October 2016

AIRCRAFT OWNER & PILOT

The official magazine of the Aircraft Owners and Pilots Association

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AIRCRAFT OWNER & PILOT

October 2016

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AOPA is a member of the International Council of Aircraft Owner and Pilot Associations.

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Chairman's Message

Supporting AOPA

By George Done

Aircraft Owner & Pilot frequently includes reports of AOPA's activity on key areas such as flight instruction, pilot licensing, aircraft maintenance and engineering. Focus is provided by specialist committees and working groups that stimulate constructive discussion. This month's magazine carries reports of the meetings of two such AOPA committees, the Corporate Members Committee and the AOPA Members Working Group.

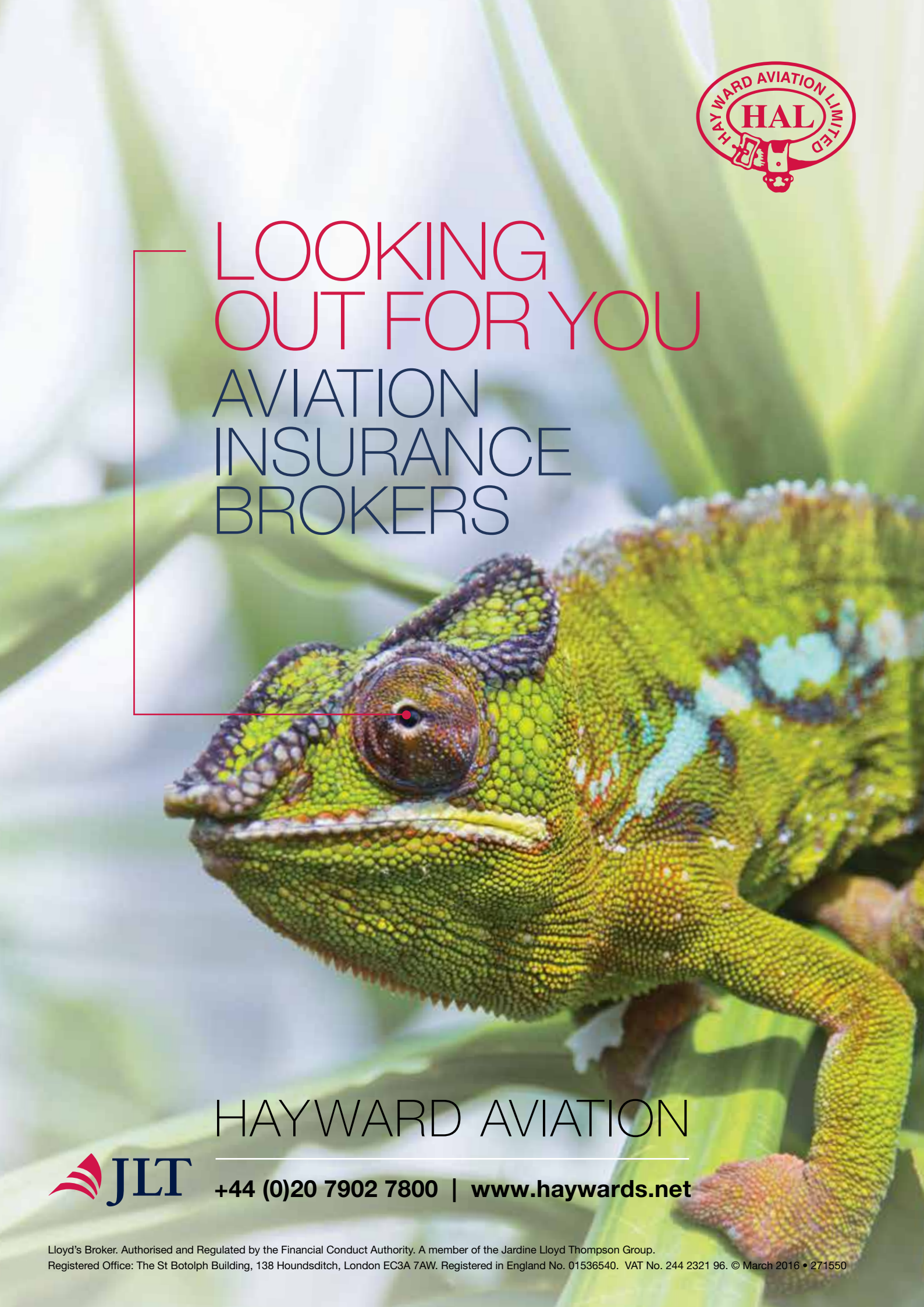
It is always a pleasure to meet AOPA members attending these meetings, and we appreciate their participation, recognising that it has to compete with many other demands on personal time. This is particularly so for the airfield managers, flight instructors and maintainers for whom the particular specialist meeting is a day out from earning a living.

"It is always a pleasure to meet AOPA members attending these meetings, and we appreciate their participation..."

The voluntary participation extends to our own board members, all of whom provide a significant service to the association through provision of advice to members, and/or chairing meetings. Their primary role, however, is concerned with the future viabilty of AOPA, particularly the financial aspect, culminating in the AGM which took place last month – the minutes and other data may be found on the AOPA website. But it is the discussion at the less formal specialist meetings that take place at regular intervals that are so valuable in determining future strategies.

The reason for this preamble is to encourage those who have thoughts and opinions about how AOPA should be helping its members, or determining its future role, to attend one of the AOPA Members Working Groups. These happen four times a year on a Saturday and often take place at White Waltham. But at least one or two a year are held elsewhere to enable wider member participation. It is a good way to learn about the latest developments in general aviation and, from AOPA's point of view, it is a potential source of future board members. *Any* member can attend - just let the office know beforehand.

The September meeting of the AOPA Members WG was held at Birmingham Airport, and the arrangements set up by Paul Kehoe, CEO of the airport and long-standing AOPA member, were impeccable, with many normally expected fees and charges waived, whether driving or flying in. It was a pity that the weather on the day was dire, rubbish visibility and low cloudbase, so nobody flew in. Nine members from the local area attended, outnumbering the regular attendees. One or two had been involved with AOPA long before any of the latter, including myself. The meeting room in Lancaster House overlooked the main 15/33 runway, and this stimulated some nostalgic reminiscences of the now defunct (it's a taxiway) shorter 06/24 used by the GA pilots then based at the aerodrome. AOPA board member John Walker spent several years as operations director at Birmingham and remembers it well! One memory that I came away with was from cursorily watching an inspection vehicle on the runway causing a Pilatus PC-12 to hold while already lined up. Out of the clouds then emerged an Emirates Airbus A380 in the throes of a vitally necessary go-around back into the murk. That was truly a sight to behold! While such excitement cannot be guaranteed at White Waltham, please think about coming along to the next meeting there of the AOPA Members WG on Saturday 12th November. We look forward to welcoming you!



AIRCRAFT OWNER & PILOT

Editorial

By Ian Sheppard

Effects of Controls!

I am glad to say I completed the flight instructor course at Redhill Aviation towards the end of last month. I have to thank the Honourable Company of Air Pilots for their support; we do need more instructors even if for those with busy day jobs, it's hard to fit in. But all pilots should be considering it, I think.

It's not an easy course but it is very enjoyable and stimulating. It's probably harder for someone who did their PPL 20 years ago, as it is a rerun of the course but sitting in the right hand seat, demonstrating the various exercises (from Effect of Controls to Introduction to Instrument Flying). But to say it improves your flying is a vast understatement!

My ability to concentrate seemed to decline towards the end with weather delays and work pressure building up, and a slight illness whcih made flying less enjoyable. Then with the "assessment of competence" it is very hard to treat the examiner as your student, and you can be psychologically thrown by any little thing that is different from the training. You are not used to flying with that person, for example, and getting an aircraft you've not flown for ages (with an ancient radio!) could be an unwanted distraction.

It is a shame PPLs need CPL theory to instruct the full PPL, but it looks like this requirement will soon go.

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Chief Executive's Diary

GA is global

By Martin Robinson

CEO of AOPA UK

As I write this we are approaching the Autumn Equinox and the end of another active season's flying (not to say you can't have some great flying weather in the winter, and brush up on your night flying too!)

19th July

I attended the 28th IAOPA World Assembly in Chicago – there were many discussions covering many topics of interest to GA worldwide. What is interesting is the common problems facing GA around the globe – from airspace access to loss of aerodromes, security issues to environmental ones, and fuel.

It is a unique experience and one which allows a genuine exchange of views – this ultimately led to IAOPA discussing Resolutions on the various issues, with votes being cast on whether to adopt each particular Resolution. In some cases we update, where appropriate, a Resolution that was passed at an earlier World Assembly – for example, 8.33 Radios goes back to 1996.

We also had guest speakers including Patrick Ky, EASA's executive director, Dr Liu, the secretary general of ICAO, and FAA administrator Michael Huerta. These high level delegates all made commitments to continue to work towards improving the regulatory environment for GA. The link between EASA and the FAA is an important relationship, as is the involvement of ICAO.

IAOPA seeks to ensure that GA has a voice at the highest level, and supporting the advocacy work that is done for GA is where part of your subscription goes!

2nd August

I met with Tony Rapson, head of the CAA's GA Unit, for one of our quarterly meetings. We had a discussion about Brexit and what the future relationship with EASA might look like.

I pointed out that AOPA has members on both sides of the argument and that we would represent our members' views equally, as it will be up to the Department for Transport (DfT) to decide what advice they will give to the department handling the details on Brexit (which is led by David Davis, Secretary of State for Exiting the European Union).

As I am sure you will agree, these are complex issues but I have said that GA deserves the best framework to support its future. It concerns me that we may end up in a worse position if the DfT/CAA does not handle this issue properly.

> ***"What is interesting is the common problems facing GA around the globe – from airspace access to loss of aerodromes, security issues to environmental ones, and fuel."***

There was a separate meeting on this subject with the DfT – the airlines have stated their position and their need to remain in EASA – whereas it may be possible for GA to operate under a national system. This may require the CAA staff members to increase and who will pay for this?

The other discussions touched on the ongoing Shoreham incident and 8.33 funding, where the CAA secured a 20% continuation to costs out of European funds.

Although August is a strange month workwise due to most of Europe going on holiday, AOPA and Helios received confirmation of funding from the GSA for Project GAGA (GNSS Approaches for General Aviation). This funding provides up to 60% of the necessary funds to establish LVPs (low visibility procedures) at 3 aerodromes.

2nd September

We had our 'kick-off' meeting with the GSA to cover project timelines. Philip Church and Ken Ashton are AOPA's project managers, both of whom are real experts in this field. This is an exciting development and we will keep you informed on a regular basis.

The NATS/AOPA/TRIG/FUNKE EVA project has come to an end. The project Manager, Bob Darby, who will be familiar to you, will provide a final report (see also his article, page 41).

I would like to thank Mark Watson of NATS and his team for really making this initiative possible. I think Project EVA has shown how working together with some financial support shows how good results can be achieved.

Other points worthy of mention:

- Air Displays are likely to see further reform pending the final outcome report into Shoreham.
- PLBs do not need to be carried in aircraft which are performing aerobatics – more to come from the CAA.
- The CAA is still discussing with the European Commission the SERA rules in Class D airspace.
- Infringements are still a hot topic between NATS, the CAA and the GA community.
- The Farnborough Airspace Proposal is still under discussion – more to come over the next few months.
- We are looking at a continued involvement with SESAR and how

Chief Executive's Diary (continued...)

we will become involved with SESAR 2020. The rules of engagement are, in my opinion, quite tough for anyone or GA body to comply with – more to follow…

Also, we continue to provide advice to individual members and this is one area where we can provide real value for money, often on a one-to-one basis.

6th September
The GBASF met to continue its high level discussion re strategic issues facing GA – Brexit was mentioned, no surprise there – but also issues around aerodromes, airspace, VAT on flight training and 8.33 were 'on the table'.

7th September
The Corporate Members Committee meeting took place at White Waltham – the level of discussion overall was very good. Brief reports of this and the Members Working Group on 10th September in Birmingham are included in this issue.

8th September
AOPA UK held its AGM at 50A Cambridge Street, London, where we reported back to members on many of the aforementioned topics.

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AOPA: Working for You

Members Working Group Meets in Birmingham

Birmingham Airport, Saturday 10th September.

AOPA continued its tradition of holding Members Working Group meetings around the country, this time visiting Birmingham International Airport. Unfortunately the weather wasn't kind so despite prior arrangements including waived landing fees and a discounted rate at ground handlers Marshall Aerospace, flying in was not an option for most.

However, as can be seen the meeting was well attended especially by the Midlands contingent, many of whom once flew from Birmingham but now have their aircraft at nearby Coventry (Baginton Aerodrome, EGBE).

Local members reflected on how it was a shame that Birmingham had all but shut out light aviation and lamented the decision to close the into-wind runway, 06-24. Now it just has the main runway, 15-33.

During a discussion about the benefits of membership it was noted that 60% of respondents to a questionnaire following infringements were not members of any aviation organisation. Chair Pauline Vahey said that more than half (53%) of AOPA members owned their own aircraft and around another 37% had a share in an aircraft, so it was not perhaps a typical organisation.

It was suggested that flying instructors could be encouraged to promote AOPA membership as soon as someone got their PPL, which was once common practice anyway.

Nick Wilcock gave an update on EASA issues (see page 14); John Walker gave an update on airfields (see page 12) and said he was liaising closely with GAAC; and then after lunch Bob Darby and John Korna from NATS updated members on LPAT trials (see page 41). The next MWG meeting will be held at White Waltham on Saturday 12th November.

LPAT device.

AOPA Corporate Members Committee Meeting

White Waltham Airfield, Wednesday 7th September 2016 (next meeting is 23rd November at WW).

The latest Corporate Members Committee meeting started with a discussion of ATOs and the new 'Declared Training Organisation' to effectively replace Registered Facilities (RFs). DTOs are likely to appear from 2018. This was quickly followed by the usual discussion about the instructor shortage, with one training school representative saying they were considering doing flight instructor so they could be assured a supply.

