

General **A**viation

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The journal of
the Aircraft Owners and
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Front cover:
DH88 Comet

Photo: Darren Harbar
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Chairman's message

General Aviation – goodbye and hello!

It seems only a short while ago that in my Chairman's Message I welcomed Pat Malone as Publisher and Editor-in-Chief of *General Aviation*, but, somewhat to my consternation, I discovered that this happened in October 2004, more than a decade ago. Pat took over the reins following Philip Whiteman's move to *Flyer* magazine after editing *General Aviation* since mid-2002. To reflect the full extent of aviation interest of our AOPA members at this time, we renamed our house magazine from *Light Aviation* to its current title, and moved the publication from quarterly to bi-monthly. Pat has taken the magazine from strength to strength and it is heart-warming to receive supportive and complimentary comments on our publication whenever I happen to meet up with fellow flyers and AOPA members at aerodromes and GA events.

So it is with much sadness that I have to report that Pat is relinquishing his editorship of *General Aviation*, and this issue will be the last one for which he is responsible.

Pat has explained that the time has come for him to cut back on some of his commitments and gave notice of his future plans to the AOPA Executive Committee six months ago, giving us time to seek a new editor and plan the changeover. Before introducing our new editor, I would like to reflect on Pat's contribution to AOPA and, in particular, the magazine. His articles reflect a love and passion for flying that stems from being a current and long-time practising pilot, in addition to being a qualified helicopter instructor. His experience includes ownership of a Robin DR400, a delightful aircraft which has taken him as far afield as Turkey in the east and across the Sahara, encountering the most unusual and bizarre difficulties en route. Pat is also editor of *Rotor Torque*, the quarterly magazine of the Helicopter Club of Great Britain, and contributes a regular page in *Pilot*. Less well known amongst aviators, unless you are also a motorcycling enthusiast, is that he is currently Motorcycling Correspondent to the *Sunday Times*.

A well-deserved accolade for Pat came in the form of the 2012 Award for Aviation Journalism from the Guild of Air Pilots and Air Navigators, now the Honourable Company of Air Pilots. Also attending the award ceremony in October 2013 to receive an Award of Honour for his lifetime achievements in aviation and space was Capt. Jim Lovell, commander of the trouble-stricken Apollo 13. Never one to miss an opportunity, Pat was able to quiz Capt. Lovell about his experiences and recount these for the benefit of readers of the December 2013 issue of *General Aviation*. At the other extreme, Pat possesses an unusual ability to write about seemingly mundane events such as the AOPA Members Working Group or Executive Committee meetings by demonstrating the relevance and importance of the topics under discussion in relation to current situations, future strategy and lobbying activities, aimed at ensuring the viability of GA in the UK and internationally.

I am delighted to announce that Pat's successor is Ian Sheppard. Ian may already be well known to many of you as an experienced aviation journalist, having been practising since 1993 when he joined the staff of the Royal Aeronautical Society. In those days, I was also quite involved in the Society's activities, and this was when I first met Ian. He joined *Flight International* in 1997 as a technical reporter, and from 2000 to 2004 he worked for Airclaims at Heathrow Airport. During this time he developed an interest in law gaining a Graduate Diploma in Law in 2005 and a Diploma in Legal Practice in 2007. Rather than practice as a lawyer, however, Ian started 'First Aerospace Media', through which he has been a writer and editor for various aviation titles such as *Aviation International News (AIN)* and *Arabian/African Aerospace* for more than ten years. Ian gained his PPL in 1991 whilst studying aeronautical engineering at the University of Bath, and subsequently a CPL at Aviation South West in Exeter in 2014. He is mainly based at Redhill Aerodrome, very handy for taking to the air, which he does in either a Cessna C150, C172 or a TB10.

Please join me in wishing Pat well in his future endeavours and welcoming Ian to the AOPA team.



George Done

2015 – big change for the better

By **Nick Wilcock**

A brief round-up of the latest developments in the wonderfully exciting world of flight crew licensing. Oh good, I hear you cry! Fortunately though, most of these will, in one way or another, be A Good Thing and AOPA continues to push for regulatory changes which will be of benefit to our members. But it would be unrealistic to expect immediate blank sheet revolutionary change, so instead we have to work on evolutionary progress within the current regulatory framework.

RF-to-ATO conversion:

EASA's Notice of Proposed Amendment (NPA 2014-28) was released on 8 Dec 2014 and includes substantially reduced requirements for non-complex Approved Training Organisations (ATOs), which after Apr 2018 will include all those providing instruction for the LAPL, PPL, BPL and SPL and associated ratings or certificates. Details of the NPA are on the EASA website at

<http://easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2014-28> and comment responses may be submitted through the web-based Comment Response Tool (CRT) by 8 Feb 2015. EASA's statutory processes will then apply; however, publication of the Opinion is anticipated for Q1/2015 with an effective date of 8 April 2015. Work on the CAA's own Alternative Means of Compliance (AltMoC) for non-complex ATOs, the revised ATO template manual and Standards Document remains ongoing; a date for release of the preliminary draft version is as yet unknown, but is intended to be 'soon.'

UK CAA AltMoC for revision to the PPL/LAPL training syllabus:

Although this project now has a new leader, regrettably the target date for completion of the work has slipped to October 2015. This will also include the production of improved PPL/LAPL theoretical knowledge examinations of greater practical nature and relevancy than the current set. But we've already seen an early result of our success in stripping away auric embellishment, with the number of exam questions for the LAPL/PPL having been reduced by 43%.

NPA 2014-29: At the December TAG/SSCC/FCL meeting, EASA's Matthias Borgmeier promised us a Christmas present – the release of the much-delayed FCL.002 NPA. True to their word, EASA released the document on 17 December 2014. Rather a generous Christmas

present though, as the whole thing consists of more than 1000 pages! Its major components are:

- NPA 2014-29(A): Cover Regulation, Annex I, Annex II, Annex III and AMC & GM to Annex I (Part-FCL).
- NPA 2014-29(B): Amendments to the Acceptable Means of Compliance & Guidance Material to Annex I (Part-FCL).
- NPA 2014-29(C): Flight Examiner Manual.
- NPA 2014-29(D): Learning Objectives.

Regrettably, the NPA has not been harmonised with the 8/9 October 2014 EASA Committee vote, which will have the effect of complicating the task of submitting responses to the NPA. Nevertheless, we have already completed a review of NPA 2014-29(A) & (B) and have circulated 29 proposals internally for peer review. Anyone may submit formal comment responses through the CRT by 17 March 2015; however, most of our draft responses cover matters already discussed with EASA. Just to take one example, for some time now we have been pressing for flight time in certain microlight



Above: time in 3-axis microlights should count towards SEP class rating revalidation

aircraft to be accepted towards SEP Class Rating revalidation. However, in their NPA, EASA hasn't adopted this recommendation, so we will continue to propose acceptance of such flight time in 3-axis microlights with non-flexible wings and which are not foot-launched – but with a proviso similar to EASA's own proposal referring to the consolidated revalidation of land/sea ratings in SEP class aircraft. In other words, even if you were to fly 100 hrs PIC in microlights over the 24-month period, you would still be required to have at least 1 hr of PIC time on SEP class aeroplanes.

EASA EIR & LAPL boards:

As part of their GA Roadmap initiative, EASA has agreed to set up review boards

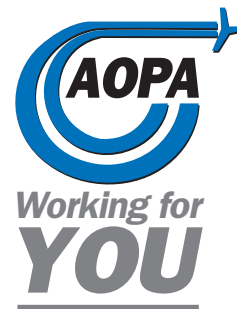
to assess problems or issues arising from certain new licences and ratings. The first of these, termed the 'EIR board', will be held at EASA in Köln on 27 Jan 2015 and will focus on the En-route IFR Rating, Competency-based Modular IR(A) and EASA's 'Simpler Instrument Flying Qualifications' working group. IAOPA will be represented at the EIR board and will be giving a brief presentation concerning the UK IMCR/IR(R) as it is known that the Head of DGAC (the French CAA) is very supportive of this rating. The first LAPL board will be held on 25 Jun 2015, immediately after the next EASA TAG/SSCC/FCL meeting at EASA in Köln at which IAOPA will again be represented.

IMCR/IR(R): Recent discussions with the CAA have clarified several matters concerning these rating(s):

- It is confirmed that IMCR/IR(R) experience prerequisites, currently described as 'following PPL issue', are also applicable to NPPL(SSEA)/LAPL(A) holders and CAP 804 will reflect this in its next amendment.
- An IMCR / IR(R) is valid on MEP aeroplanes if the pilot holds an MEP Class Rating and IMCR/IR(R) without any requirement for additional training or testing.
- The 'Continuous Descent Final Approach' (CDFA) technique for non-precision approaches, whether for notional glideslope or free descent procedures, is neither mandatory nor expected at IMCR/IR(R) level.

● An Information Notice will be released 'shortly', to clarify prerequisites for instructors who wish to provide instrument flight instruction for the IMCR/IR(R). It is likely that these will be similar to those which applied under JAR-FCL.

So as you will hopefully agree, we are continuing to work on your behalf to ease the yoke of Eurocracy under which we've suffered for many years. We expect to see a number of changes for the better by the end of the year; fortunately both EASA and the CAA are in full agreement about the need to reduce red tape and pointless regulation. As, it seems, is the government's own GA Star Chamber – perhaps that might be because of a certain date coming up in May? ■



NATS stumbles on SERA

The CAA has moved to allay fears that Letters of Agreement which have allowed aerodromes to operate more efficiently in Class D airspace would have to be withdrawn to conform with the Single European Rules of the Air.

The Authority has informed National Air Traffic Services (NATS) that no change is necessary until certain matters have been clarified, so operations can continue as per Letters of Agreement until further notice.

The problem would have affected many

small strips in Class D airspace, but also larger GA aerodromes such as White Waltham, Fair Oaks and Denham. Letters of Agreement have allowed traffic going from and to such aerodromes to arrive and depart without contacting air traffic control except at their own aerodrome, as long as they stuck to certain routes and procedures.

One small aerodrome, East Haxted, run by AOPA member Keith Hayley just one mile inside the Gatwick zone, has operated on a Letter of Agreement for

decades. The agreement calls for traffic at the strip to use certain entry and exit routes, to listen out on the Gatwick frequency and to squawk 7010. Given that such strips can often be busy, the agreement prevents unnecessary overload on frequencies used by Gatwick traffic.

In late December Mr Hayley was among several dozen aerodrome operators to receive similar letters from NATS saying it was possible that their Letters of Agreement would no longer be valid after February 4th, 2015. This would mean that every movement at the affected aerodromes would be subject to clearance from ATC at a busy commercial hub.

The letter quotes Single European Rules

Chief executive's diary:

New year, old issues

The coming year will test our regulators' ability to make an orderly and constructive retreat from the over-regulation that has afflicted general aviation for decades. The spirit is willing, but chaotic and ill-thought-out deregulation could do more harm than good. As I've said before, the only two laws we need to worry about in general aviation are gravity and the law of unintended consequences.

In November I met with CAA Chief Executive Andrew Haines for a discussion on the direction of travel with respect to the CAA's General Aviation Unit and EASA. While the CAA retains certain national powers, EU laws and regulations trump national laws. I remain concerned that given the efforts of the politicians, the CAA and EASA we will see some small overall improvements, but we will fail to tackle the problems that exist for general aviation aircraft under EASA. I will say again – ELA 1/ELA 2 just adds more bureaucracy to the system!

I met with Philip Clark of the CAA to look at the gold plating submissions – thank you to all of you who sent in your thoughts. A reply in the form of a report will go out once we have finished the review. I've also spent a lot of time talking to York Consultants, who are doing the GA review for the Department for Transport.

AOPA is wholly in support of deregulation, but piecemeal deregulation risks distorting the industry and destroying some of the most economically viable segments of it. For GA to survive and thrive, there must be a strategic plan for deregulation which does not benefit some while crushing others. We want deregulation to make a substantial difference to the fortunes of all of GA. It is largely the EASA-regulated sector that makes European GA a viable industry, yet the cost of conforming

to the regulations is driving owners and pilots out of EASA aircraft and into more lightly-regulated, largely owner-maintained aircraft with less rigorous construction standards. Deregulation which further favours only that sector will shrink GA and cost the jobs of skilled engineers, while doing nothing for safety.

Bad regulation kills aviation. We've seen that with twin-engined aircraft, economically the biggest contributors to GA in the United States, which have mostly been driven to the wall in Europe by bad JAA and EASA regulations. Are we now going to do the same with Group A aircraft? Intelligent deregulation could save the day. We accept that EASA has the problem of carrying with it all 31 states it represents, but that Gordian Knot must be cut. We need to be fully aware of the law of unintended consequences when we make changes. My greatest hope is that the work being done by York Consultants influences future Government policy on GA and supports the CAA when discussing regulations at EASA.

As a member of the EASA Advisory Board (EAB) I attended a meeting in early December in Cologne. The new chairman is from the Aerospace and Defence Industries Association of Europe, which means that most of the debates are still around manufacturing. Greg Bowles from GAMA gave a presentation on EASA's Certification Specification 23 to the group, and I had a long discussion with him on the subject, as I do not think the CS 23 will make a big difference at the end of the day. While it's good that they do the work, in terms of lowering training costs it will do very little, in my opinion – it may just mean that manufacturers can make profit from two or four seat airplanes.



The EASA Management Board has a new chairman, Mr. Pekka Henttu, from the Finnish Department of Transport. There was general support for my comments about the need for the EAB to be more proactive rather than just being a review body, as we seem to spend most of our time reviewing the Management

Board papers. I also met two board members from AOPA Norway in London as they came for a meeting with the head of UK GA to discuss the UK Red Tape Challenge. I had to explain that this was not a CAA initiative but a Government one across, all departments. We also spoke about the meeting that they had organised with the other Scandinavian AOPAs.

I attended the Industry Consultation Body (ICB) in Brussels, where the main focus was the review of the Air Traffic Management master plan and the support that the ICB wants to give to it. The proposed ICB wording, in its supporting document, focuses on ATM only. I pointed out that the Single European Sky project was about much more than ATM. The high-level political requirement is for safety to improve by a factor of 10. IATA agrees, but their priority is system costs and efficiency!

At the SESAR Strategic Planning Partnership I made the point that the GA view was that SESAR was only about delivering what Thales and Airbus want and referred to the lack of support for an ADS-B solution for GA. The airlines supported me when I again referred to the high-level political objectives for SES, particularly safety. I also had a meeting with Sharon Wang, the lady who has established a flight training school at Rochester. We wish her success with her new venture.

The December meeting of the AOPA Flying Instructor Committee discussed, among other things, the idea of *ab initio* flight training on permit aircraft. This, in my opinion, shows the strength and depth

of the Air section 6001, Classification of Airspace, which says in part:

“Class D: IFR and VFR flights are permitted and all flights are provided with air traffic control service... continuous air-ground voice communications are required for all flights... all flights should be subject to ATC clearance.”

It goes on to say: “Therefore the... operation of departing/arriving without reference to ATC is not compliant, and East Haxted is situated within the Gatwick CTR Class D airspace. This could result in NATS having to withdraw the Letter of Agreement from the 4th of February 2015. The CAA has aspirations to implement SERA fully on the 4th of

of the Association, in that it can call upon its committee structure to debate such issues. The CAA has said it will consult more widely on this issue in future, and AOPA will make sure that your views are taken into consideration. I have also had a request from the European Commission to join a panel in January to discuss the issue of 8.33 radios to see if we can find a solution for GA.

December is always a short working month. However, I did meet with Thomas Mayer, who heads up the European Regional Airport Community. The primary purpose was to discuss our joint political lobbying effort for 2015, as we share a common resource. Also, with the changes to the Parliament and new members of the Transport Committee, we wish to keep GA issues in the minds of European politicians. Sadly, Philip Bradbourn MEP passed away on 20th December – he was a supporter of aviation development across Europe.

From November 21 to 23 AOPA had a stand at the *Flyer* event in Telford, and we plan to be there again next year – come and see us. Between the 24th and the 26th I attended a conference in Tel Aviv in support of AOPA Israel. The main discussion centred on aerodromes, a number of which are under threat of closure in Israel. I reminded the audience that, as part of the aviation infrastructure, aerodromes need to be protected because once they are gone it is difficult to replace them: “A kilometre of road gets you one kilometre – a kilometre of runway leads to the world.”

January 2015 got off to a busy start. I attended meetings at Eurocontrol and SESAR, where we again discussed the ATM master plan and what GA’s future needs may be. More to follow on that. Later this month 8.33kHz radios will be discussed at European level as we continue to grapple with the financial impact of this mandate on GA.

Martin Robinson

February 2015.”

However, after AOPA Chief Executive Martin Robinson contacted Phil Roberts, Head of Airspace, ATM and Aerodromes at the CAA’s Safety Regulation Group, a ‘letter of comfort’ was sent to NATS on January 14th asking NATS to continue with present arrangements until advised otherwise. The letter was also copied to affected aerodromes, which as well as Fair Oaks, Denham and White Waltham included Andrewsfield, Audley End, Brooklands, Dunstable, Gravelly, Hunsdon, Jackerells Farm, East Haxted, Oaklands and Rush Green.

In the letter Mr Roberts said the CAA was working with the Department for

Transport and EASA to achieve compliance with SERA through a number of possible means which could include approved derogations, allowable national permissions or exemptions. Present arrangements should continue until “our work with EASA has developed sufficiently to provide you with further meaningful guidance”.

SERA was originally due to have been adopted in its entirety on December 4th last year, but the CAA decided to adopt only those provisions of SERA which conformed to existing UK Rules of the Air while continuing to work on fixing the holes in the overall SERA plot. ■





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The drone invasion

By **Pat Malone**

We've had a letter from Andrew Dent, Chairman of the drone company AM-UAS, which gives food for thought and opens a discussion about attitudes to drones. I've known Andrew for many years and he's a good pilot and a solid businessman, but our paths diverge when it comes to drones, UAVs, unmanned aerial systems or whatever you wish to call them.



The first part of Andrew's letter concerns a short story in the last issue of *General Aviation* which said that large private jets were performing rather better in the market than little piston planes. I don't think our positions are inimical, but I'm more concerned with the second half of the letter, which makes soothing noises about drones. Andrew writes:

"Sir,
Unusually for a man of his experience, your esteemed editor appears to have fallen uncritical victim in your December issue to not one, but two examples of PR puffery.

