Instrument Pilot

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PPL/IR EUROPE

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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*

Cover photograph: *Short final at Narsarsuaq…*
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Editorial

Ben Hines

Apologies again for the somewhat late publication of this issue, as before due primarily to the commitments of both your editor and the production team. This edition is somewhat of a landmark being both issue number 100 and also representing 20 years of *PPL/IR Europe*, which published its first newsletter in December 1993 when a group of 13 like-minded pilots got together in response to an advertisement. It also unfortunately marks the departure of Klaas Wagenaar from the "Pilots Talk" hot-seat.

Over the last 20 years many things have changed, but while reviewing some of the old issues it is remarkable to note how many of the same problems persist. Just as we might bemoan the mandating of 8.33kHz radios today, 20 years ago it was the mandating of 760 channel radios over the 720 which caught out one member in Germany—who would like to hazard a guess about what we will be using for communication in another 20 years time.

I hope it will come as no surprise that the FCL.008 proposal has made good progress and, with only one more hurdle to clear, the finishing line is in sight. The working group have provided a wealth of information on this (which can be found on the website where an overview is included). Outside Europe, ADS-B is making inroads in private GA in the US, and David Chambers provides an overview showing how and why this works; and John Shannon describes the planning process for an Atlantic crossing which he completed earlier this year. In the next edition John and Steven Day will move on from the planning and take us through the execution of a memorable trip.

As always, Instrument Pilot needs interesting articles that are relevant to private GA in Europe, so if you feel you have something to offer, or perhaps would like some guidance, please contact me at your convenience.

Wishing you all the best for 2014

Member Advertisement

IFR equipped Mooney Ovation for sale

G-JAKI, 1995 M20R, 1345h TT, 30h SMOH, 180kts, 280hp TCM IO-550-G, speed brakes, full IFR panel with Garmin 530, Sandel 3308 EFIS, KFC-150 flight director, KX-165, KN-62A DME, KR-87 ADF, KT-73 mode S transponder. Insight GEM-602 engine monitor, Insight SF-2000 Strikefinder, Shadin fuel computer, electric standby vacuum pump, wingtip recognition lights. Fresh annual June/13. Further details available from David Abrahamson *david@cs.tcd.ie* or telephone +353 1 896 1716.

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Chairman's Corner

Paul Sherry

An email from Ben Hines, editor of *IP*, tells me that this is the 100th edition of our in-house magazine. Although 100 is just another number, it shows the commitment that this organisation has to the support and development of IFR flight in the General Aviation arena.

Therefore it is also fitting that in this edition of Chairman's Corner we recognise and applaud the achievements of those on the Executive Committee (ExCo) who, five years ago, started out on the long road to try and change EASA's mind on instrument flying and the training required to do it. This work culminated in a recent vote of the EASA committee (comprised of representatives of the commission of the EU, the national aviation authorities and EASA) to pass with no objections the NPA (Notice of Proposed Amendment) that resulted from all the work of FCL008. This introduces three new possibilities —the Enroute Instrument Rating (EIR), the Competency Based Modular Instrument Rating (CBM-IR) and, lastly, a clear and achievable route to convert ICAO compliant third country instrument ratings to an EASA IR.

The more detailed implications of this vote will be discussed elsewhere in this magazine, as well as on the forum and in other publicity material, so I will not go into further details. However it is right and proper that we as an organisation recognise the unswerving commitment of those members who made this happen. Particular names that come to mind are Jim Thorpe, Timothy Nathan and Julian Scarfe, but others have supported them. All have shown great commitment and their achievement is to be celebrated.

Over recent years many GA pilots both within and beyond our organisation have, for quite understandable reasons, taken advantage of the perhaps more practically achievable FAA IR. Some of these had spoken to me at various meetings and trade shows to let me know that if EASA insisted that they take a full 50 hour IR course with no allowance given for previous experience, then they would just take the easy option and give up flying. But it seems that, almost for the first time at EASA with regard to GA, some common sense has dawned. We really appear to be making progress with our regulators in pushing the agenda that a Cessna 182 or a Baron should, perhaps, not be subject to the same level of regulation as 400 paying passengers on an Airbus A380 going from Manchester to Dubai.

My personal congratulations to all who have had any involvement with this project—be that big or small. Now that the positive vote in the EASA committee has been completed, we very much hope that it is just a matter of time before the proposals pass into EASA law and become a reality for GA pilots across Europe.

In addition to the matters mentioned above, it is also noteworthy to mention that EASA has seen fit to extend the derogation to the requirement to hold an EASA qualification, whatever the country of aircraft registry, from 8th April 2014 to 8th April 2015. Again this was as a result of lobbying of which *PPL/IR* was a significant part. It was pointed out to EASA that without such an extension, many pilots who currently fly on third country qualifications (usually FAA) would have major difficulty making use of the proposed capability to convert their ICAO compliant third country instrument rating to an EASA instrument rating. It would appear that common sense again came to the fore. It is very much to be hoped that the route to convert a "foreign" IR to an EASA IR will open up through the early part of 2014 thus allowing pilots to be compliant with the EASA FCL requirements in time for the deadline of 8th April 2015. However the flip side of this extension is that, once the proposed conversion route comes into being, it is highly unlikely that any further extensions on this derogation will be considered. You have been warned…

A similar vein of GA light appears to be possibly shining in the corridors of the UK CAA. This is also most welcome. At this juncture I should mention that I am aware that, looking from the continent of Europe, *PPL/IR Europe* can sometimes appear rather UK focused. We very much aim to be the natural home of all GA pilots right across Europe wishing to operate under IFR. However for historical reasons (mainly the UK IMC and the ability to fly IFR outside controlled airspace) there has been a much larger constituency of UK based pilots capable of operating IFR. That said, at a recent membership review, one third of our membership is now based in continental Europe. This might not seem large, but compared to only three years ago it is a huge change. Our objective is to continue the recruitment of like-minded pilots across Europe by a continued presence at Aero Friedrichshafen for the immediate and foreseeable future.

However, coming back to the UK CAA, it would appear that potentially huge (and potentially very positive) changes are afoot. Timothy Nathan recently attended a meeting of the GA Consultative Council (GACC). From a regulatory perspective, UK GA appears to be moving toward its own department which will operate somewhat independently of the rest of the CAA. To us, in Timothy's own words—"it will operate very much as a self-contained bubble within the CAA". The list of possible opportunities here is very long and includes getting involved with the design and approval of GNSS (GPS) instrument approach procedures, PRNAV approvals and so on. Indeed Timothy felt there was an appetite within the CAA to move a big chunk of what they do to regulate GA to approved outside

organisations. Again this is potentially a huge opportunity to get involved with the process and to work toward removing the burden of heavy regulation that can be seen to be crushing the GA industry.

Whilst I am on the subject of GNSS approaches, we have potentially positive news on equipment approvals for the Garmin GNS430W and GNS530W navigators. Over the last two months *PPL/IR* has facilitated conversations between the GSA (who put the EGNOS satellites into space), EASA, Garmin Europe and a Part 21 Approved Design Organisation based in the UK. It would appear that there is an appetite to resolve this issue by means of working toward an AML STC (Approved Model List Supplementary Type Certificate) which will apply retrospectively to all of the above kit. This would take applying for LPV approval from a major mod to a minor mod—with substantial financial savings for the owner. On Friday 15th November I was involved in a telephone conversation between Carmen Aguilera of the GSA, Matt Lyon of GAMA Aviation, and some other organisations that do work for the GSA. A brief summary of this conversation is that, in principle, the GSA are prepared to fund GAMA Aviation to prepare, submit, and take to completion an EASA AML STC to allow those aircraft with SBAS enabled Garmin GPS navigators to benefit from BRNAV, PRNAV and LPV capability. The proposed cost to the aircraft owner will be a once-off fee to GAMA, probably of the order of €300, which will be used to maintain continuing airworthiness requirements. All those involved in the process have agreed to try and complete the paper-work by the end of March 2014 so that a combined announcement by *PPL/IR Europe* and the GSA at Aero Friedrichshafen 2014 (9th – 12th April). Whilst not on the same scale of achievements as FCL008, this is nonetheless potentially another win for *PPL/IR*.

The other side of the coin with regard to GNSS approaches is having the approaches to fly. Whilst getting the equipment approved is important, it is also necessary to have the approaches designed, approved and coded into the datacards. The UK CAA is now opening up discussions with potential users regarding how such approaches might be provided and has published a draft CAP (CAP 1122) for consultation. Timothy has been approached by Mike Barnard, who has joined the CAA from the LAA as GA programme manager to participate in the process. We are currently formulating our corporate response to CAP 1122.

As part of furthering our mission to be the natural home of GA IFR pilots across Europe, three members of *PPL/IR* (Paul Trevor, Stephen Hallas and I) managed a day trip to Oslo on Sunday 10th November. George Lundberg, president of the Norwegian Light Aircraft Association, invited *PPL/IR* to speak at their annual meeting, which also gave a good opportunity to stretch the legs of the Jetprop (three hours out at FL250 and two hours 40 back at FL260). This presentation was rescheduled from a visit to Norway in June which was unfortunately aborted due to illness—however this time we had something more to say following the EASA committee vote in October. I was asked to explain the proposed changes to IFR training qualifications, and we also had a good conversation on GPS approaches. Finally I briefed them on the progress we were making with the GSA and EASA on the approval of equipment. The meeting was attended by representatives of the Norwegian CAA who also took the opportunity to find out more on these topics. We were made very welcome and I believe the Norwegian LAA really appreciated us making the effort to attend their meeting.

As all members can see, there is a lot going on in and around the world of GA IFR at the moment and *PPL/IR Europe* is involved with much of it. This brings me on to the final topic that I wish to raise and that is one of what might be termed "organisational bandwidth".

PPL/IR Europe is run by its members for its members. All but Sali Gray (who is not paid very much) are volunteers and give freely of their time and of their money. ExCo members attend meetings both in the UK, at EASA, and around Europe. For the outcome of FCL008 to get to this point has taken five years of unremitting work and attention to detail. We are involved with the UK CAA on a number of fronts and are expanding our membership into Europe. One third of our members are based in continental Europe. We now have a solid presence at Aero Expo Friedrichshafen and at Aero Expo Sywell. It is my view that many of our members, including those on ExCo, are close to maximum capacity with regard to what can be expected of them. So I believe that if we are going to move forward with certain possible developments then we may need to consider different ways of working.

It is certainly possible the changes which are likely to arise over the coming months may well give *PPL/IR Europe* real opportunities for development for the future. We need to give serious consideration as an organisation on how to respond to these possibilities and whether we open out some new horizons of activity. Such developments, if we decide to travel in that direction, might require significant investment—both in terms of finances and time. The *PPL/IR Europe* board and ExCo will be giving careful consideration to options over the next six months and they will be communicating with you on these matters.

GA Occurrence Reports

Nigel Everett

It seems that quite a few GA pilots and engineers are unaware of the Occurrence Reports that can be lodged with the CAA so that others can learn of potential problems. These are listed on the CAA's online Monthly Listing of New General Aviation Occurrences and, if you are serious about your engineering or your flying, they are well worth reading.

Recent reports include a PA28 being repaired after slight hangar damage. Quite separately from this damage the engineers discovered that the internal skin, the outboard rib and the mass balance were all heavily corroded with little remaining structural integrity on the rib where the mass balance is riveted.

Another report tells how the pilot of a TL Sting Carbon arrived for his booked slot at the LAA rally at Sywell with apparently no idea at all of the promulgated joining procedure.

GASCo aims to make the GA community more aware of this important safety resource and is now routinely publishing selected reports in its monthly email safety newsletter, *Flight Safety Extra* (available free of charge) and on its website `www.gasco.org.uk`.

The future of Instrument Qualifications for GA pilots in Europe

A report from PPL/IR Europe's Regulatory and Training Working Group

Introduction

The European Commission's EASA Committee has voted to introduce a package of changes to EASA FCL which will make instrument qualifications much more accessible for European GA pilots. There are four major improvements:

- Instrument training will be based, to a good extent, on a pilot's competence rather than just on a prescriptive number of hours. This will allow future IR training to take into account prior experience, prior training, aptitude and pace of learning, rather than forcing every pilot through a one-size-fits-all course.
- There will be an intermediate qualification, the new Enroute IR (EIR), which will also serve as a modular step to the full IR.
- The IR Theoretical Knowledge will be reduced by 40–50% by eliminating learning objectives that are not directly related to the incremental privileges of operating non-complex aircraft under IFR.
- Experienced holders of ICAO IRs will be able to convert to an EASA IR by taking a skills test and an oral examination based on relevant theoretical knowledge. The deadline by which EU residents need to undertake this conversion has been extended to April 2015.

This new regime was championed by *PPL/IR Europe*; we recognised the need, conceived the solutions, and helped lead it through the EASA regulatory framework. We are delighted that the rules published are almost exactly what we aimed for at the outset, and we are proud of what is arguably one of the most positive outcomes for GA flight training in a generation.

The new regulations are expected to become law in early 2014, with courses and exams becoming available later in the year as they are developed by schools and approved by National Authorities.

In addition, the amendments include practical rules on instrument qualification for sailplane pilots and a reprieve of at least five years on the UK's ability to continue issuing UK-only IMC ratings.

Background

Under the ICAO flight training model, the Instrument Rating is available as a natural progression from the PPL. In the 70s and 80s a substantial minority of European private pilots gained instrument qualifications—it was a notable, but attainable, achievement.

In the late 1980s the European Commission issued a Directive requiring mutual recognition of pilot licences and ratings across the EU. The result, a decade later, was the JAA (Joint Aviation Authority) and its pilot licensing regulations (JAR-FCL). The JAA was effectively a "club" of national authorities without any statutory power of its own. However, each member country agreed to implement JAR-FCL in its national legislation, and this new regime took effect across Europe during the early 2000s. There had been talk of a more accessible JAA instrument qualification (the "Instrument Weather Rating") in the mid-90s, but nothing came of this.