Martin Robinson brought up the issue of noise after the high-profile Denham case (*Peires v. Bickerton's Aerodrome Limited*) and suggested that the GAAC 'Fly Neighbourly' leaflets could be distributed again - several aerodromes have had an increase in complaints with people citing the Denham case (which was in fact about the tort of nuisance).

Then the impact of a possible third runway at Heathrow was discussed; apparently there has been no detailed impact study for GA airfields.

Other things discussed included GNSS approaches; the new ANO (e.g. allowing commercial operations at unlicensed aerodromes); the need to exempt pilot training from VAT; airfields under threat; the need to increase participation in the AOPA Wings scheme and Mentoring; SERA and UK exemptions re Class D; discussions on Brexit with the CAA/DfT; the costs of ARCs compared to permit aircraft; and, last but not least, CAA staffing issues.

PPL Corner

By Adam Winter

"Let's Talk Physics..."

Do you know the difference between momentum and inertia, stress and strain, mass and weight, kinetic and potential energies, work, power and force, speed and velocity, distance and displacement, heat and temperature, current and voltage? How about their units, or the measurements required to derive them?

Being pilots can give us the sense that as we are in control of our craft; we 'understand' its behavior, and the physics behind what we are doing. But understanding physics and having a good 'feel' or instinct for how an aircraft behaves are two very different sides of the coin; you can be an excellent pilot with little or no intellectual knowledge of the physics behind what you are doing.

I can't address all of the above, so will look at Newton's Three Laws of Motion. We will also look at inertia and momentum, and how they apply to aircraft and their contents.

There is an awful lot of physics going on when we fly. Thankfully, with Newtonian mechanics, there are only three measurements we are concerned with. They are distance, mass and time.

Distance is a measure of how far apart two things are, mass is a measure of how much 'stuff' an object contains, and time describes the order and duration of events. All other measurements (e.g. force, momentum, weight, acceleration) are a derivation of these.

For example, weight is a measure of an object's mass undergoing acceleration due to gravity, which in turn is a measurement of an increase in speed or direction change over a period of time. Speed is a measure of change in distance over time, and so on.

We should also be aware of the difference between a scalar and a vector. A **scalar** is a measurement with magnitude only. Distance, mass and time are all scalars. A **vector** has both magnitude and direction. So if we give distance a direction, it becomes a displacement, or giving speed a direction makes it a velocity.

Force is also a vector, with both magnitude and direction. I'm not particularly worried about a punch from Mike Tyson – unless it is directed at my face!

Newton's First Law

The First Law states that a body at rest will remain at rest and a body in motion will continue in a straight line (uniform motion) unless acted on by an outside force. This is often referred to as the 'Law of Inertia'. There is no unit or formula to describe it as such. Inertia is something an object has, and we can't change it. It can be thought of as a term describing how difficult or easy it is to get something moving (I'm not referring to 'Inertial Moments' that apply to longitudinal stability, these are considerations designers and engineers take into account, not us pilots).

So when you are pushing an aircraft back, the force you have to apply to get it moving is due to what we think of as its inertia. Other considerations such as if it is on tarmac or long grass and did you take the brakes off will also affect how inert it 'feels'. This is only partly true; we are not completely correct because if we were looking at a purely Newtonian inertial system (i.e. no friction and a fixed reference in space), it would start moving no matter what force we apply, but the acceleration would be different.

On the ground, friction and gravity become the law's 'outside forces' that are acting on the airplane, the 'body' initially at rest. The airplane's inertia is just the mass, it is a scalar, and we can't change it (unless we add passengers or fuel of course!) The heavier the aircraft, the more inert it is, but it will be harder to start moving because we have to overcome friction which opposes the force you are applying.

Newton's Second Law

The Second Law states that if you apply a force to an object, it will accelerate at a rate directly proportional to the force and inversely proportional to its mass. The formula describes this as well, but is usually written in the form F=m.a, or force equals mass times acceleration. The SI unit for force is thus $kgms^{-2}$, usually referred to as a newton. It is the force required to accelerate a mass of one kilogram at a rate of one metre per second every second. So after one second the object is moving at 1m/s, after two seconds, 2m/s, after 15 seconds 15m/s, and so on.

When considering accelerating an aircraft to take-off velocity we do calculations that obey the second law. How much force is required to accelerate this mass to 70kts (36m/s)? What distance will it cover over the ground and through the air? How much ground will it cover before it reaches 50 feet above that obstacle?

You use the graphs of motion from the aircraft's technical manual to calculate the take-off-run or distance. These are graphs obeying Newton's second law with a few 'real world' variables thrown in, such as temperature, pressure altitude and wind. Then you add factors for runway surface friction and slope.

When an aircraft is moving, it can be useful to think of its **momentum,** especially when it comes to stopping. Momentum is the product of mass and movement, of applying a force to an object for a period of time. Momentum can change with a change in speed or direction (velocity) as it is a vector. At the end of the trip, we think of the aircraft in terms of its momentum, because it is a moving mass (mass x velocity = momentum) and a force has to be applied for a period of time to stop it. This can be expressed as:

Mass x Velocity = Force x Time

This shows that the momentum of an aircraft can be viewed in two ways, in two different reference frames, and this can cause confusion. First there is the product of its mass and velocity through

the air. This is the speed the aircraft is flying according to the air speed indicator, and its direction, so is relevant for calculating stresses in a turn, for example.

From this perspective, when turning in still air or a stable wind, the aircraft's momentum is changing only due to the its change in direction, assuming its air speed remains constant. There is no *numerical* change to its momentum (although it is in fact accelerating, as illustrated in the diagram, below right).

During a turn in windy conditions, momentum change due to the wind is **only** by reference to the **ground.** One time to consider this momentum is when looking at the angle you are coming in on final approach. Your velocity, and thus momentum, can be considered to have components along two axes. One is the horizontal velocity which relates to the ground speed of the aircraft; the braking system will cope with that (which is actually an energy exchange–a whole other story).

"Understanding physics and having a good 'feel' or instinct for how an aircraft behaves are two very different sides of the coin."

The second is the vertical momentum (by measurement of vertical speed) that has to be overcome aerodynamically; if your vertical momentum is too great you will come down hard. You overcome some of this vertical momentum by rounding out (flaring), making your descent angle less steep and bringing your flight path parallel with the runway, before holding off. In this case, the momentum we are considering is with respect to the reference frame provided by the ground.

Wind shear also causes a change in momentum (this is just one way of looking at this situation), because it is a sudden change in velocity of the air surrounding the aircraft. If you are flying into a 40 knot headwind on final at 75 knots IAS, and the wind suddenly shears to zero, the aircraft can't instantly accelerate, so it will stall as the airspeed decreases to only 35 knots. Thankfully most changes in wind velocity are less abrupt.

Back to Mike Tyson. We can say that relative to the fist, his glove has zero momentum, but that is not very consoling when it hits you. It is important to tackle a problem from the correct perspective.

Newton's Third Law

The Third Law is the law of action and negative reaction ("To every action there is an equal and opposite reaction"). In other words, it states that all forces act in pairs, and the two forces are equal in magnitude and opposite in direction.

A simple example is to imagine lying on the ground and a person whose mass is say 75kg sits on your upraised hands. They are exerting a weight of about 750 newtons down on you, (the acceleration due to gravity being around 10ms-2, and then using F=m.a). In order to hold the person up (and assuming the acceleration due to gravity is exactly 10ms^{-2}), you have to be pushing up with a force of 750 newtons.

Exert 751 newtons or more and the person goes up, less than 750 newtons and they will go down. When you sit in an aircraft you exert a force of 750 newtons on the seat, and to support your weight the seat pushes back with the same force. At 60 degrees of bank you are pulling 2g (this means the force you feel from the seat is twice as much as the force due to gravity, which hasn't changed one iota). But – in your frame of reference – you are still sitting upright in your seat, and in the aircraft 'down' is still towards the floor.

Look outside, however, and down is very acute, while at the same time you feel as if you are being pushed outwards. Physics tells us that you are in fact accelerating towards the centre of a circle that the aircraft is flying around, and that in your trajectory, your actual velocity is at any instant straight ahead (see diagram).

Your body isn't pushing down on the seat. Rather, the seat is acting to pull you in to the centre of the circle. Imagine being a child swung around by your arms. In a similar way, you are being pulled into the centre of the circle that your trajectory is taking you around. There is no force pushing you outwards, just one pulling you in.

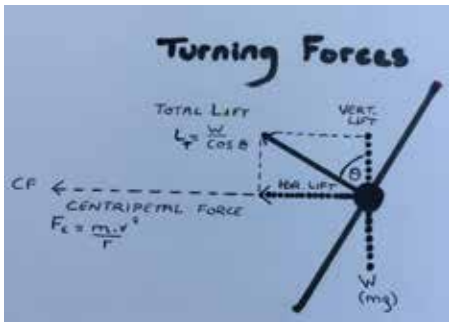
It's the same in an aircraft. The force that causes you to feel this push in the seat is called 'centripetal' and is caused by centripetal acceleration. This is an acceleration caused not by a change in speed but a change in direction, which therefore means the velocity is changing constantly even while its *magnitude* (i.e. speed) is constant.

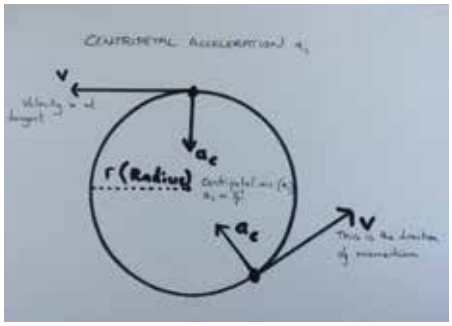
At face value, Newton's Three Laws of Motion are not hard to understand. However, they do describe steady state systems (that don't really exist in our universe, like ideal gasses, as they are just 'idealised' models to help us to understand, and to analyse).

To quote Walter Lewin, professor of physics at MIT, "Can the Laws be proven? No. Do we believe in them? Yes. Why do we believe in them? Because all measurement, all experiments are consistent with the Three Laws."

They describe a basis from which many more complex calculations can be made, and this is what makes them the essential starting point. I have stuck to a few simple applications of these laws. In aviation we know that systems are never simple or steady. There are forces lurking in the bushes that can cause chaos. They are applicable to all the situations we encounter and, as we know, these situations lead to endless discussions and arguments.

If you have any questions please e-mail adam.winter@aopa.co.uk. As well as a commercial pilot and experienced flight instructor, Adam is a qualified secondary physics teacher.





Airfields Update

Pictured: Wellesbourne Mountford.

JOHN WALKER provides the latest information relating to UK airfields (as of 6th September).

Andrewsfield

Braintree, Colchester and Tendring Councils are co-operating in developing a Local Plan for north-east Essex and have identified Andrewsfield airfield as one of four sites for potential housing in a new garden city with 10,000 homes. Public consultation on the proposals were completed in August 2016 and a definitive Local Plan is due to be issued for further consultation later in 2016.

Bourn

Site earmarked for 3,200 homes in current draft Local Plan by South Cambridgeshire District Council. The draft Plan is the subject of examination by a Planning Inspector with specific hearings on the proposals for Bourn airfield fixed for early 2017. Current site leases expire this year. Planning consent recently given for outside storage of shipping containers, plant etc. on the most useable runway.

Chalgrove

MoD owned airfield occupied and operated by Martin-Baker Aircraft being transferred to the Homes and Communities Agency. Site is one of seven being considered for a 3,500 home development in South Oxfordshire District draft Local Plan with definitive Plan being issued for consultation in November 2016.

Deenethorpe

The latest Joint Core Strategy for north Northamptonshire has identified Deenethorpe Airfield as a potential exceptional opportunity for development as an exemplar garden village with around 1,250 homes. The Brudenhall Estate, the site owner, who have supported the development, now need to produce a master plan for the site in accordance with the Core Strategy, for approval.

Dunsfold

Site owner has applied to Waverley Borough Council for mixed use development with 1,800 homes on site which area is in planning Core Strategy for employment purposes. After an extended consultation, the Council expect to determine the application in September / October 2016.

Elvington

York City Council Local Plan Preferred Sites Consultation document issued in July 2016 includes a development of up to 3,330 dwellings partly occupying the middle section of the Elvington airfield runway. Consultation period ends in September.

Halfpenny Green

(Wolverhampton Business Airport)

Aerodrome sold to MCR Property Group an investment and development company focused on commercial and residential real estate resulting in much speculation about the future of the site.

MCR are in the early stages of planning for the future of the airport.

Kemble

Commercial Estates Group (CEG) proposal to build a 2,000 home sustainable village on this 'brownfield' site as an alternative to the draft Cotswold District Local Plan proposal for a greenfield site near Cirencester. The draft Local Plan has been issued for public consultation and full Planning Inquiry into Plan and alternatives to it scheduled for late 2016.

Long Marston

Planning permission for 400 homes on site granted in November 2015. Airfield is in Stratford-on-Avon adopted planning Core Strategy for housing with up to 2,100 homes by 2031. Developer is Cala Homes in conjunction with site owner. Refer to entry for Wellesbourne below.

Manston

River Oak has given notice of intent to apply for a Development Consent Order for the aerodrome as a Nationally Significant Infrastructure Project.

The current site owners have submitted a planning application for a mixed use development with land earmarked as a park allowing occasional landings by Spitfire aircraft in conjunction with existing museums.

Thanet District Council has refused a different application by another party for change of use of airport buildings which will now be the subject of a full Planning Inquiry. The Council has also commissioned a study into the future of the site as an airport in support of their Local Plan submission.

Nottingham City (Tollerton)

With the support of the land owner, site earmarked for up to 4,000 homes

in Local Plan Core Strategy adopted by Rushcliffe Borough Council after approval from Planning Inspector.

Old Sarum

Site owner's proposal for housing development and 10 additional hangars amongst other work, objected to by various parties as detrimental to the sites heritage and potentially limiting use of the airfield. After prolonged discussion with Wiltshire Council, the proposal has been amended to delete the on-airfield accommodation and the amended application is the subject of further consideration.

