders (ANSPs, airlines, airports and industry), at their local sites.*

*These are collectively called "CRISTAL" (Co-operative Validation of Surveillance Techniques and Applications of Package I). Current CRISTAL sites include Austria, Cyprus, France, Germany, Greece, Ireland, Italy, Malta, Netherlands, Portugal, Spain, Sweden and UK. More information: [www.eurocontrol.int/cascade](http://www.eurocontrol.int/cascade) (for CRISTAL, see under "Validation Activities").*

The Swedish CAA has conducted trials in the north of Sweden outside radar coverage and in the EGOA (Enhanced General Aviation Operations by ADS-B) project just south of Stockholm in the Östgöta TMA. The project addresses the operational problems related to General Aviation operations and provides two main services, namely ADS-B and FIS-B (Flight Information Service Broadcast e.g. MET reports).

The morning started off with presentations of Cascade, EGOA and the planned trial. The weather cleared and apart from the strong winds it became perfect for the trials that took place after lunch.

About 10 aircraft ranging from a King Air to homebuilt single-seaters participated. The visitors were able to view the trial from three "stations":

- Workshop area view: Surveillance overview picture, CDTI view
- ATC view: Östgöta Control Centre
- Aircrew view (limited numbers): on board aircraft, Beech 200 and PA28.

I can report that the trial worked well and the picture you get is impressive – well the buzz word I guess is called "Situational Awareness". Even aircraft without ADS-B were on the screen through the TIS-B uplink. The screen in the control centre was not in real use, but you could see the advantage by the ability to track aircraft on the ground in nearby airports and other aircraft below radar coverage.

The equipment used for the ADS-B trials was also on display. The radio carried on board the aircraft is called a VHF-VDL MULTI MODE RADIO. As I could see it is a preproduction unit from a Danish company called RTX. It contains a 8.33 KHz communication radio, a GPS receiver and the ADS-B part that uses a link technique called VDL 4. The display was a standard HP IPaq palm computer – not really suitable for the cockpit environment in my opinion.



*The combined com and ADS-B radio is the second from the top*



## *Naples unchanged from the 80s*

I was delighted to read in Roger Drinkel's letter (*Instrument Pilot* no 51 Sept/Oct 2005) that Naples has not changed. ATC, runway, handling were all the same during my frequent trips there in the 1980s when flying for an airline with Italian connections. All that Mr Drinkel did not experience was the fire brigade.

Take off on runway 24 is restricted to aircraft with Performance (capital P). Vesuvius is inconveniently in the way of a decent SID and there is a surprising amount of deceptively high ground scattered around to the north of it. In between is squeezed the sprawling and intensely built up city. If a single engine aircraft has a power failure, or a twin/multi lacks oomph when one fails, the city is the most likely recipient of the ensuing descent. Hence runway 06 for take-off. At the time of my visits to Naples I was flying an aircraft which, although shatteringly noisy, had nothing much left when one engine failed (except slightly reduced noise). Prevailing wind is SW, but we were restricted to 06 for take off and would line up, waiting for ATC, after a suitably stage-managed and conspiratorial pause, to give us 'wind calm'. On paper we couldn't cope with anything else and in practice it became a near thing. Frequently one had to wait until there was a faceful of 24 approach lighting before hearing the call 'V1' followed by an agonised shout of 'Rotate'!

Mr Drinkel seems actually to have seen the handling agent, simply in order to be fleeced, no doubt. We rarely saw him as handling was billed to the Company. Instead, a large black dog would waddle across the apron to greet us on arrival, settling down by the front steps. We were quite fond of him, until one day someone kindly gave him a crew meal and we never saw him again. Probably it interfered with his likely diet of pasta and rats.

My experience of the fire brigade occurred when the top float switch on one of the wing tanks failed to shut off when refuelling. The stands outside the terminal have a very slight slope which was

taken into account, nevertheless the tank overfilled. The refueller, whom I used to call Signor Agip and who responded by calling me Stephanie (version of my surname from the fuel chit) stopped the flow at once but a largish pool of kerosene formed under one wing. Signor Agip packed up and went away and I retreated to the flight deck to call the fire brigade to hose away the fuel. This was difficult to convey and no official apparently saw the incident and initiated independent action. Accordingly I started the stopwatch and took the reprehensible decision not to shut down the APU. Any sparks would be blown in the opposite direction and besides we wanted a cup of tea. The fire brigade arrived 19 minutes later. Nobody castigated me for lack of safety procedure, nothing was said and no paperwork was required. Imagine such an episode in the UK!