In order to agree a "level-playing field of high standards", the JAA tended to accumulate the more restrictive preferences of each country. Training for professional licences aimed to make an ATPL equivalent to a university degree, and to provide a highly regulated process for turning young people into airline first officer cadets. Private pilot training was not hugely affected by JAR-FCL, but various elements of gold-plating, relative to previous national regimes, increased the cost and suppressed the volume of PPL training. The instrument rating, however, fell into the professional training domain. This meant that the theory exams were a subset of the "degree-like" ATPL theory, and the IR course had to be taught, in practice, by large commercial training organisations. Even the training hours for the IR crept up from 40 to 50, in part to help make up the total 200 hours of an Integrated CPL/IR course. For a period after JAR-FCL was introduced, it was not even possible to take an IR Theory course in Europe—because no school offered such a course. IR training inevitably focused on full-time commercial candidates attending long residential courses. For a PPL holder with work and family commitments, the JAA IR was infuriatingly impractical and inflexible, as well as expensive.

- As a result, there was a long-term decline in the number of European PPLs training for instrument ratings. In many countries it was, embarrassingly, only a handful of pilots a year.
- Conversely, many European pilots elected to use the US aircraft register along with the FAA's much more practical training methods.

During the time the JAA was implementing its licensing regime, the European Union created a new organisation, EASA (the European Aviation Safety Agency), to take-over the JAA's role but under a formal mandate in European law. Initially, EASA's scope was limited to Airworthiness, but an act of the European Parliament in 2008 (the "Basic Regulation") extended this to include Flight Crew Licensing (Part FCL), Medicals (Part MED) and Operations (Part OPS). The Basic Regulation also introduced significant and controversial change requiring EU residents operating US and other "Third Country" aircraft to hold EASA pilot qualifications. This meant that hundreds of Europeans flying with FAA IRs would need to requalify for the onerous JAA/EASA IR.

EASA started the process of developing Part FCL with good intentions around improving regulation for GA. However, whilst the new Light Aircraft Pilot's Licence (LAPL) was a step in the right direction, under various political and time pressures, the initial rulemaking for Part FCL failed to do much beyond codifying JAR-FCL into European law. In the subsequent consultation process *PPL/IR Europe*, along with other stakeholders, was vigorous in its feedback that major change was needed to make instrument flight training more accessible to PPLs. To their credit EASA recognised this need and, late in 2008, a new rulemaking group (FCL.008) was tasked with reviewing instrument qualifications.

PPL/IR Europe's then Chairman, Jim Thorpe, was one of Europe Air Sports (EAS) two nominees on FCL.008. We supported Jim by drafting proposals for both a new Enroute Instrument Rating and for competence-based IR training. With the backing of the other experts on FCL.008 it took a further five years for these proposals to work their way through the European system but, to the credit of all the stakeholders involved, the final FCL amendments fully reflect the work of FCL.008.

Review of the main FCL changes

Instrument Rating Theoretical Knowledge (IR TK)

The changes to the IR TK are well summarised in one of EASA's reports following FCL.008: *One of the main elements of this task was to review the existing JAR-FCL syllabus and the related Learning Objectives (LOs) for the instrument rating. Based on the group's input and further discussions with IR theory experts a significant amount of syllabus items and LOs was finally deleted from the syllabus. This was done either because these LOs are covered already by the PPL or CPL syllabus or because they are not relevant for a PPL or CPL holder operating a non-high performance aeroplane in IMC or under IFR.*

Essentially, about half of the former IR TK syllabus has been eliminated. This should go a long way to addressing the frustration many pilots have had with the depth and relevance of the JAA syllabus. The minimum duration of the TK course is reduced from 150 hours to 80 hours, of which eight hours must be classroom attendance. The number of examination papers, their duration, and the number of questions should all approximately halve.

It will take some time for NAAs to have the new exams ready and for ATOs to have the new course prepared and approved, so it may be that the new TK isn't practically available until well into 2014.

Enroute Instrument Rating (EIR)

One of the most significant changes is that the Amendments will introduce an entirely new rating into EASA FCL: the EIR.

The background to the EIR is that, despite the more accessible "competence-based" training method for the full instrument rating, the IR will still be a major step for most PPLs. The purpose of the EIR is to provide a more attainable interim qualification—both as a stepping-stone to the full IR and as a useful qualification in its own right. In order for it to be more attainable, the privileges needed to be restricted in a way that permits a meaningful reduction in training.

This goal was not an easy one. Many UK stakeholders would have preferred a qualification in the style of the UK IMC rating. However, the airspace partition that underpins the UK IMC is not workable across Europe in practice, nor is it acceptable in principle under EASA FCL. Some stakeholders suggested various other privilege limitations for an "interim" IR such as: higher approach minima; restrictions to aircraft with four seats or fewer; restrictions to not above FL100; a reduction in the number of approaches taught; etc. However, none of these help to meaningfully reduce the IR flight training syllabus because the full IR course can be completed in a low-powered two-seater at low level, with only two approach types tested and very little training unique to the skill of descending the last few hundred feet to MDA.

The partition that *PPL/IR Europe*'s working group developed, and that FCL.008 accepted, was to separate the skills and knowledge needed to fly IFR enroute from the more demanding procedural skills needed for instrument departures, arrivals and approaches. Many light aircraft operate IFR enroute-only, for the simple reason that many PPLs fly to and from airports without instrument procedures, so there is both precedent and utility for an enroute qualification. The UK IMC rating also shows that IFR skills can be taught successfully in a relatively short course of 15 hours and used by pilots who may not maintain currency in flying instrument approaches. An EIR holder will have the responsibility to ensure that a flight can be completed safely (and will have to judge weather forecasts and contingencies accordingly), just as the holder of a VFR-only PPL or a full IR does.

EIR training requires a minimum of 15 hours dual instrument instruction, ten hours of which must be on a formal course at an ATO (Approved Training Organisation) and five hours which may be conducted independently by an IRI. The course will include training on emergency procedures in the event of deteriorating weather and IFR approaches for emergency use. The EIR Skills Test will cover basic instrument flying, enroute IFR and the transition to and from visual flight in the departure and arrival phases. A candidate for the EIR needs to complete the new (reduced) IR TK course and exams. Since little of this syllabus relates specifically to instrument departures and approaches, there wasn't an opportunity to create a meaningfully abridged EIR syllabus. This means that the progression to the full IR will not require any further formal TK study or exams.

The privileges of an EIR holder will be to operate under IFR in IMC in the enroute phase of flight: in airways and in any class of airspace (including Class A, or in Class G where IFR is permitted outside controlled airspace). An EIR holder will always need to depart and arrive under VFR. Where this is impracticable or too limiting, a pilot will need to acquire a full IR.

The EIR will need to be revalidated annually, like the IR, but alternate validations will not require a proficiency check, instead six hours of PIC experience under IFR and an hour's training flight with an instructor qualified to teach the EIR or IR will suffice.

Competency-Based Modular Flying Training Course for the IR(A)

The first important point to emphasise about the "CBM IR" is that it is a *training method* for achieving the EASA instrument rating. It is not a different qualification, and the privileges of an IR acquired through this method are *not restricted in any way*. The content and pass standards for the skills test are exactly the same for a candidate in a competence-based modular course as for candidates taking the existing modular or integrated routes.

The principle of competency-based training is that a candidate is allowed to demonstrate their ability to perform a required task or to have acquired a required skill, without having to undertake a prescribed "one-size-fits-all" course of training.

The EASA Modular IR course, inherited from JAR-FCL, requires 50 hours (55 for multi-engine) of training, costing upwards of €20,000. The course was designed as an element of the training needed to take an ab-initio airline cadet to the "frozen ATPL" level, and therefore JAA IR courses were available primarily from training organisations focused on full-time commercial candidates. For a PPL with work and family responsibilities, these courses suffer from some significant limitations:

- Only available from a small number of large organisations, the nearest may be hundreds of km from a PPL's home base
- Organised around teaching 9:00am – 5:00pm Monday – Friday. Often very difficult to schedule weekend or evening training, or ad-hoc training.
- Organised around teaching on standard light MEP training aircraft; not representative of the typical GA airplanes flown by PPLs. Difficult to train on a modern SEP aircraft.
- Flight training must be from the school's base, and is conducted around a small number of standard training routes. This limits "real world" IFR skills development, and training cannot be adapted to scenarios of the airports and routes a candidate is likely to use in practice.
- Courses need to be continuous at one location. It is not practical for a candidate to undertake between ten and 20 hours at one school and then complete their training at another (eg following a relocation, or during a vacation).

The aim of the CBM IR, by overcoming these limitations of the traditional modular course, is two-fold: to make instrument training much more accessible for PPLs; and to make IR courses something that many more PPL schools and clubs can realistically offer.

The CBM training method is described in the new Section Aa of Appendix 6 to Part FCL. In essence, it requires a minimum of 40 hours of "creditable" flight time, of which:

- Ten hours must be dual instrument flight instruction on an approved CBM IR course at an ATO.
- A further 15 hours must be dual instrument flight instruction, but need not be on an approved course or at an ATO (but could be, for example, an EIR course).
- Up to 15 hours may be flight time as PIC under IFR, whilst holding a qualification allowing the pilot to fly in IMC under IFR (eg military rating, FAA IR, UK IMCR or EASA EIR).

Of course, these are the minima—a candidate could complete all 40 hours on an ATO course, or use any other mix of training within the rules. More details are available on the website `www.pplir.org`.

The training options under the CBM method will not magically make the IR cheap or easy. What it will do is allow for flexibility in how and when the requisite skills are acquired. Flexibility will often mean more training hours, not fewer, since a more intense and continuous training course is usually the most efficient way of getting a first-time pass in the IR skills test. However, for a PPL for whom a continuous course is impractical, it will allow them to work progressively towards an IR over time—perhaps using an independent instructor in a private or group aircraft, or an instrument instructor at a club or smaller PPL school (which could provide 30 hours of the 40 required without having any IR course approval). A business person who travels in their own light aircraft, but who would struggle with a six-week residential course, might prefer to do 50 hours or 100 hours of training by having an IRI accompany them on business trips, and then complete a ten hour ATO course. For an experienced VFR pilot who flies regularly (perhaps an instructor for whom the €20,000 cost of the modular course is excessive), the CBM method would allow them to accumulate creditable hours opportunistically over a period of years and then complete the IR in a ten hour course.

The other element of competence-based flexibility is that the additional learning can be wholly outside the formal approved framework. At present, ground-based training for the EASA IR is limited to FNPT2s that cost around €200/hour (the CBM method allows up to 25 hours of FNPT2 time within the 40 hours). This is an expensive and inefficient way of learning some of the basic instrument and procedural skills. A desktop PC-based training console can cost a tiny fraction of this, and whilst it may not provide the full learning benefit of the FNPT2, it doesn't have to, it just needs to be more cost effective for some subset of the underlying IR skills. An FNPT2 is a €200,000 resource that is scheduled for high utilisation in formal and structured courses. A €4,000 desktop console might be something a flight school can offer for ad hoc self-study, or might be something a candidate buys or leases for home study.

The EIR was designed also to integrate with the CBM training. Upon completion of an EIR, a PPL will have met the requirement for 15 hours dual instruction other than the required ten hour ATO course to complete the EASA IR. They will also have the requisite qualification to fly in IMC under IFR, and so they may log the 15 creditable PIC hours under IFR, and they will have already passed the required TK. So, in principle, an EIR holder is only 15 hours IFR cross-country and a ten hour ATO course away from the full EASA IR. For the sake of clarity (some readers of a previous draft were unsure of this point), there is no requirement to complete an EIR before undertaking a CBM IR course. It is merely an option.

In practice, only the most capable candidates will gain an IR through a "minimum hours" method. But the key principle of competence-based training is that a candidate can use whichever method is most effective for them to reach the skills test standard. The ten hour ATO course reflects both the ICAO minimum for IR training and the fact that the great majority of the present 50 hour IR course consists of practising skills that are covered in the early stages of training.

Other FCL Amendments

Conversion from ICAO IR (eg FAA) to EASA IR

Paragraph 8 of the CBM IR text introduces a welcome and practical means for experienced FAA IR holders to convert to an EASA IR. There are only three requirements:

- complete the skill test for the IR(A);
- demonstrate to the examiner during the skill test that he/she has acquired an adequate level of theoretical knowledge of air law, meteorology, and flight planning & performance (IR); and
- have a minimum experience of at least 50 hours of flight time under IFR as PIC on aeroplanes.

This means a conversion no longer requires taking the EASA theory examinations, nor is any formal training mandated. The minimum experience under the EASA definition is as PIC, so the training towards an FAA IR does not count, but the 50 hours are "under IFR" in a flight rules sense, and not necessarily actual or simulated instrument time. Any reader who may wish to undertake this route might choose to record "under IFR" time as carefully as possible, to make demonstrating compliance with this easier (for example, keeping a folder of flight plan ACK emails from a provider like EuroFPL or RocketRoute). It should be possible to undertake this conversion in any EASA country.

Requirement for EU residents operating aircraft on non-EASA registers to hold EASA pilot qualifications

At present, most European countries have taken advantage of the "derogation" in Part FCL, which means that EU residents operating N-reg aircraft (or on other non-EASA registers, including the M-reg) do not have to hold EASA pilot qualifications until April 2014. Our understanding is that this period has been extended to April 2015 in the final text of the amendments voted on by the EASA Committee in late October 2013. However, from April 2015, an EU resident operating a private N-reg aircraft under IFR will need to hold:

- An EASA PPL, as a minimum
- EASA Class Ratings, as appropriate
- An EASA IR
- An EASA Class Two medical with Class One audio
- EASA type-specific qualifications as appropriate

The PPL and Class Rating conversion requirements are relatively straight forward. The EASA IR conversion is also now much less onerous, but a conversion candidate should be advised that it might still require some significant study time to meet the oral examination standards and some significant flight training to pass the skills test, and plan accordingly.

Due to varying interpretations, please check the *PPL/IR Europe* forum as IMC holders may need to comply with the April 2014 date.

Colour vision requirement for instrument flight

One very useful amendment in this package is the introduction of the highlighted text to FCL610.(a).(1).(i), which details the licensing pre-requisites for an IR or EIR: "*the privileges to fly at night in accordance with FCL.810,* ***if the IR privileges will be used at night***".

This means that a pilot with a colour vision deficiency who would be precluded from holding a Night Rating will no longer be barred from IFR, but merely restricted to IFR in day time. This applies to applicants for the EIR or IR under any of the training methods, and also to existing holders who may develop colour vision problems.

UK IMC Rating

A new paragraph has been added to Article 4 of Part FCL which will, in effect, allow the UK to continue issuing IMC ratings valid only in the UK but attached to EASA pilot licences and carrying privileges on aircraft governed by EASA regulations, until April 2019.