Panshanger

Site originally earmarked for housing by Welwyn Hatfield Borough Council but final draft Local Plan reduces housing element and allows the opportunity for a realigned grass runway on land to north of previous runway 11/29. Plan currently open for public consultation and Planning Inquiry to be held in early 2017.

Plymouth

Central Government have commissioned a study into viability of reopening the airfield with a report now due sometime in 2016. FlyPlymouth, a local social enterprise aerodrome support group, plans to reopen the airfield by 2017 and start regional airliner services by 2018. Sutton Harbour Holdings, the site lease holder, has proposed a mixed-use development of the site although the current draft Local Plan retains the site for aviation. The final draft Plymouth City / South West Devon Joint Local Plan will be submitted to a Planning Inspector in January 2017.

Rochester

Judicial Review into Medway Council approval of hard runway, three new hangars and a new control tower postponed from November 2015, as Consent Order issued for Council to review decision at a special meeting (which has yet to be held). Enterprise Zone status granted for commercial part of the proposed site development.

Wellesbourne Mountford

Gladman Developments in conjunction with the owner have proposed a housing development with 1,600 homes on the site although the Stratford-on-Avon Local Plan Core Strategy has earmarked Long Marston airfield as a preferred housing development site.

The Core Strategy after approval by a Planning Inspector has been adopted by the Council and states that "The aviation related functions at Wellesbourne Airfield will have been retained and enhanced".

Tenants notified by owner that flying activities will cease on 24 December 2016. The District Council has agreed to fund a feasibility appraisal of the site to try and secure the future viability of the airfield for local businesses.

Wycombe Air Park

Site lease holder (Helicopter Aircraft Holdings Ltd), after prolonged discussions with the land owner (Wycombe District Council), has agreed a new lease. The Draft Local Plan provides for an industrial / warehousing complex on south-eastern part of the site, potentially resulting in loss of a runway and relocation of gliding activities. The Council expects to submit a final plan after public consultation to the Planning Inspector in March 2017.

RAF Wyton

Airfield site being disposed of - Defence Infrastructure Organisation and local property developer Crest Nicholson have a proposal for up to 4,500 homes on site with planning application expected to be lodged in late 2016. Site earmarked in draft Huntingdonshire District Council Local Plan for mixed use development including housing.

MoD Sites

RAF Hullavington airfield, the former RAF Wethersfield and RAF Wyton airfield (see below) now being disposed of by MoD along with sites currently occupied by USAF at Alconbury, Molesworth and Mildenhall.

Further airfield sites expected to be declared as surplus resulting from the current review of the MoD estate which was due to be completed in September 2016 but is expected to be delayed.

Halfpenny Green. Follow the blue line to the café!

Regulatory Update

By Nick Wilcock

8.33 RADIOS...

Hopefully, by the time you read this, the CAA will have announced the application process for obtaining funding assistance for updating aircraft radios to 8.33kHz channel spacing. We've been discussing the fairest way to allocate the available funds with them and they've advised us that they've been thinking along similar lines. You'll be pleased to learn that the Authority is absolutely adamant that none of the funding will be wasted on complicated administrivia, their clear aim is for funding to be given to the GA end users and no-one else!

However, it has come to our attention that some pilots, who have already acquired 8.33kHz channel radios, don't actually know whether the 8.33kHz function has been enabled. Some radios, such as the Trig TY96, have front panel indication of whether 8.33kHz or 25kHz has been selected and a simple means to switch channelling, but others do not.

Neither is selecting 8.33kHz very simple for those not familiar with menu-driven configuration selections. For example, with the Garmin GNS430, you have to select the AUX page group, then select SETUP 2, enable the cursor, scroll down to 'COM Configuration', select that to view the channel spacing field, select 8.33 and press ENT.

Not all that difficult if you're familiar with the system, but not something you'd want to have to learn in flight, I would suggest!

Once you've selected 8.33kHz, there should be no real need to change it. So if you're not sure whether or not 8.33kHz has been enabled in the radio of the aircraft you're about to fly, do check before you find yourself being unable to select the frequency you've been assigned. If you're not sure how to check, ask someone who does; all instructors should make sure that they can brief pilots accordingly.

CLASS D AIRSPACE (& SERA!)

I was quite surprised recently, shocked even, to hear an experienced commercial GA pilot expressing the view that it is only necessary to make contact with the ATC unit controlling a Class D CTR in order to enter the airspace under VFR. Well, perhaps that's the case in Trumpland, but NOT in the UK.

A pilot MUST receive positive clearance to enter a Class D CTR; if no clearance has been obtained before reaching the zone boundary, then you MUST REMAIN CLEAR OF CONTROLLED AIRSPACE!

While I'm on the topic of Class D airspace, perhaps it's worth noting a few points about the UK exemptions from SERA. As most will know, if you're flying an aeroplane under VFR in Class G, you can do so down to 1500m visibility, provided that you're clear of cloud, in sight of the surface and flying below 3000ft amsl and 140KIAS.

But under SERA, the 'clear of cloud, in sight of the surface' clause and the 1500m visibility limit do NOT apply in Class D - you have to fly at least 1000ft vertically and 1500m horizontally clear of cloud, with a flight visibility of not less than 5km. However, for some time now the UK has filed an exemption in UK airspace; although the 5km flight visibility remains, aeroplanes may be flown under VFR in Class D airspace by day provided that they are flying clear of cloud and in sight of the surface at 140KIAS or less - and have received clearance to fly in Class D, of course!

Another SERA requirement which affects VFR flight in Class D and from which the UK does not have an exemption, is SERA.5005(b), which states that, under VFR, an aircraft may neither take off nor land, nor enter the ATZ or traffic circuit at an aerodrome within a control zone, when the reported meteorological conditions at that aerodrome are below 1500ft ceiling and 5km ground visibility.

So, imagine you've taken off from an aerodrome in a Class D CTR in '9999' visibility with scattered cloud at 1800ft, but by the time you return the cloud has become broken at 1400ft. Even though you can very probably see the runway from miles away, SERA has decreed that you cannot enter the ATZ under VFR. If you haven't got an instrument flying qualification, you cannot request an IFR clearance, so what to do next? Do you have divert to somewhere more sensible? No, fortunately not necessarily. You can request a Special VFR clearance if the weather conditions are no worse than 600ft ceiling and 1500m ground visibility - and you can fly down to 1500m visibility provided that you are at or below 140KIAS, clear of cloud and in sight of the surface. If the ATC unit refuses to issue an SVFR clearance, please let us know!

NOTE on SERA

As we closed for press, ORS4 No.1159, a general exemption from the requirements of SERA.5010 (Special VFR in control zones) when flying within the UK in accordance with the conditions specified, had just expired. We have asked the CAA whether it will be re-issued, as under SERA.5010(b)(1), SVFR at night in Class D CTRs has to be 'permitted by the competent authority'. ***More importantly, with ORS4 No.1158, a general exemption from the requirements of SERA.5001 (Visibility and Distance from Cloud Minima - allowing us to be "clear of cloud with the surface in sight") when flying within the UK at or below 3000 feet a.m.s.l. within Class D airspace, this was re-issued on the day we closed for press, 29th December, as ORS4 No.1195.***

MEDICAL MATTERS: Time for a LAPL?

Article 163 of the Air Navigation Order 2016 has introduced some changes with respect to medical requirements for 'legacy' UK PPL and NPPL holders. These permit such pilots to make a medical declaration using the on-line form SRG1210; although under the Article such medical declarations are only valid for use within UK airspace (or anywhere else where so permitted); and for flying non-EASA aircraft, a derogation is in place which extends the use of medical declarations to include EASA aircraft flown by 'legacy' UK PPL and NPPL holders until April 2018, but again only within UK airspace (or anywhere else where so permitted).

The standard which must be met is that of the DVLA Group 1 Ordinary Driving Licence, provided that the licence holder does not suffer or has not suffered from specified 'disqualifying medical conditions'. These are shown in the box (right).

Pilots affected by 'disqualifying medical conditions' will need to apply for a LAPL Medical Certificate through an appointment with a UK CAA-certified AME.

To complicate matters yet further, pilots using the existing NPPL medical declaration system will, when their current medical declarations expire, also have to change to the new system. This means that some pilots who have been happily using the present system for many years may consequently need to consult an AME.

Also, under Art.150(7), pilots who hold Part-FCL licences may also make a medical declaration in accordance with Art.163, but only within the scope of Art.152 and Art.163(5) - in other words, only for non-EASA aircraft within UK airspace (or anywhere else where so permitted) and for flying with up to three passengers on board and in aircraft up to the MTOW limit of the rating or privileges of the licence.

Regrettably, the CAA website and table of requirements are, at the time of writing, self-contradictory, so with the Authority's help we will be attempting to unravel the confusion over this new system in the coming weeks.

With the ending of the derogation concerning EASA aircraft being flown by 'legacy' UK PPL or NPPL holders now less than 18 months away, the perceived attraction of Art.163 will probably be of benefit only to a minority of licence holders in the UK. If you cannot hold a Class 2 medical certificate, perhaps now is a good time to consider simply regrading your licence to a LAPL, which is valid throughout all EASA Member States and may be used to fly both EASA and non-EASA aircraft?

Disqualifying Medical Conditions:

- Being prescribed medication for any psychiatric illness.
- Bipolar disorder, psychosis or a diagnosis of personality disorder.
- Drug abuse or alcohol misuse or addiction (or conviction for drink/drug driving).
- Being prescribed medication or treatment for angina or heart failure.
- Cardiac surgical procedures including cardiac device implantation.
- Recurrent fainting or collapse (syncope).
- Unexplained loss of consciousness.
- Insulin treatment.
- Chronic lung disease with shortness of breath on exertion.
- Any neurological condition requiring medication.
- Seizures or epilepsy.
- Significant functional physical disability likely to impair safe operation of normal flight controls.

GA News Roundup

BHA President Calls For Post-Brexit Reassurances

The President of the British Helicopter Association, The Lord Glenarthur, has called on the Government to do all in its power to ensure the voice of the UK's aviation expertise is not wasted, as the country withdraws from the EU.

Speaking during a House of Lords Debate on Tuesday 5th July, The Lord Glenarthur said: "A reduction in our influence on aviation regulation will be massively detrimental. Our expertise will be missed and its loss much regretted by those EU countries with whom we have worked so closely and for so long."

He outlined the substantial role the UK has played within European-wide aviation safety and regulatory organisations including its membership of the European Aviation Safety Agency (EASA), through the Civil Aviation Authority.

He said: "The United Kingdom has played a substantial part in getting EASA to a point where it is mature and successful. I have had some direct personal experience of that through bodies with which I have been involved over the years. We have brought influence to bear to support sensible progression in regular and sometimes innovative fields of aviation. We support strict safety regulations but we also strive continually to influence the authorities to ensure that regulations are practicable, well thought through and able to maintain the viability of emerging advanced techniques in aviation.

"However, the United Kingdom, acknowledged as expert in its aviation manufacturing and operating standards and skills, may well not be able to play anything like such an effective part in future, by virtue of its withdrawal. Who knows, we might not ultimately even be a member of EFTA (European Free Trade Association) or the EAA (European Aviation Area). Then where would we stand? All I can say is that our withdrawal would be much regretted."

HOLLY PALMER-DAVISON AWARDED SIR GEOFFREY de HAVILLAND FLYING SCHOLARSHIP

The third Annual Worshipful Company of Coachmakers and Coach Harness Makers Sir Geoffrey de Havilland Flying Scholarship has been awarded to Peterborough-based photographic retoucher Holly Palmer-Davison. "Thanks to the Worshipful Company of Coachmakers and Coach Harness Makers for this amazing opportunity. I am so excited for what lies ahead and can't wait to get cracking with my flight training at Cambridge Flying Group. I am truly honoured," said Holly.

It was impossible to resist taking a picture of this aircraft (taken during the recent Members Working Group meeting at White Waltham) in the context of Brexit and the questions raised by Lord Glenarthur and others. Clearly not being able to influence EASA regulations would be detrimental to the UK/CAA but opinions seems to be unanimous in stating that we have been through a lot of pain with EASA and wecould be on the home straight so it is not really a sensible option for the CAA to go it alone again. But that debate is still to play out, and the decision has not been made yet.

> ***"A reduction in our influence on aviation regulation will be massively detrimental"***
>
> ***- Lord Glenarthur, president of the BHA.***

He continued by calling for assurances that "as part of the withdrawal process, the Government will do all in its power to ensure that the influential and powerful voice of the UK's aviation expertise and the experience of our own Civil Aviation Authority – and those who work with them – are not wasted or become less influential as we withdraw from the EU. A reduction in our influence on aviation regulation will be massively detrimental. Our expertise will be missed and its loss much regretted by those EU countries with whom we have worked so closely and for so long."

Major The Rt. Hon. Simon Mark Arthur, 4th Baron Glenarthur, has been president of the British Helicopter Association since 2004. He was chairman of the European Helicopter Association between 1996 and 2003 and of the International Federation of Helicopter Associations from 1997 to 2004.

Plymouth Firms Up Plan

A public meeting was held at Plymouth Airport at the end of September with CEO of Fly Plymouth, Raoul Witherall, presenting a solid timeframe for reopening the airport. He said a DoT study was due shortly but this should not affect the local process – the Joint Local Plan received 90 votes for the airport, and only four against. A new advisory panel has been set up with six aviation experts, including Laurie Price and Alison Chambers. Next July the Plymouth Plan will be examined in public and before that there will be a pre-submission consultation period; a final decision is expected around the end of September 2017. GA is being put high on the agenda in the plan "because it is an easier case to make on a policy level," i.e. it is the first step towards establishing scheduled aviation, said Witherall. There is a business forum on Tuesday 11th October, and public meetings on 10th January, 28th March, 27th June and 26th September 2017. A new website can be found at www.flyplymouth.com and the crowdfunding page for those that wish to help is: http://crowdfunder.co.uk/flyplymouth2017

Safety Information Ruling

According to the AAIB, on 28th September the High Court handed down its judgment in the case between the Chief Constable of Sussex Police and the Secretary of State for Transport (relating to the Shoreham Hunter accident in 2015). Sussex Police applied to the High Court for the disclosure of records that are given a protected status in law.

