

Instrument Pilot

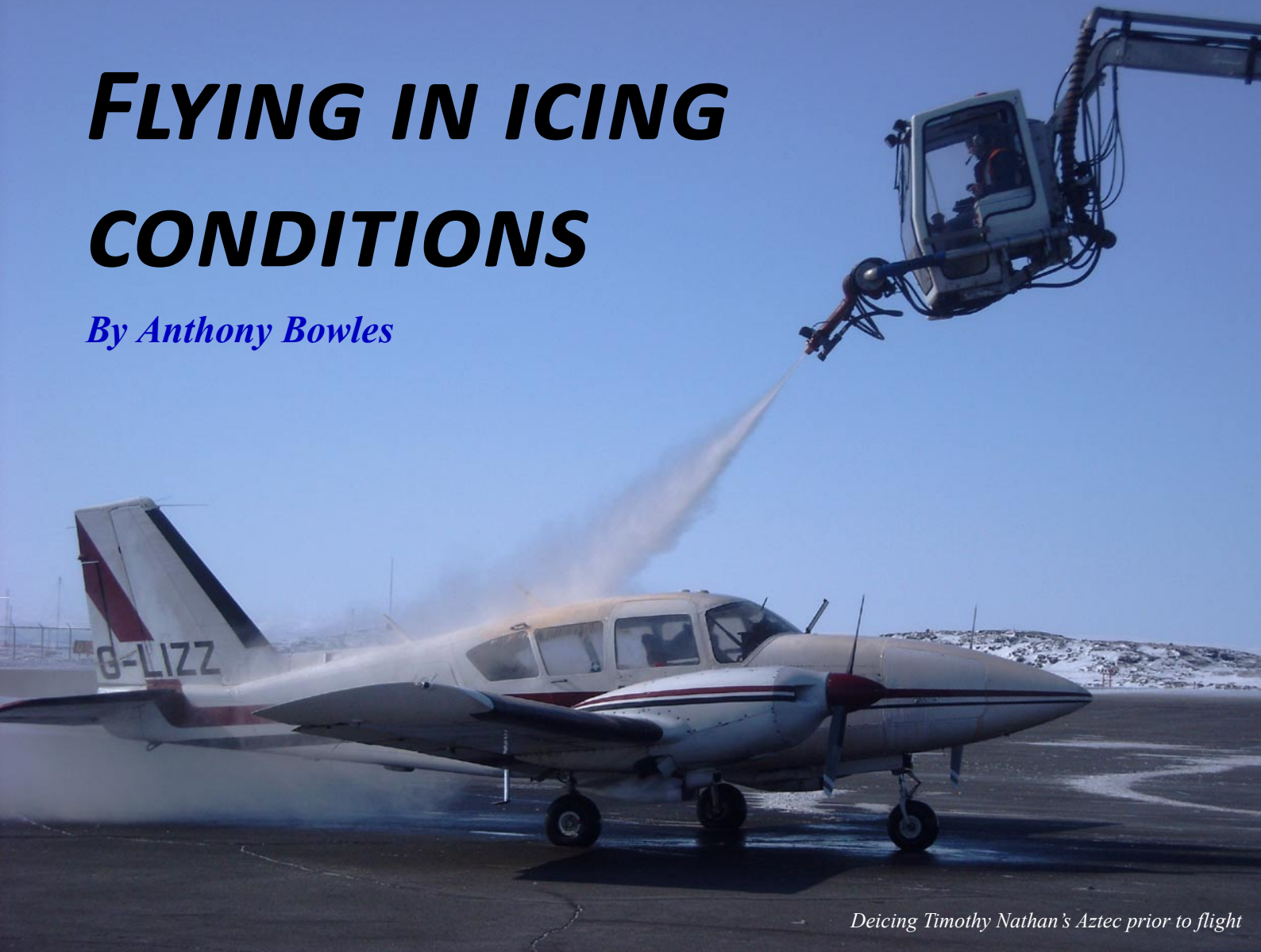
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FLYING IN ICING CONDITIONS

By Anthony Bowles



Deicing Timothy Nathan's Aztec prior to flight

Why flying in cloud below 0 degrees C need not always be a show stopper.

With few exceptions, light single engined GA aircraft are not cleared to fly in icing conditions. In the theoretical meteorology paper, we learn that airframe icing may be expected when flying in any form of cloud where the OAT is below 0°C and conditions are particularly conducive to icing in any form of cumuloform cloud, including of course cumulonimbus and stratocumulus clouds. Airframe icing occurs in flight when supercooled liquid water droplets impact on a solid surface (the wings, elevators and rudder)

whose temperature is below 0°C to give a layer of opaque rime ice. The freezing level in the UK is below airway levels for significant parts of the year and particularly in

the winter months, but light GA flights in the airways still happen on a regular basis. Are the rules about flying in icing conditions being disregarded or is there some other tactical way of maintaining a flying schedule? This article addresses the practical question of flying in potential icing conditions for such aircraft. Cloud BKN/OVC AC/AS 80/XXX; BKN/OVC CU/SC 025/070 is often seen on form 215 throughout the year. Form 214 in the winter months will frequently show a 5000ft temperature near or below freezing and a 10,000ft temperature which can on occasions drop to -15°C or below in my part of the world (SW Scotland). A flight south to the London area is planned; should I go low or high level? In winter conditions, form 215 will almost invariably go on to mention ice and possible turbulence in the forecast conditions as a further disincentive to venture high. I suggest nonetheless, that

P 3 ►



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Editorial e-mail:
theeditor@pplir.org

Website:
<http://www.pplir.org>

Art direction & production
Philip Caiger
+44 1959 532325
pcaiger@btinternet.com

Printing and distribution
Lion FPG

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Directors of **PPL/IR Europe**

Anthony Bowles

Chairman

☎ +44 1644 440229
✉ chairman@pplir.org

Jim Thorpe

Deputy chairman

☎ +44 1989 770355
☎ +44 1989 770511
✉ deputychairman@pplir.org

Ian Chandler

Secretary & treasurer

☎ +44 1702 200 353
☎ +44 1702 354 488
✉ treasurer@pplir.org

Steve Dunnett

Meetings secretary

☎ +44 2920 875 188
☎ +44 2920 876 749
✉ meetings@pplir.org

Anthony Mollison

Pilot training specialist & BBGA representative

☎ +44 1202 593366
☎ +44 1202 574020
✉ anthony.mollison@fsmail.net

Members of the Executive

Vasa Babic

DfT EASA forum representative

☎ +44 777 557 0000
✉ vasa_babic@hotmail.com

Peter Bondar

☎ +44 1845 501 062
☎ +44 7775 883122
✉ peter@bondar.co.uk

Dirk DeJonghe

Belgium representative

☎ +32 5635 0710
☎ +32 5635 0780
✉ dirk@color-bydejonghe.com

David Earle

☎ +44 7802 685642
✉ da.earle@virgin.net

Derek Fage

Web master

☎ +44 1534 861372
☎ +44 1534 752301
✉ webmaster@pplir.org

Jean-Michel Kerr

Switzerland representative

☎ +41 76 308 00 69
✉ ecoflight@mac.com

Andrew Lambert

Membership secretary

☎ +44 7836 793266
☎ +44 1428 751654
✉ andrew.lambert@emsuk.com

Timothy Nathan

Web site compiler

☎ +44 1372 812 469
☎ +44 7785 503543
✉ Timothy_Nathan@webeditor@pplir.org

Stephen Niechcial

Instrument Pilot and website material editor

☎ +44 7976 011494
✉ theeditor@pplir.org

Alan South

DfT SES forum representative

☎ +44 1763 838465
☎ +44 1763 838465
✉ alan@littliewissett.eclipse.co.uk

Press Officer

Position vacant

✉ pressoffice@pplir.org

Membership Administrator

Sali Gray

☎ +44 1452 618899
✉ memsec@pplir.org

Annual accounts for the company are available on the website. See www.pplir.org – **About Us**
For reports on meetings, conferences and other activities attended in the last 12 months by directors and members of the executive on behalf of **PPL/IR Europe** members, see www.pplir.org – **Lobbying**

CONTENTS

Flying in icing conditions	1
Do we need to rethink the IR skill test?	4
Commercial vs private IFR	6
The future of instrument training?	8
JAA IR training options	10
Pilots' talk	13
Notes to Members	17
Chairman's corner	18
Getting consent for LPV	19



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◀ P I often, but certainly not always, safe flight at higher altitudes can be done when the basic forecast conditions suggest otherwise.

However before coming on to consider the higher altitude flight, we should cover the VFR alternative. The forecast suggests that VFR at 2,500ft or below is possible and although this is getting a little tight for comfortable ground clearance in the Lake District, following the M6 south would be entirely practicable. If the winds are coming from a southerly direction, increasing with height, then a reduced journey time through less strong winds at lower level may be preferable, even if the journey is not so comfortable because of low level turbulence. Once south of the Lake District, the high ground falls away and the remaining legs are the proverbial “piece of cake”. But what if the upper winds have more of a northerly component, suggesting an increasing tailwind as you climb? Or, as is quite common in the Lake District in winter months, there is scattered / broken stratus (SCT/BKN ST) with bases around 1,000 to 1,500ft which makes VFR through the Lake District much more problematic? A higher level routing now looks rather more compelling, but is it possible?

First, we need to analyse the forecast more thoroughly. It suggests at best broken or at worst overcast, low level cloud with bases around 2,500ft and tops not above 7,000ft. There is a world of difference between broken cloud and an overcast layer. Broken suggests that a VMC climb should be possible until on top, even if some course deviation is required to achieve this. This is no problem around Carlisle as controlled airspace does not begin until FL100 or above. Once above FL70, you would expect to be above the low level cloud and it is then worth taking a look around. Yes, occasionally the tops are a uniform deck at a specific altitude, particularly if the lower cloud is stratocumulus (SC) with a temperature inversion immediately above. More frequently though, cloud tops are quite variable in height, especially if the

cloud type is more cu than sc.

If the cloud encountered is overcast (OVC) rather than broken (BKN), then an IMC climb will be necessary. Now you do need to consider the numbers more carefully; what is the freezing level? If 5,000ft, then you will need to climb through possibly 2,000ft of below freezing and ice inducing cloud, but in an aircraft with a good rate of climb, this should not be problematic. If the freezing level is only at 2,000ft then potential icing is more of an issue. I say “potential” deliberately, because flying in cloud below freezing does not automatically mean ice. Look for lighter areas of cloud; lighter means thinner cloud and lower tops than darker areas of cloud. In showery weather, avoid



areas of precipitation; these always mean denser cloud and more likelihood of ice. Bear particularly in mind that the worst icing conditions are found towards the top of cumulus/stratocumulus (CU/SC) clouds and these clouds, with their convective element, contain most moisture.