Firstly, I am unconvinced that the heavy jet sector is quite as buoyant as Dustin Dryden would have you believe (*All right for some*). I receive a regular copy of the hefty publication *Executive Controller*, the advertising marketplace for such behemoths, and the current issue contains amongst its many hundreds of pages such desperate pleas as 'any reasonable offer considered'.

Secondly, your piece '*Drone invasion begins*' repeats a PR-invented chestnut about parcel deliveries by UAVs. This is balderdash – such flights are virtually impossible under any current or prospective CAA rules, and even if they could be achieved, there is minimal prospect of carrying them out economically.



UAVs are increasingly useful tools – we have had an Aerial Work certificate to operate ours for four years and recently won a place on a £3m Network Rail contract to inspect their infrastructure at a much lower cost than helicopters. However readers can be reassured that not only will they remain below 400' agl, we also file a NOTAM before each flight.
Andrew Dent
Chairman, AM-UAS"

As a helicopter pilot who regularly operates below 400 feet away from airfields when taking off and landing I'm less sanguine about drone operations, and I think the 'assurance' that they're notified by Notam is a fig-leaf designed to give the UAS companies an excuse when there are dead bodies to be explained away. Big profits are promised from unmanned aerial systems and drone proliferation is

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unstoppable, but when there are hundreds of these things constantly in motion there will be no use hiding behind a Notam. They will be flying blind in see-and-avoid airspace, and unfortunately, that's where I'll be, too.

Forgive me if I don't share your happiness at undercutting the rail job. I'd prefer that the helicopter got the work, largely because I could see it coming. Furthermore I'd know that the guy flying it had as much skin in the game as I do, and had a vested interest in keeping his eyes peeled. A drone the size of a cannonball is impossible to spot, and the operator isn't betting his life on his ability to sense that there's trouble about. Many years ago I visited one of the world's first drone factories, in Tel Aviv, where the manager told me eagerly that a kid who habitually played video games could fly half a dozen of these at once. Gives me the willies.

So far this year we've had drones in the vicinity of Heathrow and unresolved arguments over who was responsible for a military drone coming within 60 feet of a helicopter full of squaddies. Last month I was sitting on a hotel roof in Santa Monica watching helicopters run up and down the coast, where the offshore crossing clearance around LAX is "not above 500 feet", and I watched a drone buzzing up and down the beach from the boundary of Santa Monica airport to the edge of LAX at anything from 100 feet to maybe 400. It's going to happen, and the fact that you put something in the Notams will be a sorry excuse.

There are other 'firsts' I'm worried about, too – the first hijack of a military drone by a geek with a laptop, that's going to be fun. Because of the money involved there's enormous pressure on the regulators to get out of the way, but until some basic and fundamental safety systems are put in place we should no more have blind drones in see-and-avoid airspace than we should have remote control operators running dodgems on the motorway.

We have different imperatives, Andrew – yours is to make a profit, mine is to stay alive. My claims have priority over yours, I'm afraid. ■

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Is land-sharing the future for threatened airfields?

By **Steve Slater**

Anyone who has read recent airfield reports in *General Aviation* will no doubt be by now well-aware that the continuing trend of pressures on flying sites, both from economic and housing threats and from inappropriate developments such as wind turbines in the

immediate vicinity, is most definitely not abating. The General Aviation Awareness Council is continuing to 'do its bit' as AOPA's voice in such matters, explaining to local and national politicians and to local planning officers, the value of GA

to their local communities and the importance of flying sites both as a business asset and a leisure amenity.

There is no doubt that through 2015, pressures will continue to mount, with airfields continuing to be seen as sources of potentially lucrative 'brownfield' land (no matter how green it looks to us) for conversion to housing and commercial development. However it isn't all bad news. There are signs that in some areas a proactive 'land-sharing' approach is bearing fruit, to offer increased viability and protect some airfields for the future. Here's hoping we can continue to report a happy new year!

Renaissance

In December last year there came the good news that Blackpool Airport had reopened to serve general aviation and the Bond Offshore Helicopters services to oil and gas rigs in the Irish Sea. The airport had closed when the former operator, a subsidiary of Balfour Beatty Limited, went into liquidation in October claiming losses of over £35 million. Now a new company, Squires Gate Airport Operations Ltd, has taken over and has pledged to "ensure a long term future for flying in Blackpool."

Speaking personally, I simply can't figure how the previous operators could lose that much money by simply running an airport, but the numbers clearly indicated that their policy of trying to turn Blackpool into a regional airline hub was an economic disaster. Added to that, as many AOPA members have commented in the past, the old management's attitude to GA was uncooperative at best.

Now the new operators are working hard to reverse those perceptions. Perhaps we should reward their endeavours with all our support. An AOPA fly-out for a

weekend at the seaside perhaps?

Blackpool's temporary closure highlighted another significant issue – when we make holes in our airfield infrastructure, other airfields suffer. When it closed, movements at other GA airfields such as Manchester Barton fell. Blackpool, for all its past faults, remained a popular fly-out destination. In hindsight it seems blatantly obvious that it is pointless to take off if you haven't got a somewhere to go to. This clear need for a network of active and attractive GA airfields around the country is now an important part of the case we are making to politicians and planners.

Another airfield re-opened after more than a year of inactivity when the former RAF Church Fenton in Yorkshire marked a

new life as a civilian flying site at the beginning of January. The former WW2 fighter base (in the Battle of Britain it was home to the first "Eagle" Squadron, composed of Americans who had enlisted in Canada) and latterly the centre of elementary flying training for the RAF and Royal Navy, was closed as a part of Ministry Defence cutbacks at the end of 2013.

The airfield celebrated its reopening with the arrival of over 200 light aircraft for a celebratory 'open house' fly-in. Church Fenton's new owner, pilot and businessman Chris Makin sees a rosy future ahead as a training and charter base as well as a convenient gateway to East Yorkshire, with the airfield's two 1500m runways acting as a perfect complement to the smaller airfield at nearby Sherburn, while offering a less formal operating environment than Doncaster Robin Hood airport. Given Chris's main line of business is in trading fast-moving consumables such as soft fruit, I hope it's not too much of a pun to wish that his plans 'come to fruition!'



More than 200 light aircraft flew into Church Fenton for its 'open house' fly-in. Andy Wood
Above: Blackpool reopened in December for general aviation

Sharing space

As previously reported, Rochester Aerodrome is moving ahead with plans to replace its existing two grass runways with an all-weather asphalt surface and parallel grass runway. It will use land liberated from closure of the cross runway for commercial and industrial property, which will fund the redevelopment which also includes updates to hangars and other areas of the airfield infrastructure.

This to me seems an almost perfect win-win and while some may feel sad that another all-grass airfield is being sullied by asphalt, my experience of airfields such as Sywell has shown that the addition of the 'hard' runway has had little or no effect on its character, but has hugely enhanced the airfield's viability. Not least it allows continued operations around this time of year, when historically Sywell and Rochester's grass surfaces have been too soft to be safely usable.

It is noteworthy too that a similar proposal has been made as an alternative to the attempts by the current landowners to permanently close Panshanger, which has now been unoccupied since its tenants were forced to move out last September.

The GAAC and AOA have been actively supporting the Panshanger People campaign group, not least in forcibly reminding council officers (who appear to be in cahoots with the developer to build 700 houses on the site) that the land is

still classified as an airfield in planning law and that we will fight to resist any application for change of use.

The alternative proposal which is being put before Welwyn and Hatfield council would mean the relocation of the existing grass runway, but would allow flying to continue as well as allowing some land to be reallocated for several hundred new homes. Another win-win perhaps?

Saving Old Sarum?

Some controversy, it has to be said, has surrounded a similar proposal by the owners of Old Sarum airfield for another 'land share' activity. This time the proposals involve two housing developments close to the airfield perimeter, which would fund the laying of a new grass runway parallel to and replacing the existing one, as well as a sympathetic upgrading of the airfields historic WW1 hangars and other GA facilities.

While at first sight this appears to be another win-win, with the improved long-term viability for the airfield owners and enhanced

Right: Old Sarum hopes to fund a new grass runway by building houses close to the airfield perimeter

facilities for users, a vocal protest group has sprung into action claiming to 'Save Old Sarum'. This, I must admit has me flummoxed.

To an outsider at least, it seems though that this group is largely made up of nearby residents who are complaining that the new housing will ruin views from their own homes across open countryside. That is perhaps quite understandable, except that those very views are across the airfield itself. And, I suspect, many of those now claiming to wish to 'Save Old Sarum' may be the same people who have complained about alleged noise from the airfield for the past decade or so!

As I am not a local resident and only an occasional user of the airfield, I am not really qualified to comment further. Perhaps an Old Sarum-based AOPA member might like to let us know of their comments? ■



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Old dogs, new tricks



After a lifetime of working with ground-based nav aids Chris Martin considers some of the pitfalls of over-reliance on GPS*

Bees are good for humanity, but they also have a sting in their tails which can, and sometimes does, hurt us. The same could also be said for GPS units. The move away from ground-based navigation aids to airborne pilot-operated and interpreted nav aids – Global Positioning Systems – while primarily driven by the cost of maintaining and replacing the old ground-based aids, does have many benefits. However, rather like the bees, it also has a dangerous sting in its tail.

A warning to this effect is stated by most well known manufacturers of GPS units in their manuals, normally found under 'Introduction Cautions Notes'. A typical warning would say: 'Although this ----- series GPS (also applies to other nav aid makes and models) is a precision-made and functioning electronic Navigation Aid, if it is misused or misinterpreted, continued use or reliance upon it can lead to a seriously unsafe and possibly life threatening situation.'

This potentially dangerous situation can often be worse for an experienced instrument rated pilot than for a newly qualified IR pilot who has gained his or her instrument rating using these new type of GPS nav aids. Accident figures tend to back this statement up, with more incidents involving pilots over 50. The expression "old dogs and new tricks" fits quite well (although not necessarily the old bit, but in my own case maybe it

does).

Joking aside, this is an important Human Performance and Limitations issue. If you have spent a great many years flying instrument approaches using the older ground-based conventional aids like ILS, NDB, and radar vectored approaches, these GPS nav aids units are quite alien and can be very confusing. In the case of a single crew light single or light twin aircraft, the workload on the pilot during any instrument stage of a flight is already very high, especially in turbulence. Add to this trying to think about setting up, fiddling with lots of buttons and knobs or touch-screen

functions with which you are unfamiliar, and even an experienced instrument rated pilot can enter a dangerous confused overload situation.

It may be of interest, and come as a shock to some, to discover that when using one major manufactures series W-GPS units to fly a R/NAV Localiser Approach the unit will automatically set a three-degree glide path at a number of UK airfields (and probably elsewhere in the world), even if the actual glide path for that airfield is not a three-degree approach – it may be 2.5 or 5.5 degrees. If this information is not known to the pilot, a very hazardous situation could occur.

Something else which it seems some users of GPS units seem to be unaware of is the data chip in the unit, which is supposed to be updated every 28 days (in line with the Airac cycle). If this is not done, any outages or other changes will not be recorded by the GPS unit and therefore up-to-date information will not be available to the pilot via this means.

I know of one incident which happened in my local area when an aircraft landed and reported to flight briefing, where the pilot said that he had been unable to pick up approach information on his GPS unit for an airfield nearby so had declared an emergency and landed here to check this out. The airfield they were seeking (approximately 50 nm away) had in fact closed down as a military base and reopened as a civil aerodrome, information which had been added to current charts some time previously. His data chip had never been updated, and the three pilots on board did not have a chart or any other airfield information between them. They relied totally on the GPS unit!

To update, you need to subscribe to something like Jeppesen Publications annually, then remove the data chip from your aircraft's GPS unit and connect it like a flash stick to a computer, go on to their website and reload the up-to-date information.

A very interesting but shocking example of an accident (not caused by a series W-GPS unit) but which resulted in a number of fatalities can be found on the web by entering the following into a Google search: SKYbrary - B732, vicinity Resolute Bay Canada 2011 (CFIT HF FIRE)

In my opinion all pilots who intend to fly R/NAV approaches should read this accident report. What is particularly interesting is that this involved a public transport aircraft with two qualified crew on board. It demonstrates clearly how a very easy-to-make mistake can have a disastrous result.

It is therefore very important for pilots to obtain proper differences and familiarisation training on the type of GPS equipment they intend to use. This is best done initially in the safety of a simulator. However, it can often be difficult to find somewhere with the same GPS equipment as your own aircraft. This should then be followed by dual flying with an understanding and suitably qualified instructor.

A number of private aircraft owners (not so much for group owned) seem to have the money to re-fit their aircraft with the latest new equipment and can also possibly afford the cost of engaging the services of a suitably qualified person to assist them whilst flying around familiarising themselves with their new kit. This is good, but sadly it is not affordable for most.

Many other individuals, groups, and companies (particularly the smaller ones), flying schools and clubs are unable to afford to do this. Another area of vulnerability arises if companies or schools are unwilling to invest time and money in retraining their pilots properly with new GPS technology, leaving their pilots and instructors in a very difficult situation. Flying schools and clubs have the added problem that their aircraft are often equipped with different types or brands of GPS equipment, and their instructors are often left to find out how best to use this kit for themselves. These situations should be covered by their Safety Management Systems, but some companies pay lip service to the SMS, possibly just recording entries in their documents for their auditors to see.

The manufacturers also have a place in this confusing and potentially dangerous situation, firstly by producing new GPS units



with every more functions on them in order to outsell their competitors. Many of their operating controls and functions are not represented in the same way as other manufacturers units are, leading to poor standardisation. Secondly, manuals are often over complex and lengthy, meaning in many cases they are read but not understood, partially read, or not read at all.

Add to these potentially dangerous situations the pilots who can often be distracted from their primary function of keeping safe control of the aircraft, but spend too much time with their heads down attempting to operate GPS units while flying VFR or IFR.

Computer tablets like iPads can also cause problems if not operated correctly and sensibly by pilots. Placing pad units on windscreen suction mounts in the cockpit can be a distraction, but they can also cause major compass swings or errors when placed anywhere near to the magnetic compass. And in a windscreen mounted position they are a serious external vision hazard, blocking the pilots view out of the window.



If no back-up planning has been done and carried in the form of p-logs by the pilot, and the unit runs out of battery power, it can put the pilot under unnecessary pressure, and mistakes are likely to be made. Connecting charging leads which have not been approved by a CAA/EASA approved maintenance

organisation to the aircraft's electrical system is not normally permitted, and some mounting systems which fit onto the aircraft's flight control systems are also not permitted unless they have been approved. Why not consider using a kneeboard mount instead?

Finally there are the 'Gadget Kings' who love all types of new technology, and will use GPS units to fly very close to the boundaries of controlled and restricted airspace because they think that with a GPS, they can. Airprox reports are increasingly recording details of these types of infringement incidents. The pilots involved often misjudge the drift while trying to cut close to controlled airspace, or the units are incorrectly set up by the pilot, perhaps using the 'Go To' function used instead of a routing clear of controlled airspace.



Please do not interpret my observations and comments wrongly. Pilots should embrace this exciting technology, but with caution. Get trained, and exercise caution when using it.

Regulators could perhaps look at ways, possibly though SMS, to improve safety for employed pilots and their passengers or students without heavy-handed over

regulation. Manufacturers, please take a look at ways in which you might be able to safely simplify manuals, and get together with other manufactures to agree a better system of standardisation, taking into account the single pilot's workload while using these units, particularly in turbulent and IMC flying conditions.

By working together we can make flying safer!

*Chris Martin – tech IOSH, FI (ret CFI & Examiner), AOPA Flying Instructor Committee Member (and old dog) ■

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The Apprentice

A youth starting out in GA engineering is a rare and precious resource. By Pat Malone

The government is keen to promote apprenticeships in general aviation in order to breathe life into the industry and to address the looming shortage of engineers across the entire aviation sector. The International Civil Aviation Organisation estimates that while 380,000 new pilots will be needed across the world in the next 20 years, there will be a shortfall of almost half a million technicians and engineers. It has identified a lack of training opportunities as a significant obstacle that must be overcome.

It takes years of commitment for young men and women to obtain the licences they need, and a major effort is required if we are to make a dent in the problem. Many skilled and experienced engineers in general aviation are nearer the end of their working lives than the beginning, and if they are to pass on the fruits of their experience, the establishment of a functioning training system across GA is a matter of urgency.

It has to be said that engineering in the GA sector is not a particularly attractive career. Bad regulation is shrinking the market, owners are fleeing the regulated sector for self-maintained aircraft, and labour rates are less than half what the average driver pays to have his car fixed. But as a gateway to a well-paid career in commercial aviation it can be attractive, and apprentices could win the GA industry time in which the regulatory maintenance mess can be sorted out.

Last year, Camborne College in Cornwall established a number of aeronautical engineering courses, and it entered 2015 with half a dozen students. Four of them are learning under the aegis of the outsourcing company Serco, which has a contract to help maintain Merlin helicopters for the Navy at RNAS Culdrose. In September they will be joined by 16-year-old Thai Appleton, who is preparing to work with the sort of GA engineering enterprise many of us will recognise.

Left: apprentice Thai Appleton with his father Charlie at Bodmin, where Charlie is an instructor

Cornwall Aviation Services at Bodmin airfield is a two-man outfit affiliated to the local flying club, and it looks after a couple of dozen aircraft. Engineers Rod Bellamy and John Blick have some sixty years of experience between them. Both are pilots, and both could make more money maintaining cars but stick with aircraft out of love for the job. Rod is a licensed engineer who started on steam turbines and diesel engines in the Navy 40 years ago and graduated to aircraft under his father Viv Bellamy's guiding hand at Land's End aerodrome when Viv was operating a DH Rapide. John was a car mechanic who switched to aircraft 20 years ago after learning to fly. As well as maintaining local planes, they work for owners from elsewhere in England who send their aircraft to Cornwall for maintenance because rates are lower, standards are high and service is personal. Neither Rod nor John are in the first bloom of youth, and it has not been realistically possible to make long-term plans for the company. Thai Appleton will be CAS's first apprentice, and his arrival should change the landscape a little.