Sussex Police applied for the disclosure of: statements made by the pilot to the AAIB in response to discussions or interviews; film footage of the flight which was made by cameras which had been installed on the aeroplane in question on a voluntary basis; and material which has been produced by various other people subsequently, such as experiments conducted and tests done on various aspects of the accident.

The judgment refused the application for disclosure in this case except in relation to the film footage from within the aircraft. The order to disclose materials is subject to a number of conditions. A spokesperson for the Air Accidents Investigation Branch said: "The AAIB is not able to release protected air accident investigation records of its own accord. Only the High Court can allow for their release. We note today's judgment and will now release the film footage to the Chief Constable of Sussex Police." See also article on the AAIB, page 32.

e-Go For Sale

The owners of e-Go aeroplanes Ltd have stated that they do not have the funds to carry on without outside investment. Meanwhile Terry Holloway, a long-time director of Marshall of Cambridge (Holdings) Ltd, has taken over as chairman from Malcolm Bird, following the appointment of William Burnett as chief executive in May and Richard Clabon as production engineering manager.

e-Go aeroplanes exhibited at AeroExpo, Sywell, in early July. The next AeroExpo will be held at Wycombe Air Park, 1-3 June 2017.

The e-Go is a single seat de-regulated (SSDR) aircraft for the sports and leisure market. The first customer's aircraft was delivered in June and the company is seeking funding to transform the business into a full production company.

Malcolm Bird said, "I have been deeply involved in e-Go aeroplanes since it formed in 2011 and, although I will be standing down from board work, I will be remaining as a volunteer to help with project work." William Burnett said, "Terry Holloway is a very experienced and accomplished pilot and a well known business figure within the Cambridge community. I am delighted that he has agreed to become chairman of the board and I very much look forward to working alongside him and developing the company." The single-seat e-Go design has evolved from the winning design in the high-tech category of a

competition run in 2007 by the LAA. Deregulation by the CAA now means that aircraft manufacturers can develop single-seat aircraft of up to 300kg MAUW (maximum all up weight) with the minimum of red tape and delay. e-Go costs just £15 per hour to fly, claims the company.

New ANO 2016

The updated Air Navigation Order 2016 that entered force in late August puts in place the legal basis to help simplify the GA regulatory framework, says the CAA. "It formalises many of the changes we have already made since we took up the government's Red Tape Challenge, and will help make the rules easier to understand," said Tony Rapson, head of the CAA's General Aviation Unit, "

The 2016 ANO provides the foundation for a simpler and more proportionate approach to the regulation of many GA activities that fall under national (and not European) regulation. The structure has been substantially changed to help pilots (and others involved in the operation of non-EASA aircraft) find the information that they need more easily.

Scope, applicability and key definitions are now set out at the front. Derogations, or exceptions as they are known in UK law, that apply to a number of GA activities have also been moved close to the front. Some terms have also been changed to match those used by EASA and help make rules clearer to understand, while sections of the Order have been organised to follow regulatory functions, like airworthiness, operations and licensing. The Air Navigation Order 2016 is available to view online: www.legislation.gov.uk/uksi/2016/765/contents/made. More information about the contents and restructure of the ANO 2016 is available on the CAA website.

Urgent Action on Drone Safety Required, Says ERA

The European Regions Airline Association (ERA), together with ECA, IATA, EHA, ACI EUROPE, IACA, A4E, IFALPA, IFATCA and CANSO, have jointly called for a number of urgent measures to be taken to ensure the safe operation of drones and to preserve the high level of safety in European airspace. See http://www.eraa.org/policy/airspace/remotely-piloted-aircraft-systems-rpas).

Carl Aero and Air Plains Join Forces for 182 Engines

Carl Aero, located in Germany, has agreed to cooperate with Air Plains Services, of Kansas, on Cessna 182 engine enhancements. Air Plains specialises in engine performance upgrades for Cessna 172, 180 and 182 aircraft and although it is located in central US, the company can ship upgrade kits worldwide.

Offered for the Cessna 182 is a performance package that replaces the existing engine with fuel injected Continental IO-550 engine, new propeller, and a 300hp performance kit.

The conversion has proven to be extremely popular among skydive operators, says Air Plains, as it drastically reduces operating costs while increasing efficiency. Typically, a stock 182 requires 35 to 45 minutes per lift while the Super Skydive 182 will do the job in 15 minutes at only two thirds of the cost.

Meanwhile in Europe, noise is a key issue. With the conversion, the noise footprint of the steep climbing Super Skydive has been reduced to a fraction of the stock 182.

Aviation Artists Triumph Again!

Missed it again? Always wonder what picture won? The Guild of Aviation Artists held its 46th annual exhibition at the usual venue of The Mall Galleries – just inside Admiralty Arch – yet again, during the hottest week of the year, opening on the 18th July, 2016. This year a record 146 aviation artists competed, displaying 438 original works of aviation art which were professionally hung and presented by the staff of the Mall Galleries.

The Aviation painting of the year 2016 went to Keith Burns GAvA with his very emotive painting Nr39, entitled 'CO-OPERATION.' His canvas showed a typical WW2 scene at a home bomber base where a badly damaged, four engine bomber, had just landed following a raid on Germany. Painted from the artist's eye view deep inside its dark and foreboding hanger home, showing medical personnel carrying injured aircrew from the thick black smoking aircraft to a very welcome ambulance in foreground. Above we see the fighter escort which must have escorted this wounded warrior to the relative safety of its home base.

Andrew Latham, the new chairman of the Guild of Aviation Artists, opened the exhibition with a warm welcome to all present including distinguished guests, which included the Deputy Lord Mayor of Westminster, Cllr. Louise Hyams, the Guild Patron, Air Chief Marshall Sir Glenn Torpy GCB CBE DSO ADC BSc (Eng) FRAeS FCGI, the president Michael Turner FGAvA, and Hugo Trotter. Andrew then expressed his thanks to the out-going chairman Graham Cooke (now known as the Dowager chairman), admitting that, while he had watched him during his seven years as president, nothing prepares one for the sense of privilege and pleasure to be in the midst of the best of original aviation art, its artists and supporters. He continued, "We're all aware I'm sure, of the resources it takes to mount such a display as this around us. Our thanks therefore must go to the Guild's sponsors, drawn from the cream of the aviation industry, for their support in so many ways, including financial, and to all those members and friends of the Guild who give so freely of their time."

Scott and Campbell Black 1934 by Denis Pannett FGAvA won The Alex Henshaw Trophy.

And, finally, "a very special vote of thanks goes to Tony Cowland for chairing the selection panel for many years and who is now standing down – thank you Tony for a truly committed and consistent presence." The president, Michael Turner FGAvA, then made a final presentation of Honorary Associate certificate to David Gibbings MBE, who was a founder Associate of the Guild.

Air Chief Marshall Sir Glenn Torpy, as the Guild Patron in his official foreword began by reminding us that 2016 was already an "interesting"year. Her Majesty the Queen celebrated her 90th birthday and became the longest serving Monarch, which gave the Royal Air Force an opportunity to fly the largest ever formation of aircraft in her celebratory flypast. Nevertheless, the Queen's enthusiasm for aviation was very evident from her enormous smile during her 90th birthday flypast over Buckingham Palace.

The Guild of Aviation Artists is blessed with an abundance of artists who have the skill and imagination to bring it all to life.

We are also reminded how the Royal Family has been staunch aviation supporters; the Duke of Edinburgh, Prince Charles, The Duke of York and more recently Prince William and Prince Harry are all accomplished pilots.

Unfortunately, the F-35 Joint Strike Fighter was not able to join the formation but later proved to be a great success at the Farnborough Air Show. The addition of this fifth generation fighter will significantly advance the RAF's frontline capability and will also, I'm sure, provide ample new material for many members of the Guild of Aviation Artists. The European Union referendum has seen us heading out of the EU and across the Atlantic Ocean the United States of America is involved in a Presidential election campaign, which is defying conventional wisdom.

The Guild has an important role to play in capturing the sense of adventure, the thrill and the innovation associated with flight, such as Tracey Curtis-Taylor's recent re-enactment of Amy Johnson's historic flight from the UK to Australia.

There is certainly no shortage of inspiring material – and I know the Guild of Aviation Artists is blessed with an abundance of artists who have the skill and imagination to bring it all to life. We are, therefore, set for a bumper year, which I hope you all enjoy.

Preparation for this 2016 exhibition began soon after last year's closed and in May the new chairman Andrew Latham, and over 65 helpers on submission day, got down to the delicate job of viewing all the entries. In just one day they viewed well over 500 works of aviation art and selected the 438 that were to be displayed at the exhibition. These were then photographed, recorded and stored on the upper level of the Mall Galleries until the day of hanging. The pictures get a very thorough critique in the process, with much comment from all present, which included a very strong critique from the Welsh contingent. This added another level of scrutiny to that which the initial selection panel had already given. They were then viewed by Tony Cowland (chairman of the final selection panel) who has resigned following many years in this position. He was thanked by all for a truly committed and consistent presence.

A complete list of all the various winners and highly commended is available, but limited space dictates that I can only record the winners and their very generous sponsored trophies.

Finally, because I truly appreciate a canvas which displays action, movement and third dimensional depth, my private and personal writer's award goes to Ronald Wong FGAvA, with his action packed 'FULL TILT' (Top).

LIVERYMAN Dr. JOHN McADAM PhD MA BA(Hons) FRGS.

Stricken Sailor by Jack Harding, won the Arthur Gibson Memorial Trophy.

The King of Glencoe by Anthony Lawrence, AGAvA won the Leonardo Helicopters (formerly AgustaWestland) Award.

Also: Best Group of Paintings was won by Chris Draper GAvA (Nr's 118-123).
The Last Raid, by Simon Mumford GAvA, won The de Havilland Aircraft Museum Trophy.
Fleeting Glimpse by Tony Cowland FGAvA, won The Monarch Airlines Prize.
And I'll Take the Low Road by Alex Hamilton GAvA, won The RAF Museum Prize.
Nr's 74-76 by Trevor Colgate won The Bonham Trophy and Award.
Rutland at Jutland by James Field AGAvA won the Cross & Cockade International Award.

Solo by Paul Couper AGAvA won the EJ Riding (1916-50) Memorial Prize.

Back to Base Warranty by Kai Choi AGAvA won The Messier-Bugatti-Dowty Trophy.

Dragon's Dale by Roger Murray GAvA won the 'Flypast Fellows award for Excellence'.

Twilight Thunder by Simon Mumford GAvA won The Sir George Edwards Memorial Plate.

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Long Haul in the USA

David Hastings spent many years making an annual flying pilgrimage to the USA. Luckily he kept a diary of the first trip!

While working as a Governor for the 2nd Air Division USAAF Memorial Trust I met David Patterson, a great B-24 Liberator pilot who was still flying his own superb Cessna C-337 Skymaster six-seat executive twin.

He suggested that as a British PPL I might enjoy flying in the USA as I already had the C-337 on my licence, so I completed my check-ride, attended a mountain flying course, sorted out the licences and was ready to go.

He mentioned that next year we both had to attend a 2nd Air Division Association Convention at McAfee in New York. Instead of flying scheduled airlines he wondered if I might like to see if I could get the C-337 all the way across the USA from San Francisco to New York and back. Well, what could I say but "Yes Please" – and so my flying in the USA began.

The next year saw what was to become the standard pattern for each visit to the USA. After a rest from the transatlantic flight, I would be at Pacific States Aviation at Concord Regional Airport in the San Francisco bay area to settle back into the Cessna C-337 and have my usual 2-3 hour check ride with David, including stops at Sacramento, Tracy, Salinas, Monterey and ending with an ILS at Stockton, so he could see if I had picked up any bad habits back in the UK.

Then we had a very thorough flight planning session for my first long-haul trip in the USA, where I found how easy the navigation would be, hopping from VOR to VOR beacon (VHF Omni-directional Radio range beacon) on the low-level airways. Equally, I also realised that if you are going anywhere east you first have to cross the awe-inspiring Sierras.

The day before we departed, we planned a quick flight to Sacramento and the main FAA Met Centre for a face to face briefing from the senior Met man on our route to New York and I encountered one of the very few problems I would have on the C-337.

We departed Concord and as we entered the low cloud over the bay and selected "gear up", we heard a loud bang and smelled hydraulic fluid.

"I also realised that if you are going anywhere east you first have to cross the awe-inspiring Sierras."

David's first trip was flying a Cessna 337 ("Sarah") from San Francisco to New York.

The undercarriage lever just stayed in mid-position and on the Cessna David had fitted a mirror under each wing, so you could see the nose and the rear engine. The main wheels were up and doors closed, but at the nose the wheel was only half way up and the doors open. Luckily on the transatlantic flight coming over, when I always read the C-337 Flight Manual, I had noted that in the case of a complete loss of hydraulic fluid, there is always enough left in the sump to manually pump the gear down.

The Sierra Mountains that run along the border between California and Nevada.

So we made a Pan call and were cleared to descend and return to Concord. After pumping for what seemed ages, the main wheels appeared as did the nose wheel and we got the green lights. David wisely decided that it was a landing he should make, so we changed seats and it was impressive to see all the fire trucks following us down the runway.

Back at Pacific States Aviation and the chief engineer was horrified to see all the port side of the aircraft covered in red hydraulic fluid. On lifting the cowling of the front engine, we saw that the hydraulic line, on what was a recently installed new engine, had sheared at the metal union. No problem, said our great chief engineer, you go and have some lunch and then you can do the air test on your way to Sacramento! He was as good as his word and when we returned after lunch Sarah was spotless with a replacement line fitted.