We consider the next cloud group in the forecast. This suggests altostratus and altocumulus cloud with bases between 8,000ft and tops above 10,000ft. The latter information is not very helpful since to access the icing possibilities and risk, we need to know the approximate likely cloud tops. This information can be gleaned from the European significant weather chart. A forecast of altocumulus/altostratus (AC/AS) cloud tends to suggest the presence of a nearby front; these are still shown on the 215 chart but sadly in my view, no

longer shown on the significant weather chart. Depending on the type and activity of the front, cloud tops usually vary between around 12,000 and 18,000ft, with a tendency for lower values in the winter months. Active warm or cold fronts with cloud tops above FL200 are best avoided as clear layers will be fewer and icing potential greater – nimbostratus (NS) in the cloud forecast is an indicator of these. There are several points to be aware of when considering flying through medium level cloud. The first, applicable at all times of the year, is that altostratus (AS) usually occurs in layers with clear VMC conditions in between layers. While it is difficult to judge from the ground exactly where a clear layer will occur, it usually becomes

more obvious as height is gained and a level change requested en route is made to fly in this layer. Second, I find particularly in winter months, an altostratus layer is usually thin cloud and prolonged flight can often be made within the layer without picking up any ice. This is allied to a third point, again applicable in the winter months in the northern half of the UK, which is that the OAT can be too cold for ice to form. As already mentioned, ice forms when supercooled

water droplets impact and freeze on a solid surface. As the OAT drops, more and more water droplets turn to ice particles. However, airframe icing is unlikely to occur with smaller droplets as found in altostratus and below about -15°C. With strobe lights on, these ice particles are highlighted in IMC but will not adhere to the airframe. Altocumulus (AC) is somewhat less benign suggesting a thicker more convective cloud but again in my experience in the winter months, it is usually possible to find a flight level in the lower teens which is cloud free.

It will have become obvious to the reader by now that a certain amount of experimentation is necessary to gain experience in flying in potential icing conditions. Imperative in that experimentation is to have a P 5 ►

DO WE NEED TO RETHINK THE IR SKILL TEST?

In part two Jim Thorpe concludes his reflections by suggesting practical changes to the test requirements.*

EASA Appendix 7 sets out the requirement for the IR skill test. It is not very different from the previous JAR version. Here in the UK we managed to turn that into many pages of Standards Doc 1 and a considerable part of the examiners' manual. This has led me to wonder about the extent to which the existing skill test has diverged from the real needs of single pilot IFR. I don't believe that we should have an easy test and I guess there will never be a level playing field across Europe. I am left wondering though if we really need to be struggling to climb the peaks while certain countries wander the valleys. The following, I suggest, are some key changes we could usefully make:

1. Train to the GPS

Navigation in the real world is almost entirely GPS based, yet we teach very little proper use and understanding of the GPS. We could move on to regard GPS as the prime means of navigation and its failure as a minor emergency to be dealt with by a sensible back up plan probably not the continuation of the planned flight.

2. Alternatives to airways experience

The value of the time spent getting into airways with all the ATC hassle and wasted time and expense that involves is questionable. There is currently no EASA requirement for this on the IR although there might be for the EIR. The only real value I can see is exposure to high workload RT, plus maybe getting and flying a clearance. All navigation issues could be dealt with on routes outside CAS. As an alternative to actual CAS, I suggest examiners could 'encourage' the ATO to give candidates some exposure to relevant experience (e.g. demanding RT and clearances) as part of their training.

3. Revised limited panel training

There is no legal requirement for a turn coordinator to be fitted to an aircraft; only a second source AI is required and glass cockpits don't have a TC. These differences lead to significantly different



test difficulty depending on aircraft type. EASA FCL App 7 does include limited panel but there is no definition of what 'limited' means so examiners have discretion. It would make more sense if 'limited' was whatever failure might really happen given the aircraft equipment rather than the current emphasis based on the traditional 'six pack.'

4. Reduce the emphasis on the NDB

NDB/ADF withdrawal is well under way. It is no longer reasonable for this sort of holding and tracking to feature so centrally in the skill test. There is

no EASA requirement to carry any needle based tracking instrument to be IFR legal. Section 3a of the schedule is badly worded and one might say that some NDB skills check requirement exists while the equipment is still there, but that is not justification for its current large role. Against this, some would argue that holding is still part of the real world at non-radar airports. Maybe a balanced position can be struck by testing holding skills en-route around a waypoint or VOR/DME.

5. Reduce the length of check lists

Check lists are now too long. As a result, in the single pilot world they are largely abandoned and this is undesirable. We could accept a more intelligent combination of shorter check lists, memory items and placarded information, the mix being agreed between examiner and candidate before the flight.

6. Replace the PLOG and fuel plan

The conventional PLOG and fuel plan now have a very limited role given present levels of automation. Obviously some systematic process is desirable and an EASA requirement, but the one in current use is so obviously unfit for purpose it is largely abandoned outside the training environment. As an alternative, we could have a simpler process taking account of the data provided by the avionics.

7. Introduce an oral component to the test

While there is no direct provision under EASA for more oral examination, I am sure this could be incorporated to cover use of the flight manual, use of air traffic services, pre flight inspection, weather minima, emergencies etc.

* Since writing this article and having bent the ear of the CAA once too often I have been invited to join a UK group which is being formed to put together a proposal for an updated test which can then be submitted to EASA. Anthony Mollison has also been invited to join this group and he has the benefit of a working lifetime preparing IR test candidates. Thus **PPL/IR Europe** is being given an excellent opportunity to exert influence. If members would like to input their own ideas please Email me or even better start a thread on the forum.

I think there would be support for a sensible effort to test some broader pilot understanding of theory as it applies to practical IR matters.

8. Increase the scope of training for emergencies

There appears to be no requirement for any in flight training for emergencies beyond ice and MEP engine failure after take off. This strikes me as an important omission and discussion of emergencies might form part of an extended oral component of the test.

9. Use more local test routes

It is very difficult in the UK to find airfields where training is possible on anything like an economic basis. It seems unreasonable for example, for a candidate to spend 45 unproductive minutes going to and from Bristol just to be allowed one radar vectored ILS and be charged circa £90 in a SEP. I appreciate that it is desirable for candidates to do more than just learn home base approaches off by heart but we should try to find a more efficient way of dealing with this. I appreciate that examiners cannot insist on more than the legislation requires, but an informal understanding that some breadth of log book experience might influence the selection of a local test route would be effective. Another approach would be for candidates to plan and brief a long real world route for the examiner but then fly a short local route.

So to summarise, my suggestion would be a much extended oral focussing on emergencies and the briefing to the examiner of a longish real world route given the weather of the day. There would be some informal expectation that the candidates log book should show some breadth of experience. Then there would be a skill test aimed at 45 minutes in the air with minimal pre briefing. A short navigation exercise outside CAS, maybe an ad hoc hold, general handling and then a couple of approaches at a nearby airfield which in most cases will be home base. We can still have a high and consistent standard of examining but I suggest that, without significant change, a large part of the IR training business will just migrate elsewhere in Europe.



◀ P 3 plan if matters do not work out as expected and not least if the actual cloud conditions differ from those forecast. It is also imperative that the reserve plan is put into action without delay. Just occasionally, the reserve plan will be to request a higher level; you plan for FL100 or FL110 and you find you cannot quite clear the tops; assuming aircraft performance and oxygen carrying requirements are met, a climb up to the next flight level solves the issue, but do not wait until ice is accumulating before requesting the level change. More usually, the reserve plan will be a descent and the necessity here is to have a freezing level above the MEA so that any accumulated ice can then melt off. If the freezing level is below MEA, then you should not be experimenting in the first place. In my flying from Carlisle, the first 25 minutes or so is outside controlled airspace, so there is plenty of time to climb to planned high level cruising altitude. If I do not like what I see for any reason, I cancel IFR and proceed VFR at low level or return to base without inconveniencing ATC or other airspace users. When returning from London where one enters controlled airspace much more quickly, I tend to adopt rather higher weather standards in terms of reduced thickness of likely ice producing cloud and where possible, requesting vectors to avoid climbs in cumulus (CU) below 0°C. The weather, being better in the south, usually obliges.

It is worth adding a few further observations. First, our UK climate is relatively benign in many respects including GA aircraft icing incidence. Only rarely do we experience the absolute showstopper of clear icing conditions where precipitation from warmer air falls into an airmass below 0°C so that ice accumulates over all the airframe and not just its leading edges. Second with the exception of Scotland, we are fortunate not to have much mountainous terrain in the UK, which accentuates

cloud formation and therefore potential icing conditions. Third, many frontal events even in winter, are moderately weak, particularly when they reach the southern half of the UK with little precipitation at ground level or ice generation at higher level and cloud tops in the low teen flight levels. Fourth, bearing in mind that you need to be able to see cloud layers, more circumspection is required for night operations. Weather radar can help to identify potential icing areas on the basis that precipitation is more likely to involve ice inducing cloud. Aircraft with weather radar are likely to carry deicing equipment but weather radar images are now available as satellite data downloads onto a MFD in simpler aircraft which do not have deicing equipment.



I hope that this article has demonstrated that IFR flight in potential icing conditions can be a feasible and enjoyable experience in aircraft which are not certified to enter known icing conditions providing the weather forecast for the route has been carefully evaluated and in-flight conditions continuously monitored. Lastly, bear in mind that the worst time for encountering en route icing is often not winter but springtime. By then, the more powerful sun is heating up the UK landmass and in unstable polar maritime air, strong convection through several thousand feet will generate towering cumulus or cumulonimbus clouds. Whilst usually more scattered, these may require positive avoidance action by all types of aircraft.



COMMERCIAL VS PRIVATE IFR

Timothy Nathan draws out the differences and shows that there are limits as to how far PPLs can claim to meet CAT standards.

We say quite often, especially when regulatory change is on the way, that we private IFR holders want to be treated in the same way as commercial operators, with the same rights, privileges and responsibilities. The issue has come to prominence again in the light of the recent EASA proposals to change training, testing, experience and licensing requirements for the IR and to introduce the EIR.

This has set me to thinking about the differences between our flights and those of commercial operations and wondering to what extent they can and should be equated. I have experienced several different “worlds” of aviation, from grass runways and tail-draggers, through VFR SEPs, private IFR MEPs, part-time (PT) MEPs and Executive Jets. I have not worked in the airlines but have asked fellow member and ex BA 747 Captain, Terry Rawlins, to help fill in that part.

When I started in the 1980s, (my first job was flying newspapers across the North Sea in an Aztec in the dead of night), the gulf between private and Public Transport flying was rather narrower than it is now. Businessmen and even celebrities were content to be flown around in single crew air-taxis without fuss. Typical aircraft in use were Navajos, C421s, even Senecas and Aztecs. That would be the equivalent of the minicab business today. Low expectations were met in full. The pilots of those air-taxis would very often be recently qualified CPLs with no experience of multi-crew operations. The company Ops Manual would be thrust into their hands to read, they would do a Base Check, half a dozen line trips under supervision, followed by a Line Check and then they would be off, flying to all destinations, in all weathers, on their own. It was a steep learning curve, but much of the learning would be self-taught, so pilots could rapidly develop bad habits and set their own parameters. Thus the atmosphere was one of a slightly constrained private operation rather than of a fully governed Public Transport one. These CPL/IR pilots had little more knowledge and experience to their name than would a PPL/IR (the CPL tests and exams were scarcely more challenging than the PPL/IR) and a bare minimum of real life IFR experience. However, that end of

the market has all but disappeared. There are, of course, a few single pilot operations continuing in this country to this day but it is very much the exception rather than the rule. Almost all PT flying is now two-crew and that changes everything.