It hasn't been easy, and were it not for the fact that Thai's father Charlie Appleton is a microlight instructor at Cornwall Flying Club it might not have happened at all. Finding a college course to which the apprenticeship could be hitched was far from straightforward, and even getting to first base has been a trial. Charlie's knowledge and Thai's determination have succeeded in opening the door, and hopefully more youngsters can now bolt through it.

Thai, who is in his last year at Fowey River Academy, was virtually born in an aeroplane and is learning to fly on the family's Ikarus C42. His grandfather flew Vampires in the RAF, and his father learned to fly a microlight before Thai was born. At the age of 18 months Thai was sitting in Charlie's Thruster; later he traded it in for a Jabiru, and later still for the C42. Thai says: "Dad has never pushed me into aviation, but it was always there, and I enjoyed the fact that being a pilot set my dad apart. We would fly to the Isles of Scilly together, and I took it up naturally." He began taking proper lessons in 2011 at the age of 13, and at the time we spoke, Thai was waiting for good enough weather to go solo. Thai also began helping his father with simple maintenance tasks on the aircraft.

In March last year it was arranged for Thai to have a week's work experience at Cornwall Flying Club, which is an AOPA Corporate Member. Even this is not easy; his school had to satisfy itself that the experience would be meaningful, and the Club had to undergo a risk assessment



Left: Rod Bellamy (left) and John Blick, who have 60 years of aviation engineering experience to pass on

before Thai was allowed to come. Thai, whose academic strengths are in maths and science and who is taking a GCSE in electronics, says: "After the first day I ended up in the engineering hangar, and I never left it."

Rod Bellamy says: "Thai was keen, a good worker, and from learning to fly, he had a basic level of understanding that was very useful. We were not thinking of taking on a full-time apprentice at that time, but when the topic was raised, we were interested."

With help from his careers adviser Kate Wakeham, and from his father, Thai began hunting around for a college that offered an aircraft engineering course. He went first to Truro College, where they have automotive engineering courses, but while they looked at setting up an aviation course for his benefit, they were unable to do so. For a while it looked like Thai would have to leave home to follow his chosen path, but eventually he discovered the Camborne course. While they are keen to take him on, he must first achieve certain grades in maths and science at GCSE, something he is working hard to do. If he is successful, he will start working at Cornwall Aviation Services in September, attending college one or two days a week at Camborne's hangar at Newquay Airport, where they have the best parts of a Canberra.

Rod Bellamy was involved through much of the process, and recalls sitting around a table with half a dozen people at Camborne College, all of whom had an interest in Thai's plans. "They all had their own imperatives, but everyone was absolutely committed to making this

work," he says. "They'd initially planned an assessment of Thai in September, but that wouldn't have left any time to implement a 'Plan B' if things didn't work out. So they agreed to an earlier assessment, with the condition of certain academic achievements in this year. I had to be there as the prospective employer while they debated whether he was a suitable candidate. Everyone was entirely positive and helpful.

"We have to undergo another more comprehensive risk assessment, but of course we already have our safety manuals and our airfield manual, together with other safety literature. We have an advantage in that Thai already understands safety at a basic level, having been taught by his father as part of his pilot's licence course."

When Thai begins his course he will find that like the commercial flying courses, he will be required to learn a great deal of information which he is unlikely ever to use in his working life. He needs to know the ANO inside out, the British Civil Aviation Regulations (BCARs), the Civil Aviation Inspection Procedures (CAIP) and all the fat volumes that so delight the regulators. He will also get to fix GA planes, a business which given the age of the fleet changes little down the years. "Everything else is changing constantly," says Rod. "We used to have CAA inspectors come before and after every job. Now we might not see one for a couple of years – under EASA, they just want to know that all the paperwork is in order. What the business will be like when Thai gets his licence six years from now, nobody can guess. Who buys new Group A aircraft these days? Who puts his own head into the EASA noose? My advice to Thai will be to get his licence, then go straight to the airlines. My own son went through an apprenticeship with me many years ago, and now he makes a six-figure salary working for Emirates in Dubai."

Does that mean companies like Cornwall Aviation Services will operate on a rolling cast of apprentices? "It depends on

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whether we survive the first one," says Rod. "This is not an easy course, and a young man goes through a lot of changes between the ages of 16 and 22. We can't pay him very much. Can he maintain the necessary level of dedication through it all?"

"We have high hopes, and we'll certainly do our part. That could end up with a very good job in a field he obviously loves, and from my point of view I think it's good to see young people in the hangar; often it feels as though the average age of people in this business is rising by a year every year, and that's not a very inspiring trend." ■

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Time to spare, travel by air

Caen, our first stop in France, where our radio problems started

Former Concorde captain **Les Brodie** takes a profoundly subsonic flight to Tarbes in a Tiger Moth

Tuesday 2nd September 2014 was a very nice late summer's day when I first considered flying from White Waltham to Tarbes Pyrenees Airport in order to test a TBM 900 for an article in the December edition of the *General Aviation* magazine. As described in the article, the public transport method of getting to Tarbes was awkward with regard to schedules, and expensive, which led to the idea of flying there by light aircraft. This of course was also expensive, but became more economical when I managed to convince my friend Trevor Norcott, an ex-Concorde Flight Engineer Instructor, to join me as photographer and share the flying. Trevor has accompanied me on many aviation adventures in light aircraft as well as in Concorde, and since his retirement he has become an accomplished PPL. With a steady hand for camera work Trevor was the ideal man for the mission.

Having found a willing accomplice the next problem was to find a suitable aeroplane at short notice. The slot for the TBM flight in the training and testing area to the north-west of Toulouse was set for 1000 local on Friday 5th September, and as this airspace is used by the French military and Airbus, the slots are hard to come by. The plan was to leave White Waltham early on Thursday, which gave us very little time to find an aircraft. My friends who could assist were either away with their aircraft, or not contactable. Trevor suggested we could use the

Chipmunk in which he had a share, but that already had a booking and would not have had enough hours left before the next check. The only option was the Tiger Moth G-AOBX, of which both Trevor and I own

Below: 130 bhp and sheer reliability from the Gipsy Major, apart from the odd glitch
Right: and so it proved – 75 years on, the Gipsy Major can still be relied on

a share. After a recent engine rebuild this aircraft had plenty of hours for a return trip to Tarbes, and the weather was forecast to be suitable except for the usual late summer thunderstorms over the Pyrenees. The aircraft was still in its running-in period so we decided to take it for a short flight on the Wednesday to make sure that all was well, with a final check of the weather before making our decision about flying a 1940 aeroplane for seven hours flying time each way, some of that time above water.

We looked at routing to Dover, then using the short Channel crossing Trevor had used on a previous occasion,



but this would have taken us a long way out of our way, and take us towards more cloud. As we were trying to make a dinner engagement for 1830 local in Tarbes the longer crossing between St Catherine's Point and Cherbourg suited us better. A VFR flight plan was filed to Caen using the NATS AFPEX system. We also used the excellent AOPA site to access and file a General Aviation Report. The 'Flying Abroad' information given on the site is well worth a read if you are flying abroad for the first time and is also useful to check up on the latest rules for those who are experienced overseas flyers.

On the day of departure the weather wasn't quite the same as on the fine Tuesday that made me feel that flying to Tarbes in a DH82a was a good idea. The forecast was for an improvement, but the cloudbase was too low to make an early departure. It was best to stay on the ground and drink tea while the sun did its work. We finally got airborne at 1050, having used up two hours of our valuable 'time to spare' but still with the possibility of reaching Tarbes that day. The weather,

although improving as the forecast suggested, was not good enough to cross the Channel to Caen. Instead we landed at Goodwood to top up with fuel and wait for an improvement. The flight to Goodwood was quite a challenge in itself. To start with, the remote aerial for my Garmin 296 GPS had slipped out of its Velcro location on the shoulder of my flying suit as I boarded and had ended up with me sitting on it. When I asked Trevor to take over checking our navigation with his GPS in the front seat, he informed me that his was not working either, so we had to rely solely on the 1940 P type compass and the half-mile topo. Not a good start, but the cloud had lifted just enough for our safe transit of the South Downs. There was a bonus – while we waited at Goodwood we were treated to the sight and sound of a Spitfire from the Boulton Flight Academy, taxiing out and taking off from runway 06, on which we had just landed.

We were airborne again by 1130 and set course for St Catherine's Point under the watchful eye of Southampton Radar. As we climbed to 3500 feet for the

crossing we changed to London Information to activate our flight plan and arrange a Danger Area crossing clearance through D036. We were changed to Plymouth Military for the clearance and Traffic Service. Hearing the reassuring voices of the controllers and seeing the flashing reply light on the transponder acted as a 'comfort blanket' as we set off on our 55nm channel crossing. The Gipsy Major engine sounded perfect, just as the 1930s advert said – '130 bhp and sheer reliability'. Oil pressure OK, life jackets on, PLB on board to add to our feeling of wellbeing. It was my first time in an open cockpit heading for France, and with a glorious blue sky above and the cloud below becoming less and less I was enjoying every minute. By the time we reached our FIR boundary reporting point GARMI we were two thirds of the way towards dry land and talking to Deauville, who gave us the good news that Caen was CAVOK as expected. Now full of confidence we headed direct to Caen, coasting in over the remains of the Mulberry Harbour at Arromanches, where around 6000 tonnes of supplies and equipment were landed daily 70 years before our flight. It occurred to me that the aircraft we were sitting in was based at White Waltham as an RAF trainer throughout WW2, and certainly would have been used to train many of the pilots that took part in D-Day and subsequent operations.

We were heading towards a busy provincial airport Caen Carpiquet served by Air France to Lyon and Nice and Flybe (StobartAir) to Southend. We arrived at a busy time. I had obtained prior permission the day before and had updated our ETA before leaving Goodwood. Nevertheless we were sent initially to visual reporting point NK, which lies to the north east of the airfield, upsetting my plan for a left base join for runway 13 grass. Holding off was no problem as we had plenty of fuel, but it would have been a different story if we'd flown direct from White Waltham as originally planned. It would have been right on the limits of our 18 gallon tank. Maybe the weather was on our side after all.

With teamwork and the help of a local pilot we managed a twenty minute turnaround and I was pleased that I managed to start the warm engine after two swings for Trevor who was now set to fly us to Cholet. It seemed that we would be eating dinner in Tarbes after all – I even had time to chat to Frank Currie, a near neighbour of mine who besides sharing my love of Lotus cars used to fly Moths from White Waltham before moving to Jersey. He had just arrived from Jersey with his student, a very attractive lady, and was surprised to find OBX waiting at the pumps. Aviation sure makes the world a small place. After the mag check and

Staging at Cholet after a pre-arranged non-radio approach



Leaving Cholet with hopes for a one-day journey to Tarbes put to bed



stowing our chocks in the luggage hold I strapped myself into the front cockpit. 'Time to spare – travel by air' kicked in again as I found that my headset, which had worked perfectly in the rear cockpit, would not function in the front. I had to unstrap my Sutton harness and head back to the luggage locker to change for the spare. Having checked the intercom with Trevor, and made a brief transmission that sounded OK I strapped in again and called for a VFR departure clearance, only to find that the Tower could not understand a word I was saying, even though we could hear them perfectly well. After several attempts we realised that the battery power remaining was not up to the job of transmitting. The Tower asked us to shut down and call them through the Pompier's (Fireman's) hand-held radio. This we did, and obtained a clearance to fly to Cholet with the understanding that we would follow departure instructions by acknowledging with carrier wave only transmissions. As it turned out this worked very well. I also called Cholet to advise them that we would be arriving non-radio.

The 127nm flight to Cholet was a first for Trevor but for me it was familiar ground, although I was normally at least at 24,000 feet in an AC95 Turbo Commander, or in recent years at 41,000 feet in a C560 Citation 5. But down at 1500 feet things looked very different, and you can smell the countryside to boot. We listened out on Brest Information, activated our VFR squawk and made sure we stayed well clear of control zones and restricted areas which involved climbing and descending to keep us safe and legal. By sharing the en-route flying, each of us could savour the sheer vastness of the French countryside and just how eerily quiet their roads are; we rarely saw any vehicles as we progressed southwards at around 80kts. By now the idea of dinner in Tarbes was getting far less likely so we kept the power back for economy and to give the engine an easy life, bearing in mind (no pun intended) that it was going to get us back over the Channel at a later date. Our routing took us via Flers, Laval and Segre crossing the Loire by Chalonnnes-sur-Loire.

As we approached Cholet we did try to transmit our intentions on their AFIS frequency, but they could not understand us. Luckily there was no traffic so were able to position downwind left hand for runway 03 grass where Trevor brought us gently down before taxiing across rough grass to reach the pumps. Trevor was straight off to the nearest hangar with our battery and charger while I set off to the Tower to pay the landing fee and arrange fuelling. It was nice to have a rest from the noise and the wind, but after a drink and a bite to eat we were off on our travels again. With only a 45 minute battery charge we kept our fingers crossed that there was

enough electrical energy stored for the whole trip. This was to be our final sector of the day and 'only' 93 nm to Angouleme's Brie-Champniers airport. We arrived there at 1915 local with not enough daylight left to reach Tarbes, besides which we were already late for dinner so the only option was to night stop.

In the past both Trevor and I recognised New York as our second home with the amount of time we spent there during our Concorde lives, but for me after retirement Angouleme took over the role during my time flying for Control Techniques of Newtown, Wales and Leroy-Somer of Angouleme, both part of the American giant Emerson Electric. During 11 years of operating in and out of Brie-Champniers I had never landed on the grass, even with a maximum cross wind on some occasions, so this was novel, and I had an audience as some of my French friends had heard about our impending arrival. It felt wonderful gliding in on a perfect summer evening. The sun glowing through the haze was 'pas de probleme' and soon we were shaking hands with, and in some cases kissing, the reception party. A taxi was arranged along with rooms at the Mecure Hotel, Centre de Ville, and we just had enough time to tie down and put the covers on OBX before Louis the taxi driver arrived. I felt very at home as Louis had driven me around the area for many years, and as ever was listening to classical music as we drove to town. During the journey he also continued where he had left off in trying to teach me to speak French. That task could take a few more years to complete.

Angouleme is a university town and we had arrived during 'Freshers Week' so the atmosphere was vibrant and made for a

very pleasant evening. The atmosphere in the morning though was not so good, as overnight the visibility had dropped to 100 metres. We delayed our 0730 local pick-up and enjoyed a leisurely breakfast while checking the forecast, which showed that we would be able to fly by 1000, which of course was the time that we should have been flying the TBM 900. A new slot time was made for 1500 instead, but as it turned out the weather did not allow us to get airborne until midday. The 151 nm journey to Lalubere (Tarbes's grass airfield) took us over beautiful countryside surrounding the Dordogne and the Gironde rivers and we had plenty of time to enjoy



Top right: Right hand downwind for the 28 grass at Angouleme
Above right: Plan d'Eau outside Angouleme, where author Les Brodie used to windsurf
This photo: the last leg to Tarbes took us over beautiful countryside in the Dordogne

it. It took us 2 hours 20 minutes into the wind to complete, definitely as far as we would want to venture in one go. Our radio transmissions were on limits as well. We had lost contact with Aquitaine Information about mid-journey, and they had also lost radar contact as we had to fly at 1500 feet to avoid the en-route military areas. It was only when we made contact with Pyrenees TMA that they abandoned the idea of triggering search and rescue. It was good to know that we were being cared for so well.

So after 7 hours and 15 minutes flying time over two days we finally reached our destination in the nick of time to be taken to Tarbes Pyrenees airport to get airborne in a brand new TBM 900 by 1500 local – a great sense of achievement prevailed. By 1630 we were back at Laloubere to fuel the aircraft and decide how to proceed. It was a very pleasant evening and the forecast for the following morning was not so good, so we looked for a suitable destination to the north with a grass strip to night stop. We chose Andernos-les-Bains which lies on the banks of the Bay of Arcachon to the West of Bordeaux. I promised Trevor that we would be drinking

wine and eating ‘fruits de mer’ in a couple of hours. We set off for our 1 hour 30 minute flight over the sparsely populated area of Aquitaine known as the Departments de les Landes, which happens to be the most heavily forested area in Europe. Apart from a few farms and areas that looked like heathland, all we saw were pine trees. I thought to myself I would rather be back over the Channel looking for small vessels to pick us up after a ditching than having to land amongst those trees. Thank heavens that we were sitting behind an engine with ‘sheer reliability’. I took my mind away from negative thoughts by watching the sun going down, creating a most beautiful hazy sunset. Even with a strong headwind nearly all of the way we managed to land at Andernos 15 minutes before official night with a straight in approach onto runway 31.

Below: after more than seven hours flying time we finally sight Tarbes

Bottom: turning finals for the grass field at Tarbes Laloubere

Below right: rendezvous with another 1940s aircraft, Antoine Chabbert's Stearman

We saw some people working on a Boeing Stearman PT17 in a nearby hanger one of them being the pilot Antoine Chabbert, who took up the challenge of finding some accommodation for us, even though it was still high season. Antoine and his wife tried every option, to no avail. In the end we managed to find two rooms in a B&B hotel at Gujan Mestras, a 45 minute taxi ride south of Andernos, and our ‘fruits de mer’ turned into a panini at a nearby Casino Bar. (Sorry Trevor!).

Following an early breakfast the next day we found a taxi to take us back to the airfield, which was CAVOK for our departure. The plan was to join Antoine in his Stearman, both aircraft having been constructed in 1940 on opposite sides of the Atlantic for the same purpose, over the Bay of Arcachon at 1000 local. Yet again ‘time to spare, travel by air’ reared its ugly head as this time we could not start our ‘reliable’ Gipsy Major engine. We tried everything, including cleaning the plugs. After two hours and many swings of the propeller to our surprise it started. (It turned out to be an intermittent suppressor lead that caused the problem, which was discovered many flights later). We were



able to meet up with Antoine on his second scenic flight over the bay. It was a marvellous sight for us as it must have been for Antoine and his passenger.

We flew north towards Royan, crossing the Gironde estuary where in December 1942 the famous ‘Cockleshell Heroes’ played their part in shortening WW2 by six months (according to Churchill). Operation Frankton involved twelve men in six canoes being launched from a submarine to paddle by night and install limpet mines on the side of German shipping docked in Bordeaux. Although only two of the brave souls survived, the raid was deemed a great success. From our vantage point we could see just how brave they were – the waters below us looked most inhospitable.

