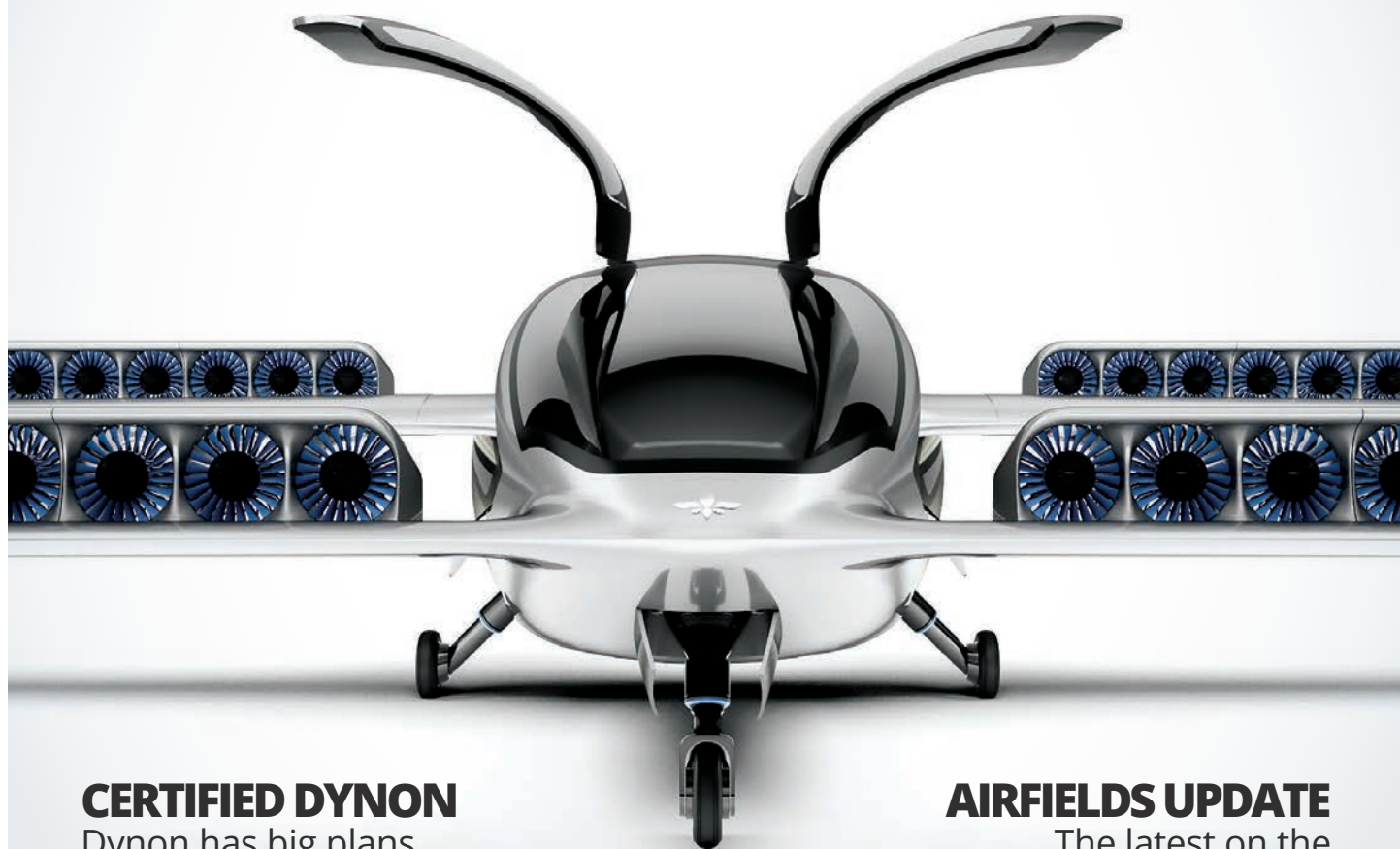


AOPA UK

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CERTIFIED DYNON

Dynon has big plans for Certified aircraft

AIRFIELDS UPDATE

The latest on the UK airfields at risk

ACROSS THE US

David Hastings spots UFOs on his adventure

AIRSPACE WOWS

Nick Wilcock's insight to penalty-free flying

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THE FUTURE OF GA IS BRIGHT

AOPA Chief Executive Martin Robinson and I visited RAF Syerston in August to present the Lennox-Boyd Trophy, AOPA's oldest and most prestigious award, to AOPA member Carol Vorderman MBE. As someone whose name is widely recognised in the UK, her support of young British cadets as well as her proposed solo flight around the world in a GA aircraft has raised – and continues to raise – the profile of General Aviation, especially for our younger generation. The presentation took place at a summer camp for air cadets, and a more appropriate venue could not have been found. The photograph on page 18 shows the enthusiasm and delight of the cadets.