Two-Crew

So let us start by discussing why two-crew creates a world so different from single pilot. It is not the division of responsibility (you do the radio and plog, I'll do the flying) but rather the sharing of responsibility which comes to the fore. Each pilot knows that he is accompanied by a knowledgeable professional whose job it is to monitor everything he does with a critical eye. The colleague has a responsibility to intervene if anything is not done correctly by the book and a requirement to report back to the company any significant breaches of rules or safety. We private, single crew, pilots often play the game with ourselves, behaving as if we are doing both jobs, whispering into our own ears, as it were. The fact is though, there is no comparison with having someone, particularly someone you have rarely met before, actually monitoring you. In some ways, it makes every flight like your IR renewal. So, unless he is extraordinarily self-disciplined or has developed a serious personality disorder, it is unlikely that the single PPL pilot will be able to behave as if he were being monitored in everything he does. One obvious example of why the two-crew environment is safer than single crew is in the application of minima on the approach. It is too easy for the single pilot to push on a little, maybe by 50, maybe 100. In a multi crew commercial environment the response is much more mechanical. 100 above, ‘Decide’ says the pilot not flying (PNF) and the pilot flying (PF) makes an immediate decision based on clear criteria, in the knowledge that, if he busts minima, his colleague is obliged to report him.

Currency

The second thing which makes PPLs and PT pilots very different is currency. Generally, PT pilots can fly up to 900 hours a year; if they fly much less, their employers will consider that resource is being wasted. If an average flight is 3 hours,

that will mean that they will make 150 approaches a year and watch a colleague do another 150. On very short haul, such as the Shuttle, that figure will be higher, maybe 300 of each (though, of course, on long and ultra-long haul it will be lower). Flying or monitoring an average of nearly an approach a day gives the professional pilot a great deal more experience than most PPLs can manage. Many of us struggle to fly 20 sectors a year but even double that leaves us an order of magnitude short of our professional colleagues.

Currency is the biggest single determinant of a safe, stable approach. I remember when I was flying for a living, if I went on holiday for a couple of weeks I would feel behind the game once I got back. Probably not enough to be unsafe or even be particularly noticeable to an observer but just enough to feel my own performance was under par. If a two week holiday can make that difference in among weeks where I might have flown five approaches, week in week out, what are the month long gaps between flights that some of us have doing to our currency?

Flight Time Limitations

A constant pressure on the commercial pilot is worry about whether the number of duty hours he has undertaken exceeds the statutory maximum. The calculations can be very complex, as daily permissible hours depend on the time that the duty began. Duties can be split, but rest in the middle only counts for half of normal rest and then the next rest period has to be extended and so on. This means that the professional pilot has to be very careful about the length of the day, whereas a private pilot is unconstrained except by his own good sense. More importantly, the PPL doesn't have a rule book to hide behind. He might feel a little weary after a long day but he does not have the luxury of telling himself or his passengers that it is more than x hours since he came on duty and therefore he has no choice but to stop.

Separation of Operation from Mission and Commercial Pressure

There are two related issues which make our experience different from that of the commercial world. One of the difficulties

created by private operations, whether for business or pleasure, is that our non-aviation needs, let's say to get to a meeting or to land where our wife's aunt is waiting in a car, can start to interfere with our judgement as to the safest thing to do. In some ways, the professional pilot is protected from that pressure, as his responsibility stops with the aircraft, but he, especially at the lighter-end of the market, suffers from Commercial Pressure. This is the knowledge that a particular decision could cost his employer dear, both in immediate costs (such as putting people into hotels or onto other flights) and intangibles (such as a customer deciding not to use the airline again). One place where commercial pressure can be a problem is where the weather is on but not quite below minima. The private pilot is usually in a position to be able to say "you know what? Ill not risk it, Ill take the train," but the professional pilot will feel pressure to operate right to the limit.

Operations Manual and Standard Operating Procedures (SOP)

Both the above factors can eat into a pilot's normal good judgement but the difference is that the professional pilot has an Ops Manual where he can take refuge from criticism. The Ops Manual will always take the side of safety over expedience. It is one of the conflicts that a professional pilot has to resolve - the extent to which he is bound by the Ops Manual and Standard Operating Procedures. Some Operators are very prescriptive, saying that their pilots must always operate by the book without discretion, whereas others allow the Captain more of a final say. The upshot is if the pilot does go by the book, at the end of the day, he is normally beyond criticism. A pair of examples will help to illustrate:

- A B777 was flying northwest over Macedonia when it suffered an engine failure. The Ops Manual stated that a landing should be made at the nearest suitable runway, so the Captain opted to land in a remote airfield in Serbia, where the facilities for managing the stranded passengers were very limited and expensive, even though a turn to Athens would have taken only minutes longer. The company were furious but could say nothing because the captain was able to point at clear, unambiguous rules in the Ops Manual, that flight safety trumps commercial considerations and in that company no discretion is allowed.
- However, when a BA B777 lost all

power on final approach into Heathrow, the Captain did use his discretion, ignoring standard operating procedures and raised the flaps from landing to take-off position. This allowed the glide to be stretched just sufficiently to ensure that the touchdown was in the undershoot, where everyone was able to walk away, rather into houses killing countless people.

The private pilot has no such Ops Manual or SOPs to protect him. He is, again, on his own. The buck stops with him, although his experience is likely to be far less than that of the combined professional crew.

Flight Planning

Another area where the professional pilot is at a huge advantage over the private is that he will be backed up by an Operations Department, which will have planned the flight, worked out standard fuel and weight and balance, checked the destination(s) for suitability, ensured that the correct charts and plates are loaded, engaged a handling agent, booked fuel delivery and booked transport and hotels, all tasks that the private pilot has to undertake himself. Many of us relish this part of the experience and consider it to be part of the fun but that assumes that the purpose of the flight is leisure and that the pilot has plenty of leisure time. If it's a business flight against tight timescales these issues become a burden and in the rush to meet a slot or beat a closing time, can be skimmed or ignored, diminishing safety and increasing blood pressure.

Minimum Equipment Levels (MELs)

The decision as to whether to depart, whether to continue and whether to return, in the face of unserviceable equipment, is very easily made by the professional crew. The Minimum Equipment List is produced and a decision made. The private pilot is not so constrained. He can decide largely for himself what should and should not stop him flying, again creating the opportunity to push an envelope. EASA are talking about making a move to introduce MELs to private operations but I expect them to be fought all the way and it will be impossible to police.

Performance

Although not strictly a PT vs private

issue, the performance of most aircraft operated for public transport is hugely better than that of most private aircraft, especially if we are talking about aircraft flown by PPL/IRs. Perf A, the ability to continue or stop safely should a power failure occur at any time, is very rare in the world of the PPL/IR. Even if the power plant(s) remain fully functioning, the ability of our aircraft to out climb obstacles, to withstand icing and to get above the weather is clearly in a different league to CAT.

One of the ramifications of Perf A is that the professional pilot or his Operations Department have to make very careful calculations before each flight as to Weight/Altitude/Temperature against runway length and obstacles in the climb out (all the calculations assuming engine failure, of course). These calculations may result in recognition that the margin is sufficiently great to make a reduced power take-off, reducing wear and tear and fuel burn. CAT also has to be careful, in the case of twin engine aircraft, that they remain within the Engine Out Diversion time/distance during cruise (90, 120, 180 or 207 minutes according to their certification). Again this is something the PPL does not have to do (luckily, as that would have stymied my North Pole trip!). Even if we PPLs have a quick glance at weight and balance before departure, I wonder how many are doing balanced field calculations and looking carefully at the engine-out profile, especially in singles! Even most of our twins are not certified to be able to continue following an EFATO and many of us will not have a plan which will result in a happy outcome in all probable incidences of power failure.

It is not just the performance of the airframe and engines but also the avionics, which are very different. Most private aircraft do not carry autopilots which can seize a commanded altitude or fly a hold or indeed fly the ILS onto the ground or a whole range of other functions which keep the commercial aircraft out of trouble.

Conclusion

So, when we seek to show that PPL/IR operations should be on a level playing ground with commercial operations we are on a sticky wicket indeed. This is not to say that we should give the argument up. Of course, a PPL/IR should be able to fly anywhere a professional can go but we must be careful not to use arguments, which can be easily undermined, by claiming too much common ground.



THE FUTURE OF INSTRUMENT TRAINING?

Jim Thorpe expands on the training implications of EASA NPA 2011-16, with reference to the EIR

While the general response to Notice of Proposed Amendment (NPA) 2011-16 has been extremely positive, there does seem to have been some difficulty in understanding how the proposals might work in practice. In particular, questions have been raised as to how Approved Training Organisations (ATO) and independent instructors might work together.

1. NPA proposals and their impact on commercial training providers.

The existing system of instrument training was designed around the needs of the airline industry. The current 50 or 55 hour courses were arrived at, not by some careful analysis of the needs of an IR candidate but rather by the need to allocate remaining required training hours when all the other boxes for an integrated ATPL course had been ticked. This makes it particularly unsuitable for the needs of the private pilot and the NPA was directed towards addressing this issue. FCL008, where the work behind the NPA was done, made efforts to avoid anything which might be seen as unhelpful by those involved in commercial training and their belief was that commercial training would continue unaffected. However, a feeling seems to have arisen that the proposed system might become the *de facto* way in which all candidates might attain the IR. In one sense this is a complement to the NPA, but some commercial flight training providers may well see it as a threat.

From an FTO/ATO perspective the current situation regarding private pilots wanting an IR is clear. The uptake of JAA PPL IRs is negligible so anything that emerges from the NPA is new business and surely to be welcomed. Then there may well be substantial numbers of FAA IR holders who will now need EASA qualifications. Again, this is new business. The perceived 'negative'

is the possibility that the reduced compulsory hours and the proposed use of independent instructors for the EIR, will take current business away from established commercial IR schools. If this were true, it would imply that it is possible to pass the full IR skill test with less training and that the current number of compulsory hours is excessive, otherwise there would be no reason for commercial candidates to abandon commercial IR schools. I suspect that most schools would argue strongly however that 50/55 hrs is not excessive and that, given the existing skill test, they do everything possible to give candidates the best chance of a first time pass. In other words, there is no threat to their existing customer base.

Let's imagine that a commercial IR candidate has some strong reason to want to use a local instructor as an alternative to an ATO. Maybe they are somewhat cheaper and in a more convenient location than the nearest specialist school. The potential negatives would be significant. They would not be training in the test environment using test routes. They would struggle to find an aircraft with the ideal mix of HSI, GPS, RMI autopilot etc. If they did find such an aircraft, it might well differ from the one offered by the ATO they would be using at a later stage. They might well end up having to learn two different sets of speeds and SOPs. All this is hardly likely to increase their chance of a first time pass. Considering the cost of the initial skill test, all it might take is a partial pass to wipe out any savings. It seems highly unlikely that any candidate would opt to use an independent instructor in this way.