It took us over two hours to reach Cholet as again our Tiger was dealing with a headwind. Trevor charged the battery for as long as we dared. After our late start from Andernos, along with the headwinds, we were running out of time to return to White Waltham on the same day. In fact by the time we started our Channel crossing on the final leg it was approaching 1800

UK time and night was rising as we watched another hazy sunset. This time we had to deal with chaotic cloud formations ahead and below. Deauville Control activated our flight plan and kept an eye on us as far as GARM. They were kind enough to change us to London early so we could check the status of the danger areas ahead of us. As expected at that time on a Saturday night they were inactive, so we stayed with London Information for the crossing and as we were up at 4000 feet we had very clear 'two way'. London gave us the Southampton weather as CAVOK but over the Channel it was a different story. Although we had clear and bright blue sky above us and were maintaining VMC, the dark rising from below along with the varied cloud formations became somewhat disorientating. It was a matter of keeping your eyes peering upwards for the 'horizon' and of course you still needed to look at the instruments to check for straight and level. This demanded a great

Right: Sunset over the pine forests of Aquitaine as we head home
Below: author Les gives his mother a Tiger Moth treat on her 90th birthday



deal of concentration. We could see how the Kennedy aircraft got into so much trouble over Long Island Sound many years ago.

As ever, Trevor and I shared the flying, and were very pleased when we saw the outline of the Isle of Wight in the haze below. We descended to 3000 feet to remain clear of controlled airspace and stayed with London Information, who were

Moths and Concordes

Even 'sheer reliability' needs TLC, says Concorde engineer/instructor **Trevor Norcott**

I have completed many memorable and enjoyable flights with Les, some more challenging than others; one in particular comes to mind, the first shakedown flight of Concorde G-BOAG for return to service after modifications following the Air France crash in Paris. The flight started with the stick shaker going off at lift-off. This was caused by a faulty Air Data Computer, which was shut down with the consequent loss of instruments etc. After a crew discussion it was decided to carry on with the test flight. More faults cropped up – a deceleration from Mach 2 with only two of the eight intake lanes working was carried out with no engine surges! Anyway, after a technical debrief back at base Les told the engineers that despite all, we would have made it to New York. I thought to myself, maybe, but it would have been some time before we got back. This is one example of how to me, Les is one of the most positive and motivated people I know.

So when Les rang me and asked if I fancied a trip to France, I thought that sounded like an interesting little idea. I have been to France once before in G-AOBX, a trip with the Tiger 9 team to Berck-Sur-Mer. Nine Tigers set off from

Headcorn and crossed the coast at Folkestone on a brilliant summer's day. Cap Gris Nez could easily be seen before leaving the English coast, and we crossed the Channel in loose formation, all looking out for one another. It soon became clear that my second visit to France in a Tiger could not be more different. I asked Les when he wanted to go, and was somewhat surprised when he said "in two days". Not much time to let the other half know, and prepare. What was the destination? Tarbes – I wasn't sure how far that was. Les wanted to take the long sea crossing! It was gradually becoming clear what a daunting flight this was going to be, but Les's enthusiasm was starting to win me over.

We considered a DHC-1 but decided to use the David Ross Flying Group Tiger Moth G-AOBX, of which we are both members. The previous winter OBX had a top end overhaul due to decreasing compression. I stripped down the top end with Ben Borsberry, who looks after our maintenance. We took the heads, barrels and pistons over to Paul Lipman, who on inspection said the barrels were scrap and the exhaust valves were out of limits – a bit of a shock. At the end of February I picked up our gleaming replacement

as helpful and as reassuring as ever, up as far as Midhurst where we finally established communication with Farnborough. Trevor routed us over his home in Sandhurst back to White Waltham where we landed fifteen minutes ahead of official dark, just as we did the evening before in Andernos. Luckily we have both been eating plenty of carrots of late.

We collected our belongings, covered the aircraft so that the ground crew could put it away in the hangar before closing time, and headed for a well-earned beer. Trevor and I discussed the trip and decided next time we should have a wind generator fitted to keep the battery charged and the radio and transponder fully operational at all times. Also that we should allow more days to cater for fickle weather and possible technical difficulties, along with booking ahead our accommodation and restaurants.

With all that in mind I think I could convince Trevor to join me in taking OBX to Aldinga Airfield in South Australia where I recently took my mother flying on her ninetieth birthday in an ex RAAF Tiger Moth VH-UEQ just before a bush fire in the Adelaide Hills closed the airfield. Oh, no! Not another story... ■



Moth and Moon

Little did we know that while we were flying over Sandhurst we were caught on camera by the photographer Brian Ayre, who was taking a series of pictures of the harvest moon. He had posted this unusual shot with OBX in the frame on a local website, where it was spotted by Trevor's daughter Jackie. She obtained it from Brian, who has kindly allowed us to show it here. He told me that the rather blurred image of the aircraft was due to him using a very slow shutter speed to capture the near stationary moon. We were of course moving a lot faster to arrive back at White Waltham in daylight rather than just moonlight.



Left: Trevor and Les at Lalouber planning the flight to Andernos-les-Baines

barrels and pistons, together with shiny refurbished heads and new sodium exhaust valves; Paul had done an excellent job for us. Put the engine back together with Ben, and she started second swing and sounded great. Took her for a short proving flight before the running-in process was started; all was going well until the engine started to feel tight after shut-down. Les and I took her on a flight to Rochester. Shortly after take-off on the way back, it felt like the

engine had a brief 'moment' when it was trying to seize up, but then returned to normal; after a discussion we decided to carry on back to White Waltham, without further incident. However the 'tight when hot' problem seemed to be getting worse. Ben and Paul decided that this had to be investigated, and on Good Friday Paul took the top end apart. As expected, all was good with the top end, but on turning the crankshaft some tightness could be felt.

I came in with Ben a couple of days later to find the sorry sight of OBX with the top end dismantled, pistons swinging in the breeze. Ben got permission to take the top cover off, and it soon became apparent that the No 3 main bearing cap was fretting into the crankcase. So out came the bottom end, which I then took to Vintage Engine Rebuilds. Fortunately they were able to machine the crankcase and bearing caps, and after line boring install new main bearing which returned the bottom end to almost-new condition.

I returned the engine to White Waltham and with the help of Ben and Digby Macworth, our LAA inspector, installed the engine and rebuilt the top end again. I must say she did look good with the whole engine now virtually overhauled and looking very shiny.

The engine started and ran great, so it was now back to running in again as Paul had fitted a set of new piston rings. All went very well, with oil consumption coming down and excellent compressions. 25 hours were soon flown, and it was time to change the oil and carry out compression checks, along with all the other checks – tappets etc. At this point Les rang me and said he wanted to fly to France, so with a half run-in engine, it was time to put my faith in all the work I had carried out!

The early post-war pattern for air races differed little from the system used in the 1930s, but there was a short-term increase in the range of power and speed produced by the aircraft used. This created more problems for the handicappers who (most people agreed) did the difficult job very well. A prospective entrant needed to submit an application showing relevant details of the aeroplane and of his/her flying experience, including information on participation in any previous events. Assuming that this and the competitor's licence were in order, the next move would be to be present at the start site by a laid-down date and time. Usually, though, competitors would arrive well before this to allow opportunities for race practice, especially to become thoroughly acquainted with the route and its turning points.

After a comprehensive briefing for pilots, the aircraft would be positioned on or near the starting line with the machines assessed to be the slowest in pole positions as the first to be flagged away. Once the spirit of the race was active, the time waiting to be unleashed was the most stressful (but not the most exhilarating) part of the day. The course to be flown could be a very long haul, often with no other competitors in sight for much of the time, or it could be a very short circuit with all or most of the route within view of the start and with all participants closely bunched. As a general rule there would be a permitted entry limit of one aircraft per

mile of the route.

The rules were simple but strictly checked. The most common fault was to cut over or inside a pylon and sometimes this occurred because of misjudged wind, but to avoid time loss it was essential to make the turn as closely around the marker as was practicable. Some aircraft could be manoeuvred very tightly and these would provide quite spectacular sights, but some pilots preferred gentler turns to avoid the loss of air speed.

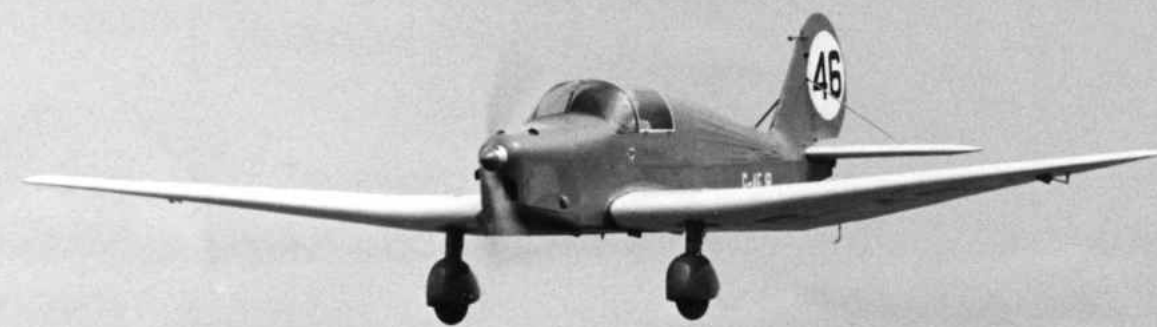
As wind is effective over time and not distance, the slower machines always suffered when it was strong; straight legs would be flown at heights that provide maximum help or minimum hindrance, as appropriate.

Usually the route would be flown over several laps, and the more of these there were, the more difficult it could be for a spectator to try to pre-judge a result. As a late starter, a very fast machine would need to overtake others more than once, so all participants could be well scattered or bunched at any time, with meaningful bunching occurring only close to the finishing line at the end of the last lap. If the handicappers had done their jobs well, all the machines would reach the line within a very short time interval.

The winner is not necessarily the pilot who flies best, and that honour may not always be awarded to the first across the line. An aeroplane that has not raced for a long time (or even never) may beat or be

beaten by the handicappers and as the sole surviving Avro Club Cadet had not competed since before the war, no one could know precisely what its performance would be. So to fly it in the 1952 Grosvenor Trophy Race at Woolsington Aerodrome (now Newcastle Airport) was an interesting venture. I had not finished very close to the front in any earlier race and I was pleased to find that my ageing steed was giving me a new experience; unexpectedly I seemed to be in the lead, but was pipped just before the post. Although I was second to cross the line I was surprised to be told later that I was the winner: the pilot who beat me had performed so unexpectedly well that he was ordered to have his engine stripped down: this revealed undeclared high compression pistons, so he was disqualified.

The handicappers needed to calculate the likely performance of an untried aeroplane (which, despite its age, had given me that probably undeserved good luck) and compare this with a mixture of well-known entries; most of these had remained unaltered since previous races, and others may have undergone various modifications – declared or not. Almost always, although sometimes disappointed, competitors accepted the judges' decisions and a formal challenge was very rare. Even then there was no inane football-style



Air racing in the 1950s

Part 2

The post-war heyday of high-speed air sport remembered by David Ogilvy

conflict. Although all pilots would like to win, most flew to enjoy the sheer sporting nature of the day.

Unlike motor racing, the system ensured that no pilot could become an unchallenged winner over a long string of events. When an aeroplane had achieved a very clear win, on the next occasion it would be re-handicapped.

The main differences between events of the 1950s and those held today would be the scale of the overall activity, the variety of the aircraft and the wide range of pilot experience. The Halifax that competed in the Daily Express race of 1950 – finishing 24th out of 61 that completed the course – was the only really heavy aeroplane to participate. For the following year the organisers imposed a limit of 12,000lbs, which still left the field open to some fast and potent machinery. The uniquely smooth sound of a Rolls-Royce Merlin was not uncommon on the race circuit and in one King's Cup event national records were achieved by two Spitfires.

These high-powered participants were very much in the minority, but the overall field was far from dull. Regular scenes on the start line included many machines that had gained pre-war fame such as the Percival Mew Gull G-AEXF in which Alex Henshaw had established the South African Cape record in 1938 and the Miles Hawk Speed-Six G-ADGP; these two were almost omni-present back-markers in the relevant post-war races. Other vintage types that reappeared on the race courses



**Above: re-fuelling for Miles Hawk Trainers and DH Chipmunks
This photo: Alex Henshaw at the controls of the Mew Gull**



Photos via Philip Jarrett



**Above: in 1952 the author won a race at Newcastle in this Avro Club Cadet
This photo: an Auster 6 leads a Topsy Belfair in the 1959 National Air Races**

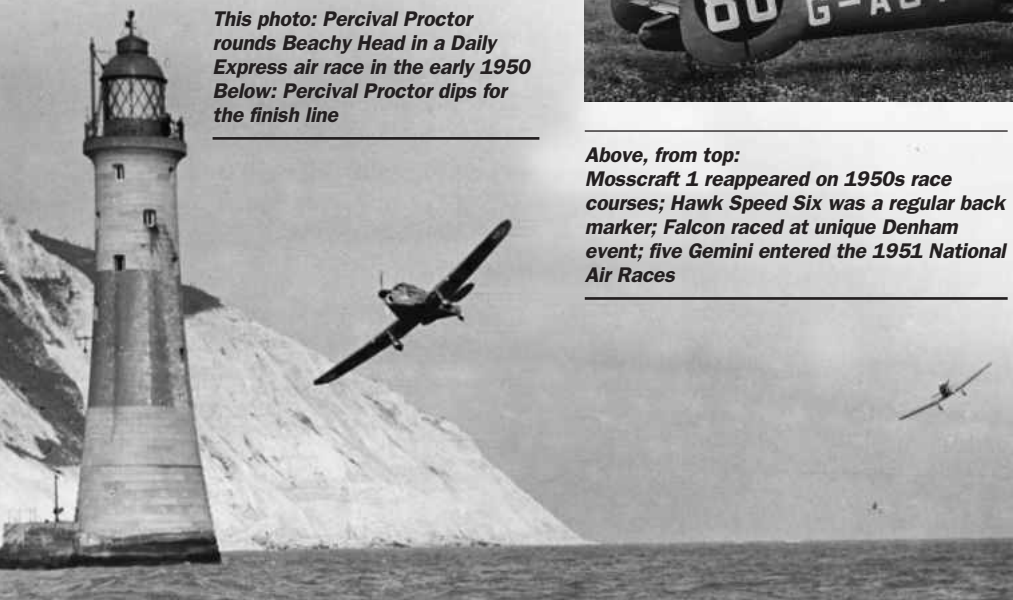
of the 1950s included the Comper Swift, Miles Sparrowhawk, Hawk Major and Falcon, de Havilland Moths of many kinds, the two Mosscraft and several others that were more occasional participants.

Air racing at the time appealed to a very broad spread of pilots, some of whom had only limited experience, while others were well known in their professional fields: Group Captain G F K Donaldson, who had attained the world air speed record of 616 mph in a Gloster Meteor, purred around the circuits at little more than 100 mph in his 90 hp Taylorcraft D (the earliest form of Auster), while Squadron Leader Neville Duke, chief test pilot of Hawker Aircraft and a keen member of the Vintage Aeroplane Club, was a regular participant in his favourite mount – the last surviving Hawker Tomtit of 1928. This attractive two-seater, powered by an uncowed Armstrong-Siddeley Mongoose 5-cylinder radial, remains airworthy today with the Shuttleworth Collection at Old Warden.

Whilst most air races were open to all, others were more specific in their entry requirements, with some restricted to very high-speed aeroplanes. In the early post-war years when Britain retained a competitive aircraft industry, there were several events in which companies could exhibit their products. One of the first of these, flown from the long-lost aerodrome at Lympne, had a field of six: two Fairey Fireflies, a Spitfire, a Blackburn Firebrand,



This photo: Percival Proctor rounds Beachy Head in a Daily Express air race in the early 1950s
Below: Percival Proctor dips for the finish line



Above, from top: Mosscraft 1 reappeared on 1950s race courses; Hawk Speed Six was a regular back marker; Falcon raced at unique Denham event; five Gemini entered the 1951 National Air Races



a Hawker Fury and a Vampire; the last of these was first to pass the post, flown by Group Captain John Cunningham, de Havilland's chief test pilot.

In those more enlightened times, the flying Services made intermittent inroads to the civil racing scene. Before the Royal Navy's Fleet Air Arm and the Army Air Corps became exclusively rotary wing forces, a Chipmunk or military brand of Auster would appear on an entry list; however, it was the now-long-gone Royal Auxiliary Air Force that took the lead with its own events for the Cooper Trophy, flying Merlin-powered Spitfire 16s, Griffon-engined Spitfire 22s and Vampires from the various squadrons located around the UK. At that time almost every RAF flying station held an annual display to commemorate the Battle of Britain. I was based at Benson and approached my boss to suggest that if the part-time auxiliaries could pace around the pylons in their Spitfires, surely the full-time regular Service should do one better and race Mosquitos. For want of a better reason the idea was rejected as 'too innovative', but as a consolation I was authorised to organise a downmarket version with the station's three 'hack' Tiger Moths. With the whole course inside the airfield boundary

A selection of faster entries...

Top right: Fairey Firefly Mk 1 trainer

Right: Blackburn Firebrand

Below, from right: prototype Supermarine Seafang, Hawker Fury, DH Vampire, DH Hornet, Spitfire

Bottom: Spitfire F.22 of 607 Sqn

Bottom right: Vampire 3 in 1950

and the windsocks as two of the turning points, this was an enjoyable exercise that seemed to be liked by the viewing public; but it was not what I had intended.

Back to the civil field, there were several privately sponsored races, including one in which each flying club that was a member of the Association of British Aero Clubs and Centres (a forerunner of AOPA UK) could enter one machine. Then there was an event held each year at Derby (Burnaston) open only to instructors employed by the Derby Aviation/Air Schools Group, flying

Miles Magisters (or Hawk Trainer 3s to use the civil name). In 1956 Norman Jones formed the Tiger Club, which in September of that year held its first race meeting, at Elstree, with six Tiger Moths. I was fortunate to be able to compete in both these one-type scratch events.