The existing IMC rating privileges will be unchanged, including the restriction to UK airspace. When combined with an EIR, the IMC rating will allow IFR operation in almost all UK airspace (ie departures and approaches in Class D, and enroute flight in Class A airways) with the exception of Class A TMAs, where IMC rating holders have no IFR privileges and where EIR holders may not conduct instrument departures or arrivals. For experienced holders of an EIR and IMC rating, the full EASA IR will require no additional TK exams and only an ATO course with a minimum of ten hours. However, an IMC rating holder can chose to undertake a CBM IR course without the intermediate step of the EIR (just as a plain PPL can), and for most experienced candidates this is likely to be the most natural progression.

Dual instrument time undertaken as part of a UK IMC rating course can only be used as creditable dual hours (up to 15) for an EIR or CBM IR if it was conducted by an IRI or FI(A) qualified to teach for the full IR. However, flight time as PIC under IFR using the privileges of the IMC rating is creditable up to the 15 hours allowed in the CBM IR. Therefore, a UK IMC rating holder, having completed the 15 hour IMC training course and having completed a further 15 hours PIC under IFR will require:

- only the ten hour ATO course, as a minimum, to complete the CBM IR training if their IMC rating instructor was qualified to teach the IR;
- if not, they will require a further 15 hours instrument training by an IRI or FI(A) qualified to teach the IR;
- in either case they will need to complete the IR TK course and pass the examinations.

Application to other Categories and Classes

- All of the EIR and CBM IR provisions referred to in this paper also apply to training and qualifications on MEP Aeroplanes.
- At present the EIR and CBM IR (including the "lite" FAA> EASA conversion) are only available for aeroplanes.
- The day-only provision for pilots with colour vision deficiency apply to any IR holder, not just IR(A)s.

Sailplane Cloud Flying Rating

The amendment package includes a new Sailplane Cloud Flying rating, which resolves a significant omission from Part FCL at present and which is a major achievement by Europe Air Sports on behalf of the gliding community.

Concluding remarks

This informal paper is intended to give readers an outlook on the promising changes we should see in 2014 to EASA instrument flying qualifications. The regulations are quite complex, and although there is a "99%" certainty that they will become EU law over the coming months, there won't be complete certainty until they are published as such. Similarly, the process of interpretation and implementation by National Authorities and ATOs may mean that the availability of the amendments will take time.

The *PPL/IR Europe* Members' Forum is the best place to ask specific questions and to get the latest outlook. All of the members who, over the past ten years, have actively contributed to the drafting and regulatory work that led to this outcome are regular participants.

Explaining ADS-B and TCAS

David Chambers

Air Traffic Management (ATM) systems worldwide are undergoing a long-term improvement programme. Reliance today remains on radar systems that don't cover mountainous areas or wide parts of the globe. Accuracy at long range is poor and inadequate to ensure traffic separation when aircraft are closely spaced to meet ever-increasing capacity demands, and the use of direct routes rather than airways is becoming more common to save time and fuel.

Two of the major technologies being introduced are Mode S and ADS-B (Automatic Dependent Surveillance – Broadcast), which rely on data transmitted by aircraft and will require equipment upgrades. This article describes these and related technologies including TCAS (Traffic Collision Avoidance Systems), discussing how they will be used and the impact they will have on GA aircraft for both VFR and IFR flight. The topic is broken down as follows:

- Squawking vs squittering
- Signals transmitted from aircraft
- Signals received by aircraft (air to air)
- Signals received on the ground from aircraft
- Signals transmitted from ground to aircraft

Squawking vs Squittering

A squawk is a reply to an interrogation pulse received from a ground station. It contains data including a four-digit squawk code, pressure altitude and additional information. While a squitter is an unsolicited broadcast sent a few times per second containing information such as an aircraft's identity, position and direction/speed.

Signals transmitted from aircraft

For many years transponders have been used to provide radar systems with additional conspicuity, identity and altitude information.

Transponders transmit on the international standard frequency of 1090MHz using an interrogate/respond method. When outside radar coverage, such as in valleys, remote areas and over the oceans there is no interrogation and no response.

Older Mode A/C transponders always reply to all interrogations. Mode S transponders differ in that the ground radar can selectively interrogate particular transponders one at a time, reducing the frequency congestion. Mode S replies may also identify which station they are responding to.

- A response to a Mode A interrogation transmits a selectable octal code between 0000 and 7777 (so 4096 codes).
- A response to a Mode C interrogation also transmits Mode A information and, if the equipment supports it, altitude information referenced to standard pressure in 100ft increments.
- Mode S ELS (Elementary Surveillance) transponders expand the data to include unique aircraft ID (which can be correlated to aircraft registration). Selective interrogation and other technical improvements increase the number of transponders which can be discriminated in RF congested areas. Altitude can be reported in 25ft increments or the same 100ft increments as Mode C. A more obvious benefit is that a Mode S transmission should include "Flight Status" (ground or airborne) which assists ground movement controllers and TCAS operators.

- Mode S EHS (EnHanced Surveillance) adds a further eight Downlink Aircraft Parameters (DAP) which include aircraft GPS position, direction and other related information. At least all eight of the following parameters must be provided to achieve EHS compliance:
  - Selected altitude
  - Roll angle
  - Track angle rate (if unavailable, true airspeed is sent)
  - True track angle
  - Ground speed
  - Magnetic heading
  - Indicated airspeed
  - Vertical rate

Squitters transmit aircraft data at all times, once or twice a second. Globally, there are three main options at different frequencies:

- 1090ES: Mode S Extended Squitter transmitting at 1090MHz, where a Mode S transponder additionally broadcasts an aircraft's unique ID, GPS position and related information. This is a worldwide standard.
- UAT (Universal Access Transceiver)—unique to US airspace—transmitting at 978MHz and designed for GA aircraft operating outside Class A (ie below 18,000ft) airspace. It has capacity for additional data, but doesn't replace or preclude the use of Mode C or Mode S transponders.
- FLARM (868MHz)—commonly used by gliders because of its low power requirement and its low cost. These units combine a GPS and transmitter, frequently broadcasting both current and predicted position information. Transmission power is 10mW, limiting its range to between 2 and 5km. Other aircraft within range can receive this data and calculate/alert any threats. Power FLARM has a range of up to 10km and can also receive ADS-B, plus Modes S and C transmissions. Battery powered portable FLARM units cost around €600; permanently installed power units costs about £1,000 plus installation and approval charges. Over 17,000 FLARM units have been sold to date, primarily to the glider community. The system incorporates several patents and is licensed to a small number of hardware vendors.

UAT is irrelevant outside the USA. No other country has adopted it, and the frequency is used for other purposes elsewhere. FLARM transmissions from GA aircraft may be useful if flying close to gliders, but since some FLARM receivers in gliders can also receive 1090ES transmissions, it makes most sense for powered aircraft operators to consider being able to send 1090ES first.

ADS-B transmissions contain more than the Elementary Mode S data, adding GPS derived location, but they don't necessarily include the full set of Enhanced Mode S parameters which would require additional sensors or data from other instruments. It includes barometric pressure altitude, geometric (GPS) altitude, position (lat/long) and ground velocity (groundspeed and direction), but not (normally) indicated airspeed. There are (at least) two levels of ADS-B out specifications.

AMC 20–24 was intended for use in non-radar remote areas (eg Hudson Bay) to provide 5nm ATC separation. It requires

- ICAO 24 bit aircraft address
- Horizontal position (lat/long)
- Horizontal position quality indicator (accuracy/integrity)
- Barometric altitude
- Aircraft identification ("call-sign")
- Special position indicator
- Emergency status and emergency indicator
- Version number (DO-260A only)
- Ground velocity (recommended)

EASA and Eurocontrol have come up with a tighter specification designed for 3nm traffic separation—it's called AMC 20-XY—and is harmonised with FAA AC 20-165. In addition to the previous list of specifications, it requires the following parameters:

- ED-102A/DO-260B & ED-73C/DO-181D compliant systems
- Only transponder based ADS-B transmission systems
- More stringent latency requirements
- ADS-B failure indications
- Validated air/ground status

Aircraft with active TCAS (Traffic Collision Avoidance Systems) send a transponder interrogation at 1030MHz to elicit a 1090MHz transponder response. More sophisticated versions may restrict this to areas without ground surveillance. Information on the relative bearing to another aircraft is obtained using a directional antenna; and its range is based on the signal's time of transmission.

There are two types of TCAS (Traffic Collision Avoidance System), TCAS I and TCAS II. The difference is that TCAS I systems have a 1030MHz receiver that can detect the number of nearby TCAS systems and thus send a more powerful interrogation when fewer aircraft are nearby. TCAS II systems go beyond TCAS I systems in that they require dual Mode-S transponders, they can coordinate with other Mode-S transponders on other aircraft and they can issue Resolution Advisories (RAs—"Climb, Climb").

TAS (Traffic Advisory System), a simpler version of TCAS, is more commonly found in GA installations, examples being the Avidyne TAS600 series, the Garmin GTS800 and the L3 Skywatch systems. These are almost identical to TSO-C118 TCAS I systems—in fact they use the same set of requirements or Minimum Operational Performance Standards (MOPS). Both systems actively interrogate nearby Mode A, C and S transponders and issue Traffic Alerts (TAs—"Traffic, Traffic"), but although approved for installation in certified aircraft, are not certified for avoidance manoeuvres. They should be used as tools to acquire the traffic visually.

There are also uncertified Portable Collision Avoidance Systems (PCAS), such as Xaon's XRX, which are not connected or wired into aircraft systems.

Equipment required

Most GA aircraft are equipped with at least a Mode C transponder which provides a squawk code and pressure altitude. While Eurocontrol estimates that around 10–20% of GA aircraft already have Mode S rising to about 40% of the GA IFR fleet, it is already mandatory for VFR in the Netherlands, and transitional arrangements are in place elsewhere requiring its installation in all new GA aircraft.

Common products that are capable of Mode S ELS (Elementary Surveillance) operation include the Garmin GTX 330 and the Trig TT21/TT31 and the Funkwerk TRT800H. The Trig and Funkwerk products are also ADS-B capable (ie can do squittering) as standard, whereas the Garmin requires a software upgrade and is renamed the GTX 330ES. The Trig and Funkwerk transponders have built in altitude encoders with a resolution of 25ft, while the Garmin requires an external encoder, supporting both 25ft encoders using a serial port and legacy 100ft "grey" encoders via a parallel connection.

In order for an ADS-B squitter to transmit position, ground speed and other parameters, they must be provided by an onboard IFR certified GPS receiver, such as a Garmin 430W or 650, and the GPS receiver must be SBAS capable (called EGNOS in Europe, WAAS in the USA).

The UK CAA has been working with vendors to develop a low-cost Mode S out product suitable for widespread GA adoption. This could incorporate a certified GPS receiver, similar in functionality to a FLARM unit. To keep the size and power consumption down, the

project, codenamed LAST (Light Aviation SSR Transponder), was initially designed to use an RF transmit power of 20 rather than 70 Watts. However, this was incompatible with some older SSR ground equipment, and it may have been superseded by recent commercial Mode S transponder products—current status unknown. A different project is said to be considering a low-cost ADS-B out device for the GA market and/or considering the use of non-certified GPS as the position source.

ADS-B out equipment (both the certified GPS and transponder/squitter) must be panel mounted and cannot be portable. However, FLARM, since it is uncertified, can be portable.

In general, EASA considers the classification of any change that introduces ADS-B to be a major change—ie a Major Mod costing thousands in approvals paperwork. However, a modification may be classified as a minor change if the following conditions are met:

- Transponder is ETSO-2C112b approved and complies with the requirements of ED-102/DO-260 or DO-260A
- GNSS receiver is approved under ETSO C-129A, TSO C-129, TSO C-129A, ETSO C-145/C-146 or TSO C-145A/C146A
- Direct interface exists between transponder and GNSS receiver
- Latency (less than 1.5 seconds/95%) issues are a major concern (ie not broadcasting a position that is already out-of-date).

Flight plans

The type of transponder in use must be specified in any flight plan. The simplest case is straightforward and extends the existing scheme:

- N = Nil, no transponder
- A = Mode A, squawking a code but no pressure altitude
- C = Mode C, squawking both a code and a pressure altitude
- S = Mode S, squawking a code, pressure altitude and an aircraft ID
- E = Mode S plus extended squitter
- H = Mode S plus extended squitter with enhanced surveillance

The aircraft ID for a commercial flight is the flight number (eg BAW123—British Airways 123 would have call-sign Speedbird 123). For GA flights the aircraft registration is normally used and rarely changed—common exceptions include IR flight tests where the call-sign EXAM01 or similar might be allocated.

However, perhaps surprisingly, Mode S can also be specified using one of the letters I, P or X—indicating the lack of pressure altitude, aircraft ID or both, respectively. Since all three of these cases appear to cover very rare/unusual situations, it seems strange that they have been catered for.

Additional letters further qualify which ABS-B and/or UAT modes are supported, typically in Europe they are either:

- B1—for ADS-B out only
- B2—for both ADS-B in and out

Timescales

The FAA has mandated the use of ADS-B out (either 1090ES or UAT) by 1st January 2020 for all aircraft flying in Class A/B/C airspace, Class E above 10,000 feet, and at specified airports.

Australia has mandated the use of ABS-B for all aircraft operating above FL290 by December 2013 and for all Australian aircraft flying IFR to be ADS-B equipped by 2nd February 2017.

EU Regulation 1207/2011 mandates the installation and use of Mode S and ADS-B avionics for aircraft operating flights with an individual certificate of airworthiness first issued on or after 8th January 2015 (new aircraft) and for aircraft operating flights with an individual certificate of airworthiness first issued before 8th January 2015 (retrofit) by 7th December 2017 at the latest. Fortunately, this does not apply to smaller aircraft.

Eurocontrol has required all aircraft weighing over 5.7 tonnes or flying at cruising speeds above 250 knots TAS to carry Mode S EHS since March 2009. Aircraft below these thresholds are required to comply with ELS only when flying in Mode S ELS or EHS airspace.