To repeat the point; the NPA proposals are not about commercial training. Neither in most cases are they about reducing the total number of hours required to get a full IR. However, I do suggest that they offer more flexibility in how training time is structured. Therefore, it does no harm for

training organizations and regulators to reflect on how they currently operate and decide whether they can incorporate some of the same principles to gain extra flexibility for commercial candidates. There is no measurable evidence I know of to separate the graduates of a highly structured six week, full time, course in the UK (with all the overheads and cost that implies) and graduates from an intensive two week course delivered by an independent US instructor who visits the candidate's home airfield with a desk top procedure trainer.

Leaving aside these musings, in Europe, even with the proposed changes, there is little doubt in my mind that if a candidate requires an IR with the object of becoming an airline pilot, then the best way to go in the future will still be a full time course at a specialist ATO. The ATO will have more room for manoeuvre in terms of total (ATPL) training time and it may be that exceptional candidates will spend less money and complete the course somewhat quicker. Other candidates will still take 50 /55 hours or even longer just as they do now. The EIR is competence based but there is no change in the situation where an ATO has to sign the candidate off as fit for test*.

2. Fixed number of hours v flexible hours with competence based assessment

One argument frequently advanced in favour of fixed hours training is that the additional hours impart some general skills rather than just training to pass the test. This seems unlikely. My experience as an instructor is that everyone focuses on passing the test; why would they not when spending £6 a minute? There is no evidence that the test is matched to the real world skills needed by either commercial pilots or private pilots. It is simply a consistent check that candidates have achieved a well defined set of skills, some of which are highly relevant, some

**Actually the whole process of a 170A seems to me an anachronism from the days when CAA skill tests were like hens' teeth and could only be booked by approved schools months in advance. Why should an examiner not test anyone who is willing to present themselves? It is for the school and the candidate together to make the difficult judgement as to the right moment with its inevitable trade off between uncertainty*

less so and some plainly irrelevant. The skill test focus is almost inevitable. In a highly expensive, stressful, process with limited relevance to real world needs, it is completely rational for most candidates to have ticking the boxes as the main aim.

3. The lack of training records or audit trails outside of an ATO environment

Again, one might reference the USA where an IR test candidate can appear with no records whatsoever beyond normal log book sign offs and the TK pass certificate. However, if a training record is seen as helpful, this is easy to address by simple paper or electronic duplicate records held by both the instructor and the candidate.

4. How ATOs could benefit from the NPA

A viable approach would be for commercial ATOs to encourage a limited number of independents. In effect, they would represent a sales force and a broadening of the ATOs geographic appeal. The instructor would do the schools standardisation program and might be able to source a local aircraft that came close to matching the school aircraft characteristics. You will note the struggle to create a credible scenario without the full involvement of the ATO. It is simply not easy for anyone to convincingly compete, using some ad hoc arrangement, against a well organised full time commercial school. The opportunity for other cooperative business models also exists. Perhaps an independent instructor believes there is an ongoing stream of business and takes the risk of sourcing a suitable aircraft and developing routes which match the test route characteristics using the ATO SOPs. He might perhaps agree with the ATO to use their simulator. Market forces will in the end drive the ways in which the NPA might operate.

Another area for cooperation is the local flying school, presently a (Registered Facility) RF, which will become a 'light touch' ATO, whatever 'light touch' may come to mean. It might be possible for such schools to enter into formal arrangements with a specialist ATO, making it viable for them to operate well equipped modern

aircraft for differences training, PPL hire, the En route Instrument Rating and the IR. It is worth reflecting that the RF will face some challenges in the new system and it is hardly likely to reduce their costs. They will probably lose their IMC business other than renewals and all post PPL instrument training will require an instructor with a full IR. The EIR will be the most obvious volume replacement business and it will require employment of instructors that a small school might find hard to justify on a full time basis. Perhaps competent well qualified part time instructors working for two or three schools as the need arises would be an answer.

5. PPLs and the independent instructor

Unsurprisingly, if we turn to a PPL holder wishing to get an IR, the role of the independent instructor becomes obvious. Candidates are likely to have limited time and possibly financial constraints in terms of cash flow timing rather than total cost. They may want to do the course over several years, they may want to use their own aircraft. They might want the instructor to accompany them on business trips. They might want to get an EIR along the way and build some solo IFR experience. They need flexibility and training tailored to their circumstances and this is where the independent instructor can shine. If asked is this the most certain, quickest or cheapest way to get an IR, the answer is likely to be no. This may not matter, since for these customers going to a commercial school for 6 weeks operating with inconvenient schedules and locations is simply not an option. What these pilots want is a process that fits their needs and takes account of their constraints. To repeat, it will take them longer and it may well cost more. On the other hand, it will be more enjoyable. Importantly, it will be far more likely to equip them for the realities of single pilot IFR. The truth is that a newly qualified IR straight from the skill test is likely to have little or no idea of how to cope with real instrument flying. For them there is no ops department, line training or experienced captain alongside. They are just left to launch themselves into what can be a quite daunting environment. A longer process with more real world

exposure and the ongoing support of a local mentor will make that transition less painful. Significant numbers of private pilots will once again be able to acquire and use an instrument flying qualification.

For a PPL, those negatives in using an independent instructor as predicted for a CPL/ATPL will not have disappeared entirely, but with different parameters, the solutions might also differ. Perhaps a candidate opts to take the test in their own aircraft. It may not have the ideal equipment fit for a skill test, but as compensation, he will be very familiar with it. One must hope that the unreasonable UK requirement for aircraft to be approved for test will be abandoned. If its IFR legal then it should be test legal. It may be that the cost advantages of an approved simulator are irrelevant because the candidate will acquire ample total qualifying hours over the extended period of training. Instead, the candidate might be advised to do a few hours on an ATO simulator or use some desktop procedure trainer based on its value as a training aid, not on its ability to deliver less costly training hours. Some trips might be for business purposes and while their training value will be less than a dedicated training flight, from a skill test perspective they will still be very valuable. The independent instructor will be a personal advisor able to suggest the best option to fit the individual circumstances. The NPA model gives flexibility. It is up to individuals to use that flexibility to their best advantage in their own terms. Should instructors or schools not give best advice and deliver value to their students, market forces and the forums will soon show them the error their ways.

6. The economics of the training environments

For the UK, the chance to perfect their aviation English is and will remain, a big draw for many candidates from mainland Europe. However, we also have the disadvantages of the CAA and VAT. I am not about to go into an anti CAA rant. They are a large organisation and inertia is slowing their ability to react to the huge changes EASA implies. There is a lot they could do to make the UK training industry more competitive without having any effect on the quality of the

P 16 ►

JAA IR TRAINING OPTIONS

Peter Holy takes the prospective IR candidate through some of the many permutations in Europe

This article has been written from the perspective of an FAA IR holder, who is already a relatively experienced IFR pilot with his own N-reg aircraft and who is acquiring the JAA IR using the '15 hour' conversion route. This project was driven by the EASA proposal to require all pilots, whose operators are EU based, to acquire EU licenses and ratings. This hits operators of foreign registered aircraft whose pilots will have to meet additional training and test requirements to gain those European papers, which are in addition to the State of Registry papers required under ICAO to fly the actual aircraft. This latter requirement will remain. The only concession EASA is making is that ICAO Type Ratings will be accepted directly. The hugely controversial proposal has been postponed to April 2014 but there is a case for sorting out the duplicate papers before then, in case of a regulatory mess which might compromise one's insurance. A more urgent reason is to capture the current 15-hour IR conversion route which is proposed to end sometime after April 2012; it may continue or be replaced by something similar, but nobody knows. Pending the realisation of the proposed EIR, the alternative would be the full 50/55hrs which, for any experienced pilot, would be a huge waste of time and money.

The JAA IR ground school and flight training process is, as we all know, much more restrictive than the FAA IR. For a start, it must be done at an FTO and this even extends to the ground exams for which an FTO has to sign you off. As a result, the number of UK private pilots doing the JAA IR has been miniscule. As the JAA IR can be done in various places in Europe and the good-weather southern locations are popular, I did some research on the options.

Ground School

The bottom line is that an English speaking pilot is best advised to simply sit the IR exams in the UK (at CAA Gatwick, usually). They currently cost £68 each. These well established exams

are supported by online question banks (QBs) which purport to contain the actual questions from the 7 IR exams. These QBs are actually far from 100% accurate but are good enough and they reduce the study workload by an order of magnitude. QB based study is now the norm on the commercial pilot FTO scene. There is a case for any European pilot to do the UK IR exams (so long as he speaks English, obviously), because it is clear that the UK CAA has weeded out most of the poor quality questions which the original JAA Common Question Bank (CQB) contains and which are still to be found in the JAA IR exams in the rest of



JAA-land. The UK IR QB has also been stripped of many airliner-based questions and is thus smaller than the others, which are generally just an unedited IR portion of the 14-exam ATPL set. The JAA CQB is now in the public domain. I personally found some 90% of the JAA IR theory to be depressingly irrelevant to any conceivable form of present-day aviation (which makes QB based study an excellent solution) but at least the UK CAA seems to have removed many questions which are poorly phrased or in some cases unintelligible and which can be seen in the official JAA CQB.

If doing an *ab initio* IR, JAA mandates classroom attendance; it requires 200-250hrs of study for an approved IR course and a minimum of 10% of the hours must be in the classroom. However, the actual hours a school does in the classroom depend on what is specified in the course approval they applied for and a lower figure is possible. For existing

ICAO IR holders, a number of European aviation authorities allow you to skip the classroom part entirely. In the UK, this is 'at the discretion of the Head of Training' but in practice is standard. The English language JAA exams can be sat at various places around the world e.g. the USA and certain British High Commission premises in far distant places. Most of the papers are the UK CAA ones.

Flight Training

U.K.

European protectionism means that JAA IR flight training cannot be done outside JAA-land. The PPL and the CPL can be done in the USA, etc. but not the IR. The UK runs a system with a reputation for being strict. This reputation is probably merited given historically the large number of ex RAF examiners, the mandatory use of window screens instead of the IFR hood and the enthusiastic pursuit of NDB holding procedures. However, in the past few years, UK CAA flight tests have become more flexible and were brought up to date, with GPS and autopilot use being allowed in some enroute phases of flight. While NDB holds and approaches remain in the test and must be 100% hand flown, the difficult requirement for being established within 5 degrees of the inbound track in the NDB hold for 15 seconds (previously 30 seconds) has been removed. That requirement led to all sorts of obscure 'gate'-based procedures being taught by the FTOs, took up much of the 50/55hr (SE/ME IR respectively) *ab initio* training time and could easily swallow the whole 15hr IR conversion. Other non-precision procedures may be tested instead e.g. VOR or possibly even GPS/RNAV. On VOR approaches it is fairly easy to achieve anyway. The 'gate' method of flying NDB holds (necessary to achieve the old inbound tracking requirement) is still taught by most FTOs but is not examined. When flying an NDB approach you are still required to be established within 5 degrees of the track before descending to the next level

but you normally have a longer distance to do that than in the hold. It is likely that further modernisation is held back largely by the poor availability of FTO aircraft equipped with GPS or GPS with a current database. The UK also runs the 170A pre-test test. This was established in the UK in the 1970s because far too many poorly trained IR candidates were being put forward for the IR test and subsequently failing and thereby wasting the then very limited CAA flight tester availability. Today, the 170A is essentially a course completion certificate which the FTO is obliged to give you once you have done the hours (as above) and completed the syllabus. You can then go and directly book the IR test (IRT) via the CAA. This also means that, post-170A, you can cost-effectively fly with a freelance IR instructor (outside the FTO environment) for additional currency etc before going for the IRT.