So, airborne again into the low cloud for my first ILS for real at Sacramento, followed by talking with a great Met man and it all looked good. We planned to do our flight to New York the easy way, flying in four hour legs taking 3/4 days with no night flying and was I excited.

The next day I was up very early to check on the Met and then drive down the Freeway to Concord, calling at a Doughnut House for breakfast on the way. At the airport it was a superb golden dawn, with Mt. Diablo standing out bright and clear and Pacific States Aviation had already wheeled Sarah out of the hangar, refueled and polished her. The four rear seats had been removed so we had plenty of room for all our charts, luggage and the survival kit needed for the Sierras.

We file our flight plan, load all our gear and food on board and then carefully pre-flight Sarah. Was I really going to fly her all the way across America?! That's the equivalent in Europe of going to Afghanistan and back.

It was 0715hrs and I start engines at the beginning of my greatest flying adventure yet, thanks to David Patterson. We taxi out before the big jets are moving and the tower wishes us "bon voyage". We are cleared to the hold at runway 19R, where I complete my engine run-ups and pre-takeoff checks under the watchful eye of David and then at 0745hrs we are airborne. We carry out all our after takeoff checks and then start a gentle turn to starboard, with San Francisco still hidden below us in the early morning fog. We are handed over to Oakland Center as we cross the Sacramento River, climbing up 5,500ft and heading east for New York over 3,000 miles away, on airway Victor 6.

Into the High Sierras

Now we can see the forecast weather front across our route, as we approach the foothills of the Sierras, climbing hard to our new assigned flight level of 95 and I get my first taste of the rough air and rain, as we run in between the cloud layers. Suddenly as we approach the Lake Tahoe VOR, we break out of the clouds, as we streak towards the glowing sun in the east – and what a morning to be alive! We are settled comfortably into the cruise at 170 kts with both engines leaned back to give us just over 12 gallons an hour on each, slightly different from the 23 gallons per hour on take-off! Navigation is easy in the perfect weather and we pass the VORs with such wonderful names as Battle Mountain, Lovelock and Wells.

Time for our first coffee and snack as we settle back at FL115 talking to Reno, but with not another aircraft in sight at our altitude. David does the navigation while I just enjoy the flying. One thing I have not mentioned is that when I first started on the C-337, David said that when I flew his aeroplane I would indeed fly it as the circuit breaker for the autopilot would be pulled, so it's work all the way, with the usual regular scan of all the instruments to check that everything is "in the green" (instruments reading in

the green safe sector). We pass ridge after ridge in this amazing part of America with not a soul in sight, no roads, no buildings, no people, just wild mountain scenery and you wonder just how the original settlers ever crossed the Sierras on foot. This is all so new to me.

At 1000hrs we fly over another ridge and begin to see the famous Bonneville salt flats of car racing fame, and somewhere down below was the old wartime airfield of Wendover, where we are planning to stop. David arranged this as it was here that the 467th Bomb Group from my airfield at Rackheath first formed before flying to England. He thought I would enjoy this piece of history, as well as my first mountain desert airfield landing, with the airfield elevation of 4,240 ft. Suddenly the field appears in the distance, so we talk to the tower who clear us to land on runway 12. I started the descent in extreme turbulence – very hard work. David reminds me of the mountain flying course lectures on high altitude, high temperatures and rough air.

We have a normal circuit speed of 110kts coming back to 90kts on the approach, so I add another 10 kts just to be safe. This is the first time in my life that I have been really thrown around by rough air in the circuit, but David seems happy and at 1040hrs I make a passable landing at this deserted airfield in the heat of 108 degrees. We taxi up to the tower and are met by a very friendly FBO (Fixed Base Operator), whose Cessna 172 is the only other aircraft on the apron. He refuels Sarah, cleans her windshield, offers us coffee and takes our photograph. I gather I am the first English pilot he has seen at the field. My first experience of the flight line service that we will enjoy on all our flights in the USA. We walk over to the old wartime hangars and you can almost hear the roar of the B-24s and feel the wartime atmosphere. Also on the field is a detachment of the National Guard, flying jets and helicopters.

We pre-flight Sarah before starting up for the next leg of our journey, which is to the mountain airport at Rock Springs. My first high-altitude take-off works well and we cross over the white Bonneville salt flats, climbing to FL95 (9,500ft) in the very rough air. We are now dropping at times nearly 500ft,

XB-70 Valkerie at the National Museum of the US Air Force, Wright-Patterson AFB, Dayton, Ohio.

before we come up with a massive bump, and I begin to wonder how much more the aircraft can stand before the wings come off. However, David assures me that Sarah has been doing this for years and I am not to worry. Next we pass over the beautiful Salt Lake, which is quite stunning, before we talk to Salt Lake International airport and another friendly greeting after hearing an English voice. We manage a quick soft drink from a non-spillable carton, before once more we are above the mountains, really being thrown about, but I seem to be getting used to it and David just smiles at my attempts to keep us right way up. His comment of, "Let the old girl cope on her own" seems to be the best way, but this is all something frighteningly new to me.

Wendover (on the Nevada/Utah State Line) was more of interest to me because it was a wartime airbase, rather than the nearby Bonneville Salt Flats.

Then at 1300hrs Salt Lake Centre hands us over and we are talking to the Tower at Rock Springs, who advise us of extreme turbulence on the approach - gee, how can it be worse than the rough air we are in now!

The airport elevation is 6,760 feet and I have to get used to not having QFEs (altimeter setting to read zero on landing), but mentally adding the circuit height on to the QNH elevation (altimeter set to height above sea level).

The tower clears me for the 10,000ft runway of 27 and I start the descent, with David reminding me once more of the mountain flying rules, but he seems happy. The tower were certainly right about the extreme turbulence on the approach and even with my 20 knots extra, I find it extremely hard to fly a steady approach. Mind you talk to Sarah nicely and leave a trickle of power on the rear engine at the flare and you can make quite a good landing, despite the strong cross wind. We taxi in to the ramp and shutdown, but even here the Cessna is being rocked about.

We refuel and enjoy a pleasant coffee in the FBO crew room and again everyone is so friendly. Back out to Sarah, a careful pre-flight and then we start up, with David briefing me on the high altitude crosswind take-off procedures and at the hold for runway 27 we lean off the mixture on the ground to ensure max-power.

The Cadet Chapel at the United States Air Force Academy north of Colorado Springs.

At 1310 hrs we are cleared for take-off and I must admit that I am not very happy. Still, other than using a lot of the runway before she wanted to fly, we are away once more on airway Victor 4 and climbing back up to flight level 125 as we go on to oxygen. This is an amazing world and the scenery just wonderful. For more than an hour we just watch the cloud shadows tracing their patterns on the ground below and at last the turbulence begins to ease, as we fly through the last pass.

Leaving the beautiful mountain to starboard we talk to Denver Center, who clear us down to FL95 through some heavy rain showers and then kindly give us radar vectors around his busy zone. Quite nice to be able to take off the oxygen masks at last and the air traffic was certainly very hectic around Denver, but the weather was clearing.

Finally, the controller lines us up for an ILS (instrument landing system) approach at the joint military and civil airport at Colorado Springs, says goodbye and transfers us to a great girl in the tower who clears me for runway 17, all 11,000ft long, with an Air Force A-10 as my number two; what a life this is!

With such a long runway you just cannot fail to make a "greaser" of a landing, which pleases David, and we taxi up to the terminal parking area as we are night stopping here. Sarah is refuelled and we join the big league of the business jets parked beside us. We tie her down and then the aircrew transport takes us

to the Clarion Hotel. My first day is over, but what an experience, and we have a good yarn and de-brief over supper.

We also meet up with a USAF officer, who suggests that we visit the US Air Force Academy the next morning, if we have time. David decides that this is just too good an opportunity for me to miss, so instead of our planned flight to Dayton in Ohio, we revise our plan and decide to night stop at Topeka, so giving us a spare morning. The academy was absolutely stunning and we were made so welcome.

The shining aluminium spires of the Cadet Chapel with the High Sierras as a backdrop are just unbelievable and we meet many of the 4,500 officer cadets under training. We also pause to admire the granite rock beside the parade ground, which has the words, "*Man's flight through life is sustained by the power of his knowledge*," as well as visiting their superb baseball stadium. Then back to the airport, pre-flight Sarah, with the Fixed Base Operator giving us a packed lunch and we are ready to start.

Airborne from the short runway of 12 at 1310hrs and David has requested a low level clearance so I can enjoy the scenery, he really spoils me. Once settled into the cruise and this time the air is smooth, we unpack our great lunchboxes and just let Sarah do all the work, as we fly over this barren part of Kansas, but it is all unbelievable for me. In the late afternoon sun we pass over cultivated land once more and start our descent for Topeka. A great lady in the tower clears me for runway 13, all 12,819 feet and David grumbles that she should have given me the short one, he thinks the lady air traffic controllers are spoiling me because of my English accent!

Another smooth arrival and I am really beginning to get the feel for landing a C-337. We taxi up to the FBO, refuel and tie Sarah down for the night, with as always really superb service from the Fixed Base Operator - what a difference this is from the UK. Just as we were about to leave for the airport hotel, a guy runs up, having heard my English voice and learnt that I was ex-RAF Transport Command and invites us to visit their hangar, where they have a wartime C-47 Dakota, which is still flying. For the young owner this aircraft is a personal memorial, as his father fought and died flying Dakotas in WWII. We have a great hour with them, but they spoilt the day by saying that if only we had landed earlier, we could have flown with them in the Dak! So another hard day's flying is over, a discussion over supper on what I have learnt so far and then to bed utterly exhausted.

Another hard day's flying is over!

Into the circuit at Wendover, where we stopped before heading to Colorado Springs and then Topeka.

Up with the Big Jets

It's Sunday, we are up early and we have now settled into a regular daily routine. Over breakfast we run through our day's route with diversions etc. Route planning is easy, as we are flying on the low level airways and they have their own chart and you fly from VOR to VOR, all very simple. David is surprised to see that I also carry my own half million topographical chart, with the route marked on it, but is pleased that I have decided to have a back-up in case "the black boxes" all go dark. Also I am enjoying map reading and navigation by eye on a 3,000-mile flight, something totally new for me.

Then we are back to the airfield, visit Flight Service to check on the Met and Notams and then file our flight plan. Next out to the aircraft and a thorough pre-flight, including checking for water in the fuel at all four drains, one in each wing and one under each engine. After all that we are ready to strap-in, with me in the left seat at the beginning of another great day.

We talk to the same great girl in the tower who greeted us the day before and again I am offered the long 12,819ft runway 31.

All checks complete and we are airborne at 0810hrs on the four-hour flight to Dayton International airport in Ohio, still on airway Victor 6. The city of Topeka makes a fine sight in the early morning sun, as we are cleared up to FL75 (7,500ft) on a heading of 071 degrees, passing over the Missouri river and settling in to our normal flying routine of check, check and check again, but it is a splendid morning and we are soon above the haze and the Cessna C-337 is really great fun to fly.

"We unload the kit, because we are stopping here for two nights, as David has decided that I must spend a day at the US Air Force Museum at Wright-Patterson field."

Then nearly four hours later, I start the descent through the haze towards Dayton and my first experience of landing at a busy International airport and being mixed in with the big jets, the Boeing 747s, 757s and 737s, something very differert for me. As always my English accent gets me well looked after and I am given radar vectors to slot me nicely on to the ILS for runway 24L, with the request to "45 Sierra please keep your speed up" as I have a Boeing 747 behind me!

We land at 1220hrs and taxi up to the Business Aviation Terminal to be greeted as always by a friendly marshaller and line boy, who asks what he can do for us. David tells him we need fuel and a hire car and he does not bat an eyelid. We unload the kit, because we are stopping here for two nights, as David has decided that I must spend a day at the US Air Force Museum at Wright-Patterson field. Sarah is tied down and our hire car arrives – what service! Again in the evening, we have our usual de-brief over supper at a Red Lobster Inn and David seems reasonably happy with my flying, but he is teaching me so much and I am just so lucky.

The next day we tour the USAF Museum and what a display. We visit the 8th Air Force Memorial garden to see the plaque of David's Bomb Group, the 445th at Tibenham, as well as the 467th from my village at Rackheath. Then we enjoy the faithfully restored Wartime Nissen briefing hut, before going inside the massive display area and are delighted to see a Cessna 02A, the military version of our C-337, hanging from the roof, as well as a B-24 and a Mosquito, to name just a few.

We visit the shop, where David buys me a superb plaque of "High Flight" (the famous poem) as a memento. Next we have a great hamburger lunch with the essential iced tea, before touring the missiles and aircraft outside and then taking a shuttle bus over to the other side of the base, to see all their reserve aircraft. After a hectic but very enjoyable day we make it back to the Airport Hotel and a yarn about flying before we turn in.

New York Here We Come

The next day, David has booked a breakfast for 0500hrs, where we make our usual route planning and then out to the Business Executive Terminal before it is light. The Met are forecasting fog in the New York area, but are sure it will clear before we arrive, so we file our

flight plan. Out to Sarah in the semi-darkness and I do my first pre-flight by torchlight, another new experience for me. By now the big jets are really moving and our start-up clearance is delayed for 10 minutes as this is the morning rush hour, which David had hoped to avoid. Eventually, at 0710hrs, we are cleared to join the queue to the hold of runway 24L, again with a Standard Instrument Departure clearance to the east, bound for New York just over three hours away.

Take-off at 0720hrs and the air is silky smooth and we turn east climbing to FL95 on airway Victor 12 with the morning mist still hanging in the valleys below us, on a heading of 085 degrees. Sarah has everything "in the green" and we pass over the Ohio River on a perfect morning for flying. We enjoy a coffee high over Pittsburgh and then three hours later, when we arc handed over to New York Center, my world is soundly shaken when I listen to the almost constant R/T chatter and we have quite a job to get our initial call in before the boundary.