According to the UK ANO (Air Navigation Order), while Mode S (at least ELS) equipment must be fitted to any new aircraft, there is as yet no cut-off date requiring the entire GA fleet to upgrade from Mode A or C unless undertaking any of the following activities:

- Operating as a public transport flight
- Flying above FL100
- Flying IFR or VFR in Class A, B or C airspace
- Flying IFR in Class D or E airspace
- Crossing a TMZ (Transponder Mandatory Zone) without specific ATC clearance

Eurocontrol estimates (based on declared equipment in flight plans) that around 35% of all aircraft are ADS-B out equipped today; but they consider the equipage rate of the GA IFR fleet to be very low. Commercial aviation is working towards a full implementation by the end of 2019.

In Europe today, only North Sea airspace mandates ADS-B out for commercial operations under IFR. The Norwegian CAA has mandated that all helicopters carrying out commercial operations in that area must be ADS-B equipped by April 2014.

Signals received by aircraft (air to air)

Aircraft can receive:

1. Mode A/C/S squawks from other aircraft nearby
2. ADS-B out broadcasts directly from other aircraft nearby
3. ADS-B re-broadcast from ground stations (when the ground station is so equipped), called ADS-R
4. FLARM broadcasts from nearby gliders and other equipped aircraft

If within radar coverage and equipped with a transponder, then aircraft nearby will transmit squawks when interrogated. An active TCAS (Traffic Collision Avoidance System) can also interrogate nearby aircraft and cause them to squawk. Additionally, other aircraft may be simultaneously broadcasting their positions through any one of 1090ES, UAT and/or FLARM.

Ground stations may rebroadcast any ADS-B signals received, and they may supplement these with additional ADS-B transmissions representing aircraft identified using traditional radar and Mode C equipment. Called ADS-R (Automatic Dependent Surveillance – Rebroadcast) and TIS-B (Traffic Information Service – Broadcast), these are described in a later section. These signals can be used by aircraft to enhance awareness of nearby traffic—known as ATSA (Airborne Traffic Situational Awareness). Receiving these signals from other aircraft is possible using portable, uncertified devices and doesn't require or rely on having ADS-B out or FLARM fitted. These receivers are known as PCAS (Portable Collision Avoidance Systems).

There are units which can receive both 1090 and FLARM signals, such as the Power FLARM. These can drive displays on built in GPS equipment, such as Garmin or portable tablets like an iPad. Popular GPS navigation software, such as SkyDemon, have integrated with the FLARM data feed and can show nearby traffic on a real-time chart display. FLARM determines threat conditions and generates traffic alarms when appropriate.

FLARM units transmit both their current and future predicted positions and altitudes derived from their built-in GPS units. For other nearby transponder equipped aircraft, PowerFLARM will only detect their presence if they are interrogated by secondary radar, and then it will give only relative altitude/ascent/descent/distance—but not bearing information since it has no directional antenna.

In the US, a combined receiver for both 1090ES and UAT such as the standalone battery powered Stratus 2[1] ($899), connects to an iPad to display traffic information. This kit includes a GPS receiver and also receives ADS-B in signals transmitted from the ground to provide weather and augmented traffic data—see later section for details. It works directly with the popular ForeFlight app.

Garmin's GDL39[2] ($699) is a similar portable unit connecting to an iPad via Bluetooth. It also has a built in GPS receiver and ADS-B in, working with the Garmin Pilot app; and there are several other similar portable battery powered ADS-B receivers, such as Dual's XGPS170[3] model (also priced at $699). Systems like these have two main display formats:

1 A simple digital readout and audible alarm, that displays the direction and range of conflicting traffic
2 A screen plot showing nearby traffic, projected flight path with indicated altitude and change—similar to what's provided on an air traffic controller's screen.

Signals received on the ground

An upgrade programme has been in place throughout Europe for radar systems to switch to Mode S. These use the same rotating radar installations and they are backward compatible with Mode A/C transponders. Many IFR flights are now handled using Mode S exclusively, but parts of Europe continue to use older equipment.

A number of separate non-rotating receivers are installed to detect and process ADS-B signals, feeding into the same displays and ATC systems. The high power of aircraft transponders (typically 70 Watts or more peak RF transmit power) provides a range of hundreds of miles, but this is mostly line-of-sight. Signals can't be received from flights in valleys or more remote areas.

Multilateration (MLAT) is a system which receives the same signal at multiple locations, and computes an aircraft's position by comparing the difference in the signal's time of arrival at each site. MLAT techniques are frequently used to provide airport surveillance. Recently these techniques have been further developed, and they are now being used to provide surveillance within Approach, Terminal Manoeuvring Areas and Enroute airspace. These systems are known as Wide Area Multilateration (WAM).

As WAM and ADS-B have many synergies, an integrated WAM/ADS-B system is being offered by industry and will become a key element in the future surveillance infrastructure. Both ADS-B and WAM are being deployed throughout Europe, with full coverage to be achieved by no later than the beginning of 2020.

It is also planned to equip the next generation of Iridium satellites with ADS-B receivers so that they can relay signals from almost anywhere on the planet. The project, Aireon, is a joint venture between a number of partners including NAV Canada. It will allow wide area coverage in regions where physical radar installations aren't feasible. Canadian, Australian and trans-oceanic flights will be covered, allowing closer traffic spacing and more efficient routing. The timescale for full implementation is 2017.

It is still likely there will be some terrestrial blind spots/coverage holes for outlying GA traffic flying at low level or blocked by terrain. It remains to be seen if satellite data or other sources will be used to augment the system.

When Mode S was first deployed, the traffic levels overloaded some ground systems and there were cases where GA aircraft were told to switch off their transponders. This wasn't an issue with Mode S as such but was more related to the software which filtered out VFR traffic from individual ATC screens. Peak data rates of 33,000 transponder replies per second have been processed in the Frankfurt area, confirming that the system has the technical capacity to handle substantial traffic loads. Aircraft data can be filtered by type or by position to remove clutter as required.

From as early as 2015 when some existing SSR radars reach their end-of-life, some regions in Australia will use ADS-B as the primary means of traffic management. Australia will decommission about half their surface navaids (NDB/VOR/DME etc) in 2016 from 424 to 215, saving about $120 million per annum; other savings will come from reduced fuel burn, efficiency and safety benefits. This will place tremendous reliance on the GPS system, but other satellite systems such as the Russian GLONAS may also be used. Because air traffic management systems link IFR flight plans to an aircraft's Mode S transponder ID, incorrect flight numbers are already causing delays. For GA traffic, however, since their call-sign is almost always the aircraft's registration, this is rarely a problem. The cost of fitting ADS-B out to over 4,000 IFR aircraft is estimated at $130 million.

An ADS-B receiver at home for £10

You'll need a Windows PC and a USB dongle receiver designed for digital TV, plus some free drivers and open source software. This allows you to receive and display ADS-B signals from aircraft in your vicinity. If you spend more on a sophisticated antenna (say another £60) and position it outside, then you can pickup traffic data from hundreds of miles around. One hobbyist wrote a clear description showing how to set this up: `http://sonicgoose.com/using-a-rtlsdr-dongle-for-ads-b/`

FlightRadar24 shares this data via their central server, allowing anybody to view and track flights. This is linked to published commercial flight schedules, allowing tracking of almost any commercial flight and probably many IFR GA flights in the future.

Signals transmitted from the ground

Arguably, the term ADS-B in relates only to the ability to receive ADS-B signals from other aircraft. It has also been used to describe some additional data services sent from the ground to aircraft, providing a wide range of useful and updated information pertaining to flight. These have been used to encourage take-up of ADS-B in the USA. In Europe, there are no supplementary FIS-B or TIS-B services currently provided which might encourage adoption across the GA fleet. Data can be broadcast:

1 1090ES for TIS-B only
2 UAT at 978MHz for TIS-B and FIS-B, relevant only in the USA today

TIS-B, Traffic Information Service – Broadcast, allows pilots to have a similar view of all nearby traffic as seen by ATC. ADS-B out transmissions are broadcast from the ground for those aircraft without their own ADS-B out equipment. These could include Mode-C/S equipped aircraft being tracked by primary and/or secondary radar. This data supplements signals received directly from nearby aircraft (air to air) and builds up a more complete picture of all aircraft in the vicinity.

FIS-B, Flight Information Service – Broadcast, provides a whole range of useful data including NOTAMs, METARs, TAFs, SIGMETs, ATIS and weather graphics such as rain radar. It is only broadcast on UAT and is unavailable outside the USA. The data channel bandwidth using 1090MHz is insufficient to support it.

A key difference between these two services is that FIS-B is broadcast—anyone can receive it and download exactly the same data. On the other hand, TIS-B is customised and only broadcasts a subset of data on request. In order to receive TIS-B, the aircraft ADS-B squitter must be configured to indicate TIS-B is requested. This indicates to the ground-station that a response is required for traffic affecting a particular aircraft ID in a specific location.

Traffic data is supplied within a 15 mile radius and +/- 3,500 feet which is often described as a "hockey puck" shape of airspace around the target aircraft. The ADS-B in can be received by a non-certified receiver and displayed on a tablet (iPad) or certified GPS (eg Garmin). It's built into G1000 glass panel cockpits as standard these days. For standalone/portable units, Garmin provide the GDL39 and their Garmin Pilot App for the iPad which provides this service.

The FAA are keen for pilots to fit ADS-B out and this is one reason why the TIS-B is only sent in response to ADS-B signals. There is a situation where you may have TIS-B receiver but not ADS-B out. In this case, if nearby aircraft are ADS-B equipped and receiving TIS-B data, then you may also take advantage of that.

On the Garmin app which displays TIS-B, traffic data quality is shown at four levels:

- TIS-B data coverage with a blue background in the area
- TIS-B data coverage nearby (received for another aircraft area)
- Degraded TIS-B data (received for another aircraft further away)
- No TIS-B data

Summary

For the European GA pilot flying light aircraft (less than 250 knots, 5.7 tonnes), there is no requirement to fit ADS-B out now or in the future. Mode S ELS is sufficient and should be installed if not already in place. Fitting ADS-B out may in some cases allow ATC to provide a better service and optimal routing for IFR flights, such as through reduced traffic separation. It also allows other nearby aircraft identify potential threats on TCAS or on a cockpit display using an ADS-B in receiver. Supplementary services (TIS-B, FIS-B) aren't available outside the USA and are unlikely to be provided. This reduces the advantages of fitting ADS-B across the GA fleet, although adoption could be encouraged by reducing certification requirements and re-using the same Mode S hardware. Fitting a combined FLARM/1090 receiver to warn of potential threats from nearby traffic can be useful. This could be done either with certified or non-certified/portable equipment, and can also be linked to a tablet (iPad) screen or existing GPS map display in the cockpit.

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http://www.luftfartstilsynet.no/regelverk/aic-i/article8259.ece

Proposals to remove unnecessary bureaucracy from GA sector released

Sourced from https://www.gov.uk/government/news/red-tape-to-be-slashed-for-aviation-sector

The government and Civil Aviation Authority (CAA) have announced plans to strip away unnecessary bureaucracy for the UK general aviation sector. Some of the proposed changes were suggested during the General Aviation Red Tape Challenge (RTC), which found that the current regulatory regime is often impractical and far too prescriptive. The general aviation (GA) sector includes flights other than commercial scheduled air services. Most of the world's air traffic falls into this category, from gliders to corporate flights.

Minister without Portfolio Grant Shapps said: "The General Aviation Red Tape Challenge received a phenomenal amount of responses, receiving three times as many e-mail submissions as any other RTC theme to date. This shows the real need for change in a sector that is worth around £1.4 billion to the UK economy and supports up to 50,000 jobs. We have identified a number of areas where existing regulations are unduly onerous, or where the CAA could improve its approach. The measures we are announcing today

(6th November 2013) will ensure that the regulatory framework is proportionate—deregulating completely wherever possible, and minimising regulation where it is still necessary. This will ensure that we have effective safety regulation while supporting the sector to grow. This is in line with both the government's deregulation commitment and also its wider drive for growth in the economy."

Aviation Minister Robert Goodwill said: "General aviation is an extremely important sector of UK civil aviation and it is right that we do everything possible to enable it to thrive. That includes making sure that, where appropriate, we ease the burden on what are often smaller operators and businesses who find navigating a complex regulatory framework particularly challenging. I welcome the time the GA community, and the associations in particular, have taken to respond to this challenge. I look forward to working with the representative bodies including the Light Aircraft Association, the Aircraft Owners and Pilots Association, and the British Business and General Aviation Association in taking this forward. We will also continue working with other EU member states and the European Aviation Safety Agency (EASA) to ensure that EASA's stated aim of proportionate and risk-based regulation is embedded in its activity."

The CAA is setting up a new GA Unit dedicated to more proportionate, effective regulation that supports and encourages a dynamic GA sector for the UK. The unit will be in place by April 2014. The CAA has also launched a "right to reply" consultation, today (6th November 2013), on its detailed responses to the GA Red Tape Challenge which will run until 6th December. By April, with the new GA Unit in place, the CAA will publish detailed delivery plans for its full programme of GA work.