Europe

In northern Europe, IRT standards are similar to the UK, although only the UK mandates use of the window screens. I couldn't find any advantages for a UK pilot looking to do the flight training and IRT in northern Europe. I checked out a few places (France, Switzerland, Italy and Holland) but nobody seemed to offer anything useful. In southern Europe, things get more interesting, with more reliable weather, less formal training and flight tests and more edible food. For an already experienced pilot, these present an opportunity to meet the JAA IR requirements more easily. The UK IR system, with its disadvantages (as discussed above), has driven many pilots to do their IR training in the south, with Spain being a popular location. I have had good reports on FIS at Jerez, they communicate well and a couple of pilots I know did the IR conversion there in one week of intensive flying. I believe that one can use one's own aircraft there but it must be EASA-reg. There are Spanish aeroclub/FTO options but they have various issues (e.g. a joining fee of €800 and no temporary membership options). Another option is Greece where I have flown a number of

times in the TB20. There are a number of FTOs (mostly at Megara near Athens) but with the exception of *Egnatia Aviation* at Kavala, which I have twice visited (2009 and 2011), I have not been able to make any meaningful contacts with Greek FTOs. I have also found Egnatia less than responsive to written communications. There is no avgas at Kavala so Egnatia operates Diamond diesel aircraft. Egnatia offers a package for a conversion to a ME PPL/IR, done in a DA42, for about €6k including accommodation. The price falls a little for a SE conversion in a DA40. The accommodation is basic and in a very nice nearby former fishing village, Keramoti. There is free transport and there are plenty of nicer hotels to choose from if you want to upgrade. The whole package certainly



DA42 used for training by Egnatia Aviation

beats hacking around the UK drizzle in a beaten-up Duchess. Wearing the full pilot uniform with no short trousers allowed is, unfortunately mandatory for all customers, which will take some getting used to in the summer but you will have the immense satisfaction of setting fire to it once you are done! You certainly won't be able to wear it with a straight face back in the UK! Thomson fly from Gatwick direct to Kavala in the summer and the much better served Thessaloniki airport is 5 hours away by bus or 1.5 hours by car. With the poor prior comms caveat, Egnatia would be at the top of my list for a pleasant environment to spend the estimated 2 weeks. The southern countries have the advantage of good weather which ensures the project is done on schedule. This is obviously important as you will be staying in a hotel, though it's worth noting that UK IR training will also involve hotel residence for many

people due to the FTO requirement. The converse of this is that if you get bad weather abroad, you will be stuck out there with nothing to do except perhaps some simulator time. Both Greece and Spain do get bad weather especially in the winter. The reduced formality of the training and flight tests results in these countries sometimes being criticised by those with an interest in the UK FTO business and this must be borne in mind when reading comments on pilot forums etc. The UK CAA is often quoted as not being happy about people training abroad but in reality they present no obstacles to it. There have been cases where the CAA required a photocopy of the examiner's certificate to check that he had a valid IR when he did the flight test, so it is highly advisable to obtain this document

before handing over any money. Unfortunately, there is a fine line between informality and poor organisation. A lot of time can be wasted and some of the accounts I have read of some other Spanish schools resembled *Fawlty Towers*! Nevertheless a lot of ATPL training goes on down there despite private GA activity being very sparse.

Unsurprisingly, there are JAA IR training facilities in most of Europe but it was clear that, with a few exceptions which are run from the UK, Austria, etc. most of the FTOs are not organised for English-only speaking students.

This limits the nice-weather options considerably.

Aircraft Requirements

The UK CAA has certain requirements in Standards Document 7(A) for the aircraft used for training and test. This document details the window screens specifications too. In essence, they need to block the pilot's view 60 degrees either side of straight-ahead whilst allowing the examiner to see out. There is no requirement to block out the sky (and doing so complicates their construction) but most FTO screens do that as well. They are often attached by Velcro which can leave a mess from the glue but I found that as an alternative, suction pads may be used. The screens are required for the IRT only (the FTO training can be done under a hood) but in practice most UK FTOs train with the screens, partly so

the candidate gets used to them and partly to save them removing and refitting them all the time. They can reportedly create a claustrophobic feeling in the cockpit (though I never had any problems with those I constructed and in fact much prefer them to the hood). Obviously the instructor/examiners lookout for other traffic is compromised to some degree, which I imagine might become more relevant as the regional CAA flight test centres have closed and training and the IRT are increasingly conducted outside controlled airspace. I had a near-mid-air during my under-hood JAA IR training when somebody flew straight through the Shoreham IAP inbound track. Other relevant issues for owner aircraft include requirements for a minimum set of avionics and owner-maintenance is not permitted subsequent to the last service signed by an engineer. For an N-reg this means the last 50hr check needs to be signed off by an A&P; the Annual will be signed off by an A&P/IA anyway.

As far as I could establish by contacting dozens of FTOs around Europe, only the UK caters for training for an IRT in an N-reg aircraft. With no useful exceptions, all the other JAA countries support local aircraft registrations only. In fact, most non-UK FTOs and many UK ones refuse to work with a customer's aircraft of any registration. This makes the UK the definite favourite for an N-reg aircraft owner doing the IR conversion route. The price is an IRT stricter than some others, FTO costs among the highest and having to make (or borrow, etc.) the window screens. However, I can't claim this research to be exhaustive because a lot more is possible (particularly in southern Europe) when talking to somebody face to face rather than by email. The special support of foreign registered aircraft in the UK appears to be a long tradition, also found in the helicopter scene which has a long history of using N-reg aircraft and unlike the fixed-wing scene, was not driven by the FAA IR (there are almost no IFR approved helicopters below the level of a twin turbine). In the UK, if the aircraft is N-reg or any non-JAA reg, you need to get the Department for Transport's permission for the entire period of training and checkride. To their great credit, the DfT processes this free of charge, entirely by email and normally within a few days. The most relevant bit is the following, which prevents an N-

reg being used if owned by too-large a syndicate: *Permission for flying training will normally be given only to the owners of the aircraft concerned or to any pilot employed by the owner to fly the aircraft on their behalf. If the aircraft is owned by a Trust permission may be given to the trustor. If the trustor is a group or company, permission may be given to members of that group or Directors of the company if the number of members or Directors is no more than four.*

Problematic Combinations

Despite the JAA attempt at 'unification', it is not possible to freely mix geographically different theory exam passes, flight training and checkrides. Some information on what is acceptable to the UK CAA can be found in LASORS. Beyond what is in LASORS, one is into 'grey' territory but I have managed to check out a few things. All UK flight training FTOs and many European FTOs, accept the UK theory exam passes but it does not work the other way round. If you sit the exams outside the UK, the UK CAA will refuse to add any resulting IR onto a UK unless the flight training and checkride were done in the same country as the exams. So if you sat the exams in Greece (where they cost just €5 each, in Athens) you would need to do all the flying out there also. This low cost is not unusual (in Slovakia the total cost for all exams is €18 total). The UK CAA seems to be the most expensive by a vast margin but it's probably worth it because you get the mostly garbage-free question bank and the total cost is not significant in the wider picture. Similarly, the UK CAA does not accept an IR onto a UK licence where the training was done in one country and the checkride in another.

It appears that the only 'mixed' IR combinations which are sure to work with a UK licence are:

- 1) Undertaking exams, training and checkride in the UK (obviously).
- 2) Undertaking the exams in the UK and the training and checkride in another country.
- 3) Undertaking exams, training and checkride in another country.

Pilots who are resident and flight training outside the UK would naturally do the exams in their own country. However, if, for example, you sit the exams in Austria, you may find that no Spanish or Greek FTO accepts the Austrian exams and Austria is your only flight training option. However, I have never checked this out and it is probably far from universally true because at least one of the Spanish FTOs is run from Austria anyway. In general terms, the IR exams must be administered by the State approving the FTO and this would appear to preclude option 2) above but there appear to be bilateral agreements in place which cover at least specific IR FTOs outside the UK and possibly only for exams done in the UK or in the FTO's country.

The CAA document for adding a non-UK (JAA) IR onto a UK licence is SRG1193. It asks for various documents from the examiner. An interesting bit of information is that if you do the IR conversion outside the UK, the local Aviation Authority (AA) (e.g. the HCAA in Greece) is not involved in issuing the IR. The local IRT examiner completes the UK CAA forms directly. This is just as well since the HCAA is known for taking months to issue new papers. It is only for licences that the local AA gets involved. For the vast majority of UK pilots doing the IR conversion, it is advisable to do the exams first and then choose the flight training FTO as a separate exercise. If using a non-UK FTO, check that their local AA (and their local AA IR examiner) will accept UK exams for the IR issue and get it in writing. Specifically, check that they will accept the 7 IR exams; certain non-UK FTOs I know of have formal acceptance only for the 14-exam ATPL set and they do the 7-exam IR version under an informal agreement.

The proposed EASA system will change the above substantially with exams, flight training, flight tests, etc. all doable in different places. However, it is too early to consider this because so much is in a state of flux and every proposed deadline is slipping.



Pilots' talk

Compiled by Sahib Bleher

Transition altitude change for SE England

Following a request from air traffic service provider NATS, the CAA has approved changes to the Transition Altitude beneath the Worthing and Clacton Control Areas (CTAs) to the east and south of London. The approved change will harmonise the Transition Altitude level at 6,000ft for both Worthing and Clacton CTAs and align these areas with adjacent controlled airspace. The change does not include the creation of any new controlled airspace or changes to airspace classification. It will mainly affect airspace over the English Channel. In addition to the claimed safety enhancement, it will also simplify operations below Controlled Airspace in the South East of England ahead of the London 2012 Olympics. The changes will take effect from 8th March 2012. A major new initiative to raise the Transition Altitude nationally to a much higher level will soon begin its consultation phase and may ultimately increase the airspace available to General Aviation.

Cirrus all-composite single engine turboprop under consideration

Cirrus Aircraft is considering whether to build a pressurised all-composite single-engine turboprop from a variant of



the all-composite Epic Escape, the sleek, single-engine turboprop from former kit manufacturer Epic Aircraft of Bend,

Oregon. The parent company of Cirrus, China Aviation Industry General Aircraft, acquired Epic Aircraft's assets last year out of bankruptcy.