In 1954 the Vintage Aeroplane Club organised one very restricted event at Denham, creating the most nostalgic of post-war races. Participating aircraft included de Havilland's own 1925 Cirrus Moth, DH Leopard Moth, Blackburn B2,



Avro Club Cadet, Spartan Arrow, Miles Hawk Major, Falcon Six and Hawk Speed Six, all but one of which was the sole surviving airworthy example of its type. Nothing like it has been or ever could be held again.

Going back much further in history there had been several other unusual races, with the local authorities of Manchester and Liverpool challenging each other in an Inter-city race, won by a Gipsy Moth at 98 mph. I doubt if anyone suggesting this idea to today's councils would receive an acceptable welcome! The activities of the 1920s and 1930s included some intense challenges, including the famous Schneider Trophy races, when, in 1931, a Supermarine S.6B seaplane set up a world speed record of 379.05 mph; the constant struggle for improved performance played a key part in Britain's success in World War 2. That, though, is a story on its own and is out of scope here.

On a smaller scale the air racing scene of the 1950s re-awakened the pre-war spirit, except that the much-changed aircraft industry was not geared to design or production of light aeroplanes for sporting challenges. Fortunately specimens of the specialist racers of the 1930s were back on the start lines, as were several other types that were having their renaissances. The 1935 Hawk Speed-Six and its owner/pilot, Ron Paine, participated in more UK races than any other entrant, usually averaging speeds just short of 190 mph.

Considerable numbers of less specialised but very appropriate types took part regularly and those entered for the 1951 National Air Races included no fewer than eleven Hawk Trainers (Civil Magisters), nine Proctors and five Gemini. Unfortunately, due largely to an unrealistic demand by Customs and Excise (42% of the income from ticket sales) the Nationals for that year were abandoned.

To go into full detail about air racing activities of the time could lead to a book, so I will move towards an end by encouraging more of today's pilots to 'join the club'. I was very fortunate on the right place, right time basis, for the then ageing owner of the well-known Comper Swift



Above: three aircraft that participated in the air race organised by the Vintage Aeroplane Club in 1954. From the top: DH Leopard Moth; Blackburn B2 and a Spartan Arrow

G-ABUS was reluctant to lose it, so he sought someone younger to fly it and race it. I became that lucky person. The diminutive racer would be 'mine' for as long as I wished on condition that I would return it to him when I had finished with it. For almost five years it gave me enormous pleasure and some 'experiences', including a very hurried forced landing when the main oil pipe split open in the middle of

the 1955 King's Cup air race. The aeroplane and I were covered in oil so I could see nothing, but on closing the throttle and just landing ahead I was pleasantly surprised to stop in the centre of the then all-grass Baginton Aerodrome (now Coventry Airport). Fortunately the little Swift was kinder to me in the following year and made amends by bringing me home into third place. Some time later Doug Bianchi was heard to say "don't lend an aeroplane to Ogilvy – he leaves his oil pressure scattered all over the countryside!"

Air racing in the UK has a very creditable safety record, but an especially unfortunate loss was HRH Prince William of Gloucester, then the active President of AOPA UK and a very enthusiastic private pilot, with his own airstrip in Northamptonshire. In 1973 he was killed when things went wrong on a pylon turn, although the formal accident report failed to find the precise cause.

The scope and atmosphere of the scene today may not be quite what it was 60 or so years ago, but I am assured by current participants that it remains very enjoyable and I recommend any pilot with a sporting competitive instinct to look into it. The body to contact is the Royal Aero Club Records Racing and Rally Association, 5 Playsteds Lane, Great Cambourne, Cambridge CB23 6GA. The Aviation Secretary is Judy Hanson, tel 01954 710817, email: judy.hanson514@btinternet.com. Do it – and enjoy! I did, so why not you, too? ■



Neville Duke was a regular participant in his favourite mount – the last surviving Hawker Tomtit, still flying today with the Shuttleworth Collection



The author taxiing Comper Swift G-ABUS during the Kings Cup at Elstree

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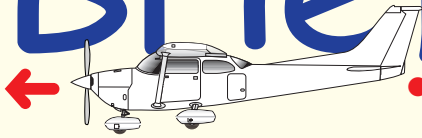
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 LIGHTSPEED

Briefings



resource management and the automated cockpit have improved safety levels, but automation can also have a downside. A number of incidents have raised the question of whether pilots are too reliant on automation in the cockpit." Allianz's Head of Aviation Claims Sebastien Saillard says: "More focus should be placed on continuous training with pilots flying with and without automation. Basic airmanship remains essential to safely operate any aircraft and in particular if, for any reason, automation is unavailable."

While last year's air accidents loom large in the memory, the study shows that your chances of dying in the crash of a commercial aircraft are three times lower than your chances of being killed by lightning. Some 3.3 billion people will fly during 2015, and the long-term accident trend indicates that fewer than two in every 100 million will be killed. ■

Tomorrow's accidents

An anticipated shortage of skilled pilots could adversely affect aviation safety in future, according to a global study by insurance giant Allianz. The proliferation of drones, and greater reliance on automation also pose potential threats – and ironically, a lack of accidents makes dealing with them more challenging because we don't have enough experience.

An under-appreciated threat comes from cyber attacks, according to Allianz. "New generation aircraft are highly exposed to cyber-crime due to the prevalent use of data networks, onboard computer systems and navigation systems," says Ludovic Arnoux, the company's Head of Aviation Risk Consulting. "Data breaches and cyber attacks are perceived to be growing risks."

In 2012 88% of global aviation fatalities occurred in Africa and Asia. In some parts

of Africa, safety and training standards are comparable to those of 50 years ago in the US or Europe, Allianz says.

The company's report notes: "In commercial aviation operations it is estimated 70% of fatal accidents are related to human error with pilot fatigue a major contributor. Initiatives such as crew

Lydd's ambitions

Lydd airport has issued tender documents to contractors for the construction of its long-awaited runway extension. An announcement about the successful contractor will be made in the coming months, with construction of the extension due to start later this year.

The extension will enable regional jets to fly a full payload of passengers to a wider range of destinations across Europe, but the airport's operators say the expansion of commercial operations will not come at the expense of general aviation.

Lydd has already spent £35 million upgrading facilities over the past ten years, including the installation of a new ILS, a new executive terminal with VIP facilities, improved passenger check-in and security, and a new departure lounge.

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The Comet rises again



The de Havilland DH88 Comet is a beautiful aeroplane, delightful to fly and a credit to its designers, but it has a number of idiosyncrasies of which the pilot should be wary, and it is particularly unforgiving of indelicate handling on take-off and landing. Flying this wonderful aeroplane has reinforced my regard for the record-breaking pilots of the 1930s who flew the Comet, often heavily loaded and with C of G near the limits, in wild weather or at night, blazing a trail across thousands of miles of ocean and jungle to shrink the globe in a way that staggered the people of the time.

Although the Comet is more than 80 years old it is a match for many a modern piston twin, its exceptionally clean lines allowing a cruise speed approaching

200kt. It handles remarkably well on one engine, but field of view is poor at all stages of flight and the ergonomics of its cockpit is typical of the vintage. It was designed for speed and range, not for ease of use. And you should never attempt a three-point landing.

The Comet is a priceless historic aircraft that represents a milestone in Britain's aviation development and the people at the Shuttleworth Collection have invested much time, money and tender loving care in putting it back into the air. Much has changed down the years. Originally the aircraft had two Gipsy R six-cylinder engines driving two-pitch propellers, but G-ACSS now has later Gipsy Queen II engines driving DH propellers with constant speed units. The cockpit is not

entirely original as it was reworked during the 1980s rebuild, with the idea of re-enacting the Australia flight. The retractable undercarriage, a de Havilland first, thankfully now has an electric motor – early pilots lamented the thirty three and a half turns of the manual wheel that lowered the gear. The lockable tailskid is a later addition, and the rear fuel tank (of three, all in the fuselage) has been removed. The capacity of the centre tank, originally 120 gallons, has been reduced to 60 gallons to make room for the undercarriage motor. The original still-air range to dry tanks was about 2900 statute miles if throttled for economic cruising at 175 kt; burning about 17.5 gal/hr. At full throttle cruise the aircraft's range was about 2500 statute miles at 190 kt true



burning 22 gal/hr. With the current fuel arrangements the range with a crew of would be nearer 1200 statute miles with a 1 hr reserve; it would be no further if solo due to cg issues. But a normal display is around 20 minutes so I don't have to consider any fuel or C of G management issues during that time.

As ever, a mass and balance calculation is vital, and I have been flying the Comet with 30 gallons in the front tank, 50 in the centre, and a 45 lb bag of ballast chain on the passenger seat. This puts the C of G just inside the forward limit. If I had a passenger the C of G would move to the aft limit and I could put more fuel in the front tank, but could not fill it because I would come up against our weight limit, which is 5,100 lbs – in the old days they

were cleared to 5,500 lbs, and C of G management was a matter of beginning by taking a little fuel from the front, then a little from the rear, then back onto the front tank and so forth. The centre tank is on the C of G, so matters less.

The fuel system is not complicated but the labels are odd. On the right of the centre console there's a fuel cross-feed cock, which is a push-pull T-handle. The fuel selectors are on the left and right sides of the cockpit. The normal arrangement is for the front tank to feed the left engine and the centre tank the right. 'Fuel shut-off' is the next position on the selectors, and the third position is labelled 'tank isolate'. If, say, you wanted to feed both engines from the front tank you would leave the left engine in normal feed, pull

the cross-feed T-handle and move the right hand fuel selector through the shut-off position to 'tank isolate'. That would stop fuel feeding out of the centre tank.

On the walk-round, there's little to see. The engines are very closely cowled and it's a man-hour's work to take the cowlings off, but the ground crew look after the aeroplane and will have certified that the oil and fuel quantities are correct. I like to be there when the aeroplane is refuelled, although the fuel gauges appear to be trustworthy.

It's possible to get in without a ladder but it does require agility, so the best arrangement is a stepladder to get you up to the cockpit. There's a hard point on the left wing root to stand on, and that's about the only place you can stand on the

The front office occupied by a succession of famous distance record breakers



Comet's very high nose makes taxiing a challenge



aeroplane. Before you get in, check the ballast is securely fastened with the rear seat harness, and check that the correct RT lead adaptors are plugged in. It has an old NATO single socket, and once you're sitting down you won't be able to reach the plug.

Getting in is rather like lowering yourself down a well. I wear a back-type parachute, and that sorts out the fore and aft position – the pedals and seat are not adjustable. A variety of cushions are used to get the height right. You need to be looking straight into the cylinder head temperature gauges, which are fitted above the coaming. When you're wearing a helmet, there's not a lot of room between your head and the canopy. A four-point harness is fitted – the original probably only had a lap belt.

The canopy hinges to the right, and the catch on it is a trap. Once you're seated, you can't unlock the canopy to close it. If you had someone in the back they could reach the lock, but when you're alone you either have to have the ground crew do it for you, or unlock it before you strap in, then bring it down over your head as you sit down. It's a bit unhandy. You slide another catch forward to latch it down. The

canopy is one of my paranoid issues because if you were to start the take-off roll with it unlatched, it's going to open and you won't be able to close it, then then it's going to rip off. I have a ground crew attendant at the departure end of the runway holding up a board saying 'Canopy Locked?', a foolproof 1934 solution to a potential problem that can arise when you get busy and distracted.

The RPM levers and throttle are on the left side of the cockpit, with the mixtures behind them and friction controls adjacent. The brake lever is on the left side of the centre console. You set a certain amount of brake with the lever and use the rudder pedals as necessary. If you pull the lever all the way back you'll have full braking on both wheels, with no differential. With the lever fully forward you get no braking at all, and if it's somewhere in between you will get no braking until you apply rudder, and it will brake on whichever side the

rudder is applied. The normal arrangement is to put on a number of clicks on the ratchet to suit your mood and the crosswind. I generally take off and land with two or three clicks set.

Engine instruments are on the left of the panel, oil pressures are orange strip indicators in the centre, and the carb heat controls are down on the centre console below the brake lever, colour coded red and green. Front and centre is the large artificial horizon, and below it is the direction indicator. On the right you have the flight instruments – airspeed indicator, altimeter, VSI, turn and slip. In flight I don't spend very much time looking at the panel, I just refer to the airspeed regularly on approach, and the engine instruments occasionally. There's a P-type magnetic compass down on the right side, and behind that is the T-handle for the tailwheel lock. Also there is the trim control, a lever like a big handbrake. It's a spring bias system like a Tiger Moth – it applies a force to hold the stick where you've put it, it doesn't move a tab or alter the tailplane setting. There's no aileron trim, but there is a rudder bias, a little winder wheel in the rear cockpit which you can stretch behind to reach, but cannot



Left: Dodge Bailey checks the Comet's undercarriage, originally a design weak point
Above: the CHT gauges atop the coaming provide pitch clues on take-off and landing
Right: the two plungers with which the ground crew prime each Gipsy engine
Lower left: mixture, prop and throttle controls – the silver knob is the flap lever
Below: crossfeed cock, P-type compass, tailskid lock – yellow-striped wheel is manual undercarriage





Dodge Bailey

Roger 'Dodge' Bailey spent ten years flying the Hercules in the RAF before becoming an instructor on the Bulldog with Glasgow University Air Squadron. He went to the USAF Test Pilot School at Edwards Air Force Base, where he flew some 25 different aircraft but worked primarily with the Phantom F4, Northrop T-38 and A7 Corsair. Test Pilot School, he says, turns a man into a workaholic, it then takes at least a decade to recover! He was a test pilot at the Royal Aircraft Establishment at Bedford from 1987 to 1989, then joined Cranfield University as Chief Test Pilot in 1990. At around the same time he began flying for the Shuttleworth Collection.



Comet's relatively high aspect ratio wing tapers to a point and is without washout
Far right: vertical stabiliser is effective by the standards of de Havilland designs

see. There's no need to use it – I have flown the aeroplane single engine for the climb tests and the forces are not at all bad.

The flap lever is on the left side of the cockpit. It's fully back for retracted, and fully forward through four notches to flaps right down. We don't use the full-down setting because while you can push the lever into position, you can't reach it to reduce flap, it's too far away. The flaps, which are under the fuselage, not on the wings, are primarily airbrakes – they don't change the stalling speed much, they just provide some drag for the approach. They make a big pitch change, and with the flaps down the aeroplane pitches up noticeably. As you get faster with the flaps down the aircraft pitches more and more, and the fact that you're pushing so hard to fly the aeroplane is maybe a clue that you

straightforward to get going and the noise in the cockpit is not excessive. Then the usual checks – oil pressure coming up, starter warning light out, set 1100 rpm. The ground crew will have disconnected the external power, so turn to aircraft battery and the right generator and start the left engine on internal power.

Now you need to crack on, otherwise it's going to get too hot. After running for about a minute I'll put the RPM levers fully forward. We normally shut down with the props aft, which is different to most twins nowadays. There are a couple of reasons – if you shut down in fine pitch, you expose a part of the propeller mechanism that is susceptible to corrosion, and by going to coarse pitch you cover that up. Secondly, by going to coarse pitch you take all the oil out of the prop dome and back into the engine. So when you start the engine you

Dead cut check at low RPM first, then up to 1800 RPM, check that the prop controls affect the RPM, come back on them two or three times to make sure you've got warm oil in the prop. Then go to full throttle briefly to make sure the RPM goes up to where it should be, which is about 2350. As soon as you're confident it will get there, come straight back to 1800 rpm, where you check the carb heat and the mags. Repeat for the other engine, then you're ready to line up.

Elevator trim set about a quarter back, mixture fully rich, props fully fine, carb heat cold, engines on normal feed, flap to position 2. When they did the original flight tests they found the take-off roll was a minimum in position 2, but it was only different from 'up' and 'position 1' by about ten yards or so. I would be quite happy taking off with the flaps up as it doesn't



haven't raised the flaps.

Parking brake fully on, and to start the engines the ground crew must prime the Gipsies. There's a panel on each engine behind which are the typical Gipsy flooding controls, one you pull and hold out, another you pump until fuel runs out the bottom of the engine. Check the magnetos are off, then the crewman hand-turns the prop a few times to suck in. Check fuel in normal feed, mixtures fully rich, throttles open an eighth of an inch. We use external power to save the battery and normally start the right engine first – both engines are left-hand tractors. Props clear, mags on, and press the start button on the centre console. Usually the clutch slips, the prop stops and you have to give it a few prods to start, but it's easy and very

warm the oil up, then pump warm oil into the prop. If you had shut down in fine pitch and left the aircraft in cold conditions, you'd get a lump of cold congealed oil that you can't easily get out, so the prop can stick in fine pitch for a while. That can catch you out because you can taxi out but on take-off the engine will likely overspeed.

Once the engines run for a minute you go to fine pitch, then you're ready to taxi to run-up. Ensure the tailskid is unlocked, then do the normal weaving taxi to clear the area ahead because the view is very poor. I use differential power a lot while taxiing. When you're ready, turn it into wind, and if you run up one engine at a time you can do it on the brakes... for both, you'd need to chock.

make any difference worth mentioning to the stall speed. The SOP says flaps 2, but I'm seriously considering making the SOP flap zero, simply for the engine failure after take-off scenario. You don't really want flaps down if you don't need them. We'll do a mini-risk assessment on that, but that's probably what we'll end up doing.

There are two more essential things you need with this aircraft for take-off. One is that the canopy needs to be locked down – as an aide memoire we have the crewman with the sign – and the other is that the tailskid needs to be locked to help you keep straight during the take-off run. The skid lock is a little T-handle on the right side of the cockpit. The rudder won't help much early in the run as the prop wash isn't going over the rudder. The most

marked effect on the aeroplane with the tail down will be P-factor, asymmetric blade effect, which yaws the aircraft to the right when you apply power. You can ameliorate that to a certain extent with asymmetric throttle, so you tend to lead with the right throttle. The big challenge is the lack of forward view. You can see nothing ahead apart from the panel; all you've got are runway edges about 30 degrees either side of the nose, so the aeroplane can yaw quite a bit before you spot it unless you are paying close attention. Everything needs to be in your favour in terms of keeping it straight, so you want the tailskid locked.