Explaining the role of the new unit, CAA Chair Dame Deirdre Hutton said: "We are absolutely committed to improving the way we regulate GA. We have made a start, for instance deregulating in some areas and delegating responsibilities in others. But there is much more we can do. The new, dedicated GA Unit is a formal recognition that GA needs a different and less onerous regulatory regime to commercial air transport. It will ensure we understand better the impact of our regulation on the sector, that we are as transparent and efficient as possible in how we go about it, and that we identify opportunities to reduce burdens and costs wherever we can." The measures announced on 6th November 2013 included:

- creating an independent Challenge Panel, including GA industry experts and professionals. This will report directly to ministers and will run until April 2014. It will provide a "critical friend" function to the CAA. It will seek to identify opportunities to deregulate, promote growth of the sector and ensure focus on the development of an ambitious GA deregulatory programme;
- seeking to identify projects which would support investment, jobs and the growth of the GA sector. Potential projects could include those which support vibrant GA training or maintenance sectors, business jets or the development of new technologies for general aviation operations. Government, CAA and the panel will work together to identify potential projects. We are also open to suggestions where projects might add the most value and will proactively consider funding options including the contestability fund and catapult funding;
- a renewed commitment to work proactively with European bodies such as the European Aviation Safety Agency (EASA) to look for ways in which unnecessary regulatory burdens on the GA sector can be reduced. Recent successes include securing EU agreement that the applicability of commercial safety standards to general aviation should be included in the EU REFIT review programme, and securing EU agreement to allow the UK to continue issuing the Instrument Meteorological Conditions rating for pilots until April 2019, with a commitment from the government and CAA to get this further extended if required;
- a commitment from CAA to delivering a programme of culture change, deregulation and self-regulation; moving towards a model of supporting compliance rather than policing regulations, enhanced transparency, better value for money, and allowing the GA sector itself to take on more responsibilities for ensuring safety. Some examples include:
  - a commitment to have all airworthiness forms on-line by the end of 2013 and an aim to have 70% of licensing application transactions on-line by Christmas;
  - the consultation launched in September this year on the deregulation for airworthiness purposes of single-seat microlights;
  - the creation of a "commercial experimental" aircraft category to facilitate proof-of-concept flight testing;
  - the development of policies for applying the principle of "informed consent" to certain aerial activities;
  - full support for the government's commitment to implement civil sanctions as part of a range of proportionate interventions designed to encourage compliance
  - a series of CAA-led workshops with the sector which will identify further areas for either full deregulation or contestability including the delegation of responsibilities, for example to professional associations as appropriate;
  - the GA Unit will operate with financial transparency, from a cost base better matched to the nature of its oversight, and with a constant eye on driving down its costs (and hence fees and charges) and also the costs of compliance. It is likely preliminary evidence of this financial transparency will be seen during the late 2014 review of fees and charges for 2015, with the subsequent years' review being fully reflective of the GA Unit's first full year of operation;
  - improving communication with the GA sector, for example by providing targeted, relevant information in more accessible ways;
  - a new "Gold Plating" Challenge initiative to help GA users challenge rules and procedures that they believe exceed EU requirements, and an initiative to bust myths about GA regulation, for example making clear that there is no regulatory requirement to log aircraft movements within the UK and that there is also nothing to prevent pilot/owner maintenance of defined tasks on their aircraft.

Julian Scarfe and Ed Bellamy of *PPL/IR Europe* have been appointed to the six-person Red Tape Challenge Panel. Julian reported "I'm excited to have the opportunity to make a difference to GA regulation in the UK."

PPL/IR Europe welcomes new members

Axel Waldecker	UK/EGSX	Barrie Humphries	UK/EGBW	Charles Depasse	UK/EGLD
Herman Sterken	Netherlands/EHMZ	Jerome McAleer	UK/Witney	Jørgen Poulsen	Denmark/EKRK
Neil Cathmoir	Malta/LMML	Rolf Dahlstrom	Sweden/ESOW	William Roberts	UK/EGKB

Across the North Atlantic from Gloucester to Tulsa in a light aircraft

Part One: Introduction and preparation for the trip – John Shannon and Steven Day*

The first thing you have to ask yourself before planning a transatlantic trip in a light aircraft is why on earth would you want to do such a thing? The trip is expensive, time consuming, full of administrative hassles and it involves some danger. However, in my view, all "adventures" usually have some or all of these components and can hardly ever be justified on purely logical grounds.

My logical ground was that my friend Roy Hitchon and I were going to a Flight Simulator course in Dallas in early August 2013; why not fly to Dallas in the aircraft for which we were having the simulator course?

But realistically, my real motivation was that I have long wanted to fly the Atlantic. I have read all the hair-raising tales of those early flying heroes—Alcock and Brown, Lindbergh, Jim Mollison, etc. Could I match up to the "Giants of Old". Or was I more akin to "Wrong Way" Corrigan, who, on landing in Ireland, said "I'm Douglas Corrigan. Just got in from New York, where am I? …I intended to fly to California…". I was sure I could do better than that, especially as my old flying partner, Roy, agreed to join me on my mad adventure.

Some men, on retirement, in a menopausal fling, buy a fast open topped sports car to show they are still "young". I purchased a 31 year old Cessna 421C "Golden Eagle". It is the same sort of thing. Now a 421C, although a veteran like me, is a very capable aircraft and it certainly has the range for flying across the Atlantic without modification—at least if you go via Greenland.

After I decided to make the trip, I found out that Steven Day was also planning to take his Mirage to Oshkosh at the same time. We both share the same hangar at Gloucester Airport! This was, to say the least, quite a coincidence; perhaps the idea of making a transatlantic flight in a light aircraft was some sort of infectious disease.

Preparation

I thought that it would be helpful to jot down some thoughts on preparation for a transatlantic flight which I hope others who are contemplating a similar mad adventure might find useful.

Pilots

The most important bit of advanced preparation for any flight is making sure that you are appropriately experienced and qualified for the route, and if you are not, that you fly with an experienced pilot who is.

By way of introduction, I note that a current instrument rating is required for flights across the North Atlantic; this is sensible as it is highly likely that part of the flight will be in IMC and, in any event, IFR flight plans are required.

Pilots for our trip to the US

I have an ATPL with about 4,500 hours. Of these hours, about 1,500 hours were gained flying in the Caribbean (where I was born)—mostly over the sea with either dead reckoning or NDBs as navigational aids.

Roy is an extremely experienced pilot—now retired from BA—with thousands of flying hours and is a flight instructor/examiner—but, like me, had never flown the Atlantic in a light aircraft.

Pilots for the trip back to the UK from New York to Gloucester

Roy returned home to the UK from New York by commercial flight. On my return journey, my co-pilot was my very capable younger son, Peter (19) who has had a PPL since he was just 17 and has just started training to be an airline pilot at CTC.

The Aircraft used for the flights

In reading this article, I would like you to bear in mind that my transatlantic flying experience is based on a Cessna 421C which is not exactly your average general aviation aircraft. The aircraft has a very good range. The useful range with normal IFR reserves is about 1,100nm.

For transatlantic flying, it is absolutely critical that you have good fuel reserves to allow you not only to get to your destination but also to your alternate airport. Alternates are few and far between in Greenland and North Canada—often more than 200 miles apart. The 421C is well equipped to deal with the large distances involved. The 421C is pressurised and can cruise at F250. (We will see later that this can be important.) The aircraft is certified for flight in known icing and has radar.

I should note that the aircraft uses avgas and is UK/EASA registered—both factors which make international flight more difficult.

Other items to consider when planning a transatlantic flight

Download a copy of the "North Atlantic International General Aviation Operations Manual". Pay particular attention to the sections about weather and climate. Roy and I took the view that we would limit our trip to between June and September, when the weather is at its "least worst" in Greenland. You can fly at other times but the combination of tougher weather and icing makes such journeys much more subject to delays and at the end of the day, more challenging for light aircraft, especially if you are not certified for flight into known icing and/or cannot fly sufficiently high to get above any clouds with icing. The centre of Greenland is a plateau of 11,000 feet and the minimum approved flight level is F140 to cross Greenland. You would not want to get into icing and then find you cannot descend due to high terrain.

Fog is a major potential hazard, especially when flying to Greenland. The Atlantic sea is relatively warm; the land is cold. The maritime air over the sea is relatively moist. When it is blown across the cold land, fog can form very quickly over the coast line. Most of the widely scattered Greenland airports are by the coast. It is not unusual for all of Greenland's west coast airports to be fogged in at the same time. Weather forecasts for Greenland are getting better but are still not as good as we are accustomed to in Europe or the US and, in any case, forecasting coastal fog is always difficult. Ensure that the dew point/temperature spread is such that fog is unlikely, or defer your flight until the likelihood of good weather improves. Our rule was that we would not go to Greenland unless our destination was forecasting VMC weather (see our flight from Goose Bay to Nuuk BGGH). Do not plan to go on the basis that the weather is above instrument approach minima. (There are no ILS or GPS approaches in Greenland). Also always bear in mind that alternates are far apart.

Wind speeds can be quite formidable going westbound (see our flight from Narsarsuaq BGBW to Goose Bay). Remember that, with

large variation (30–35 degrees or more west of Greenland), you must ensure your flight plan takes account of the fact that enroute forecast winds are shown as true headings! Remind yourself of how to calculate "points of no return" and calculate in advance the PNRs for all your flight legs. Do not try to guess them enroute.

Cold weather flying has implications for aircraft equipment

For example, on my aircraft, preheating the engines is mandatory whenever the engine has been exposed to temperatures at or below minus 7 degrees Celsius (wind chill factor) for a period of two hours or more. There are no heated hangars (that I am aware of) or other facilities to provide preheating when the temperatures are low in Greenland. That is one of the main reasons why we decided to avoid the colder months when planning to fly via Greenland.

Give yourself plenty of time to make arrangements. You will require at least three months, but four months is better if it is your first Atlantic crossing and you need to get a US visa.

Fly in an aircraft with which you are experienced and with equipment that you know well. Be familiar with your aircraft performance and fuel flows, and test them on a long distance flight before setting off across the Atlantic—especially if you are going to use a ferry tank.

Aircraft preparation and maintenance

Carry out a thorough annual or 100 hour service before you plan to leave. Tell your maintenance organisation that you would like particular attention paid to the engine and fuel systems. If appropriate, borescope your cylinders. Check the functioning of your autopilot. Do a compass swing. Make sure your ADF is working as most Greenland approaches are NDB/DME. (An ADF is a legal requirement in Greenland/Iceland/UK for IFR flights.) Take some spares—we took some spark plugs, spare vacuum pump, navigation light bulbs and fuses.

Ensure in advance that you verify that appropriate fuel is available for all the airports where you may be landing and recheck on the day of the flight. (Narsarsuaq had run out of avgas until about two weeks before we were due to travel.) This is particularly the case for avgas which is not available at all airports. Buy a manual fuel pump for those airports where avgas is only available in 50 gallon barrels. Fuel is very expensive as is handling if outside normal hours of operation.

Over the centre of Greenland you cannot descend below F140 due to the high ground and often you would want to be higher to avoid icing in clouds. If at all possible, use a turbocharged aircraft so as to allow you to fly high. This means, of course, that you will either need oxygen or a pressurised aircraft. If the latter, check to see that your standby oxygen bottle is full and the system is in good working order.

Consider whether you will need to use anti-icing fuel additives—even if you are using avgas. I took eight cans of slow flow Prist and had alcohol added to the avgas at Wick EGPC. My aircraft manual says that I should use a fuel additive when anticipating temperatures of less than minus 29 degrees Centigrade for more than two hours. The problem of water moisture icing in fuel is a particular difficulty when taking off from a humid environment to a cold one. Avgas fuel icing is usually more relevant to pressurised aircraft that are going to fly above 20,000 feet, although fuel icing does seem to be rather aircraft specific. The 421C engines with heated fuel manifolds are pretty resistant to fuel icing. Jim Thorpe, who most of you will know or know of and who is a member of the *PPL/IR Europe* board, does nothing about fuel icing in his 421C and he has never had problems on his Atlantic trips. On the other hand, there is some evidence that Aztecs, for example, are more prone to fuel icing problems. If you are using jet fuel, fuel icing is always a consideration. You are unlikely to get Prist in Greenland.

Unless you plan to use all the airports on the northern Kangelussuaq BGSF route via some very small airports, you will need a range of 900 nm (in still air). I found that the web site "220kts.com" was a very useful flight planning resource to become familiar with the various routes across the north Atlantic and the leg distances involved. If you are going to use a ferry tank to extend your range, organise fitting it well in advance—especially if you are EASA registered! (We did not need a ferry tank.) Be generous in your fuel planning. We allowed, as a minimum, for 10% contingency on the enroute section, one approach at the destination, go around and flight to alternate and then one hour reserve.

If you want to use the southern route across Greenland via Narsarsuaq to Goose Bay, you will need to carry an HF radio, unless you can fly at F250 (see our flights from Iceland to Narsarsuaq and Goose Bay). HF radios are a real pain, they don't work well and, in some versions, require you to trail an aerial behind the aircraft which can be problematical. Unfortunately Satcom phones are still not approved as substitutes in the North Atlantic. (We didn't carry an HF radio as it would have been virtually impossible, from a cost point of view, to get it approved for an EASA registered pressurised aircraft.)

Most light aircraft pilots' therefore use the northern route via Kangelussuaq and Frobisher Bay, which does not require HF radio. The northern route also has the advantage of shorter flight legs between airports and it avoids Narsarsuaq, which has an instrument approach that I would not want to use in anger (see video of the approach to Narsarsuaq). The northern route has the disadvantage of adding at least a day to your journey.

Unless you have a toilet or commode (our 421 does) and a co-pilot, carry a pee bottle or equivalent.

EASA registered aircraft are faced by maintenance challenges when travelling outside of EASA-land. It is impossible to be fully legal with an EASA registered light aircraft if you have to have maintenance or repairs done in the US and Canada! As far as I am aware, Yingling, in Wichita KICT, is the only general aviation maintenance operation in North America with EASA approval for light aircraft maintenance and repairs. Wichita is far away in Kansas and, as I understand it, Yingling are thinking of giving up their EASA registration for light aircraft because the bureaucratic costs are disproportionate. However, in practice, common sense can prevail. For emergency repairs, as long as you have any work done by an appropriately approved FAA organisation or mechanic, ensure that a meticulous record of the work done is provided, obtain the name and qualifications of the supervising mechanic (who should have at least three years experience as a licensed mechanic), get the FAA return to service certificate and the paper work supporting the details of and the provenance of any parts installed, and I would hope that you could regularise the paperwork situation from an EASA point of view with your EASA maintenance organisation on your return to EASA-land. However this approach should be only used, I suggest, for emergency repairs. Any scheduled maintenance that you might need to do abroad should be discussed with your EASA maintenance organisation before you leave EASA-land. You may be able to authorise simple work, such as oil and filter changes, on the basis of your pilot's licence. Such maintenance paperwork problems, needless to say, do not apply to US registered aircraft. I will describe the technical repairs we had done in the US (and the trip itself) in the next edition of IP.

Flight planning

Discuss with Jeppesen your options; ensure your GPS database covers the areas that you will be flying over. You can download free approach plates from national Airmen's Information Publications for the whole route except for Canada. You will need to buy a subscription to cover

Canadian approach plates. I use Jeppesen JeppView on my Ipad and I was able to get coverage for two months for the whole of the US and the North Atlantic for about a £300.00 supplement. I recommend using North American flight planning software for the US and Canada. From my experience this summer, Rocket Route, which is brilliant in Europe, is intermittent once you leave the UK for Iceland. (Rocket Route either have or will, no doubt, sort out their teething problems soon but it remains the fact that they would have had very few subscribers in the US and Canada at the time of our flights and their north American competitors are very well established.) However, FBOs at Wick, Reykjavik BIRK, Narsarsuaq and Nuuk are very efficient at lodging your flight plan. At Goose Bay I was helped via telephone by the very good local Flight Service Station. To repeat what I said above, variation can be as much as 30 degrees or greater! In my view you need Jeppesen plotting charts, and you will need to plot the enroute Atlantic sections of your journey. You will then be able to work out the latitude and longitude of your reporting points. You must report your position with an estimate for your next position to ATC at least once every hour. For a more detailed treatment of the North Atlantic communication and reporting rules see the "North Atlantic International General Aviation Operations Manual".