Backscatter scanners banned at European airports

In its new airport security policy, the European Commission announced that it will ban the controversial 'backscatter' body scanners, which emit ionized radiation, from all airports in the European Union's 27 member nations 'in order not to risk jeopardizing citizens' health and safety'. The UK will not, however, allow passengers to opt out if they are selected to go through the machines, which will remain in use at Manchester. Citing a non specific 'security threat' to Britain, the transport secretary, Justine Greening, announced in a Commons statement that there would be no pat down option available to fliers, despite an EU mandate for the provision to be introduced. Manchester Airport, the only airport in the UK which now has the scanners, installed 16 of the £80,000 machines and has been told it can continue using them for another year. However, no new machines will be allowed.

Luxury tax on aircraft in Italy

Italy has introduced a new 'luxury tax' on private aircraft as part of 'austerity measures' which will have a serious impact on the aviation industry and is likely to cost the country more than the revenue it brings in. The new tax will be levied on a sliding scale from €1.5 per kilogram per year for aircraft under 1,000 kgs to €7.55 per kg for aircraft over 10,000 kg, with helicopters paying double. While the tax will further depress aircraft ownership in Italy, it could affect every pilot in Europe because it applies to any private aircraft, of any nationality, which remains on Italian territory for 48 hours or more.

War over Emissions Trading Scheme

The European Union appears to be on a political collision course with the United States and other leading nations after the European Court of Justice in Luxembourg blocked an appeal by Airlines for America (A4A) against the imposition of the emissions trading scheme (ETS) on non-European airlines. Political action over ETS now seems likely to shift to the U.S. Senate, where the Committee on Commerce, Science and Transportation is considering the European Union Emissions Trading Scheme Prohibition Act. The act, which mirrors a bill already passed by the House of Representatives, would make it illegal for U.S. operators to comply with ETS and would require the U.S. government to help them in the event they face penalties for non-compliance.

42 states are now united in their opposition to the ETS including Russia, China, India, Japan and Brazil. The Chinese government, reportedly, has already blocked one order for Airbus airliners by a state-owned airline and it and other governments have not ruled out taking trade sanctions against EU companies in retaliation over ETS. The governing council of the International Civil Aviation Organisation (ICAO), meeting on 2nd November in Montreal, also adopted a declaration opposing the European Unions 'unilateral' action to include non-EU aircraft operators in its emissions trading scheme (ETS) as of January.

The European Business Aviation Association (EBAA) says revisions are needed to the European Union's Emissions Trading Scheme (ETS) to ensure it doesn't unfairly burden business aviation. EBAA says the controversial climate change initiative, which was recently changed to include aviation emissions, places a disproportionate cost on so-called 'small



emitters' like bizjet operators. *'Business aviation is treated unfairly compared with other modes of air transport. On average, business aircraft operators must acquire up to 96% of their historical emissions in permits compared with only 15% for airlines'*, EBAA said in a news release. EBAA says the EU could reduce the cost to small emitters through simplified administration and streamlined reporting and verification. The group also generally deplored the timing of the implementation of ETS on aviation when most sectors are already financially strained.

Could computerising air-traffic control save carbon, time and money?

British inventor David Parkinson believes that using computers to calculate perfectly smooth trajectories for planes could painlessly cut 8% of aviation emissions. The Guardian newspaper reports Parkinson as saying *'We've already done it on the railways. Many people assume that train signals are still controlled manually by signalmen, but in truth the system was automated years ago'*. Working from an airspace model for south-east UK on his laptop, Parkinson has developed a programme to calculate the most efficient trajectories for each plane, saving time and fuel compared with sticking to sub-optimal routes flown at the moment. According to Parkinson and he is not alone in noting this, the current system is hugely out of date. *'The operational concept is 50 or 60 years old. The guys do a good job. They're very skilful people. But the tools at their disposal include scribbling on paper strips. Planes have enormous navigational capability that has evolved over time, but for largely historical reasons controllers are still chained to manual systems'*. NATS dismissed the new proposal out of hand, but the Guardian observes that they did so without detailed analysis and challenges them to at least conduct a thorough feasibility study. We guess neither Parkinson nor the Guardian appreciate that within the bureaucratic EASA decision-making processes, 50 years out of date may not be considered all that antiquated after all!

Piper sale to Brunei finalised

Piper Aircraft Inc. was sold in 2009 to the government of Brunei and the transaction has now been finalised by

finance and investment management firm Imprimis who managed the company until Brunei was comfortable enough to take the reins itself. The manufacturer is currently negotiating with Florida officials over the repayment of more than \$10 million in grants and incentives it received when it promised to keep its headquarters in Vero Beach, Florida.

Domestic drone use challenged in US courts

The Electronic Frontier Foundation (EFF) filed papers seeking to force the FAA to release information about the use of drone aircraft and the identity of entities allowed to fly them inside the U.S. above an altitude of 400 feet. That specific kind of operation requires authorisation from the FAA and as yet, the FAA has not made public any information regarding who has been granted the authorisations and how those recipients are using approved aircraft. Last April, the EFF sought records through the Freedom of Information Act and says it has not seen a response from either the FAA or the larger Department of Transport. The use of drones in surveillance of U.S. citizens is not theoretical, according to at least one report. The EFF's lawsuit specifically cites law enforcement use of those drones in *'at least two dozen surveillance flights since June'*, as reported by the Los Angeles Times. The suit has prompted public support from Jane Harman, former chair of the House Homeland Security Intelligence subcommittee. The EFF believes the public *'needs to know more about how and why'* drones are employed in surveillance of U.S. citizens. Drone use has been on the rise militarily and also domestically as the U.S. Customs and Border Protection has started to employ use of the vehicles and currently operates eight Predator Bs. It is the reported loaning out of those drones for local police activities that has drawn the most public scrutiny.

Iran: Spoofing Brought Down U.S. Drone

Iran says that knowledge it gained through reverse engineering less sophisticated drones allowed it to trick an RQ-170 Sentinel drone into landing itself there, nearly undamaged, in early December. An Iranian engineer says specialists reconfigured the drones GPS

coordinates to tell the aircraft it was actually landing at its base in Afghanistan, the Christian Science Monitor reported recently. The technique, called 'spoofing', means that the Iranians did not need to crack the vehicles encrypted remote-control systems or communications. U.S. defence personnel have downplayed concern about the potential transfer of leading-edge stealth technology, saying even the Sentinel's systems are somewhat



dated. They also concede that more technologically robust nations (like Russia and China) may be able to create advanced radar profiling based on intimate knowledge of the vehicle's shape. With that, it is possible the stealth qualities of the RQ-170 could be compromised. As for the drone's electronics, the military is staying quiet. That has led informed observers to wonder if the Sentinel's systems are adequately protected by electronic defences designed to prevent unauthorised access.

Britain and France to build UAVs jointly

Britain and France plan to collaborate on building unmanned aerial vehicles, British Defence Secretary Philip Hammond said. *'We will look for a suitable opportunity, probably now in the new year, to make a joint announcement to that effect'*, he said.

FAA to charge companies for charts

The days of inexpensive navigation and chart apps for mobile devices appear to be numbered with the FAA's announcement that it will begin charging for previously free downloads starting from 5th April 2012. The Aeronautical Navigational Products Directorate (Aeronav), which currently makes the latest charts and other navigational products available online for free, says it has to recover the costs associated with developing and hosting the products, which means charging fees to companies for those downloads and



no longer allowing individuals to access them at all. As of 5th April, only those with distribution contracts with Aeronav will be able to download the data. The most noticeable impact will likely be on the small but increasingly popular industry segment (like ForeFlight and WingX) developing flight-related apps for iPads and other consumer electronics. It will also have an impact on websites like RunwayFinder which use the data for their online products, some of which are currently available for free. As smaller firms may go out of business, the pervasive fear in the industry is that this could lead to only one or two entities controlling the market for the distribution of government-produced information that is essential for flight safety. Moreover, the FAA told about 70 vendors during a meeting that as paper sales continue to decline, the FAA charges for digital charting products are likely to increase in order to cover fixed overhead costs. The agency also assured the vendors that it would not be developing any apps or other products to compete with them.

Cambridge Aero Club to take over GA movements at Cambridge Airport

From 2nd January, well ahead of the PPL/IR Europe AGM, Cambridge Aero Club will take over the handling of most private General Aviation and helicopters at Cambridge Airport and is preparing for the responsibility with refurbishment of the existing flying school facilities. Luke Hall, Aero Club Manager and Chief Instructor said, *'These are exciting times for the airport and we look forward to providing an attractive environment for both regular club users and valued GA customers'*.

UKAB reports GA and Military airprox incidents up

According to the most recent report by the UK Airprox Board (UKAB), the number of airprox incidents involving GA and military aircraft rose in 2010. The report

shows 35 incidents involving passenger aircraft in 2010 and the majority of these incidents involved the airliner conflicting with a military or General Aviation light aircraft. While Ian Dugmore, the Director of UKAB, commented, *'The increase in the number of occurrences involving military or GA aircraft is not such good news'*, he also admitted that the trend is offset by the increased percentage of these airprox in which there was no risk of collision, which reflects increased willingness to report relatively minor incidents.

Ash detection technology successfully tested by EasyJet

Technology which would enable an aircraft to skirt around the thickest concentrations of ash has been tested by EasyJet. Known as AVOID, it makes it possible for a pilot to see an ash cloud ahead of the aircraft at altitudes between 5,000 and 50,000 feet. The budget airline, which tested the system on a microlight aircraft over Mount Etna, said the trials



were successful and it hopes to install the equipment on its fleet next year.

Following the policy change to allow airlines to make a safety case to fly through low and medium concentrations of ash, subject to the approval of the Civil Aviation Authority, EasyJet believes its technology will enable pilots to adjust their route and avoid the thickest concentrations of ash. Experts are predicting that Katia will be the next volcano to erupt and that it will be on a much larger scale than last year's eruption of Eyjafjallajökul.

Jetpacks go commercial

Nearly 60 years after rocket belt technology was invented at Bell Labs in 1953, Mexico's Tecnologia Aeroespacial Mexicana (TAM), now sells a custom-built Rocket Belt (the proper name for a jetpack) for \$250k. That price tag gets you 30 seconds of flight time on your hydrogen



peroxide-powered pack. Importantly, it also gets you full flight training so you don't kill yourself using the coolest toy you've ever bought. Its competitor, Jetpack International, a Colorado company, sells 'the world's longest-flying jet pack' – one that flies for 33 seconds instead of just 30. It also flies using hydrogen peroxide for fuel, but costs only \$155k and that price also includes proper training. Jetpack International also claims to be releasing a true jetpack (that is, a jet belt instead of a rocket belt) by the end of this year. This will burn jet fuel instead of hydrogen peroxide and pull flight time all the way up to 19 minutes. With that kind of time, says Jetpack International's founder, you aren't spending the whole flight figuring out where to land.

Free emergency landings at Carlisle

Carlisle Airport has joined the Strasser Scheme, agreeing to waive charges for genuine emergency and precautionary diversion landings by non-commercial GA aircraft under three tonnes. This brings the total of participating airfields to 207 in the UK, with just five airports not participating: Belfast International, Cardiff, Leeds-Bradford, Luton and Manchester.