So, routine instrument checks, harness, flight controls, then canopy locked, tailskid locked once you're lined up. Brakes set two or three clicks. Then you need to think about what you're going to do with the conditions you've got. Assess the wind, and the crosswind component. If you had a crosswind from the right, bearing in mind the aeroplane already wants to turn right due to P-factor, the combination could

ultimately overpower the aeroplane, so there's only so much crosswind you could accept from the right – we haven't established how much yet.

You also need to consider what you'll do in case of engine failure at various stages. When the aeroplane is on the runway, if an engine fails you're just going to turn it into a landing. Between becoming airborne and getting the gear up there is a period of uncertainty, as in any light piston twin, where you may need to make the decision just to crash the aeroplane into a field rather than attempt to climb out. In the case of the Comet it will be safer to crash land with the wheels up – as the only exit is via the canopy and if the aircraft were to be tripped up by its wheels in a soft or rough field and finish up inverted, you'd be stuck. The engines are pretty close together and the single-engine minimum control speed is reasonably low – the Comet is one of the better de Havilland aeroplanes in this regard, with a good vertical tail helping directional stability.

Release the brakes, start putting on

power, leading with the right throttle. Initially the stick is held back to put the skid in the ground and keep you straight, but only for a short time because you want to get the aeroplane into its zero-lift attitude as soon as possible, and that's done by pushing the stick forward to put the CHT gauges on the end of the runway. This puts the RAF 34 wing section pretty close to its zero lift Alpha. You must not let this aircraft get bounced airborne in a nose-up attitude, because it will drop a wing. Aerodynamically it's a very efficient wing, but the stall characteristics wouldn't meet modern requirements. If you left the tail down too long you'd get to the point where the aeroplane was ready to fly at that Alpha, perhaps at 70 or 80 mph, and if it hit a bump it would get airborne. If you tried to hold it airborne in this tail-down position at that speed, the wing would drop; and if you let it touch again in that attitude it may get bounced even more nose-up. There are a couple of reports of this sort of thing happening in the thirties, and I experienced it when I was first

The world-beating Comet

The de Havilland DH88 Comet was designed, built and flown in just nine months to participate in the MacRobertson Air Race from Mildenhall to Melbourne, which it won in a time of 70 hours, 54 minutes and 18 seconds – a barely credible achievement for 1934, when a trip to Australia generally took several months. Pilots Tom Campbell-Black and Charles Scott shared a prize pot of \$75,000, but Campbell-Black's offer to buy the aeroplane was rebuffed, and it was sold to the Air Ministry for £7,000.



G-ACSS in Martin Place, Sydney 12 November 1934.

After a landing accident at the Aeroplane and Armament Experimental Establishment at Martlesham Heath in 1936, Comet G-ACSS passed into the hands of architect Fred Tasker, who had it restored at Essex Aero at Gravesend. Much in demand from would-be record breakers, it flew again the following year in the hands of Flying Officer (later Group Captain) Arthur Clouston. Clouston made several epic trips, including flying to Cape Town in 45 hr 2 min and back in 57 hr 23 min. In 1938 Clouston and the aviation correspondent of the *Daily Express*, Victor Ricketts, flew G-ACSS from England to New Zealand and back – a total distance of 26,450 miles – in 10 days, 21 hours, 22 minutes.

Cannibalised for parts – one Gipsy engine ended up in Alex Henshaw's Mew Gull, also now in the Shuttleworth Collection – G-ACSS spent much of the war under a tarpaulin before being bought back by de Havilland for £150 and restored to static condition by technical students. On display in de Havilland's aero engine showroom at Hatfield until 1965, it was once again refurbished for static display before being handed over to the Shuttleworth.

In 1973 the decision was made to restore the Comet to airworthy status, a protracted process because of cost and difficulty, but one strongly supported by RAE Farnborough. While under restoration it made another flight to Australia, this time in the hold of a freighter, 50 years after the MacRobertson race. Finally, after some £7 million had been spent, the Comet took off from Hatfield in May 1987 on its first flight since 1938. In July that year G-ACSS suffered a groundloop at Hatfield but was repaired and flown again, and after the closure of Hatfield it was transferred by road to Old Warden, where the runway had to be lengthened and realigned to accommodate it. The Comet flew again in 2002, but the undercarriage collapsed on landing. Repairs and further runway work were completed in August last year, when Dodge Bailey took G-ACSS into the air to begin a test flying programme. The Comet was first displayed to the public at the Shuttleworth Pageant on September 7th, and a full flying season is planned for 2015.



Closely-cowled Gipsy engines cool better when the gear is raised

learning to land the Comet and I bounced the landing. So to avoid that, as soon as we can – around 50 to 60 mph, but well before the aircraft is capable of flight – we put the aircraft in the zero-lift attitude. With the tail coming up the gyroscopic forces will yaw the aeroplane, so we need to counter that with rudder.

Speed builds quite rapidly, you feel the aeroplane getting light on the gear, and you just maintain that attitude until the aeroplane bounces airborne. If it's over 90mph the chances are it won't touch again, but if it wants to touch again, you just let it. By 100 mph it will fly for sure, so you make a very small stick movement to select a shallow climb attitude. You're looking for about 110 mph single engine climb speed, and you'll have that by the time you're reaching to select the gear up – if you have a spare hand, put the brakes on first. At a safe height retract the flaps, moving the lever back to your left hip, usually while the gear is still travelling. When the aeroplane is clean and over 110mph it will climb single-engine at 300

to 400 fpm. With two engines I want to get the speed to around 140mph, at which point it will be climbing at more than 1,000 fpm.

Another small forward stick movement puts you straight and level. The aeroplane has a very low level of longitudinal stability so the stick does not move a huge distance in any phase of flight. Set the boost and RPM you want – typically coming back to 2100 for cruise, and minus 1 to minus 3 psi boost.

In the climb or cruise you have to keep turning the aeroplane all the time to give yourself a view. It's quite fast, and if you fly straight and level for a few seconds there's a whole new area in front of you that you haven't been able to see. And you're monitoring the cylinder head temperatures. We want to see no more than 210 degrees before we get airborne, we're allowed up to 240 briefly for take-off, then we want to see it coming down again – the engines cool better with the wheels up. They normally settle around 190-200, depending on the power.

Set one engine to zero thrust and fly at 115 mph and you'll find the aeroplane is easy to keep straight and will climb at 300 fpm, wings level. It doesn't have an asymmetric control problem – performance is like many light twins of today. There are no pre-stall warning symptoms of any sort, it's dead smooth until one of the wings drop, and it could be either one. That will happen within 2 mph of 80 mph, regardless of flap setting. The wing drop is quite marked. There are other aeroplanes in the Shuttleworth Collection that are similar – the Mew Gull and the little DW1 have similar characteristics. You get a wing drop and a loss of lift at the same time so the aeroplane sinks, and you have to be pretty aggressive in getting the stick forward to reattach the airflow. I think if you tried to hold it into the stall and hold the wing up with opposite aileron, a spin would quickly result. George Ellis, who did the flight test programme in the late eighties, held it into a stall and in his report he says he rather wishes he hadn't. You have to dump the nose so far, not to





Eighty years old and as beautiful as ever, the Comet flies for the first time since 2002

get airspeed but to get the angle of attack low, that's the important thing. So you're going to lose some height – the minimum height loss technique taught to commercial pilots until quite recently of powering away from the stall would probably not be a good idea.

We've now got to display the aeroplane, and what the Comet will do well is fly fast. We can then use that energy to pull up and wingover back. Exploring those wingovers, we find that with minus 1 boost and 2200 rpm the aeroplane will do 200 to 220 mph, and we can pull up from that and do a nice big gentle wingover – less than 2g. Over the top we'll be down to around 140 mph, and then we can fly back down the display line at 220. That way we can show the aeroplane, show off the top surface, the plan view, the registration, and when it's flying fast it kind of whistles, so during a high-speed flypast down the crowd line it makes a nice noise. The wingover is the best way of getting it back in front of the crowd again; if you tried a level turn at 200 knots it would take more room, more g and with it an increased risk of a stall in the turn with the obligatory wing drop – enough said.

For the landing, you start the downwind leg at 130 mph, then pop the gear down when you're below the 120 mph gear limiting speed. RPM fully forward, flaps position 2 as we approach the end of the downwind leg. Abeam the point at which you intend to touch down, take flap position 3 and 110 mph and begin a continuous turn to the threshold. If you roll level too early, you'll not only lose the runway, you'll lose the whole aerodrome behind the nose, so you need to maintain about ten degrees of bank in the turn

down to the aerodrome boundary, in the same way as you would a Spitfire. During the approach your eyes are constantly flicking between the approach view and the airspeed indicator. Because there's little stick-free longitudinal stability there are no off-trim airspeed cues, so it'll get off speed and you won't feel it – you don't have to pull the aeroplane to make it go slow. You can't relax and leave it to manage its own speed/AoA. A critical moment comes at about 50 feet and 100 mph, just at the beginning of the marked runway. You have the left side of the runway in sight, then you roll the wings level and you get your first sight of the right side of the runway. You close gently with the ground, getting your height cues from your peripheral vision, and looking at the airspeed – if you're on the slow side, leave the throttles alone or add a bit, if you're fast, you can close the throttles at this point. As the aeroplane approaches the ground it will be slightly tail down, and you can't let it hit the ground and bounce in that attitude. Just before you think it's going to touch the ground, you once again place the CHT gauges on the end of the runway. If you're too quick you can get a harder touchdown than you wanted, but that will usually work out okay. The idea is to get it pinned in the zero lift attitude, keep it straight and let it slow down. Once you have the aircraft pinned you can decide whether to continue the landing or throw it away. If the latter, just apply full power and let it bounce itself airborne again, as in the take off.

Once you have decided to continue the landing you need to appreciate that it's a very clean aeroplane in a low drag attitude, and the only thing slowing it

down is the wheelbrake setting you went off with or set downwind. The tail will naturally want to go down as you decelerate, but you need to stop that happening with forward stick. The stick is moved progressively until it's fully forward, at which point the tail is going to go down, but by then the aeroplane will be too slow to bounce airborne again.

Once the skid is on the ground the Comet will keep straight and come to a stop pretty quickly. The brakes take a little finesse... if you decide to use them to help stop you can lift the tailskid if you overdo it. Once at walking pace unlock the tailskid to steer off the runway, and now you need to think about shutting down fairly promptly before the cylinder head temperatures rise. On the way in, move the prop levers to coarse. With low oil pressure the props will take a while to change pitch. Other than getting the props into coarse pitch there's nothing unusual about the shut-down. The mixtures won't stop this sort of engine, you have to do it on the magnetos. Turn one mag off at idle and the engine will run a little slower. Then turn off the second mag. When you're sure the engine is stopping, open the throttle fully. That puts a big wedge of cold mixture in the cylinders to stop any running-on caused by incandescent material – the cold mixture just puts it out.

The Comet, the pinnacle of aeronautical engineering in 1934, has been impeccably restored at the Shuttleworth and the finish reflects great credit on all those who have worked on her for so long. I feel privileged to be able to fly her and look forward to the start of the display season – if you would like to come and see her fly, the season opens on the first Sunday in May. ■



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*'Massive power, no wing and no glide ratio' –
Roy Harford sees the big beasts battle at the Reno Races*

For quite a few years, fellow helicopter pilot Jeremy James and I had talked about going to the Reno Air Races. For a couple of adrenaline fuelled speed junkies the sight and sound of WWII fighters flying around the course at 50 feet or less while travelling at 500mph was a powerful draw.

The 2011 races saw the horrific crash of a radically modified P-51 Mustang, killing

the pilot and ten spectators, when the elevator trim tab separated. For a while afterwards it was touch and go that the event might be banned. We thought that we had better get it done, just in case.

Reno Stead airfield sits in a natural bowl at 5,043ft in the high Nevada desert just twenty minutes north of the city and provides the perfect location for air racing. September mornings can be quite cool at

50F, climbing to 90F in the afternoon with CAVOK the norm.

The whole event runs for a week with several days of practice, testing and qualification. The races themselves start on the Wednesday. Friday was our first morning. We arrived for an early breakfast, checked into the Checkered Flag Club and collected our "goody bags" before settling in for the morning's racing.



Main photo: T6 Gold start, a race solely for Harvards
Above: Sea Furies on the flightline – 924 used to belong to Doug Arnold and still has a Bristol Centaurus engine

This photo: Jeremy James with Sawbones, a 1949 Sea Fury with a 3,000 hp Wright Cyclone engine



relaxed and informal with not a 'jobsworth' in sight. We set aside a couple of hours each day to check out the pit areas.

The Biplane Class predictably comprises mostly Pitts Specials with a sprinkling of Lynch Skybolt, Christen Eagle and Mong. Yes, that's a new one on me too, but a highly modified Mong Sport went on to win Sunday's Biplane Gold Final with an average lap speed of 241 mph.

Generally second up in the race schedule was the Formula 1 Class. As the name suggests these aircraft are dedicated racers built to a strict formula which specifies, among other things, wing area, minimum weight and most crucially a maximum 200 cubic inch engine. The homebuilt Cassut Racer was most numerous in class but, to my eyes at least, the Wasabi Special Siren was the most elegant. Small they maybe but these pocket rockets can top 260 mph around the course.

Next up, the T-6 (Harvard) Class. Plenty of sound and fury topping out at just under 250 mph, and massively impressive. With a gaggle of Harvards rounding the pylon you could just imagine you were on a WWII film set.

Stepping up a gear was the Sport Class, mostly comprising modern high spec, high speed touring aircraft such as Lancair and Glasair designs. Many of the Sport Class may look like the standard version aircraft but under cowling the engines are anything but standard. A good example of this was Kevin Eldredge's No. 42 NXT Relentless – his 550 cubic inch Titan engine pushes out over 700 horsepower. TBO is rather short, however, at just one Reno Race season. With Sport Class speeds topping 400mph drag reduction becomes even more important and the



A highly modified Mong Sport went on to win Sunday's Biplane Gold Final with an average lap speed of 241 mph

D. Ranney Logan

All six classes race every day, generally starting with the lower-powered aircraft and working up to "the bad boys of air racing", the Unlimited Class. The course length varies from three miles to eight miles according to class and aims to give a lap time of around one minute.

Apart from detailed definitions, safety and emergency procedures, race-specific rules are few. They are generally

summarised as Fly Low, Fly Fast, Turn Left. When passing to the right of the 50ft pylon course markers the cockpit must not be below the top of the pylon. Between pylons however they are frequently lower.

Buying the Checkered Flag Club membership package gave us access to the pit area where we could get up close and personal with the aircraft, the ground crews and the pilots. Everything very

aircraft displayed many aerodynamic optimisations in the quest for speed.

Moving to the next level was the recently introduced Jet Class, dominated by the Czech built L-39 Albatross which although first entering service in the 1970s looks not at all dated to me. I did notice a solitary de Havilland Vampire in the entry list but it failed to appear. There were several L-39s in the static park for sale –



*The start of the Formula One race – the lower-powered aircraft begin the day's racing
Above: the most elegant Wasabi Special Siren*



A homebuilt Cassutt Formula One racer, most numerous in class

D. Ramney Logan

Right: Sport Class race medal winner Klaus Savier with his Long-EZ, The Determinator



The famous GeeBee racer – it has killed more than its share of pilots, but it's for sale if you've got the bottle

\$250,000 will buy you a tidy L-39, a type rating equivalent \$15-20,000, and you can expect to use 200 US gallons per hour of Jet A1. The Jet Class completed their laps at a whisker under 500 mph in the mid afternoon finals, but no doubt would have been faster in the cool early mornings.

Mid afternoon each day we get to what the excellent race commentator Steve Stavarakakis loved to describe as "the bad boys of air racing" the Unlimited Class. The primary stipulation in this Class is that they be propeller driven and piston engine powered. Anything beyond that is limited only by your imagination and your budget. The Unlimited aircraft fell into two groups, air cooled radial engine and those powered by liquid cooled V-12s, with Hawker Sea Fury and North American P-





D. Ranney/Logan

Sea Fury 'Sawbones' in flight – owner-pilot Robert Crandall is an orthopaedic surgeon

Strega's engine develops more than 3,000 horsepower. The exact figure is strictly classified.

Of the five Hawker Sea Furys racing only one still sported the original 2,500 horsepower Bristol Centaurus double bank radial engine. Two others had swapped this out for the more powerful Wright Cyclone R-3350. But hey, we're in the USA so why stop at just another measly two bank radial engine? Why not install the big daddy of all radial engines, the 4,300 horsepower four bank radial from a Boeing Superfortress? Two Sea Furys had done just that. Mustang No.38, Precious Metal, and its pilot Thom Richard currently feature in Breitling ads around the globe.

Watching the racing each day it became apparent that race technique played just as big a part as sheer horsepower. Arriving at the pylon turn and standing your aircraft on its wingtip may look impressive to spectators but the increased drag really pulls your speed down.

In between the races there were lots of other aerial activities. Sitting on the ramp in front of us was a 1920s Waco biplane with some strange contraption slung underneath. Our curiosity was soon satisfied when it started up. The contraption was a 3,000 lb thrust jet engine and the combo was aptly named the Screaming Sasquatch. Just imagine trying to get that one past EASA!

To get our adrenaline pumping before the Unlimited Class race each day there was a display by the USAF's F22 Raptor. Everything about the F22 is 'r-sum', as the Americans say. Just sitting parked it oozes



'September Fury' has been racing since 1971 and has averaged 468.266 mph over a measured course



Left and above: Grumman Bearcat No.77, aka Rare Bear, was superbly turned out and the five and a half feet removed from the wingspan was very noticeable

51 Mustang being most numerous.

Two things struck me about the Unlimited Class aircraft – how superbly they are prepared, and how much wing has been cut off to reduce drag. Taking a close look at the wing of Mustang No.7, Strega, to say it was like glass is to do it an injustice. It gave the appearance of having been moulded as a single piece, with not a rivet or panel joint to be seen. Grumman Bearcat No.77, aka Rare Bear, was also superbly turned out and the five and a half

feet removed from the wingspan was very noticeable. You would never know that it had been rebuilt from a wreck.

Both of these aircraft would later suffer engine problems during racing which was rather ironic as Rare Bear's pilot had stated that his intention was to melt down the Mustangs.