We found VHF communications were pretty good for most of our flights, but we were flying at F200 or above. Expect communication gaps lower down, especially to the west of Greenland. Even at F250, we were out of contact with Gander for about 25% of our flight from Narsarsuaq to Goose Bay. However, usually it is possible to get a relay via overhead airlines. The normal procedure is to transmit on frequency 123.45 and if you cannot get anyone, to try 121.5 and then go back to 123.45 (see our flight to Goose Bay). I suspect that VHF communications are better on the northern route which is approved for non-HF equipped aircraft at levels below F250. We hired an Inmarsat SatCom telephone—a reasonably low cost emergency stand by unit. Continuously monitor 121.5 while over the Atlantic.

If you have not flown in North America before, you should become familiar with North American flight rules. The key difference to the UK is that, in practice, there is no uncontrolled airspace in IMC conditions—ie you need to have an IFR clearance before flying in IMC. VFR is allowed in VMC in airways and there is radar coverage virtually everywhere in the US. As you will see later, under the Homeland Security waiver/route approval, foreign registered aircraft should normally file IFR flight plans while in the US, although I have been led to understand (but I have been unable to confirm) that it is possible to go VFR as long as you have filed a VFR flight plan and you keep to your plan.

Safety and related equipment

You will need immersion suits, a recently tested life raft with cover, a Personal Locator Beacon which is correctly registered with the Coast Guard, emergency food and water supplies, warm clothing, and fly repellent and fly spray for Greenland—in the summer there are lots of mosquitos. Andrew Bruce of Far North Aviation at Wick rents survival gear and rafts which you can leave with his agent in Goose Bay and then collect the emergency gear on the way back to Europe.

Insurance

This can be a show stopper—so talk to your insurance broker as early as possible. You may find that, unless you have sufficient experience for the flight, you will need to hire a professional ferry pilot to accompany you, at least for one of the legs. We paid a supplement of about £3,000 over our normal premium to cover our two flights across the Atlantic and flying in North America for two months.

Airports

If you are routing via Wick, then you should research the following airports—the old historic names in brackets are for old-timers like me; use the Inuit names for flight planning –

Northern route: (the longest leg is 520nm)

EKVG	Vagar, Faroe Islands (as an emergency diversion)
EGPC	Wick, Caithness, Scotland, UK
BIEG	Egilsstaðir, Iceland
BIRK	Reykjavík, Iceland
BGKK	Kulusuk, Greenland
BGSF	Kangerlussuaq (Sondre Strømfjord), Greenland
CYFB	Iqaluit (Frobisher Bay), Nunavut, Canada
CYVP	Kuujjuaq (Fort Chimo), Quebec, Canada

Southern route: (the longest leg is about 670nm)

KBGR	Bangor [Intl], Maine, US
CYYR	Goose Bay, Newfoundland, Canada
BGBW	Narsarsuaq, Greenland
BIRK	Reykjavík, Iceland
EGPC	Wick, Caithness, Scotland, UK

Check the opening hours of the airports, fuel handlers and customs—especially at weekends in Greenland. As far as I am aware, all airports are normally shut on a Sunday in Greenland, unless you want to pay a very high overtime fee.

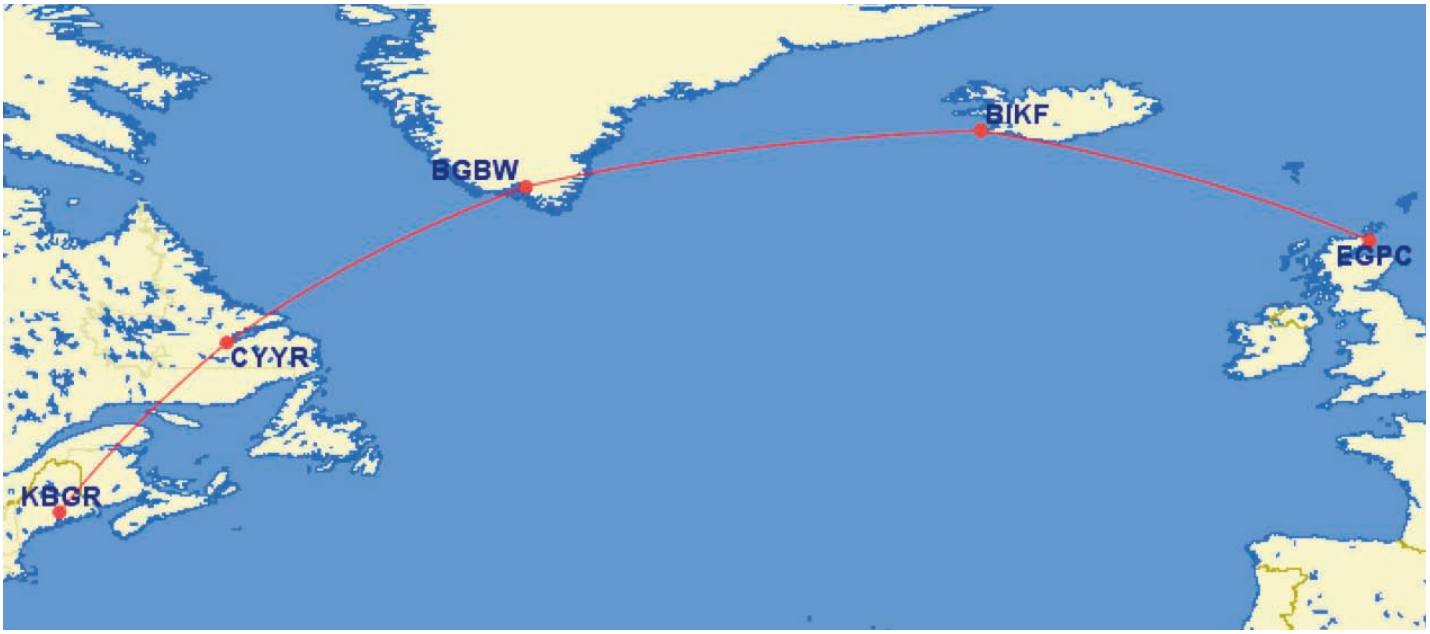
Getting accustomed to the local time changes is quite difficult. There is a four-hour time change between Iceland (which is GMT in the summer) and Goose Bay. I recommend that you always work in GMT and then convert to local time. It is still easy to make a mistake so it is worthwhile always rechecking the local time. While you gain time going west, you lose time going east. Accordingly, if you fly from Goose Bay or Kangelussuaq to Iceland in one day, start from Goose Bay as early as possible as otherwise you will arrive in Iceland very late and possibly incur extra customs charges, etc.

Handling agents, hotels and miscellaneous items

Roy did all the hard work of contacting handling agents and booking hotels in advance of our trip. I would note one or two things that you might find useful. In Wick, let Andrew Bruce of Far North Aviation book you into the local Castle. You will get a nice meal and a comfortable night's sleep. At Reykjavik, Flight Services Ltd can provide handling and are a two-minute walk from the Hotel Lofleidir—which also has a restaurant. Woodward provides handling at Goose Bay and can arrange a local hotel.

Customs and Immigration formalities are easy for Iceland. Customs officers will meet you at the aircraft and then take you into the FBO to complete the paperwork. If you are in transit when visiting Greenland, you are unlikely to have to see a customs officer. However, for Canada, you must telephone customs (1–888–226–7277 last summer) at least two hours but not more than 48 hours before flying into Canada. (Another number was 1–905–679–2073.) In both Canada and the US everyone but the pilot should stay in the aircraft until customs turn up!

One needs to buy a US Customs and Border Protection Decal. You can do this online but allow at least two weeks for the decal to be mailed to you from the US. Carefully follow the instructions showing where the decal is to be affixed to the outside of the aircraft. You need to file a flight passenger manifest for the US Electronic Advance Passenger Information Service "EAPIS" up to five days ahead of your arrival (or departure). This can be done online, but keep saving your work on the webpage.



US Homeland Security Route Waiver/route approval for EASA registered aircraft (not required for US registered aircraft)—can be applied for online. Note, I highly recommend regularly saving your online application form as you fill it in as there is a high chance that your application will time out on the website and you will have to start all over again. Give a good and comprehensive description of the overall purpose of your trip and general route and then enter all airports that you might land at enroute, including alternates. You should mention, in a comment, that you reserve the right to land at other airports if so required by ATC, adverse weather or technical problems. The route waiver approval number must be put on each flight plan in the US. The approval is nominally for IFR plans only but I have heard (but have not confirmed) that VFR flights can be made but that you must file a VFR flight plan with the route waiver approval number! Include in your application all passengers that you might be carrying both at the US border and for flights within the US. Five working days notice is formally required to change your filed route! No ability to change your route is available at weekends!

In practice you can normally change the route in two working days—other than at weekends. All this is quite irritating but it is what the US authorities require. We took the view that as long as we kept on the agreed overall route, we would not worry about landing at a different airport. For example, we landed at Tulsa instead of Dallas for technical reasons—we needed work done on our autopilot. We felt that this deviation was covered by our comment that we reserved the right to land at other airports for technical reasons. I should add that we included our waiver number on all flight plans and filed IFR.

I hope you can indulge me in a little "rant" about all this. The requirement for the prior route approval is due to an ignorant politicians' response to the terrible events of 9/11. If I flew to the US in a US registered aircraft which I owned, I would not have to file for a prior route approval! No check would be carried out on the route I intended to take inside the US. But because my aircraft is registered outside the US, I need to obtain prior route approval. Surely any terrorist danger arises from the intentions of the pilot and not from where the aircraft is registered! If the US wants to monitor light aircraft for security reasons, either they must monitor all aircraft or monitor all pilots. But it is meaningless to monitor only foreign registered aircraft, given that, if I were a foreign (or US) terrorist, I would buy a US registered aircraft and then would not be subject to any route check. This whole rigmarole reminds me of the nonsensical UK Dangerous Dogs Act—widely considered to be the worst drafted piece of legislation in recent years—which was again an example of politicians needing to "do something" even if what they do is either meaningless or idiotic or both. End of "rant".

Avoid Washington DC airspace unless above 18,000 feet. (There is online information with respect to the prohibited airspace around Washington.) Otherwise get approval in advance to fly in restricted Washington airspace—get it right or risk being shot down!

You will need immigration visas for all occupants of the aircraft at the US border going in and out. I believe that a visa is required for all non-US citizens on board at border crossings even if the aircraft is US registered but as this did not apply to us, I cannot be entirely sure this is correct. My following comments apply to the London US Embassy but I suspect they will apply to other countries in Europe. Allow six weeks to get an appointment at the US Embassy. The appointment can be booked online. The online visa application is long and tortuous and the website times out—keep saving your work. Be prepared to be confused and confounded by the detailed questions about your education. Of course the visa application expects you to know about the meaning of "high school" and "college"etc. You will need to provide an electronic photo which the visa application software determines whether it is adequate for the visa application. Allow a day at the Embassy to get the visa issued! Note that you cannot take in mobile phones or any other electronic devices into the Embassy. Set aside a little extra time to go and deposit such items at one of the nearby shops that provide a secure deposit service. Allow five working days for your passport to be returned with the visa. A visa is not necessary for non-US passengers on flights within the US (as far as I can tell).

Arrange to get a US Sim card for your mobile phone sent to you in Europe. Expect rather spotty coverage when outside large US and Canadian cities. While you are away, ask people to contact you by email you, assuming you have email on your phone. Virtually everywhere has WiFi internet connections.

Finally money! Have $2,000 hidden somewhere in case you need to buy fuel with cash. Greenland is expensive both for fuel and handling. Save enough (say $10,000) to ensure that you do not let individual bills on your transatlantic trip get you down; suspend your budget control instincts for the duration of the transatlantic flights.

*The second part of this article, which describes the journey and includes links to video clips from the flight, will appear in the next edition of *IP*

Pilots' Talk

This is Klaas Wagenaar's last compilation of news items and snippets based on various regular aviation publications and bodies such as AOPA, Aviation eBrief, Aviation International News,

Approximately 130 emails with circa eight articles or more, totalling circa 1,000 potential news items are being consumed for every Pilot's Talk publication by the compiler. I continued this format with great enthusiasm and it surprised me that over the past year we received only one comment on a particular news item. For the lack of knowing better, I take the silence from the audience as a token of appreciation for this feature in the magazine and wish my successor all the best with selected GA-related news items to keep the *PPL/IR Europe* pilots happy readers.

New research finds hypoxia can be detected before symptoms become apparent

A team of Mayo Clinic researchers have found that hypoxia can be detected before incapacitating physical symptoms, which can be a safety threat at high altitudes, are noticed. "This study opens the door for objective assessments of hypoxia and additional safeguards for … pilots and others working in high altitudes," says Jan Stepanek, MD, the Aerospace Medicine Program Director and Co-Director of the Aerospace Medicine & Vestibular Research Laboratory. Hypoxia is a lower than normal level of oxygen in your blood. To function properly your body needs a certain level of oxygen circulating in the blood to cells and tissues. When this level of oxygen falls below a certain amount, hypoxia can cause a variety of symptoms including shortness of breath, impaired speech, slowed reaction time and passing out. Historically, the most common way to detect hypoxia is by physical signs and individual symptoms. One of the most commonly studied effects of hypoxia is reaction time.

The Mayo Clinic study team used the King-Devick neurocognitive performance test, which is commonly used to identify cognitive changes related to sports-related concussions and to assess cognitive function under conditions of low oxygen-simulating altitude. The King-Devick test assesses the time in viewing, identifying and reading aloud a series of numbers on three consecutive test cards. Based on test times of 25 participants, the study concluded that the King-Devick test is an effective tool to detect "impairment of cognitive performance at a pre-symptomatic stage of hypoxia." "This study provides an objective indication of hypoxia that is involuntary, reliable and repeatable," Stepanek says. "This means that people can be tested for cognitive declines before having symptoms, because often people won't have symptoms until it is too late."