Airlines call on EU states to deliver on Air Traffic Management Obligations

The Association of European Airlines (AEA), the European Low Fares Airline Association (ELFAA), the European Regions Airline Association (ERA) and the International Air Carrier Association (IACA), have jointly issued a plea to EU member states *'to stop procrastinating'* on

the Single European Sky project '*and finally start delivering on their obligations*'.

Total 91 UL Avgas now available in UK

Several airfields in the UK are now able to supply Total 91UL Avgas for about 15 pence per litre less than 100LL Avgas. Turweston, North Weald, Rochester, Thruxton, Wellesbourne Mountford and Compton Abbas now all sell the fuel.

Alderney first airfield in UK AIP with LPV approach

The Crown dependency of Alderney is the first airfield in the UK AIP to have a published LPV approach, that is a GPS approach with vertical guidance leading to lower minima. There are over 2,500 such approaches in the US (where they now outnumber ILS approaches) and over 40 elsewhere in Europe. In order to fly the approach aircraft will need to be fitted with a WAAS GPS that is approved for IFR approaches. For an aircraft registered in an EASA state that will mean getting an STC, while N registered aircraft with an approach approved WAAS GPS will simply be able

to go and fly the approach. (Ed. see article on page 19 by Paul Draper)

Old Buck becomes new home of FAA examiner

Touchdown Aero Centre Ltd, operators of Old Buckenham, have announced that the airfield will become the new home of the only FAA examiner in Europe, the Middle East and Africa. This is the latest development in the airfield's ambitious GA revival plans. Tom Hughston, FAA Designated Pilot Examiner, is authorised to conduct flight tests for the award of licences and ratings for Private, Commercial, Airline Transport & Instrument Pilot Single and Multi Engine Land as well as Flight Instructor Renewal and Reinstatements.

Free CAA/RIN Olympic pilot briefing event on 10th March

To help pilots prepare for flying in south east England during the 2012 London Olympics, the Royal Institute of Navigation (RIN) and the UK Civil Aviation Authority (CAA), through the Airspace and Safety Initiative (ASI), have joined forces to host a free briefing day in central London on

Saturday 10th March 2012.

The event will be held at the Royal Geographical Society and features presentations and Q&A sessions offering pilots the chance to get the latest information from the CAA, NATS and MoD on:

- How to use Atlas Control, the air traffic control unit that will provide the service in the Restricted Zone, R112.
- The options available for flight planning to get access to the Restricted Zone, R112.
- How airfields can apply for and use exemptions.
- The interception procedures planned to be used by MoD aircraft.

Since the venue has a maximum capacity of 750. Pre-registration is essential. To register, email your full name and any affiliation (e.g. flying club) to olympics@rin.org.uk. All bookings will be confirmed. For details of Olympic airspace changes go to www.airspacesafety.com/olympics.



◀ P9 output. A large proportion of the CAA functions has been taken away and I suggest this requires a changed culture of more targeted evidence based style of regulation and inspection. At present, we seem to have solutions searching for problems. RF's have been very lightly regulated and there have been no serious problems. They will become ATOs, so why would they need more regulation to do what they already do satisfactorily? Beyond that, why couldn't a small RF/ATO provide some instrument training? They have been doing it for the IMCR, again without apparent difficulty.

Why must there be such a large difference in requirements for an approved IR school and an RF? There is no obvious reason why a small school could not deliver some quality instrument training. The exact balance of flexibility and regulation would need intelligent compromises but the EIR and the CBM IR will produce significant new business and could be a catalyst to revitalise that section of the training industry directed at pilots who want to use aircraft to go places.

7. Changes which would help

The CAA could help, not by one dramatic thing but by lots of small factors. Why not just use foggles like the rest of the world? No need for screens which damage the aircraft and arguably reduce the ability of the instructor to maintain a good look out. Why have approved aircraft and approved check lists? If the aircraft is legal for instrument flight and has a manufacturer's approved check list, then that should be enough. That is not to deny that a different check list might help a candidate pass the skill test; simply that there is no need for an approval process. It's not the CAA's job to consider the financial viability of schools, check their health and safety policy etc; these duties are enshrined in civil law. Why do the operations manuals and the training manuals grow into massive tomes with lengthy repetition of material easily found elsewhere? The assumption seems to be that unless the ATO started by rearing the goose from which to get the feathers to make the quill pen with which to write the manuals, it is in some way cheating by not working from first principals. Almost all the required information is

available in electronic form and there is no reason why the whole training industry could not maintain 80 or 90% of the necessary material on a single website and the remaining 10 - 20% school-specific material could simply reference this single up to date standard source. The ideal endpoint should and could be that anyone who wants to do IR training of any sort has easy access to appropriate facilities. In some places this will be specialist commercial IR schools with all instruction in house. In other instances, specialist ATOs will work with non-specialist schools or independent instructors. In some locations, clubs or general flying schools will do some MEP and IR training; in others it will be independent instructors. No matter what the training process, the candidate will in the end be assessed and trained by an approved ATO and then be required to pass an unchanged common skill test. This is an entirely positive development and it is up to regulators, schools, individual instructors and pilots to make the best possible use of the opportunities.



NOTES TO MEMBERS

BY STEPHEN NIECHCIAL

Social weekend

Waterford, Ireland

6th - 8th / 9th July 2012

Friday

Arrivals and dinner at the Waterside restaurant in the Marina Hotel.

Saturday

Waterford Crystal factory tour (am); light lunch; coach tour to New Ross; Visits to Dunbrody famine ship and Ros Tapestry Exhibition; Dinner, fine dining back in Waterford.

Sunday

Waterford walking tour, visits to the Treasures of Waterford Exhibitions at Reginald's tower (Viking treasures) and Bishop's palace (regency Ireland).
Flight departures Sunday afternoon for those needing to return promptly or stay over the extra night for informal social relaxation.

Accommodation

We will be staying at the Waterford Marina Hotel. Twin/double rooms: € 109 per person for 2 nights (Friday – Sunday); € 129 for 3 nights (dept Monday), € 30 single occupancy supplement. The rate includes dinner on the Friday.

Participants will settle their own room bills and a kitty will be collected to meet all group expenses including additional meals, coach hire, museum entrance and guided tours.

Please complete and return individual booking forms, which will appear on the website in the New Year, to the meetings secretary, Steve Dunnett meetings@pplir.org. Numbers will be limited to 30 so please confirm by **30th March 2012** to retain hotel provisional booking. Thereafter rooms will be dependent on availability.



Forthcoming Events

24th March 2012

**Executive Committee meeting,
Coventry Airport**

The next meeting of the Executive will focus on issues of governance and final revision of the *PPL/IR Europe* Articles of Association, prior to submission for approval at the AGM. Any member of *PPL/IR Europe* is welcome to attend as observers.

28th April 2012

**Spring meeting and AGM,
Cambridge Airport**

The programme and booking forms will be posted on line and in *Instrument Pilot* in the new year. Cambridge airport is offering free instrument approaches on the day, free landing fees >100 litres fuel upload and tours of tower and airport, in addition to our regular programme.

18th - 21st April 2012

Aero Friedrichshafen trade show

We are currently exploring the possibility of a *PPL/IR Europe* representation at the annual Aero trade show, Friedrichshafen, Germany. Please contact Andrew Lambert if interested in contributing.

25th - 27th May 2012

AeroExpo UK, Sywell Aerodrome

PPL/IR Europe will again be represented at AeroExpo UK with an exhibition display stand and as organisers of the seminar programme. Please contact Andrew Lambert or the meetings secretary for further details or the membership secretary Sali Gray if you are willing to give 2 hours of your time to manning the *PPL/IR Europe* display stand.



Chairman's corner

Anthony Bowles



I mentioned in my last Chairman's Corner that I would initiate a Forum discussion and poll on two matters: firstly whether members still found the laminated *PPL/IR Europe* membership card with optional photograph useful and secondly, what members thought of *Instrument Pilot* being available on line with an optional printed version available when required. The results so far have been somewhat surprising. On the membership card issue, out of 59 votes cast, around two thirds have voted for no membership card with the remaining third voting for some form of membership card and the majority of this group preferring to keep what we have at present. On the I.P. issue, over 70% of 62 votes cast have opted for an electronic version of I.P. only with the balance preferring to maintain the present printed edition posted out to members.

The first point to make, is that while a useful number of members have expressed views, the votes cast come from less than 20% of the membership. This reflects, I suggest, the number of active members using the Forum and thus it is perhaps rather too soon to draw any firm conclusions. For those members reading this piece who have firm views one way or the other but have yet to express them, I urge you to go ahead and vote now. Log on to the Forum, go to the General Discussion section and then scroll down to the two poll items, open them and log your vote as well as reading what other members have written about the two issues. Please do this soon as the Executive Committee will be considering the responses at our next meeting towards the end of March and we would really like feedback from a greater proportion of the membership than we have so far received. If the electronic vote is not your preference, then an email to me at chairman@pplir.org will do just as well but I do not promise to respond individually to any points made.

While not pre-empting any decisions that may be made, my guess is that we will continue to have some form of membership card, even if this becomes a simple printed card or one that can be downloaded and optionally printed out. The laminated photographic card would then be available as an optional extra to those that want it. On I.P., we must bear in mind that there is always going to be a need for some printed copies if only for handing out at our stall at AeroExpo each year and at Friedrichshafen for this year, as well as copies required for sending to the great and good in aviation circles. Given that there is a certain minimum print order, the scope for cost savings on an electronic version



is largely limited to postage costs, not insignificant these days but the smaller part of the cost of overall production of I.P. I have also noted that the electronic version is now usually available on our web site a couple of weeks before the printed version reaches me and has the advantage of colour throughout.

The time allocated to the Annual General Meeting at our spring meeting on 28th April at Cambridge will be slightly longer than usual this year. This is because at our last Executive Committee meeting in November, we decided that the Memorandum and Articles of Association of *PPL/IR Europe* should be revised and updated. Unless you are a company lawyer by profession, you may consider this a somewhat dry and uninteresting subject and indeed

it is in many respects. Nevertheless these documents set out effectively the terms of reference which govern how our company, limited by members' guarantee operates and it is important that these are kept up to date as times change and new procedures evolve. Ian Chandler, our treasurer and company secretary is undertaking the necessary work for this which will be signed off at the next Executive Committee meeting and details of the changes proposed will be posted on the Forum for approval at the AGM.

Lastly and reverting back to *Instrument Pilot*, I would like to pay tribute to Paul Turner who has effectively been production editor for the last few years. This is an essential task carried out efficiently behind the scenes on tight deadlines taking the material submitted by the Editor and turning this into the form you see in your electronic or printed copy in appropriate and logical order and with the addition of photographs and/or graphics to enhance the printed word. With the latter, Paul has been ably assisted by his wife Sally, a skilled photographer in her own right. As you will know from the last I.P., Paul and Sally are glider pilots as well as pilots of the more conventional aircraft that most of our members fly. His job as production editor is being taken over by David Abrahamson and Philip Caiger who will each work on alternate issues of I.P. and kindly responded to the email I sent out in early December. Ben Hines also responded and will be helping Stephen Niechcial, I.P. editor and Claire Siggery, the daughter of one of our members and a professional graphics designer, has also very kindly offered her services on an occasional basis. I am very grateful to these volunteers and there is always space for more in other interest areas so if you have some time available and are interested in helping out, please drop me an email and tell me how you can help.