The sky is now full of aeroplanes of all shapes and sizes and at 1015hrs New York Center clears us into the descent for Morristown, one of the busy regional airports in the New York area. We get a friendly greeting from the Tower, who gives us radar vectors for the 6000ft runway of 05, as number two behind a Cessna Citation and the workload for both of us is now high, but what an experience!

1030hrs and we land at Morristown and are given taxi instructions to the business aircraft terminal, where as always the marshaller is already waiting. We shut down and complete our checks and then get them to refuel to full tanks. As we are stopping here for the 2nd Air Division Annual Convention, we have to move lo a long stay tie down area. David leaves me to go and pay for the fuel and says, "OK you taxi her to the park while I get a hire car."

My heart misses a beat, as this is the first time I have been on board Sarah on my own, let alone start-up and taxi her. Still, a quick call lo the tower for start-up clearance and as usual the English voice is greeted in a very friendly way. I decide to taxi on the front engine, which starts easily and having heard my voice the tower obviously decides that I need help, as I am kindly guided step by step, all the way round various hangars to the parking area, where another marshaller is waiting. I shut down, complete the checks and have the aircraft tied down before David arrives with the car. We place the sun blinds over all the windows and carefully check that everything is off, before we depart for the convention.

I cannot believe that I have just flown over 3,000 miles all the way across the United States, what an amazing dream it has been and in a week's time, I have to fly all the way back again. The scenery, the mountains, the incredible service from the FBO's and no landing fees as well as a great aircraft. This is the life and how can I ever thank David enough for making it all possible and for teaching me so much, as well as trusting me as a British PPL with his superb Cessna C-337 Skymaster.

Brazil's Aviation Dream

LABACE is held every August at Sao Paulo's Congonhas Airport (also pictured below in the 1930s). In the foreground are the Dassault 2000 and new 8X.

IAN SHEPPARD attended LABACE (Latin America Business Aviation Convention & Exhibition) in São Paulo in August. Unfortunately he arrived just after the Olympics and left before the Paralympics.

Brazil's general aviation fleet is reported to be at least 14,000 aircraft, a fleet second only in size to that of the United States. With a booming economy up until five or six years ago, things looked good for GA manufacturers providing everythng from light piston singles to intercontinental corporate jets, and helicopters.

Cessna Turbo Stationair HD with Garmin G1000 and enhanced vision system (right screen and pod on wing).

The commodoties crisis has put a real dampener on things and alleged economic mismanagement and a corruption scandal centred on state oil company Petrobras hasn't helped the country, whose currency (the Real) has depreciated by 70% against the US dollar since 2010.

Despite this, confidence at the annual LABACE show was very high until last year, when things started to build up to the impeachment of President Dilma Rousseff. At this year's show, which was pushed back to late August to avoid the Olympics, news of the impeachment was awaited by all and when it came most Brazilians seemed to be relieved.

Whether it will boost the market for aircraft is another matter. Sao Paulo has more helicopters than any other city in the world and is expected to see many more future sales. Grandiose plans for new GA airports around Sao Paulo have stalled over the past couple of years although at this year's show most were pointing to the start of an upturn, and even the currency showed signed of turning the corner.

It was surprising not to see Cirrus at this year's show. Having sold so well in China, Brazil would seem like a great market. Most of the main GA aircraft manufacturers have local dealers now, who exhibit at the show, and for private flyers looking for something smaller for their own use or for training, there was a Cessna 172 on display as well as a Beech Bonanza, and then everything from single-engine turboprops (see below) to personal jets such as the HondaJet and then all the bigger jets from the likes of Brazil's own Embraer (based at nearby Sao Jose dos Campos), Dassault, Gullfstream and Bombardier. Indeed the world's best-selling small jet over the past three years has been Embraer's Phenom 300.

Every year there are discussions at LABACE about moving the show to another airport. Congonhas is getting busier with low-cost carriers and the exhibition area and hangar are dated, but still Congonhas is frequented by many of Brazil's business elite and business aviation is commonplace. Other options include Campo de Marte airport just north of the financial district that is heavily used by helicopters, but the runway cannot take larger jets. Some say it would get more international visitors if it were held in Rio. The Brazililan Aviation Association (ABAG) will no doubt continue the debate!

Brazil has a long history of aviation starting around with legendary pioneer Alberto Santos Dumont (some in Brazil claim he flew a heavier-than-air aircraft before the Wright Brothers).

Rio de Janeiro's second airport is named after him but it is now one of five slot-controlled airports in Brazil, so is not frequented as much by light aircraft. However Brazil has some 5,000 airports and airfields which the country hopes will one day develop to create a booming aviation market. Many of the existing fleet are used by agricultural and other industries and many are ageing and could provide excellent replacement opportunities.

Surprisingly Brazil does not seem to have a pilot shortage and one exhibitor at LABACE put this down to the long tradition of general aviation - in contrast to the likes of China. So there's a strong message there for any country wanting to develop aviation, in that general aviation needs to be nurtured to supply the pilots needed to fly the aircraft, and train engineers and to get people engaged in aviation.

The rest of South/Latin America is still not well represented at the LABACE show, though some manufacturers were touring their aircraft and using LABACE as a stop-off. There are plans emerging of an aerospace show in Rio, as the continent does not really have the equivalent of the Paris or Farnborough Air Show. It has FIDAE in Chile but that is predominantly defence.

Mexico is the highlight at the moment but most in the Mexican GA community look to the US and are likely to attend NBAA in Orlando, 1-4 November. Al being well, AO&P will be there and will report back in the December issue.

L to R. Turboprop TBM900, Piper PA46R-350T Matrix and Pilatus PC-12NG. Piper also has new turboprop singles now, the M500 and M600.

The Vital Role of the AAIB

PHIL SLEIGHT, acting deputy chief inspector at the UK's Air Accidents Investigation Branch (AAIB), spoke to Ian Sheppard about its work in GA and air transport, and why understanding its role is important for pilots, owners, engineers and anyone involved in aircraft operations.

Most people are aware of the AAIB and their work investigating major accidents (such as Lockerbie) but few outside the pilot community are aware of the breadth of its work, with several general aviation accidents being investigated at any one time. Although its remit doesn't cover military aviation it works closely with the Military Aviation Authority, based at Abbey Wood Bristol. Some investigations involve former military types which are on the civil register, such as the Hunter that crashed last year during a display at Shoreham.

The acting chief investigator of air accidents is David Miller and he oversees a total staff of 50, including six principal investigators, ten operations inspectors (who are professional pilots who also spend time flying professionally to remain current), 12 engineering inspectors (all chartered engineers) and six recorded data inspectors.

AO&P met with Phil Sleight, acting deputy chief inspector of air accidents, who is an engineering inspector, and was formerly with British Airways Engineering. "We look for a nice broad engineering knowledge base, and often send engineers on courses e.g. Rolls-Royce do one for accident investigators, and BA did one when they introduced e-logbooks." He said that some have GA experience too, one inspector having been with the LAA previously, for example. "And all engineers are encouraged to get a PPL."

Engineers look after all the technical aspects, going out on site to examine wreckage, ground marks etc, and recover wreckage back to Farnborough for further investigation. They will then go out to look at any relevant technical records and interview engineers where appropriate. The operations inspectors interview those who are involved in or witness accidents, including pilots, any cabin crew, and passengers.

Afandi Darlington, senior inspector of air accidents (and one of the engineering inspectors), showed me the large hangar (which can be seen in the aerial view of the branch) where wreckage is placed for detailed analysis and inspection. It's a sobering experience – the last time I was there (many years ago) the Lockerbie 747 forward section had been reconstructed there, so now the hangar seemed far larger.

Now, the Shoreham Hunter nose and engines is most prominent wreckage as you walk in, but it is informative to see and discuss other wreckage from accident investigations many of which I have followed over the past couple of years, though some I was not so aware of. The helicopter that crashed into a bar in Glasgow is there at the moment, and the King Air that crashed after departing Stapleford. There was also a glider, a couple of microlights and some light aircraft, all with sad stories as they were all fatal accidents; but the inspectors must get used to that and focus on causes and how lessons can be learned.

We then visited the labs, although if complex analysis is required components or items of wreckage is sometimes taken to specialists. The voice recorder lab is a sealed room with strict control as to who can enter to listen to the CVR – while

AAIB is not austere and in fact you feel very welcome in what is almost a collegiate atmosphere.

It's no accident that AAIB's HQ is tucked away in a quiet wooded area adjacent to TAG Farnborough Airport. Discretion and sensitivity are key.

other equipment is used for analysis of data, with the first step being to extract the data from what can often be a damaged data recorder. Clearly this doesn't apply to GA aircraft, but Sleight pointed out that despite there being mainly GA wreckage in the main hangar, larger aircraft investigations make up the majority of the branch's work, and often involves going overseas (where the AAIB will be assisting due to some UK connection, such as Rolls-Royce engines or the operator or aircraft registration being British). "Now we spend lots of time recovering data from tablets, and even smartphones can record position information, and lots of people use GoPros," said Sleight, referring to GA accidents in the main. "We also find that Flightradar24 gives good data, and we do interpretation of [ATC] radar data." This work is all done by the third set of inspectors, the recorded data inspectors.

"So we put this all together to build up a better picture," said Sleight, who added: "The only time we use video reconstruction of data is to demonstrate to a layman, it is not used as an investigative tool. The resolution of the data can make it hard to get an accurate picture," so investigators don't want to jump to false conclusions.

"Sometimes we'll go in a simulator to look at some of the aspects, testing a hypothesis perhaps, but it's very easy to go in the simulator and do tests that fit data to a certain extent and the danger is assuming something. If you've not got the factual evidence you can only say this is a possibility – you don't want to go down the wrong track. It would be very easy to jump to conclusions to fit facts to a hypothesis. "And likewise if you get a fact that doesn't fit the hypothesis it would then be easy to ignore it."

He said investigation is difficult and "we're always questioning, as it's an iterative process, analysing the facts and seeing what's missing. Our aim is to make recommendations, if we have enough information, and to prevent it happening again.

"...We'll make a point of saying that if the pilot decided to go around earlier the accident may have been avoided...carb icing we see a lot – and it can happen on most days of the year."

Trying to get to the cause can be challenging as there can be so many contributory factors, and we look at each safety issue. And we also look at other accidents, as there may be a pattern – and then we may do a safety study." He said the last such study was on the use of foreign-registered aircraft in the UK, after there were several accidents (in that case with Gazelle helicopters).

Sleight said that the AAIB gets between 600 and 800 notifications a year and will do a field investigation for any where there are fatalities, which in 2015 numbers around 40. For these an investigation team will be sent, its size depending on the magnitude of the task. For non-fatal accidents the norm is for the AAIB to ask the pilot to complete a Report Form, with some 200 being completed last year (2015), said Sleight.

Mandatory occurrence reporting is governed by EU Regulation 376/2014 and can be from anything from balloons to bizjets and airliners; anything with a UK civil registration, in general (so parachuting is not included unless an aircraft is involved in the incident).

Anything where an aircraft is damaged or there are broken bones would likely require a report but if there was a forced landing with nothing to be learned, and perhaps at most cuts and bruises, the AAIB would not initiate a report. "Heavy landings, or 'abnormal runway contact', is very common especially with students," said Sleight. "They bounce maybe, put the nose down and break the nose gear, or even break the main gear. Often it's because the approach was unstable and the pilot chooses to attempt to land rather than go around. Or it may be that a pilot landed long, and we'll make a point of saying that if the pilot decided to go around earlier the accident may have been avoided." He also said, "Carb icing we see a lot – and it can happen on most days of the year."

On the legal side Sleight said "We're getting more and more challenges for disclosure. We have certain protections for information and we want people to be able to provide it freely, but we are not above the law and that is why there is a public interest test in the courts." He added that the courts were very aware of the need not to discourage confidential reporting.

"We work closely with Chirp and with GASCo," said Sleight, "and with the various aviation groups too…but we have to be sure to distance ourselves too. It's

Afandi Darlington, former Airbus aerodynamicist and Farnborough Aircraft Kestrel engineer who joined the AAIB in 2010. He is now a senior investigator. Afandi flies an RV but his true love is gliding.

more a sharing of information as we're all here to promote safety. But we've got to protect confidential information, and not cause any speculation or feed it."

He encouraged pilots and others to report incidents if in doubt as "it's better for us to decide if we want to do anything further or not. The majority would only lead to an Air Accident Report Form – we don't want people to fear us."

He noted that AAIB Bulletins are notified by e-mail (you can sign up on the AAIB website) and it also puts out a tweet on Twitter when the latest monthly AAIB Bulletin becomes available as a PDF online. He added that the AAIB is conducting a web survey in the autumn to ask what the aviation community want to see.

Sleight said that the AAIB has prior arrangements with the emergency services, with "working protocols as to how we operate on site and when parallel investigations are going on. The branch also works with coroners who also conduct a 'no blame' type investigation where there are fatalities, looking at how the individuals died.

In the UK, the AAIB has the power to take the wreckage and then will work with the police so they can examine it as well.

Finally, he noted that there was a review of the AAIB's resources in 2010 but since then with MH370, North Sea helicopter incidents and more recently Shoreham, plus other airline incidents, the branch had been extremely busy. "There has been a lot of pressure on resources." But he concluded by saying, "Going forward we want to remain very engaged with the GA community as well."

AIR ACCIDENTS AND THE LAW

The AAIB is the body responsible in the UK for the investigation of aircraft accidents and serious incidents in accordance with Annex 13 to the Chicago Convention (ICAO), EU Council Directive 94/56/EC; UK Statutory Instrument No. 2798 of 1996; the Civil Aviation (investigation of Air Accidents and Incidents) Regulations 1996; Statutory Instrument No.2693 of 2005; and the Civil Aviation (Investigation of Military Air Accidents at Civil Aerodromes) Regulations 2005.

Its authority to investigate aircraft accidents originates from the Civil Aviation Act 1982 (as amended). These regulations are accessible through the AAIB website (www.aaib.gov.uk) and separate (broadly similar) regulations exist for accidents that occur in the Isle of Man or the Channel Islands.

WHAT IS AN ACCIDENT?