This study is the latest in a long line of contributions from the Mayo Clinic Aerospace Medicine researchers' efforts since the inception of this line of work in Rochester in the 1930s, officials note. Mayo Clinic physiologists and altitude scientists developed several life support systems and strategies vital to military pilot safety in the World War II era that still remain in use today. Prior to pressurised aircraft cabins for commercial airline passenger flights, aircraft flew at relatively low altitudes to avoid hypoxic (low oxygen) conditions. Mayo scientists developed an oxygen mask for pilots and passengers to wear during flights, allowing travel at higher altitudes above turbulent weather conditions, making flights smoother and more tolerable to travellers. Today, a team of Mayo physicians and scientists are continuing to investigate problems related to altitude, spatial disorientation and acceleration protection in dedicated laboratories at the Mayo Clinic in Arizona.

Flying with diabetes—all is not lost

The Regional Meeting heard from Douglas Cairns, a member of AOPA UK who is a diabetic and who has spent much of his life fighting to be allowed to fly. He has been at the forefront of a successful campaign in the UK, where the CAA announced last year that pilots with insulin-dependent diabetes could continue to fly commercially and privately. This precedent gives hope to thousands of pilots at risk of losing their careers through diabetes, and thousands more who wish to become pilots but are currently debarred from the profession in most countries. Cairns (pictured at right) was an RAF pilot who was grounded when he developed diabetes, and he has spent decades convincing doctors and regulators that most diabetics, if properly treated, can fly perfectly safely, professionally and otherwise. To prove his point he has flown around the world and to the North Pole, and medical opinion is swinging around to back him. He uses a small digital device, the size of a mobile phone, to measure blood sugar regularly, and in 12 years and 3,000 hours has never had a problem.

Apart from the USA, five countries now allow private flying for pilots with diabetes—South Africa, the UK, Canada, Australia and Israel. Until the UK allowed commercial flying, Canada was the only country where pilots were not grounded when they developed diabetes. Today there are 560 pilots with diabetes flying in the USA, and a further 17 professional pilots with diabetes flying commercially in Canada.

Mr Cairns thanked Martin Robinson, CEO of AOPA UK, who he said was instrumental in leading him along the correct path in his lobbying efforts. The CAA has filed for a derogation with EASA to allow medicals to be issued to pilots with diabetes. EASA challenged the derogation but the UK dug in its heels and was allowed to continue. The Agency challenged the CAA's decision a second time, but the UK has affirmed it. It is open to EASA to challenge it again but the signs are that it will not do so, partly because it is on extremely tricky ground with regard to discrimination laws. Ultimately, if authorities in other European countries refuse to follow the UK CAA's lead, it should be open to European diabetic pilots to obtain their flying licences through the UK CAA and use them anywhere in the world.

CAA confirms permanent Farnborough squawk

A "listening out squawk" covering Farnborough Airport is to be made permanent, the CAA has confirmed. The code was originally created as a short term measure to assist Farnborough LARS air traffic controllers during the London 2012 Olympics. It proved so successful, however, that it remained in place on a trial basis after the Games finished. The squawk will become permanent on 14th November 2013 and will become the tenth such code in operation in the UK.

Listening out squawks, officially known as Frequency Monitoring Codes, have played a vital role in reducing infringements of controlled airspace by enabling air traffic controllers to alert pilots if their aircraft looks likely to infringe. Any aircraft fitted with a Mode A/C or Mode S SSR transponder can use these codes. By entering the relevant four-digit SSR code into the transponder and listening to the published radio frequency, a pilot signifies to air traffic control that he/she is actively monitoring radio transmissions on that frequency.

The Farnborough Frequency Monitoring code is 4572 and the radio frequency to monitor for Farnborough LARS (West) is 125.250 MHz. It is recommended that pilots flying within eight nautical miles of Farnborough Airport use the code.

UK CAA to issue IMC for next five years

The UK CAA has welcomed a proposal from the European Commission to allow the UK to continue issuing the Instrument Meteorological Conditions (IMC) rating for pilots until April 2019. According to the CAA, the move follows considerable effort by the CAA and UK GA to support the retention of the rating.

Since its introduction in the 1960s, the IMC rating has been acquired by thousands of UK private pilots to help them plan and fly safely in instrument weather conditions. "National" ratings, such as the IMC, were to be phased out by April 2014, but the proposal, which is expected to be included in the next amendment of the European Aircrew Regulation, will extend this deadline, allowing flying schools to continue offering IMC training and many more UK pilots to add the rating to their licences.

It had previously been agreed that pilots who already held the rating before April 2014 would be allowed to use it indefinitely within the UK and to transfer it to a new EASA Private Pilot's Licence as an Instrument Rating (Restricted) and this agreement remains.

Praising the move, Andrew Haines, CAA Chief Executive, said, "The IMC rating has proven itself over the years to be a valuable safety tool for UK general aviation—training private pilots to cope with our very unpredictable weather systems. This is a sensible way forward which will aid flight safety in the UK. One of my first commitments to the GA community was that the CAA would argue strongly for the retention of the IMC rating and the privileges and safety benefits it brings. We will continue to make the case for its permanent preservation for the benefit of future generations of pilots."

Jim Thorpe, [past] Chairman of *PPL/IR Europe*, told FLYER "It is undoubtedly the start of a new era for any PPL who wants to gain an instrument flying qualification. The IMC rating has a reprieve in exactly the form *PPL/IR Europe* suggested might work some years ago. We have, thanks to the efforts of *PPL/IR Europe* working through Europe Air Sports an Enroute Instrument Rating and a competence-based route to the full IR. The holders of third country instrument ratings now have a viable way of obtaining an EASA IR which recognises their experience and an extra 12 months grace before they need to comply.

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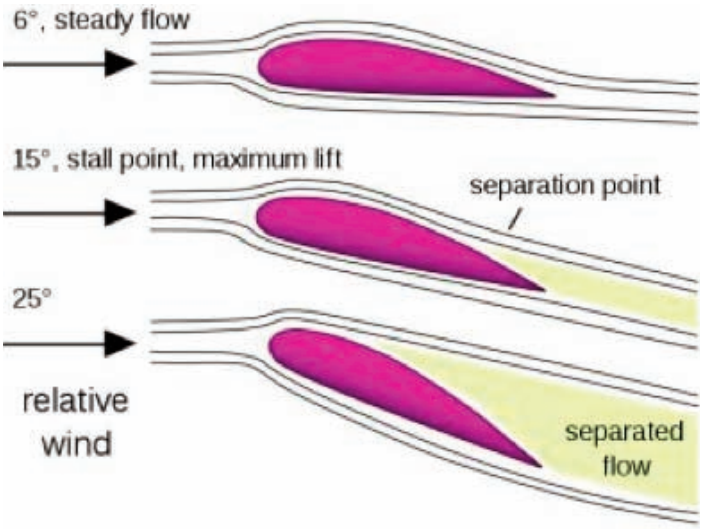
New stall-training rule delayed

A new rule from the FAA that would affect changes to how commercial pilots are taught to deal with stalls was expected to be published last October, but has been delayed because of the US government shutdown. In a statement, the FAA said that employees at the FAA, the Transportation Department, and the Office of Management and Budget were furloughed, and "the agency is assessing the shutdown's impact on finalising the rule." The new rule will mandate changes in how flight simulators work and how pilots are taught to react to stall warnings.



The new rules were motivated mainly by the investigation into the 2009 Colgan crash in Buffalo, which killed 50 people, and the Air France loss in the Atlantic in that same year, in which 228 people died. The FAA published an Advisory Circular (PDF) addressing stall recovery in 2012.

FAA and EASA will upgrade stall training

The FAA this month will issue a rule requiring a new approach to stall training for airline pilots that runs counter to previous guidance. According to Dr Jeff Schroeder, the agency's chief scientific and technical officer, the new approach will, "take a lot of work to undo previous training because some pilots are 'spring-loaded' to the previous technique."

At the Royal Aeronautical Society's annual International Flight Crew Training Conference in London last month, Schroeder explained that operators will have five years to comply with the new requirement. Flight simulator providers will need to make changes to stall, buffet and icing models used in their devices, and rules governing these changes should be issued in 2015 with a three-year implementation grace period.

European Aviation Safety Agency rulemaking officer Dean Dousi told the conference that his agency will publish similar rules in the third quarter of 2016, following the publication of a concept paper in 2013. This will be subject to public consultation in 2014, with resulting recommendations to be made to the European Commission in 2015.

The rulemaking process follows in the wake of highly publicised accidents involving stalls, including Colgan Air Flight 3407 near Buffalo, NY, and Air France Flight 447's plunge into the Atlantic Ocean within four months in 2009. Since then, multiple industry groups have debated improved approaches for dealing with loss of control in flight, identified as the leading cause of aircraft fatalities.

Schroeder estimated the total cost to develop new aerodynamic models for 50 aircraft types at $20 million, plus another $30 million for these to be installed on approximately 300 full-flight simulators.

FAA on the CFI practical as BFR

A new direct to final rule issued on 16th September 2013 by the FAA introduces a subtle but substantive change for CFI candidates, and according to NAFI chairman of the board Robert Meder "This is a good thing." The new rule considers practical tests flown for the issuance of a flight instructor certificate, or renewal of a flight instructor certificate, or the addition of a rating to a flight instructor certificate, or reinstatement of the certificate, as meeting 24-calendar month flight review (BFR) requirements. The rule went into effect on 15th November, until then practical test rides for flight instructor candidates continued to be treated as different from other ratings and did not automatically satisfy the requirements of the BFR. "This alleviates confusion for flight instructor candidates who, until 15th November, must still specifically ask that the examiner or inspector also log the ride as a BFR—something the examiner or inspector could, though perhaps rarely would, deny," says Meder. "This brings the CFI practical into conformity with other practical test rides, and should make life simpler." Again, until 15th November, certified flight instructor candidates had to ask the inspector or examiner to also provide an endorsement for a flight review upon completion of the practical test.

Garmin D2 Pilot Watch at Aircraft Spruce

Aircraft Spruce is now selling the new Garmin D2 Pilot Watch which has GPS capability plus a worldwide airport database that features Garmin's signature direct-to and nearest functions. Additionally, pilots can start their "time-off" using the stopwatch and set a vibrating reminder to switch fuel tanks using the timer. Also, it automatically starts the GPS when altitude detects that you've taken off.

Other handy features for aviators include display of multiple configurable time zones including Zulu/UTC, compass with HSI, GPS and adjustable baro-altitude, moving map and user defined waypoints. Additional customisation allows the pilot to select their favourite data fields including GPS ground speed, GPS track, distance from waypoints or destinations, estimated time enroute, bearing, glide ratio and much more.

Garmin offers new weather pricing and position reporting service

At last October's National Business Aviation Association convention Garmin unveiled new worldwide weather pricing plans, as well as a new position reporting service. These services offer pilots seamless access to weather products around the world and supply position information to both owners and operators, ultimately increasing safety and situational awareness, Garmin officials said.

"The new, straightforward worldwide weather pricing plans offer owners and operators predictability of their month-to-month service charges and provides pilots confidence knowing they'll have access to valuable weather information when they need it most" said Carl Wolf, Garmin's vice president of marketing and sales. "Customers told us they wanted a completely integrated position reporting service with the Garmin avionics they already have—and we listened, delivering the capabilities they need for their operations in a completely integrated package."

Customers may select from two worldwide weather plans based on their flying needs. For those with moderate flight activity, a package that offers a set number of weather requests for a single monthly price is available. For owners who fly more frequently, a larger package encompassing more weather requests offers pilots an additional option.

These plans also contain monthly fees, as well as any airtime charges associated with the weather requests for an easy-to-understand price, company officials said. All-inclusive plans start at $100 a month. Existing customers can continue to use their existing plan or rollover their account to either of the new, simplified plans at any time, officials noted.

Position reporting services offer owners information that may be important for business and personal purposes. Using their Garmin Flight Deck or avionics, pilots may choose how frequently they wish to send a position report to be displayed by a provider such as FlightAware.com.

To take advantage of these new plans and service, as well as other global connectivity services, customers need a GSR 56 Iridium datalink transceiver and a compatible display using the latest software. The GSR 56 is currently compatible with the GTN series, G500, G600, G500H flight displays, select G1000/G950-equipped aircraft, and G900X flight decks for experimental aircraft, with future availability in select G2000, G3000, and G5000-equipped aircraft.

Jeppesen's Mobile Flitedeck VFR

Tobias Baesch and Marcus Marth from Jeppesen gave delegates a demonstration of the company's Mobile Flitedeck VFR product for iPad which was designed with the assistance of AOPA members who participated in an online survey. Mr Baesch, navigation portfolio manager, said there were many strong and agile competitors in the field, such as SkyDemon, and Jeppesen had thought long and hard about whether it should enter the market. It had ultimately decided to do so and had formed a small team of young people straight from university with all the key disciplines.

The demonstration showed a single-chart presentation which zoomed right down to airfield taxi presentation, with data appearing and disappearing as necessary. Tapping on screen produced relevant local data, while information such as NOTAMs and weather were presented in text format. IAOPA is considering linking with Jeppesen to provide discounts on certain products.

Better NASA predictions could protect pilots from radiation

Professional pilots who fly at high altitudes for business or commercial aviation are exposed to as much radiation as workers in nuclear power plants, and that exposure is climbing as airlines fly polar routes more often, according to NASA. During a typical polar flight, pilots are exposed to the equivalent of two chest X-rays, an exposure rate three to five times higher than flights at lower latitudes. "Multiplied over the course of a career," says NASA, "this can cause problems such as increased risk of cancer and possibly cataracts." The space agency is working on its models for predicting the intensity of radiation so flight planners can alter course to avoid the most intense radiation events.

A research report, forthcoming in the journal Space Weather, compares NASA's radiation predictions to actual measurements aboard aircraft. "The results are encouraging," said Chris Mertens, a senior research scientist at NASA Langley Research Center. "But we still have work to do." Mertens said the goal of the effort is to adopt a simple-to-understand, timely report similar to weather forecasts. The polar flights are popular because they can save up to $40,000 per flight in fuel costs, while altering course to avoid a polar radiation storm can cost as much as $100,000. Improved forecasts could "help the airlines to make the right decision" to protect the health of pilots and passengers, according to NASA.