Unlimited Class modifications are not confined to the airframe. The standard RR Merlin engine in the Mustang would develop around 1,500 horsepower, but



War-vintage North American P-51 Mustang flies with ultra-modern Lockheed Martin F-22 Raptor at Reno



menace. With its stealthy angular looks and totally matt grey finish it looks not unlike the secret Soviet plane that Clint Eastwood was to steal in the film Firefox. The F22's vectored thrust really does enable it to turn incredibly tightly at speed. Even without afterburner it can climb vertically and cruise at Mach 1.5. Oh yes, and the price is r-sum too at \$100m OTR.

Back to reality – we witnessed the closest ever finish in the semi final of the Unlimited Class. Mustang Strega had not qualified well but went from sixth to second in one lap. Flying a higher line, the pilot rounded the final pylon and traded height for speed to catch the leading Mustang, Voodoo, the eventual winner of Sunday's final. So close was the finish that the timing system could not separate the two Mustangs. Take a look at the YouTube video by searching for: 2014 Reno Air Races – Saturday Unlimited Gold.

In the event we were denied a rerun of these two Mustangs duelling in Sunday's final as during the ten minute cool down Strega declared a Mayday with an engine problem. As commentator Steve said, these aircraft have "no wing and no glide ratio" but Strega's pilot, Bill 'Tiger' Destefani, put it down on the alternate runway unscathed. Should you damage your Merlin engine at Reno next year, don't expect much change out of \$1m to fix it. Search 'Precious Metal Dead Stick Landing' on YouTube for a cool headed piece of flying. You hear the engine cut at low level followed by a steep pull up to gain height followed by a smooth landing. Fortunately nothing seriously wrong with the RR Griffon engine, just a fuel feed problem

Unlimited Class pilots wear water cooled suits; sitting just a few feet behind an engine punching out 3,000 horsepower is always going to be a hot place. The post race cool down is there to accomplish other things. As you might expect it allows the engine to cool but just



Above and this photo: Unlimited Gold champion Voodoo, a clipped-wing Mustang, runs up on the ramp – note, no sissy ear protectors



No, you are not seeing things – Mustang 'Precious Metal' really does have two propellers. Its RR Griffon engine comes from a Shackleton

D. Ramey Logan



Above: flying legend Bob Hoover, in omnipresent straw hat, signs autographs at Reno – now 92, he flew until recently

as importantly it allows the pilot to recalibrate from race pilot mode to normal landing mode.

Signing copies of his autobiography in the paddock was legendary aviator Bob Hoover. I recall seeing Bob's display at Farnborough in the 1980s, flying the rather staid Shrike Commander, demonstrating rolls and loops, manoeuvres not normally associated with an executive twin. But his party-piece finale was a real show stopper. Demonstrating total command of energy management, he shut down both engines, performing a loop and an eight-point hesitation slow roll finally touching down on one tyre, then the other, before rolling to a stop. Go to YouTube and watch him perform the eight point roll whilst pouring a cup of tea.

A surprise visitor in the paddock parking area was G-BYLP, a single engined, single seater Rand KR2. I didn't get to see the pilot but a board alongside announced that it was on a round the world flight and had dropped into Reno for the Air Races, as you do.

The Reno Air Races are a highly

**Above: Screamin' Sasquatch is a Waco biplane with a turbine engine bolted underneath, and should not be approached
Right: a 1917 American La France fire engine – the author got invited for a ride by the winner of a Sport Class race**

professional show which have been running for 51 years and can be combined with stays in Lake Tahoe, Napa Valley or San Francisco. I thoroughly recommend a visit. R-sum! ■



D. Ranney Logan

This photo and below: Highly-modified Yak 11 'Czech Mate' has its original 700 hp engine replaced with a 2500 hp Pratt & Whitney



The twin that won't make a drama out of a crisis



Peter R March

I gained my twin rating in a Piper Seneca. 'Asymmetric flying' is a key element in the qualification, and I've always wondered if Cessna's distinctive and unique 'push-pull' twin, the 337 Skymaster, is a better solution to the problem of losing an engine. And as luck would have it, I got to find out.

I've seen Glen James around Sleaford airfield – just north of Shrewsbury – many times. His flying machine fascinated me. It's a very rare breed indeed in the United Kingdom – a Cessna 337. It was part of his fleet of aircraft, which included a Russian classic, a beautiful Yak. But the 337 twin prop 'Cessna Skymaster' is one-of-a-kind, which attracts curiosity anywhere it goes.

The chance to fly it was a trifle spontaneous. I was preparing my Mooney M20C for some local flying with my fellow owner Dave Tinsley. The Skymaster was sitting there, on the grass outside the clubhouse and I kind of drifted over to have a look. Glen noticed and within minutes we'd agreed to go for a flight later on in the day. I went back to preparing the Mooney. That's when I heard the Skymaster making its first flight of the day.

You don't see a Cessna 337 so much as feel it – as if its purpose is to cut the air

into pieces with its blades and fling the bits in all directions in a cascade of sound. The Skymaster is notoriously noisy – so much so that some airfields ban them for their take-off decibel count. And sure enough, just as I'd finished checking the fuel drains on the Mooney, I heard the distinctive sound as the 337 rose majestically into the air, ripples of noise radiating out close to the speed of sound from its huge twin props.

That was it. Instead of taking off in the Mooney, I taxied it up to the club house and waited patiently for Glen to land, hoping that he wasn't intending to take full advantage of the large twin's five hour endurance. Presently, I spotted the twin-boomed bird on final approach – a far quieter affair than its departure. Within moments it was settled on the centreline, and a minute later shutting down between the Yak and a Cessna 182.

I ambled out to engage again with Glen, who was already preparing his next sortie, this time in a Grumman AA5B. Glen said he'd be more than happy to take me up in the 337 after that. As he marched towards the Grumman, I ambled round the Skymaster, its engines ticking as they cooled in the fresh summer air.

I was struck by the aircraft's sheer size;

it gives the impression of a kind of seniority over its peers. Compared to a Seneca or other 'conventional' twin, the 337 is a huge, towering machine, far larger than the normal four or six seaters one occasionally sees on the aprons of Britain's provincial aerodromes. The internal space reflects this, with a relatively cavernous cabin. The twin boom tail has to be wide enough to accommodate the rear engine and prop, and the passengers benefit from the width. In truth, the actual all up weight isn't greater, but the size gives it the feel of something gigantic, as if the designers wilfully built it to be intimidatingly big.

The aircraft I was perusing was pressurised and configured in a four-seat arrangement. Theoretically at least, a Piper Seneca is supposed to hold six people – though in reality you'd be pushing it to fit all those passengers in with any luggage, and more than half full fuel tanks. By contrast, the Skymaster occupants enjoy great space. You could literally sleep in the back in comfort, while the two in the front enjoy probably the roomiest cockpit area I've seen in a private twin. This seemed like a different type of private flying experience.

I did a few circuits in the Mooney, till I

Lembit Öpik samples Cessna's unique 'suck 'n' blow' twin, the mighty 337 Skymaster



Keith Wilson



Top left: Cessna 337 Skymaster, banned at some airfields because of its decibel count
Top: twin booms must be wide enough to accommodate rear engine and prop
Above: Skymaster gives the impression of being much larger than its peers
Left: centreline thrust means loss of an engine causes no excessive drama

heard on the radio that the Grumman was back in the circuit, and duly returned to the apron myself. Glen and I met up at his aircraft. After a briefing about the main features of the 337, we were set to go. The start-up procedure was tremendously straightforward. There was a brief moment of churning and vibration as the cylinders woke up, and within seconds the industrial-sounding engines were turning.

After warming up, Glen taxied out to the holding point for Runway 23. The checks

were standard and straightforward. Anyone who's flown a twin before would have no issues with it. The props may be in line, but there's still two of everything and the procedures involve the same repeated activity as with any twin prop.

The very different thing about the 337 is an absence of one particular fear. It's not haunted by the curse of asymmetric flight. A 'normal' twin exposes the pilot to vulnerable moments during climb out: in Glen's words "With those twins, you've got

a split second to deal with an engine failure, and remember they don't usually fail straight away. And there's the question of a critical engine to think about. Get the procedure wrong and you're flipped over in an instant." Not so the Skymaster. Its beauty is that, even if an engine does fail, there's no adverse torque pulling the aircraft over onto its back. Effectively, a 337 twin becomes a manageable 337 single, still able to climb and perform a conventional circuit. As if to underline the fact, Glen pointed at the two digital fuel flow meters: "Watch those and tell me if either of them goes to zero. That's really the only way to spot an engine failure." It was a strangely reassuring comment.

As we started the take-off roll, the power felt more like turbine thrust than piston power. The engines performed faultlessly and within a few hundred metres we rotated into an unstressed 1,000 feet per minute climb at 100 knots, en route to a

cruising altitude of 6,000 feet.

My first sense was one of solidity. It had been a thermally kind of day, but the aircraft's bulk damped any sense of turbulence. We just soared skywards as if on inclined rails. It also felt to me that, as well as the mass of the machine absorbing the air currents, the wings somehow absorbed turbulence rather than passing it on to the occupants. Whether this is correct or not, the fact is that this aeroplane definitely does provide a noticeably smoother ride than just about any piston plane I've flown in.

Levelling out led to calm and comfort. Once in the cruise, the speed just rose. It will hold 150kts all day without a sweat, with a never exceed velocity (Vne) of 205kts – which is achievable at a cost. The tanks will drain at a far higher rate, and the extra knots add a fistful of pounds per hour to the fuel bills. By contrast, at 150kts the low drone of the pistons, the props synchronised at 2,400 rpm and the turbocharged engines faithfully holding their manifold pressure regardless of altitude, the impression is of a touring aircraft par excellence.

Top right: Red Bull's Cessna 337 shows how the undercarriage swivels as it is raised
Right: the Skymaster's front office – spacious, but plenty of old-style clutter
Bottom right: US military used the Skymaster for forward air control in Vietnam

Despite our plan for a short flight I couldn't help feeling I was going on a journey unencumbered by worries of engine failures or crank from squeezing into some tiny cockpit which sacrificed comfort for speed. You almost feel obliged to plan for a continental visit, and with the pressurization, Instrument Rated pilots have a real reason to climb up into the airways and make the most of the extra speed the altitude and turbos can supply.

We were in relatively calm air at 6,000 feet and Glen let me play with the handling above a patchwork of mid-summer cumulus. The feel of the aircraft is unmistakably robust – almost heavy. Unlike some of the more twitchy light trainers, you have to tell the 337 to turn. There's no complaint, no bad habit in its handling. It just expects you to be confident and decisive. Again, the substantial size and weight of the machine supplies a sense that you're flying much more than a private plane. This wasn't lost on Cessna. They knew they had something special and produced a vast series of variants, mostly with 210 horsepower engines. Some versions have a range exceeding 1,600 miles and a ceiling of 33,000 feet. Neither statistic is out of place with this machine. It feels built to fly up there with the big boys. They even made a turbine version, which served in

various roles including with military operators around the world.

After around 45 minutes in the air I came to realise that despite the unusual appearance of the Skymaster, you don't notice the prop arrangement in flight. The sound of a twin often includes the resonance from the two props, and doubtless this could be the case with the Skymaster. But we didn't have any uncomfortable effects. There is the impression of being surrounded by the deep throbbing noise of power from front and back. It's actually reassuring – and even calming, in a way that's a bit hard to explain. Yet there's no sense of the generous noise output inside the cabin. Whatever the complaints of those on the ground, you're unlikely to get any gripes from your passengers, who are more likely to be put to sleep by the hypnotic hum of the engines.

After a standard let-down, Glen brought the bird back onto finals for landing. He grumbled about his round-out, claiming "That was the worst landing I've done all day." Frankly, he must be a perfectionist because there was nothing wrong with it



Peter R March



as far as I could see. The aircraft doesn't float. Whatever ground effect the high wings offer is more than negated by the weight, and the aircraft lands without any of the 'float' that can cause Warriors to take their time before settling on the deck.

Shutting down on the now quiet grass apron, there was a sudden silence, which made me realise how the soothing roar of the 337 had somehow seeped into the cockpit as a feeling more than a sound. Whatever the laments of those outside, all's well inside, though perhaps my outstanding Bose 'active noise reduction' headset had something to do with that.

So, did the 337 live up to expectations? Absolutely – and then some. Even though I'd had a look inside before we flew, I hadn't realised how spacious they are when you're in flight. There's no shoulder rubbing, and the back is wider than most cars. The pressurisation system, which Glen briefly demonstrated, plus turbocharged engines, made his particular model of the 337 capable of flight above 20,000 feet. Its feel puts it in the category of solid and dependable – belying the fact the design is over 50 years old.

The 337 isn't to everyone's taste. If you love sports aircraft then you'd probably be



Peter R March

better going for something else. But if you're in the market for a twin and you like your creature comforts, there are few more elegant ways to reach the South of France than in a Cessna 337.

Glen James was very generous to take the time to fly with me that afternoon. The result is another convert to this most sensible of twins – one which, in the event of an engine failure, is far less likely to lead

you to disaster than its more conventional competitors. It really won't make a drama out of a crisis. In fact, the only real casualty when you go flying in a big beast like the Skymaster is your wallet. ■

BOOK Reviews

Gatwick Airport The First 50 Years

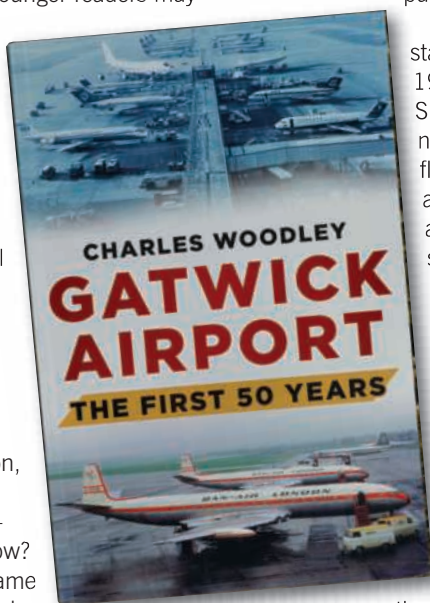
By Charles Woodley
www.thehistorypress.co.uk
157 pages, well illustrated, £14.95

So there's this scheme for two runways at Gatwick, which claims to offer a better deal for Londoners because it means aircraft on finals don't have to drag right across the city. The kicker is that this is 1943 and Gatwick is an RAF aerodrome that is being promoted as London's post-war international hub. And the competition seems to be Heston and Fairlop, an airfield near Ilford in Essex. Little thought seems to be given to that mudpatch they called the Great West aerodrome at Heath Row.

Charles Woodley's history covers the period from 1930 up to the turn of the century and much is expected to happen in the near future, but I'd submit that from the aviators' standpoint, the most interesting times are behind us. They used to have massive air shows at Gatwick before the war, attracting 150,000 paying spectators and countless fly-in visitors in private aircraft – they once recorded 100 aircraft landing in 30 minutes. Tell that to the Satco who gets jumpy with four SEPs in his circuit.

What's striking is the number of charter operators and airlines that have operated from Gatwick, all of them now driven out of business or crunched in the shark-like maw of the state airlines that became British Airways. Younger readers may recall British

United Airways, Caledonian, Davies & Newman – Dan-air – and Laker, while gentlemen of a certain vintage may recall aeroplanes carrying the names of Sammy Morton and the fleets of Harold Bamberg's British Eagle, Ciro's, Orion, Eros, Hornon, Falcon, Pegasus – where are they now? In fact the only name that graced Gatwick in 1946 and still adorns aircraft in the



21st century is Bond, then hauling fruit from the Med in clapped out bombers, now servicing North Sea oil operations with helicopters.

The helicopter shuttle between Gatwick and Heathrow is covered – initially provided by a Westward Airways BN Islander, and later by a British Airways S61 helicopter. In general, Gatwick's development, like much of the British aviation industry, seems to owe much to the time-honoured 'meddle and muddle' strategy. Author Woodley has amassed a wonderful collection of illustrations, from posters advertising aerial services to photographs of unusual aircraft. A fascinating, fact-packed ramble through the history of an airfield which (at the risk of tempting fate) seems to be one of the few in Britain that has a guaranteed future.
Pat Malone

From Spitfire to Meteor

By Albert Horton
Edited and published by Robert Davies 150 pages www.lulu.com £9.75

When I heard the title I knew that I must discover where and when this pilot had been. Soon I found that he and I had joined and left the RAF at identical times and had been on the same units within weeks of each other. I was not aware of meeting him, but I felt that we should compare notes. Unfortunately, though, he had died shortly before the book (second edition) was published.

The courses followed the standard pattern of the later 1940s – pilot grading school at Shellingford (in Berkshire and not, as quoted, Oxfordshire) flying training on Tiger Moths and Harvards and, after being awarded 'Wings', a three-ways split according to the coming operational role. Albert went to No.203 Advanced Flying School at Chivenor in Devon, to fly Merlin-engined Spitfire 16s before converting to the more potent Griffon-powered versions prior to a posting to No.208 squadron in Egypt. This was a fighter-reconnaissance (FR) Unit and the tales that the author relates show how vast the differences can be between the RAF at

home and the Service in the Middle East. I had been on detachments to the area, but they were of short duration and I had not picked up the threads of working and living in the midst of it for 2½ unbroken years. I had much to learn and, from the book, I did so. I had no experience of being required to carry a revolver when flying or leaving the camp.

The Spitfire pilots carried out many unusual flying tasks including providing a low-level air mail service to small remote army units in the desert, opening the cockpit hoods and throwing out specially protected packages to be picked up by the soldiers. There were several examples of strange behaviour, including one person's determination to lose a persistently troublesome aeroplane; he took off normally, but on the climb did some energetic throttle pumping to simulate serious engine trouble, declared that the machine was not safe to


land, set it pointing to open desert and baled out in a conspicuous position to ensure that everyone could see him land on the airfield. According to the story – one of many – everyone was so pleased to see the end of this rogue 'hangar queen' that no further action was taken!

Before long the Spitfires were retired and replaced by Meteors. This led to many more cases of inter-squadron rivalry and to an even stronger level of inter-Service

competitiveness. At one point this reached a stage in which the RAF pilots were ordered not to scrap with their shore-based Royal Navy colleagues, but some time later a liaison was established and the more long-serving of 208's pilots, who had Spitfire backgrounds, were allowed to fly the Sea Furies and Fireflies, a privilege clearly denied to those jet jockeys who lacked relevant piston experience. Another idiosyncrasy of the time and place was the creation of a formation aerobatic team without the squadron commander's authority or – apparently, in the early stages – even his knowledge.