Definition of an Accident

"Accident" means an occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight and such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

1. A person is fatally or seriously injured as a result of:

- being in the aircraft
- direct contact with any part of the aircraft, including parts which have become detached from the aircraft
- direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew.

2. The aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes) or minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike, (including holes in the radome).

3. The aircraft is missing or is completely inaccessible.

Definition of Serious Injury

"Serious injury" means an injury which is sustained by a person in an accident and which involves one of the following:
hospitalisation for more than 48 hours, commencing within 7 days from the date the injury was received;
a fracture of any bone (except simple fractures of fingers, toes, or nose);
lacerations which cause haemorrhage, nerve, muscle or tendon damage;
injury to any internal organ;
second or third degree burns, or any burns affecting more than 5% of the body surface;
verified exposure to infectious substances or harmful radiation.

WHAT IS A SERIOUS INCIDENT?

Definition of a Serious Incident

"Serious Incident" means an incident involving circumstances indicating that there was a high probability of an accident and is associated with the operation of an aircraft, which in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down.

The incidents listed below are typical examples of serious incidents. The list is not exhaustive and only serves as a guide to the definition of 'serious incident'.

- A near collision requiring an avoidance manoeuvre or when an avoiding manoeuvre would have been appropriate to avoid a collision or an unsafe situation.
- Controlled flight into terrain (CFIT) only marginally avoided.
- An aborted takeoff or a takeoff using a closed or engaged runway, a taxiway or unassigned runway.
- A landing or attempted landing on a closed or engaged runway, a taxiway or unassigned runway.
- Gross failure to achieve predicted performance during takeoff or initial climb.
- All fires and/or smoke in the cockpit, in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished with extinguishing agents.
- Any events which require the emergency use of oxygen by the flight crew.
- Aircraft structural failure or engine disintegration, including uncontained turbine engine failure, which is not classified as an accident.
- Multiple malfunctions of one or more aircraft systems that seriously affect the operation of the aircraft.
- Any case of flight crew incapacitation in flight.
- Any fuel state which would require the declaration of an emergency by the pilot.
- Runway incursions classified with severity A. The 'Manual on the Prevention of Runway Incursions' (Doc 9870) contains information on the severity classifications.
- Takeoff or landing incidents, such as undershooting, overrunning or running off the side of runways.
- System failures, weather phenomena, operation outside the approved flight envelope or other occurrences which caused or could have caused difficulties controlling the aircraft.
- Failure of more than one system in a redundancy system which is mandatory for flight guidance and navigation.
- The unintentional or, as an emergency measure, the intentional release of a slung load or any other load carried external to the aircraft.

An air accident, just like any other accident such as a road accident, may involve the air ambulance and possibly police helicopters which are located around the country. AAIB works closely with the emergency services.

HOW TO REPORT

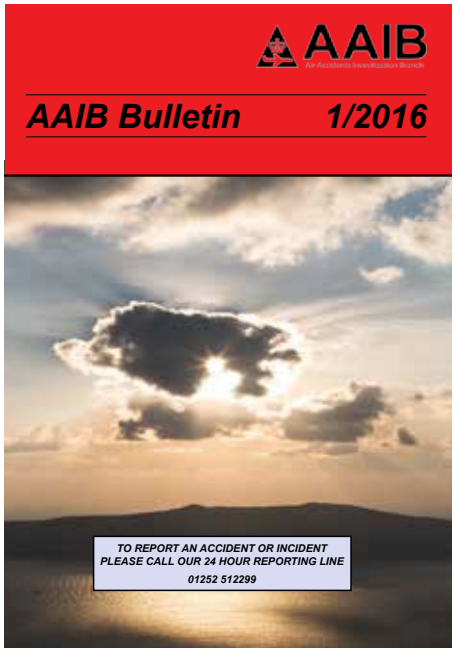
Aircraft Accidents or Serious Incidents should be reported to the Air Accidents Investigation Branch (AAIB) and aircraft accidents should also be reported to the police.

Who must report an aircraft accident or serious incident?

The following people must notify the AAIB without delay if they have knowledge of an aircraft accident or serious incident which occurred in the UK, a UK Overseas Territory or a Crown Dependency:

- The crew of the aircraft.
- The owner of the aircraft.
- The operator of the aircraft.
- People involved in the maintenance, design or manufacture of the aircraft.
- People involved in the training of the aircraft's crew.
- People involved in providing air traffic control, flight information services or aerodrome services to the aircraft.
- Staff of the Civil Aviation Authority
- Staff of the European Aviation Safety Agency

In the case of an accident, the commander of the aircraft or the aircraft operator, if the commander has been killed or incapacitated, must also inform the police.



The AAIB's recorded data inspectors take great care to extract information from CVRs and FDRs that can be badly damaged (yes, 'Black' boxes are actually orange!) Recording media range from microchips to tape or wire. AAIB also has a display of early recorders. Current survivability standards require recorders to withstand 1100°C, a 10-hour oven test, impact of 3,400G for 6.5 ms, a 5,000lb weight for 5 minutes on any axis, immersion in fuel/oil for 24 hours, water immersion at sea for 30 days, penetration resistance of 500lb from 10ft with a quarter-inch diameter contact point, a a pressure equivalent to a 20,000ft deep in water. At present light aircraft don't need any recording device but phones and tablets often provide data.

Information to give to the AAIB

The AAIB will need to know as much of the following information as possible:

- The type, model, nationality and registration marks of the aircraft.
- The names of the owner, operator and hirer (if any) of the aircraft.
- The name of the commander of the aircraft.
- The date and time (UTC) of the accident or serious incident.
- The last point of departure and the next point of intended landing of the aircraft.
- The position of the aircraft in relation to some easily defined geographical location.
- The number of:

1. Crew on board and the number killed or seriously injured.
2. Passengers on board and the number killed or seriously injured.
3. Other persons killed or seriously injured as a result of the accident.

- The nature of the accident or serious incident and the extent of damage as far as is known.

For a list of current field investigations please see the AAIB website.

AAIB 24-hour reporting line

Tel. 01252 512299

Tel. +44 1252 512299 from outside UK

For further information please contact:
Air Accidents Investigation Branch
Farnborough House, Berkshire Copse Road
Aldershot, Hampshire GU11 2HH
Tel: 01252 510300 Fax: 01252 376999
Email: enquiries@aaib.gov.uk

Gliders ahoy!

In August this year, following a number of recent incidents that have compromised safety when aircraft over-flying glider sites have come into close proximity with winch-launching gliders, the UK Airprox Board (UKAB) and the British Gliding Association (BGA) issued a joint statement to remind pilots about the dangers of over-flying gliding sites, especially as the summer months mean much greater gliding activity is likely.

Some recent Airprox incidents illustrate the risks:

2014013 – a glider aborted a winch launch at Tibenham, Norfolk when a PA28 overflew the site.

2014211 – an Augusta 109 helicopter came close to a glider winch launching at Dunstable, to the west of Luton

2015026 – again at Dunstable, an MD902 helicopter came close to a launching glider

2016036 – an unidentified light aeroplane overflew Lasham, the busiest gliding site in the country, during a winch launch.

2016074 – an R44 helicopter overflew Husbands Bosworth south of Leicester and caused a winching glider to abort its launch.

Four of these incidents were categorised in the highest risk category - A – where it was judged a serious risk of collision existed and luck played a major part in the fact that collisions didn't occur. The full reports are available from http://www.airproxboard.org.uk within 'Airprox Reports and Analysis', side heading 'Individual Airprox Reports', under the appropriate year.

The key point is that pilots should not rely on seeing the winch launch happening as they approach the glider site. A glider will go from ground to 1000-1500ft in about 20 seconds, so spotting it in the climb is too late to do anything about the conflict. Nor is the danger passed once the glider is released

QUICK FACTS

The British Gliding Association (BGA) is the governing body for the sport of gliding in the UK.

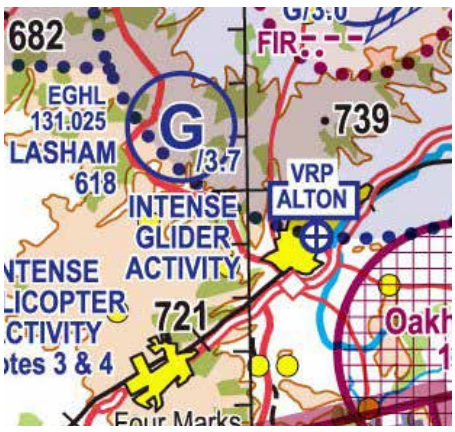
There are approximately 2,500 gliders and 8,500 regular glider pilots in the UK making in excess of 250,000 flights a year.

Gliding sites are listed in the AIP at ENR 5.5, including the authorised maximum winch height where applicable.

AIC Yellow 083/2011 gives more general information about gliding activity in the UK.

More details are available from the UK Airprox Board - http://www.airproxboard.org.uk and the British Gliding Association - https://www.gliding.co.uk/

Anyone planning to fly near Lasham, the UK's busiest gliding site, should assume there is gliding on most days, even in the week.



As well as publishing a map of sites the British Gliding Association (BGA) also has an interactive map at https://www.gliding.co.uk/club-finder.

from the winch. Pilots are very unlikely to see the cable itself and, depending on the winch-launch height, the hazard from these continues for at least another 20-30 seconds as it descends under a small parachute that is effectively invisible. Some glider sites are capable of launching to altitudes of 3-4000ft, with associated increased cable descent times. Maximum launch altitudes are indicated on the 500K VFR chart with a forward slash and height; as an example, Lasham has a maximum winch-launch altitude of 3700ft, as shown on the attached graphic as /3.7.

Pilots should always assume that a gliding site is active. Ed Downham, who, as well as being a UKAB gliding member, is a Boeing 777 captain said: "So far, we haven't seen an actual mid-air, either between the aircraft or with the descending winch cable. But it could soon be a matter for the AAIB rather than UKAB. Be under no illusion, such an encounter is highly likely to be fatal for those involved".

Chris Fox, another UKAB gliding member and an R44 pilot, also commented: "A recurring theme in these reports is that the powered aircraft pilot

Gliding is perhaps the best introduction to flying and particularly being relaxed in an aircraft with no powerplant! Organisations such as the Air League provide scholarships.

assumed that the gliding site would not be active – perhaps because the weather was less than perfect, or it was late in the day. Gliders can, and do, winch-launch in strong winds and any cloud base that permits the launch to be completed safely – often in conditions that would deter many other GA pilots."

The UKAB advice is to avoid glider sites at all times; only overfly them if you have timely, positive confirmation from the site itself that they are inactive. When avoiding glider sites, beware of simply skirting the ground location by a narrow margin because there are likely to be gliders operating close to the site as

Hitting a winch cable is not a good idea! It's not only gliders you have to look out for; around gliding sites don't assume there's nothing going on as you won't be able to see for sure until you're dangerously close.

they soar within gliding range and, even if a site has finished winch-launching for the day, it may have gliders returning from cross country flights, or motor gliders self-launching into the local area. Many gliders these days fly with a system called FLARM, which is a relatively cheap electronic conspicuity aid. The associated P-FLARM unit is also relatively cheap, easy to fit in any aircraft, and provides potentially life-saving audio and visual cues for those hard-to-see gliders

CONSPICUITY GETS CLOSER

The SESAR-funded Project EVA has been a successful collaboration between AOPA, NATS, FUNKE Avionics and TRIG Avionics. Now flight trials have been concluded and a report will be prepared, moving us one step closer to the elusive 'Known Airspace Environment' where affordable conspicuity devices are the norm in GA . BOB DARBY (AOPA project coordinator for EVA) describes the trials and the next steps...and how such a device could help direct our scan to other aircraft.

On 22nd and 23rd August 2016, warm and almost cloudless weather with perfect VFR visibility welcomed pilots and aircraft to Brimpton for the final set of flight demonstrations of Electronic Conspicuity (EC) by Project EVA: "Electronic Visibility via ADS-B". Interoperability between various EC devices was the main theme.

Interoperability – See and BE SEEN

Project EVA has promoted the notion of "*See, BE SEEN and Avoid*" for conflict avoidance by VFR pilots in uncontrolled airspace. Mutual interoperability is key to effective *See and Be Seen*, made possible by EC equipment that transmits and receives ADS-B on 1090MHz.

See and BE SEEN has been developed by FLARM over more than a decade, mainly for glider pilots and using an unregulated radio frequency. More recently Power FLARM has added the capability of receiving ADS-B transmissions on 1090 MHz.

BE SEEN on 1090MHz requires equipment to transmit on this, the worldwide surveillance frequency. Because 1090MHz is used by ATC radars and TCAS, the airborne collision avoidance safety net that all commercial air traffic above a certain weight and speed must carry, use of this frequency is strongly regulated. However, the benefit of using 1090MHz is that it can in principle, enable mutual detection between all airspace users as well as by ATC on the ground. Use of 1090MHz therefore offers the best means of awareness of all traffic in any class of airspace and improvement of safety for all airspace users.

SESAR Large Scale Demonstrations

Two years ago, NATS together with AOPA, Funke Avionics (Germany) and Trig proposed Project EVA to the Single European Sky ATM Research (SESAR) office in Brussels. SESAR covers all aspects of improving aviation safety and efficiency throughout Europe with a budget exceeding €2 billion over more than a decade. Its main focus is commercial air transport. However, through the determined efforts of Martin Robinson (CEO of AOPA UK) together with other GA organisations, the GA voice is heard. Project EVA is the first sizeable GA project supported by SESAR and is one of the Large Scale Demonstrations that SESAR commissioned to demonstrate progress to date.

Aims of Project EVA:

1. Fly EC devices that operate on 1090MHz to support airborne traffic situation awareness in the GA environment;
2. Investigate the ground use of 1090MHz transmissions from GA aircraft;
3. Develop recommendations for best practice for use of such equipment by GA pilots; and
4. Investigate the certification and approval path for low-cost EC equipment.