Stop Press: Filing GAR forms in the UK

AOPA UK has been informed that the system of designated airports through which GA can access the UK without filing a General Aviation Report has been abandoned by the UK Border Force without consultation, and that a GAR must now be filed no matter which point of entry is used. Border Force warns that a fine of £1,000 could be levied in case of default. AOPA is working to address the issue and more information will be made available as soon as possible.

Committee to FAA: PEDs are safe

Personal Electronic Devices (PEDs) are safe for use in all phases of flight on almost all aircraft, according to information soon to be released by an FAA advisory committee and made available to The Wall Street Journal. The committee's conclusions reportedly include scores of recommendations that include lifting current restrictions on WiFi use below 10,000 feet. The recommendations refer specifically to devices used to access onboard WiFi services. The findings are expected to add weight to arguments that support gate-to-gate use of personal electronics in the passenger cabin of commercial aircraft. However, cellular access has not been approved, and for many commercial flights the recommendations may not usher in substantial changes.

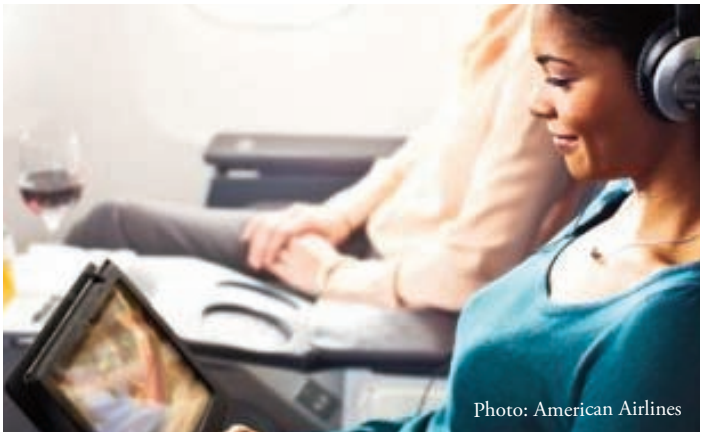


Photo: American Airlines

According to the journal, the committee will recommend that ground-based cellular connections remain unapproved for use on aircraft because the FCC prohibits airborne cellular service, but that WiFi use through an aircraft's WiFi system be allowed. The FCC's stance on the use of cellular communications on aircraft stems in part from concerns that cell service could interfere with communications systems. And the committee will reportedly recommend that the FCC and FAA reconsider their positions on that theory. But the focus of the recommendations will be to allow the use of onboard WiFi during all phases of flight. Presently, more than half of the commercial passenger aircraft operating in the US have earned approval for onboard WiFi systems. And the only change expected to be supported by the forthcoming recommendations affects gate-to-gate use. Cellphones accessing WiFi services will still need to be operated with cellular capabilities shut down.

CAA instrument approach consultation

Last year the CAA embarked on a consultation that could see an increase in the number of instrument approaches available at smaller airfields in the UK.

The consultation, which ran until the end of December, suggested approaches to runways that don't meet full instrument runway specifications, to unlicensed airfields or to those that don't have approach control services should be considered on an individual risk-based basis. It also suggested and encouraged the use of satellite-based approaches.

FAA expected to relax cabin electronics rules

Last October an Aviation Rulemaking Committee (ARC) told the FAA that the use of certain electronic devices in airline cabins should be allowed. The new guidelines, which would likely take effect next year, according to the Times, would allow passengers to use their tablets to access downloaded content such as e-books, podcasts, and videos, anytime they are on the aircraft, but the ban on using WiFi during take-off and landing will probably remain. The ban on cellphone use in flight also is expected to remain in place.

Sources from the ARC told the Times the new FAA policy, when it takes effect, will require the airlines to certify that their airplanes' systems can tolerate interference from electronic devices, rather than trying to test every individual device that comes on the market. The ban on using cellphones aloft is not enforced by the FAA, but by the Federal Communications Commission, on the grounds that such calls can interfere with transmissions between cellphone towers on the surface. The ARC, which began its work in January, was originally scheduled to complete its report in July, but asked for more time.

Sharp increase in reported near misses

The FAA says that a sharp increase from 2011 to 2012 in the number of reported incidents involving failure to maintain proper separation of aircraft in flight is likely due to changes in how such incidents are reported and not due to increased risk to aircraft, but not all agencies agree. The year-over-year increase ran the numbers up from 1,895 to 4,394 for consecutive one-year periods ending on 30th September 2012. The FAA's old method of acquiring data relied on reports filed by humans; the new system also relies on humans—without fear of punishment—and includes automated reporting at some facilities. Although the reported figures are up, the FAA notes that high-risk incidents as a percentage of total incidents declined. The FAA hopes that new technology may also help improve safety, but a recent GAO report shows some bodies are not convinced that all the increases in near-miss incidents can be entirely attributed to changes in reporting.

Both the GAO and the Transportation Department's inspector general found that error rates also increased at certain centres that used computerised reporting, meaning that the increase was due to other factors. And the use of automated reporting isn't the only factor. The FAA also changed some of the definitions that identify which incidents are reported. And the FAA has added a new ranking system for incidents, which now includes a "high-risk" category. The introduction of new terminology and new reporting system means it may take some time before any emerging patterns become clear. For now, reported incidents on the ground and in the air increased last year, and facilities guiding high-altitude flights showed a 39-percent increase, according to an IG report. NATCA released a statement that said in part, "We are proud of the collaborative efforts we have undertaken with the FAA to reduce safety incidents and increase reporting opportunities for controllers and FAA employees."

Safety researchers suggest autopilot redesign

Before control of an aircraft shifts from the autopilot to the pilot, the system should require the receiving pilot to acknowledge that he or she has assumed control, according to a recent study of ergonomics and flight safety. Eric Geiselman, lead author of a two-part study published in Ergonomics in Design, emphasised that the warning should occur before the autopilot is disengaged, not after, as is currently required. "The sudden disengagement of autopilot is analogous to a pilot suddenly throwing up his or her hands and blurting to the co-pilot, 'Your plane!'" said Geiselman. The study, which focused on two high-profile 2009 crashes—Colgan Air in Buffalo and Air France off the coast of Brazil—concluded that current autopilot design is flawed and "creates unnecessary emergencies by surprising pilots during critical, high-workload episodes."

Geiselman and co-authors Christopher Johnson, David Buck and Timothy Patrick examine many other design-level safety issues in the two-article series and offer solutions they say could be affordably implemented with available technology. The authors conclude that better design of automation technology on aircraft can prevent future accidents, and more pilot training shouldn't be the only solution pursued by the industry. The authors have combined expertise as pilots, flight instructors, crew resource management instructors and human factors researchers. Their reports appeared in the July and October research annals published by The Human Factors and Ergonomics Society.

UK CAA to issue IMC for next five years

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Since its introduction in the 1960s, the IMC rating has been acquired by thousands of UK private pilots to help them plan and fly safely in instrument weather conditions. "National" ratings, such as the IMC, were to be phased out by April 2014, but the proposal, which is expected to be included in the next amendment of the European Aircrew Regulation, will extend this deadline, allowing flying schools to continue offering IMC training and many more UK pilots to add the rating to their licences.

It had previously been agreed that pilots who already held the rating prior to April 2014 would be allowed to use it indefinitely within the UK and to transfer it to a new EASA Private Pilot's Licence as an Instrument Rating (Restricted) and this agreement remains.

Praising the move, Andrew Haines, CAA Chief Executive, said, "The IMC rating has proven itself over the years to be a valuable safety tool for UK general aviation—training private pilots to cope with our very unpredictable weather systems. This is a sensible way forward which will aid flight safety in the UK. One of my first commitments to the GA community was that the CAA would argue strongly for the retention of the IMC rating and the privileges and safety benefits it brings. We will continue to make the case for the permanent preservation for the benefit of future generations of pilots."

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NTSB broadens pilots' rights in enforcement appeals

Last November the NTSB announced the issue of a Final Rule applicable to the aviation certificate enforcement appeals process and that it was also issuing a Notice of Proposed Rulemaking to extend one of that rule's benefits to pilots involved in emergency enforcement cases. The Final Rule allows pilots subjected to certificate enforcement to appeal to administrative law judges acting under the Federal Rules of Civil Procedure and Federal Rules of Evidence. Litigants may also seek appeals in a Federal district court or Federal court of appeals. Under the Final Rule the FAA must also disclose its enforcement investigative report to a pilot involved in an enforcement case. A separate proposed new rule would extend that specific right to pilots involved in emergency enforcement cases.

The NTSB says the proposed rule is the result of public comments. According to the NTSB, the proposal was the result of "substantive feedback and suggestions" received during the Interim Rule's public comment period. The NTSB says it received ten comments in response to the Interim Rule and those comments were enough to move the NTSB to action.

NASA showcases potential game changers

NASA, working with the Lindbergh Foundation, will show off early research which it believes could lead to "potentially revolutionary aviation concepts and technologies" during a three-day virtual seminar that was held from 22nd to 24th October, 2013. Subjects covered included ceramic matrix and hybrid composite materials for next generation aircraft, cooperative gust sensing and suppression for aircraft formation flight, sense and avoid radar for small UAVs, and turboelectric distributed propulsion. Distributed propulsion would replace a single engine with "boundary-layer ingesting propulsors" that could be tailored to provide enhanced aircraft control while increasing overall efficiency.

Pilots reminded of licence changes in 2014

The UK CAA has reminded holders of "national" pilot licences of the need to convert to a European equivalent by 8th April 2014 to maintain their current flying privileges. The deadline affects all commercial and private pilots holding a valid non-JAR licence (sometimes referred to as CAA licensed) issued before January 2000.

With just six months to go to arrange the switch over, the CAA said it was concerned some pilots would be left with invalid licences if they failed to meet the deadline. Flight instructors, in particular, could be caught out and face disruption to their training schedules.

Aeroplane or helicopter pilots holding a national PPL, CPL or ATPL are encouraged to visit `www.caa.co.uk/eupilotlicensing` for more information on arranging to convert their licence to one issued by the European Aviation Safety Agency (EASA). Pilots flying microlights, gliders, gyroplanes or hot air balloons are not affected by the 2014 deadline.

To ease the conversion process, UK national licence holders who miss the deadline will be allowed to use the privileges of the new Light Aircraft Pilot Licence (LAPL) for one year only. This will restrict the licence holder to non-commercial operations as pilot in command in the appropriate aircraft category, and does not include any instrument flying or instructor privileges. Since this will happen automatically, pilots don't need to contact the CAA to receive these privileges.

By April 2015, however, all national licences across Europe must be converted to an EASA equivalent for the holder to continue flying "EASA aircraft" which include many popular recreational types such as Piper PA28s and Cessna 172s.

But since national licences will remain valid indefinitely for non-EASA aircraft, national PPL holders flying a microlight or vintage aircraft in the UK can continue doing so unchanged and need not contact the CAA.

The need to convert national licences by April 2014 is part of the standardisation of pilot licensing across Europe, a process that began in the UK in April 2012 and which is due to be completed in 2017. After 2017, any pilot flying an EASA aircraft will need to have an EASA licence with a valid EASA medical certificate.

Due to varying interpretations, please check the *PPL/IR Europe* forum as IMC holders may need to comply with the April 2014 date.

Alaska bucks trend towards increased cockpit automation—"hands-on" flying still the norm

The Economist posted a column recently that explored the trend toward increased cockpit automation, especially for the airlines. The article highlights the vast differences between flying large commercial airliners into major airports and the type of flying performed in Alaska where off-airport landings on gravel bars or into remote airstrips with little available instrument support are often the norm. While automation has come with several benefits including reducing crew numbers, fuel savings and maintenance assistance, the largely unrecognised price has been high. Here's a bit of the magazine's more troubling analysis:

The problem today is that aircrew may log thousands of hours on the flight decks of modern airliners, but their actual hands-on flying experience may amount to mere minutes per flight. When things get frantic—whether through a mistaken input or a sudden runway change by air-traffic control during descent—aircrew can be so pre-occupied punching fresh instructions into the flight-management computer that they may fail to notice their airspeed and altitude are falling precipitously.

Photo: Jeffrey Schäfer

In Alaska, cockpit automation is at a minimum even for carriers flying what are considered "large" aircraft in the state (Era and ACE for example). With the exception of the major airlines, air taxis and commuters in the state operate equipment that still relies heavily upon basic pilot skills and decision-making through all phases of flight. This is particularly true in rural Alaska and brings up an interesting difference between Alaskan pilots and those who train and work elsewhere. While the aircraft might be smaller here, the pilots are actually much more engaged in flying them than their counter-parts in the lower 48 US States. Consider the recent UPS and Asiana crashes as The Economist does:

America's two recent fatal air crashes—the Asiana Boeing 777 passenger jet on final approach into San Francisco international airport on July 6th 2013 and the United Parcel Service Airbus A300 freighter coming into land at Birmingham airport in Alabama on August 14th—are cases in point. Though investigations have barely begun, both situations point to distractions the pilots faced while trying to take control of the aircraft. In both instances, the pilots seem to have been unaware, until the last few minutes, of their proximity to the ground and of how slowly their aircraft were flying. Both finished up crashing short of the runway.

In both instances, federal investigators have found little evidence of equipment failure before the crash. They are now focusing more on how the pilots were trained. Babbage was recently shown a training report by a now-retired "standards captain" at United Airways, who had spent five years in Seoul instructing Asiana and Korean Air Lines crew. The account is not for squeamish passengers. The instructor describes how, when checking out even experienced crew, asking them to make a visual approach (ie, using basic head-up flying skills) for a landing "would strike fear into their hearts" so dependent had they become on the head-down operation of their automated equipment.

Interestingly, the July Soldotna accident involving Rediske Air did not even register as "recent" for The Economist, despite the fact that it took place one day after the Asiana crash and had a greater loss of life, killing ten people. In all likelihood, it is being overlooked here because it took place in Alaska and is assumed to be thus somewhat unavoidable. There has been no suggestion of influence from cockpit automation in that crash, nor will there be in the final NTSB report. In Alaska, such lack of hands-on skill is unthinkable in the cockpit, if not simply flat-out impossible. While pilot error continues to be a problem here, especially in general aviation activity, situational awareness is a requirement for the shortest and most basic of flights. Visual approaches for landing are common and often necessary in the bush, and are actively practiced even at the state's major airfields. A slavish devotion to instrumentation is something that Alaska flying has never required and as equipment and navigational aids are upgraded, the cautionary tale presented by the Asiana crash in particular is one that all pilots should take to heart.