This may give the impression that no serious work was undertaken, but this is not the case. Operating in an increasingly hostile environment, everyone was aware of the possible need for rapid reaction and on one occasion a warning was received of an impending attack on the base by the Egyptian Air Force. This failed to happen, but clearly constant preparedness was essential and, following early warning of





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possible trouble, with pilots aboard and all aircraft plugged in, the twelve Meteors could be airborne in 35 seconds.

This book contains much more of interest, but unfortunately it suffers from one serious setback: care and proof reading are virtually absent, with such errors as 'Fury's' for 'Furies' – and many others. Despite that, the meat of the content makes it well worth a read. – *David Ogilvy*

Tony Ryan Ireland's Aviator

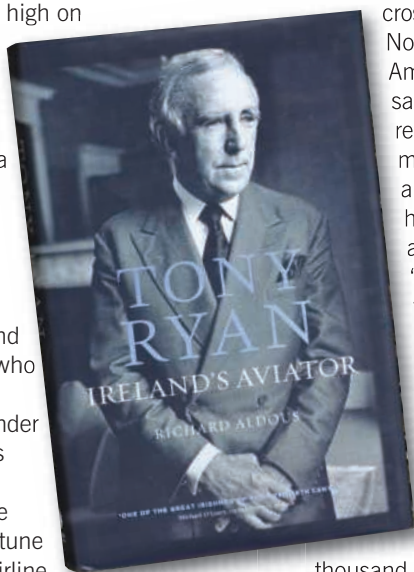
By Richard Aldous

www.gillmacmillanbooks.ie
Hardback, 264 pages. 14 pages of
photographs. €11.99

Let's get one thing straight... Tony Ryan is not responsible for the worst excesses of the airline that bears his name. That's Michael O'Leary, a man who would undoubtedly have made a fortune in some industry somewhere because he is so greedy, ruthless and brilliant. But Tony Ryan can be held responsible for giving him an entrée into the aviation business, for which sin his picture may legitimately join that of O'Leary on your dartboard.

Ryan, the son of a railwayman from Tipperary, began as a wage-slave at Aer Lingus and effectively invented the aircraft leasing industry, creating Guinness Peat Aviation, its first global giant. GPA was described as "opportunistic, greedy, parasitic, unyielding, lacking in sophistication, professionalism and maturity" – which could be a characterisation of Ryan himself, who although he lived high on the hog and wore cream linen suits and Gucci loafers could swear like a Tipperary railwayman and unleash towering rages. Guinness Peat made Tony Ryan a fortune and a lot of enemies who crowed when the company went under and he lost all his money in an ill-judged IPO. So he made another fortune with a low-cost airline called Ryanair, which for good or ill has helped to create the modern aviation industry.

Is 'shenanigans' an Irish word? If not it should be, because nothing better describes Tony Ryan's business model. The story of how he managed to convince the legal system that he had no interest in



Ryanair, and thus prevent his legions of creditors from stripping the airline away from him, deserves no other description. Commercial and political manipulation, financial prestidigitation and breathtaking front seem to be the qualities required for serious success in the airline business, and if the rules didn't work for Tony Ryan, he changed them.

His legacy is Michael O'Leary, who started out in business life as Tony Ryan's personal assistant on a salary of zero – he settled for a piece of the action when Ryanair was worth very little – and went on to make the company what it is today. The protégé often embarrassed the master, and they had bitter disagreements about the direction of the airline, but Ryan knew talent when he saw it and always let O'Leary have his head. In his later years Ryan became a patrician citizen and a patron of the arts, and indeed he is quoted here as being "one of the greatest Irishmen of the 20th century". The quote comes from Michael O'Leary. – *Pat Malone*

Over the Blue Planet

by Matevž Lenarcic

www.geaart.si €50

This book of aerial photographs of our planet and its thin, fragile layer of air is a collector's item for pilots and aviation enthusiasts with large coffee tables. Author Matevž Lenarcic is an accomplished photo-journalist, adventurer, mountaineer and aviator with qualifications in biology and natural conservation.

He writes about two flying tours he undertook at great personal risk, to fly over all the continents and oceans, criss-crossing the equator and over the North Pole from Europe into North America, collecting black carbon samples from the air for further research into global warming. One might think, that in doing so he also contributed towards it; however, the Pipistrel Virus aircraft he flew is one of the 'greenest' machines in the world, using unleaded petrol extremely frugally.

The large and heavy all colour book with 400 pages of large photo plates shows a unique perspective only seen from an ultralight aircraft with large windows flying at a height of not more than a few thousand feet. The author's expertise in photography and aviation is displayed in the stunning photographs. However, unseen, unwritten and hidden in a very subtle way in the task itself, is his courage in flying across, over and through some of the most hostile conditions of weather ranging from +50o C to -50o C.

This reviewer is well aware from

personal experience, how complicated an affair it is to devise, plan, organise and arrange the funding for such a global project and to take it to completion. The author states in passing that money can buy anything, 'a kidney or a space flight', but the reader will note that true courage with a sense of global purpose continues to be the province of adventurers considered mad by the armchair pundits.

From a pilot's point of view I was disappointed that there was not much description of the flights from each sector, considering that a one round-the-world tour which included section of the Antarctic, the North Pole and flying around Mount Everest is covered in the book. The author probably knows that the person buying this limited edition monograph (1000 copies) knows a fair amount of the travails of such an endeavour and will have checked out the flight progress on the website. The Pipistrel Virus performs impeccably all the time, except once when the engine stops at an altitude of 3000 meters to glide to a safe landing at an airport 45 km away.

Another instance is described where the author has to wait for a couple of weeks for experts from the Pipistrel factory to repair damage caused to the fuselage due to flying through heavy turbulence through stormy weather near Australia.

I am awestruck by the length of the flight legs achieved by Matevž Lenarcic over the Southern Pacific Ocean, en route from Chile, via Cook Island to New Zealand, a distance of more than 12,000 km covered in 46 hours of flying. The black carbon measurements were collected by a special tube fitted close to the pitot tube; the graphic nature of this black carbon is seen in a dramatic photo taken over the Congo River, Africa. Another photograph shows the soot accumulated over the aircraft after a flight across India, where I know from personal experience that soot and dust render flying conditions so hazy as to be IMC through many months of the year, before the monsoon rains clean the air of its contaminants from open wood burning cooking fires and car pollution.

I enjoyed this book of photos much more than a similar one of photos taken from space and others with photos taken during planned photo flights, as the power of the atmosphere and the vastness of our planet is evident, as well as the courage of the Author. I doff my hat to Matevž Lenarcic. – *Deepak Mahajan* ■



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Going over the edge



Tufan Sevincel hears the call of the mountains, flying into the challenging Courchevel Altiport

Rubbing my hands together for warmth I climbed into the left seat of the glass-cockpit Cessna 172 and began to wait impatiently for Alexander Combes, my flight instructor at the Three Valleys Aviation Club. I had learned some French aviation phraseology when I was at famous Caribbean airport of Saint Barthélemy (Gustaf III), which has one of the hardest approaches in the world, but where landings and take-offs are child's play when compared with Courchevel. Alexander arrived, and with my entire French vocabulary of a few sentences I called the control tower at Courchevel Altiport, where I am undertaking mountain flying instruction.

"Je demand des instructions pour le roulage." (Request take-off instructions).

The controller, or "aiguilleur du ciel" – signaller of the sky, as the French with their romantic aviation terms of the past would have it – was apparently unappreciative of my pronunciation and responded with, "Répétés s'il vous plait" (Please repeat yourself).

Alexander's face blanched. I think he had surmised that I would be trying to speak French throughout the flight. In response to a barrage of French from the tower he told me I could start taxiing, so I pushed the throttle slightly and moved ahead.

After centre-lining runway 04 I was about to begin preparations for take-off,

but Alexander, looking back past the empennage, said "Stop. You must line up again, so you are able to use every centimetre of the runway."

When the rudder was about to touch the wire fence separating the runway from the road he seemed satisfied. "Right! You are now free to take off", he said as he rather self-consciously checked his safety harness.

I started the aircraft rolling on 04, the only runway used for take-offs at Courchevel altiport, situated at an altitude of 6,581 feet, where only 403 feet of the runway is in the pilot's line of vision. It's rather like accelerating towards the edge of a cliff. When one arrives at the lip of the 18.6-degree inclined surface, you feel as if your bottom is falling out, and of course it's too late to abort the take-off. I heard a



Top: Courchevel Altiport lies at 6,600 feet and has a 537-metre runway with a slope of 18.6 degrees

Above: permanent icy conditions on the apron mean brakes should not be used

Below: the apron at Courchevel is 212 feet above the landing threshold of runway 22

Below left: on the apron the altimeter reads almost 6,600 feet – use of QFE is impractical





Above: the ski resort of Courchevel appears under the left wing after take-off
Above right: the Three Valleys Aero Club, where mountain flying instruction is available

thrilled yell from my son, sitting in the back to shoot a video of the event, as if he was riding on a rollercoaster. As we sped down the incline the aircraft lifted its wheels off the ground of its own volition, and by the time we reached the end of the runway we were already 300 feet in the air.

During the briefing I had received at the aviation club, Alexander had explained in detail that when I had reached a safe altitude I had to make a 45-degree turn to the left and climb to 7,000 feet if the weather was fine, or to 6,600 feet if it was foul. I had understood the 7,000 feet part of the instruction, but I wouldn't be telling the truth if I said I could visualise how I would approach the field from an altitude of 6,600 feet. You

see, the flat section at the top of the field was at 6,600 feet, which meant that I would have to approach the runway at the

same level as the tower while trying to land. When you do the calculations, you are surprised to find the difference in altitude between the highest and lowest points of the field, which are less than 500 metres apart, is 212 feet and you can't decide if the cold has affected your ability to count. The altitude of the airport also means that the QFE on a standard day would be 793mb, so all flying is done on the QNH – winding 200mb off the altimeter is not a viable option.

When we gained a little height, and given that we would have no trouble with visibility on this clear day, we decided to climb to 7,000 feet. Thankfully the strong winds that sometimes generate severe turbulence as they whip through the deep valleys of the Alps, were absent, although there was some wind and the ride was quite sporting.

We continued to ascend while skirting Courchevel, the biggest ski resort in the world, but soon we came face to face with an imposing mountain. When the town of Bozel in the Isere Valley comes into sight, you immediately have to make a 135-degree right turn. This turning point, for

some reason, has been named November. I made the wide turn, but when Alexander, pointing with his finger, asked: "Do you see Runway 22?" I was struggling against the turbulence to hold the aircraft at 7,000 feet. Yes, the runway was there, visible as a thin line out to my right, but it seemed barely possible that we might land on it.

A 6,500-foot hillock right in front of us began to grow rapidly in my windscreen – too rapidly for my liking, but my panicky move to edge towards the runway was cut short by Alexander's curt words: "Monsieur, too early, continuent." So we continued until we got so close to the mountain I thought we would hit it, when I heard his instruction, "Turn now – final approach."

I banked quickly onto a heading of 224 degrees, the reciprocal of my take-off. At Courchevel, one only ever takes off downhill and lands uphill. The mountain across the valley from the downhill end of the runway is so close that one almost brushes it when making the base-final turn, and one must turn north-west on



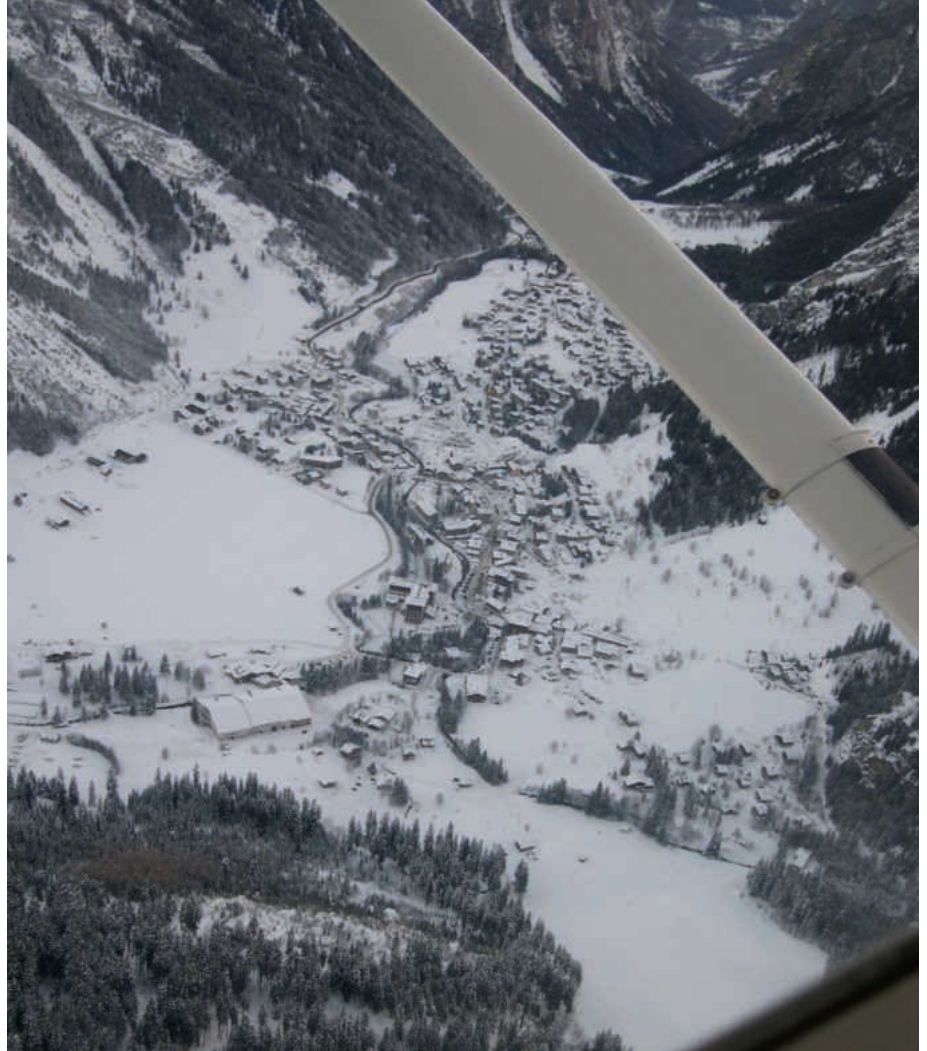
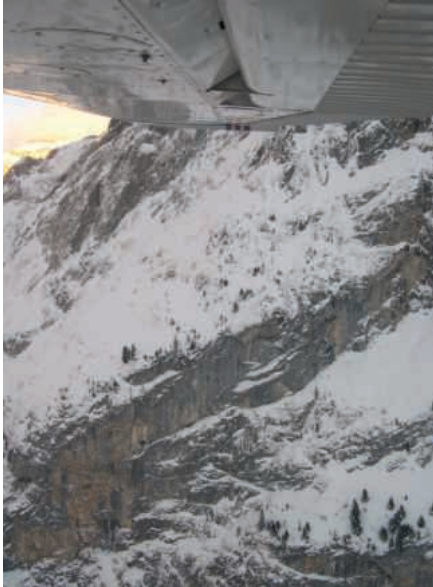
take-off to avoid it. The 1,788 ft long runway at Courchevel is surrounded by 10,000 feet peaks. Understandably, the altiport has no IFR approach or runway lighting.

Despite the sun glaring into my eyes as I approached I concentrated on the runway, stretched out like a grey string ahead of me, and dipped the nose so as to lose 500 feet per minute. Alexander had warned me not to let the airspeed drop below 80 knots. On short final one is committed to land at Courchevel – there are no turn options, and one cannot outclimb the mountain ahead. But with the sight picture looking good, he asked me to continue the approach.

A few years ago, when the tower was not operating, a Cessna 182 was taking off while a TB-20 was landing. The two planes collided in the middle of the runway. Remembering that incident, I double-checked that no-one was preparing to take off as I approached the runway. I then heard Alexander's deep, confident voice telling me I had to land without reducing speed.

I felt the usual relief when I heard that

sound I love to hear, that chirp of the tyres touching the ground. Until a short while earlier, only a ski-equipped Twin Otter had been able to use the runway because it could not be cleared of snow, but now a ribbon of asphalt stretched ahead of me up the hill. I was about to throttle back, as habit dictates, but Alexander, anticipating my move, pushed the throttle fully in. Of course! How could I forget? I had landed on the flatter lower section of a runway which soon became an 18 degree hill, and



if I did not maintain a high power setting there would be no way I could climb the hill to the apron at the top. When we taxied at full throttle over the lip and onto the flat section of the runway I allowed myself a deep breath of relief.

Having successfully completed a landing at Courchevel Altiport, one of the most difficult in the world, I felt a great sense of achievement and exhilaration. The ultimate goal of some intrepid pilots who aspire to landing on short and hazardous airstrips in the hills is to receive the “mountain rating” certificate. If you wish to go one step further, you may try to get a “snow” certificate that would allow you to land on

Above left: unforgiving terrain with no forced landing options is your constant companion Above: over the village of Bozel in the Isere Valley you turn right through 135 degrees

glaciers and snowbound flatlands in the Alps – feats that very few people have experienced. You have to pass through a minimum of five hours training to qualify to land and take off from the mountain airports that the French call altiports.

The altiports are built on hillsides whose inclination is such that it is not possible to land

and take off in the same direction. When you examine the record of accidents in

these demanding altiports, it is not at all difficult to understand why they must be approached with special circumspection and sound good sense. Quite apart from the difficulties of flying into and out of the altiports, the weather in these deep Alpine valleys is often harsh and more unpredictable than most of us are used to.

Having completed what Alexander pronounced to be a successful flight, I decided to continue with the training by flying to other altiports in the Alps. My ultimate aim is to land in the stunning Alpine valleys by ski-plane, a long-held dream that I'm sure will one day come to fruition. ■



Far left: on long final for 22 an escape would be possible with a steep turn to the right Left: all go-round options lapse a long way out, and a landing must be attempted Above: on touchdown, full power must be applied to make sure the aircraft can reach the apron

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