EVA activity

Since August 2015 when the flying demonstrations began, nearly 100 hours of demonstration flights have taken place, at many locations including Germany, on 14 types of light GA, from weight shift microlights to Piper and Cessna aircraft and including home-built and factory-built types such as Europa and Tecnam. Pilots have all been volunteers led by AOPA. SESAR has supported half their flying costs for EVA flights.

Brimpton flights

The fully capable *See and Be Seen* EC equipment flown at Brimpton was

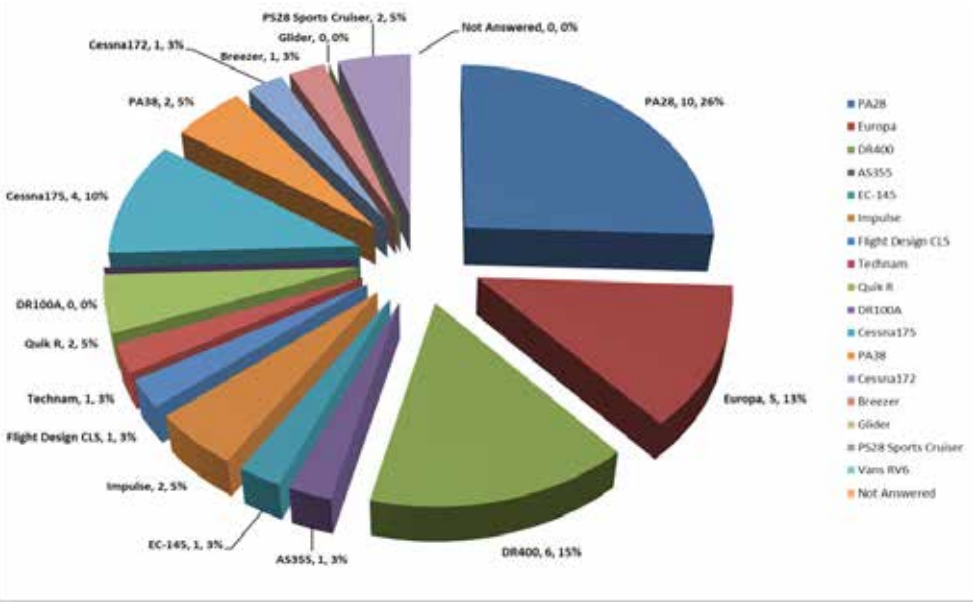
- **LPAT: Low Power ADS-B Transceiver, developed by Funke for NATS.**
- **Trig TSAA receiver. Prototype TA60 flight test unit, based on an existing Trig product.**

These devices both transmit and receive on 1090MHz and therefore support full mutual interoperability. The Trig device, in addition, implements the "Traffic Situation Awareness with Alerts" capability standardised by EUROCAE and RTCA, which calculates from the ADS-B data received if any of the aircraft detected pose an imminent collision risk.

As well as LPAT and Trig, other 1090MHz capable equipment flown was:

-NATS GPS trial ADS-B out equipment for the BE SEEN element, complemented by Power FLARM for 1090MHz ADS-B reception. Together these provide both See and BE SEEN.

-Pilot Aware, detecting 1090MHz ADS-B for display on a tablet running Sky Demon, complemented by NATS GPS trial ADS-B out equipment providing both See and BE SEEN.



All ADS-B detection devices except the Trig device rely mainly on a cockpit display of adjacent traffic, to help the pilot acquire the nearby aircraft visually for traffic situation awareness. There is no guidance on avoiding action. Avoidance is by pilot judgement and action following Rules of the Air.

FLARM provides more than just relative position by indicating also which of the nearby aircraft pose a threat – a particular concern for gliders climbing together in a thermal in close proximity. The TSAA function in the Trig device is the most advanced. Not only does it work out which other aircraft is a threat, it announces this in the form of a traffic call-out such as "traffic, left 3 o'clock, ½ mile, 100ft above". The significant benefit of this is that it immediately draws the pilot's eyes out of the cockpit to look for the threat aircraft, rather than peering inside to interpret a small display. (Alan Burrill's item in the August 2016 issue of this magazine explains all these devices in more detail.)

The flight days at Brimpton were aimed at demonstrating the interoperability aspects of all combinations of these devices and effectiveness was measured by pilot opinions of each device.

Eight sets of flights were flown with 6 participating aircraft and 11 pilots and observers. The flight tracks plotted below show the extent of the activity, as recorded by the NATS trials WAM and ADS-B surveillance coverage.

EVA Conclusions

There have been many flight days over the past year. NATS has carried out a thorough review of the questionnaires that each flight crew completed after every flight. From this feedback, draft guidance on the installation and use of EC equipment for GA VFR usage is being prepared.

EC development is not over. EVA has demonstrated the potential of 1090MHz EC and mutual interoperability between different 1090MHz devices. Reception of the LPAT and NATS GPS trial ADS-B-out data, as depicted in the tracks from the Brimpton demonstrations, has also shown the capability of ground surveillance to detect and track low power ADS-B transmissions.

A few points to remember are:

-**Alerted Visual Scan using EC equipment is up to eight times more effective for visual acquisition than unalerted scan.**

-**Pilots usually overestimate their capability to see other aircraft. In good VFR conditions, 2NM is the maximum normal acquisition range and it can be much less. EVA measurements support this.**

-**At present, few aircraft transmit 1090MHz ADS-B. Electronic Conspicuity will not realise its full potential until the majority of aircraft are equipped with mutually interoperable equipment.** ***Even then, EC is only an aid to visual acquisition and a good visual scan will remain the principal means to avoid airborne conflict for the VFR pilot.***

Related and Future Activities

The CAA Conspicuity Working Group (CWG) met several times during the period of Project EVA and has developed CAP1391, which explains the benefits of EC in terms of reducing the safety risk of airborne conflict between GA in UK uncontrolled airspace. It sets out the required minimum technical specification and explains the regulatory approach manufacturers need to follow for portable EC devices to be legally used on board

aircraft in uncontrolled UK airspace. LPAT considerations have been a major influence on this development.

The CWG development of CAP1391 in parallel with the EVA Project shows what the combination of industry, service provider and regulator can achieve when they work together with flying associations, including AOPA, towards a common goal. The UK regulations are now in place to allow manufacturers to produce and pilots to install ADS-B-out equipment for use in UK airspace, together with the ADS-B-in capability which uses this data to improve safety. The UK environment is ready for Trig, Funke and others to launch their products. This could be a pathfinder for Europe as a whole.

"EC development is not over. EVA has demonstrated the potential of 1090MHz EC and mutual interoperability between different 1090MHz devices."

Furthermore, EVA and CAA CWG members are already contributing to EASA Rule Making Task 0679 that is looking at the revision of the SPI IR, where the use of ADS-B is a major consideration. The realistic possibility of widespread ADS-B-out from GA aircraft could be the stimulus for significant change in European surveillance infrastructure.

Above (Top): Installation of LPAT and Power Flarm.
Above: In the circuit - a confliction in progress on the downwind leg and (second microlight image): Mixed weather / low cloud –the conditions were ideal to test traffic technology.
Below left: Traces at Brimpton and five images of EVA demonstration flight cockpit installations.

Abbreviations and Glossary

CAP 1391	Electronic Conspicuity Devices. UK CAA, Published 23 March 2016
CWG	UK CAA Conspicuity Working Group, part of the Airspace Safety Initiative consisting of CAA, NATS, AOPA, LAA, BMAA, BGA, BHPA, GASCO, RAF and more.
EASA	European Aviation Safety Agency
EC	Electronic Conspicuity
EVA	Electronic Visibility via ADS-B
FLARM	Flight Alarm
GPS trial of ADS-B out	See NATS paper "General Aviation: ADS-B/GPS Trial Results, Dec 2015"
LPAT	Low Power ADS-B Transceiver (NATS-Funke development)
SESAR	Single European Sky Air Traffic Management Research
SPI IR	Surveillance Performance and Interoperability Implementing Rule.
TSAA	Traffic Situation Awareness with Alerts. EUROCAE / RTCA standard (ED-232/DO-348)
WAM	Wide Area Multilateration, A ground based surveillance technique that, together with ADS-B, can offer an alternative to radar surveillance.

Letters

Dear Sir,
What a great article by Sotirios Antonopoulos in your August 2016 magazine! I teach basic navigation to our local Air Cadets and I would like to use the article for teaching the obvious lesson that they can't always rely on smart phones - although in this case I just know some of the cadets will point out that a smart phone could have also saved the day! Can you, or Sotirios, give permission to reproduce it (photocopy) or, better, is there a link to the article online?
Many thanks, Mark Dravers
[Permission was given! -Ed.]

Dear Sir
Having heard that you would be covering this in the August issue, I was disappointed to find that your article merely quotes from the CAA website. I feel that many members who, like me, are pure leisure flyers, who often don`t venture more than, say, 50 miles from their home base and cover very familiar territory, are getting the short straw. Unless I have taken leave of my senses, there are some very important issues here. Would you care to publish how AOPA interprets Part-NCO both for UK only leisure flights and touring at home and abroad? It will give me great pleasure to be told that I am taking Part-NCO too seriously, (the absence of Comment to date in the GA press leads me to suspect that I may be doing so). Please will you let readers have your detailed assessment and how failure to comply precisely with the requirements may affect insurance claims?
David Scrutton
[We hope tol run something more detailed in December's *AO&P* - Ed.]

Dear Pam,
I just wanted to say a big thanks for the speed and efficiency that you processed my AOPA (Basic) Aerobatics certificate. I wish you could get a job at the CAA (e.g. value for money, speed and efficiency of paperwork *et cetera*).
Any way, thanks again.
Kind regards,
Gervais Henderson

Windshear and the Myth of the Downwind Turn

Turning downwind when manoeuvring to land and at low speed requires good airmanship. When close to the ground, one is apt to disregard airspeed and instead judge speed by ground reference. As an instructor once said to me: "all aircraft get interesting close to the ground". Airspeed is what keeps the plane in the air and that is really all that need be said about "the peril of the downwind turn." In his rebuff to a similar statement from my letter of last month, Mr Bunbury claims that the inertia of an aircraft is a factor when making a turn downwind. This statement is unequivocally false – and though I have already proved the point, I have below recruited statements from three industry experts (each more qualified than I am) in support of that fact.
Mr Bunbury seeks to "prove" his claim by asserting (if I may summarise) that inertia has a role when manoeuvring an aircraft in gusty winds when the airspeed is close to the stall. That statement is, of course, absolutely true – and is why we carry more speed when on finals in a gusting wind. However, this does not show that a downwind turn is of itself dangerous, as inertia plays no role at all when making balanced turns in normal conditions. If it did, then large aircraft like the Hercules, with its massive inertia, might be raining down upon us.
Barry Schiff has 28,000 hours in 350 types, has published 1,700 articles in 111 aviation publications and is a contributing editor to AOPA Pilot (USA). He holds many honours for his contribution to Flight safety. See his article: https://www.aopa.org/news-and-media/all-news/2016/may/pilot/proficientpilot in which he states: *"Although most pilots agree that there is no aerodynamic difference between a downwind turn made in a homogenous wind and an upwind turn made under the same conditions, there are surprisingly many who do believe that turning downwind constitutes a threat to safety."*
Peter Garrison is an aviation journalist and aircraft designer/builder with 4,000 hours of flight time. He holds a multiengine commercial license with an IR for all classes of flying machine. See this article: http://www.flyingmag.com/technicalities-4 in which he states: *"The unfortunate thing about the zombielike persistence of the physics dispute is that it distracts pilots from what they should really understand about downwind turns".* Garrison was to become so wearied by the repeated need to defeat "explanations" involving inertia, that he penned this spoof: http://www.flyingmag.com/pilots-places/pilots-adventures-more/last-word-downwind-turns-really
Lastly, ATPL holder, aviation author and safety advisor, **Rick Durden.** In his book "The thinking pilot's flight manual", he directly addresses the conflation of ideas expressed by Mr Bunbury: *"The most insistent on this myth get the concept confused with the effects of wind shear, which is a sudden gust. Wind shear and wind gradient (rapid wind speed changes with altitude) are separate animals entirely. In a steady-state wind, the aeroplane doesn't have to accelerate to "keep up" with the wind – it is already moving within the air mass".*
I hope we can all agree that the myth of the downwind turn should be filed in the same folder as other long-disproved chestnuts such as: "getting on the step"; the supposed dangers of operating an engine "over square", or of operating an engine LOP; and some truly dangerous myths, such as "sparing the engine" on take-off. However, I fear we haven't yet heard the last about any of these!

Bob Gilchrist

Dear Sir,
In the June edition of *Aircraft Owner & Pilot* there was a piece called 'Speaking French to the French'. Here is a link to the PPL radiotelephony I used at Limoges airport: http://www.caz.ltd.uk/aviation/english-french-radio-telephony
It may help to extend someone's knowledge.
Crispin Horsfield, AOPA member

Dear Sir,
What an excellent article by David Wood – *A Risk-Based Approach to Airspace*, *AO&P* August '16.
I hope the CAA and NATS will take his suggestions seriously, if not to heart.
With best wishes, Anthony Kedros
[Mr Wood has indeed been invited to present his idea to the CAA - Ed.]

Letter: The Brexit Effect
Martin [Robinson's] comment in the recent IAOPA newsletter about Brexit is very true. Lots of people I know who voted for Leave [in the UK Referendum on EU membership] seem to think we'll no longer be affected by Brussels legislation and everything will be wonderful. The ELT/PLB ruling in the same newsletter is a case in point. I actually had a manufacturer's seat on a Brussels EASA committee back in 2007 where I was able to add to arguing successfully for PLBs in light aircraft rather than the costly ELT solution. In future we won't be able to attend these meetings yet will have to adhere to any legislation. AOPA UK is one of the most effective European based GA advocates, one which other EU pilots envy, and has invested heavily in EU influencing. It's a pity we will no longer be inside the tent.

Robert Hill, EGSR AOPA Rep

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williameroberts2@aol.co.uk

1987 Beech Bonanza F33A

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