Regarding the difficulties of understanding the name of an unintelligible waypoint, I have evolved my own solution as this happens so frequently. My transmission is on the lines of 'confirm cleared to Gobbledegook, Golf Oscar Bravo Bravo Lima, *confirm*'. I try to make my pronunciation as near to the peculiar word that I can but it is probably quite wrong. If there is no reply I keep repeating until someone corrects me, all the while either heading straight on or turning in the direction that I want to go, provided there are no obvious conflicts. Similarly, if Mr Drinkel had said to ATC 'destination Naples, confirm Naples LIRF' (or anything else Italian), someone would have come back with 'Napoli LIRN' in short order. One has to speak in the English that they understand and the phonetic alphabet plus flight plan language is usually intelligible. Also (a bit of psychology), use a deliberate error to obtain the information you require – people love to correct someone else's apparently faulty thinking.

But Italy is gorgeous – I have never been done for either aerial speeding or noise in the land of the Ferrari...

Adèle Stephenson

MEMBER 703



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A PPL/IR Europe member with a basic knowledge of websites and the willingness to donate just a few hours a month to update our web site with files and information supplied by other members. Training and assistance will be provided. For details please contact our Membership Secretary at [MemSec@pplir.org](mailto:MemSec@pplir.org)

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A PPL/IR Europe member with the talent and enthusiasm to take on the very low workload but imperative post of Meetings Secretary. Just a few hours a month will cover the duties of long serving Ian Chandler who is taking over Paul Kelly's post as Treasurer. Ian will provide full details of what the job entails. If you are interested please ring Ian on +44 (0)795 781 2523 or email him at [meetings@pplir.org](mailto:meetings@pplir.org)

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## Roskilde, Land of Vikings and raw fish

Continued from Page 12

our prejudices as to what the Danes eat for starters. After an excellent meal we walked to the station for the train journey into Copenhagen, followed by a boat trip around the canals and river of the City. By now time was getting on so it was off to The Tivoli Gardens for a meal in the Nimb Restaurant, which is in one of the original buildings and is full of character. Guess what we had for starters – you got it; more herring. Yet another sumptuous meal was followed by a walk around the Tivoli Gardens culminating in a show quite unlike anything this writer has seen before. Based on tales by Hans Christian Andersen the ‘actors’ were adorned with huge outfits, some as much as 4-5 metres high, depicting various fairy tale characters. Their dancing, the music, lights and



*Inside Roskilde's magnificent cathedral*

accompanying firework display guaranteed to bring out the child in even the most hardened old aviator! That said, only two of our members proved ‘ard enough to face the fairground rides; the rest of us suddenly and inexplicably being overcome by tiredness and an overwhelming desire to get the train home, leaving our two intrepid aviators subjecting themselves to loops and rolls at G-force levels well beyond the design limits of any GA touring aircraft.

### **Roskilde Fjord**

With all the exertions of the previous day, a lie-in on Sunday was very welcome and we set off at 12:00 noon local for a walk to Roskilde Fjord and lunch on the Sagafjord, a lovely old boat built in 1955



*The Danish Royal Yacht Dannebrog at her Copenhagen berth lent splendour to Danex 2005, the largest ever multi-national naval exercise being conducted in the Baltic*

but with engines from the mid 30s; this information gleaned by some of our party who were able to make an escorted visit to the engine room. While its name might suggest a cruise liner for geriatrics it is, in fact, a very well appointed restaurant ship and we spent a leisurely two and a half hours enjoying yet another delicious meal while the scenery of Roskilde Fjord rolled past outside. The opening course of the



*The Sagafjord restaurant ship*

meal – don’t ask; but by now our Viking roots were beginning to show and we were ‘putting away’ raw fish dishes with aplomb and a level of accomplishment we would not have thought possible only a few days previous; either that or it might have been helped by the numerous large jugs of lager which kept appearing. A little known fact that did emerge from this being that, in the same way that Guinness never tastes as good as when brewed and drunk in its home country, Danish lager is at its best on home soil – or in this case on home waters.

### **Copenhagen**

We then had a coach ride into Copenhagen where our hard working ‘guide’ Jeppe did an excellent job explaining things as we were driven around the main sites of the City, before finally arriving back at his house for our final meal together. With sixteen of us sitting down to eat this was bound to be a major undertaking, but Lone (Jeppe’s wife), and Jacob and Martin (his sons), did us proud. Based on our previous experiences of Danish catering we were nonplussed to find that the first course was cooked fish! Jacob is training as a chef and



*Frederik's Church at the Royal Palace*

from the standard of this meal, his training must be nearly complete as the whole meal was absolutely delicious. Then it was back on the coach to the hotel. Quite what Jeppe’s neighbours made of a large coach turning up in a quiet residential street to drop off and subsequently pick up a number of ‘tourists’ is not known, but the get together at Jeppe’s certainly rounded off an entertaining and enjoyable weekend for us all.