GETTING CONSENT FOR LPV

Paul Draper outlines a development of great promise for GA instrument flying or will over regulation kill another opportunity for Europe's aviation industry?

What is LPV? These are the letters you'll be coming across quite frequently in the aviation press. They stand for **Localiser Performance with Vertical guidance**. LPV procedures are a new operation and the CAA have authorised their use at suitable airfields in the UK. In the future, pilots will be able to fly a three-dimensional ILS/Glideslope-look-alike operation down to minima equivalent to CAT-I operations on an approach system entirely supported by Space Based Navigation Aids. There will be no need to install any ground navigation infrastructure since LPV procedures use EGNOS (European Geostationary Navigation Overlay Service), which is a European Commission system owned and operated by the European Satellite Service Provider (ESSP). The lack of any requirement for ground based infrastructure will obviously provide very clear benefits to both airfield operators and pilots.

Alderney is the first airfield to benefit

from these operations in the UK. Until last year Alderney relied solely on Instrument approach procedures based on an NDB. Approaches there can still be carried out using the NDB but from December 2011 users can, alternatively, fly the Lateral Navigation (LNAV) procedure which uses GPS guidance or the LPV procedures based on EGNOS. An LPV approach is normally a "glide slope" in terms of flying rather than a "step down" one although at Alderney, on runway 26, there is an initial "step" due to the constraints of the nearby French airspace. This emphasises the need to review very carefully the approach/landing plates before using them (at any LPV equipped airport). The approach procedure on 26 is also different to that on 08 at Alderney. The new LPV procedure provides some significant improvement in system performance during poor weather conditions. The reduction in the Obstacle Clearance height (OCH) for the GNSS LNAV (non-precision) approaches is only

40ft compared to the NDB OCH. However, the LPV procedure reduces the minima by 90ft. At Alderney the NDB RVR will be reduced from 1400m to 1200m for the LNAV procedure and to 900m for the LPV procedure. Another very real advantage of GNSS approaches into an airport such as Alderney is that one is not relying on the old NDB we love to hate with its coastal effect and other vicissitudes!

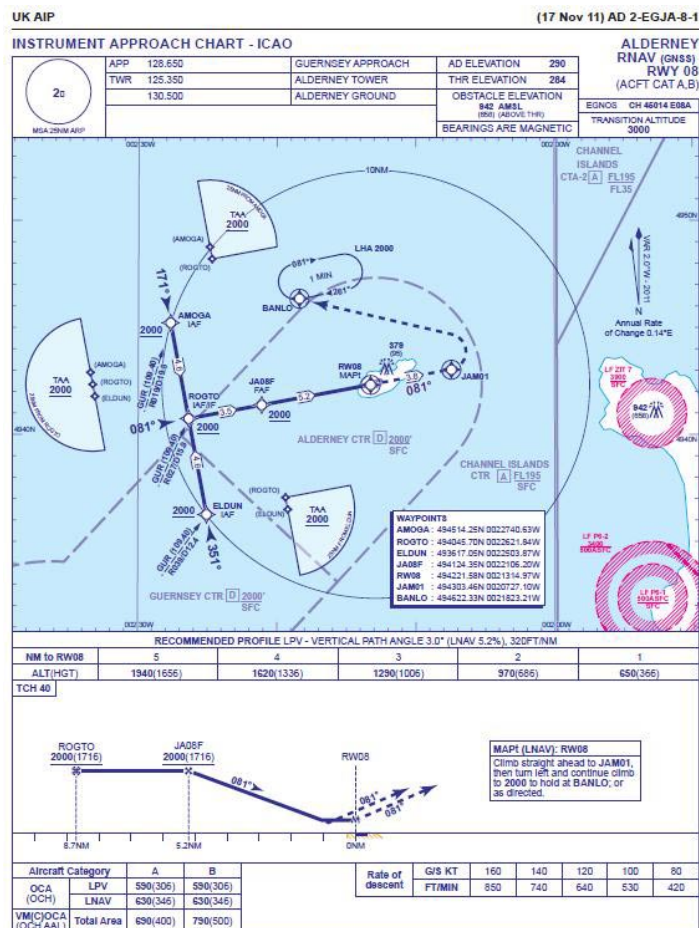
An important milestone has been reached in Europe whereby LPV approaches will now start to be introduced. This will include airports in the UK which cannot justify the cost of having an ILS as either the primary

landing aid or as back-up aid. The effect will be to introduce instrument approach procedures at some airports that have never previously had any such approaches at all – and all this because there is no need for ground based equipment. The advantages do not stop there because, as at Alderney, lower minima than previously applied to eg NDB approaches will be possible at a great many airports. As an example, take Pau (LFPB) where the GNSS LNAV DH is 460 with 1500 RVR and the LPV is 250 with 800 RVR. This potentially will be further enhanced in 2013 when EGNOS will facilitate LPV approaches down to DH 200, the same as most existing ground equipment based ILS. Pau has an existing ILS, with a slightly lower DH currently, but if this fails when the weather is poor the option of using the LPV approach rather than having to divert will be invaluable; the operator will also have the option of using only LPV to minimize costs in the future.

In the UK mainland, Southampton is expected to be the next LPV airfield (planned for Spring 2012) on RWY 20. Work is also underway to roll-out these procedures in 11 Highlands and Islands operated airfields on the Scottish mainland and the surrounding isles as well as other more mainstream airports and will, hopefully, include some GA friendly aerodromes.

How did I come to be involved in all of this? My close friends Anthony and Linda Mollison who run Professional Air Training (PAT), the commercial pilot and IR training school at Bournemouth Airport, were contacted by NATS who invited them to participate in a joint EC funded, Eurocontrol / NATS project. The project was aimed at developing the use of LPV in GA aircraft and ideally to show it could be done with a retrofit non-glass cockpit. PAT, not having much spare time (!), asked if I would deal with this for them (as if I do have such time!), particularly as I had obtained PRNAV approvals for their fleet of Duchesses and a Sierra some two and a half years previously via a minor mod process; it was hoped a "minor mod" would be possible for LPV approval.

Hence, in November 2010, the project started in earnest and I began to produce some costing based upon information from





Harry Lees of Lees Avionics, whom we knew well and who is now MD of Gama Engineering, their successor company. Discussions also took place with the CAA who were most likely to deal with the application for EASA. However, it soon became clear there was a problem. EASA would not agree that this application could be dealt via a minor mod application. This meant that the costs of getting certification for both PRNAV and LPV would be significant. I should explain that since obtaining the PRNAV approvals noted above, EASA has decided no more would be granted without a full STC application.



In order to gain certification for the LPV operations we needed to upgrade our GNS 430 to a GNS 430W (the W stands for WAAS, the American equivalent of EGNOS) and change the antenna. Unfortunately as EASA required us to submit a full STC application we had to re-think, re-cost and re-apply via NATS to Eurocontrol and the EC for permission to proceed on the much higher cost basis. In January 2011 NATS were able to confirm this had been approved so we could move forward. Also in January, the CAA, acting on behalf of EASA, questioned whether a non-slaved (i.e. mechanical) HSI would be acceptable, as was fitted in the Duchess, rather than an electronic version. Fortunately they agreed it would. They also raised an issue about the DME being in the centre stack and hence not directly in front of the pilot, but again they fortunately agreed that, subject to test flights and the fitting of annunciator lights in direct view, they would accept it. Gama Engineering

then learned the application had to be via AMC 20-28 instead of CAP 773, used up to then, for the LPV element...even more paperwork! Just to add to the tension, the question of Baro Nav function issues arose with the possible need for an autopilot or flight director capable of meeting deviation accuracy requirements much tighter than in the case of the FAA equivalents in AC20-129! The whole process was so far removed from the FAA process, where some 2500+ LPV approaches had been introduced without the need for STCs that I began to think we would not succeed. February closed in a sombre mood! In March the CAA, on behalf of EASA, confirmed the requirements for the certification basis and Garmin assisted in working on a "guidance document" (compliance statement) for EASA. Until that was agreed, the application could not proceed.

So many issues and problems had been raised, even thus far, that I was again thinking we would not be able to progress. However, in discussions with Vasa Babic, Jim Thorpe and Julian Scarfe, it was decided we needed to try to do something about the whole STC approvals business in Europe compared to the USA. Out of that, the paper "EASA over-regulation of light aircraft GPS installations denies safety benefits to General Aviation pilots" was born in April. The final version was sent to EASA and many others later and I now know that EASA, in particular, thought it well founded and they took it very seriously. It clearly helped in the latter stages of our application. In June, NATS received final approval from Eurocontrol to proceed with the STC application, including the required FMS and Gama / Garmin completed the compliance document. It was time to arrange a contract between NATS and PAT.

The contract drafts were worked on in June and July and exchanged in August... fortunately I had some experience of these types of documents! A sub-contract was then put in place with Gama for the equipment and STC work, which was already proceeding apace. In September the 52 page

(!) certification plan was sent to EASA/CAA and in early October the existing Duchess GNS430 was removed for conversion to a SBAS (EGNOS) unit. Later that month, the aircraft was taken to Fair Oaks for the refitting of the GNS430 (now a W version), the new aerial, annunciator panel (a repeater unit to show of any malfunction of the 430 directly in the pilots view) and associated wiring. November saw the Alderney LPV/ APV procedures published and we took the Duchess to Guernsey to base it there for the flight trials with the CAA Chief Test Pilot. An Aurigny Trislander was also being test flown as they were running a close second behind us in the approval process (also by Gama) and its kit also included a GNS 430W. They would find LPV of great value getting into Alderney so were planning to upgrade their entire fleet. After a day's delay due to the weather (trials had to be in VMC), they took place on 23rd November and went really well. After analysis of the independent test results (yet another "box" had been temporarily fitted for the test), the CAA, on behalf of EASA, said they were content and the STC was issued on 19th December.

As part of our contract with NATS, we have agreed we shall assist with publicising the new procedures both within the U.K. and in mainland Europe, so this is probably not the last you will hear about it. There is also more to do, as the aim for GA is now to try to convince EASA, that with the results of the retrofit, it is perfectly safe to proceed with an installation basis via a minor mod application/approval process. Unless that can be achieved, much of the benefits of this whole new system will not be won in Europe for the retrofit market with GNS 400/500 range models. Only new generation glass cockpits or newly installed GTN models, as just announced by Garmin, who have persuaded EASA to grant AML STC approval certification for that range, will be able to be installed in most aircraft types via a minor mod approval. Without EASA agreeing a change of approval basis, they will exclude a large number of existing aircraft owners who will reason it is just not worth the expense of getting an STC for their GNS 400/500 range or using one for their aircraft bought, at considerable cost, from the STC holder and the spread of the system to many more aircraft and aerodromes will be held back. That would be a great pity.