Prior to the presentation, Martin and I were given a whistle-stop tour of the various training activities arranged for the cadets attending the camp. These included winch-launched gliding and 20 minute flights in a Chinook helicopter (30 cadets at a time in this big and noisy beast) and, on the ground, hands-on courses on radio, air traffic control, drones, defence technology and piloting skills using part-task training simulators. Also, as part of key community engagement, the Aviation Skills Partnership had arranged for a master class in aviation for 50 non-cadet pupils. Overall, a wide variety of career opportunities in aviation were presented. The enthusiasm conveyed by the cadets for all the activities was pleasing to see, and the visit brought back pleasant memories for Martin and I, who are both former air cadets. I was lucky enough to be awarded a flying scholarship, enabling me to earn my PPL before starting work at the Handley Page aircraft company.

The event provided an upbeat counterbalance to the downward trend of the number of PPLs issued by the CAA over the past decade. Previously, the well-being of GA has been a strong indicator of the level of activity in commercial pilot flight training. If this is still the case, then forecasts of growth in the CAT sector are worth studying. Aircraft manufacturer Boeing has analysed the future market for airframes over the next 20 years, highlighting an 'extraordinary demand' for people to fly and maintain commercial aircraft. It forecasts that 617,000 commercial airline pilots will be needed; 40% in the Asia Pacific region alone, and 18% (or just over 100,000) closer to home here in Europe. The demand is global, and the promotion of flying as a career – for business, personal transport, or recreation – will be important. For AOPA, the focus needs to be on how to get people into flying, whatever the age group.

Those days as a student pilot may be long forgotten, but it is still the case that the initial training is undertaken in General Aviation aircraft at flying clubs and flight training organisations. A large proportion of these, in the UK, are AOPA Corporate Members. In support, the AOPA Training Committee provides a valuable forum for constructive discussion and engagement with the regulators on licensing and training matters. It is through activities such as these that AOPA aims to ensure the future viability of general aviation, for which your continued support is welcomed. ■



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Articles, photographs and news items from AOPA members and other readers are welcome. Please send to the Editor. Inclusion of material in AOPA Magazine cannot be guaranteed, however, and remains at the discretion of the Editor. Material for consideration for the December 2017 issue should be received no later than 01 November 2017.

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EDITOR'S MOMENT

LOOKING AHEAD

Firstly, thank you to everyone who sent emails, letters and comments about the last issue of AOPA UK.

I have to hold my hands up and apologise for the mistakes that were made in the magazine. I can assure you that they were human error and not intentional. I try to ensure that all members have a magazine they enjoy picking up and want to read from cover-to-cover. I, along with my team, will make sure we are diligent to ensure your enjoyment isn't quelled by simple mistakes.

Right, that said, there's still some good weather out there and still plenty of flying to be done before the nights really draw in and we have to sit there waiting for spring 2018. In this issue there are plenty of features to not only help you perfect your flying, but also get you into the cockpit and in search of your own aviation adventures.

The next issue will help with some winter maintenance so your pride and joy will remain well-kept over winter.

David Rawlings

Editor, AOPA Magazine UK
david.rawlings@aopa.co.uk



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IT IS ALWAYS A PLEASURE MEETING OUR MEMBERS

One of the most rewarding parts of my job is to fly and meet fellow aviators. And so it was, when I paid a long overdue visit to the AOPA Iceland fly-in in Mulakot and Tuzla in Romania. It is always a pleasure to meet members who provide the financial backing and support to the association through their membership. Even if we have not met in person, let me thank you for your support, because without you GA doesn't have an independent voice.

AUGUST

As this is the month that most people take their annual holiday, it's usually the least busiest month in the AOPA calendar.

3RD AUGUST

I had one of my quarterly meetings with Tony Rapson, the Head of the GAU. Tony deals with questions from me, which are often outside his remit, because he is our CoA focal point. Tony is always helpful and will always find an answer – it may not be the one I want, but he will get an answer, whatever the question.

5TH-7TH AUGUST

Went to Mulakot, a small GA airfield in Iceland – I had an enormously enjoyable weekend. In Iceland GA is a real family affair. I want to thank Valur, his wife and two sons who I can honestly say are totally immersed in GA – thank you for your kind hospitality. Mulakot is a camp site with GA aircraft that fly all day. Ray also took me for a flight in his new Cirrus. Iceland is a really rewarding flying experience and I can recommend it to any member. There are cheap flights and if you contact AOPA Iceland they will help find an aircraft to fly.

16TH-20TH AUGUST

Paid a visit to Romania – whilst GA is still developing there – it's an interesting place to fly. I recently flew with Julian



"I went with George to present the Lennox-Boyd Trophy to Carol Vorderman for her work in promoting flying"

Botta in his C182 from Bucharest to Tuzla. Julian said: "OK, I fly! You navigate and do the radio!" Well it all worked out. I want to congratulate the Romanian ATCOs who were able to deal with switching between English and Romanian.

Whilst the primary purpose was to speak in a conference organised by Pria about the GAGA work AOPA UK is doing, it coincided with a local fly-in which, to my utter amazement, was packed with people. During the flying display three Diamonds flew in formation and it was very well executed. I am sure it was exciting for the spectators. The lead pilot had a job with EasyJet, and the other two were club instructors.

Back in the conference there was a discussion on professional flight training. The thought was that the UK must have incentives that attract individuals into the industry. Romania actually doesn't apply any taxes to professional pilot training – including VAT! The Romanian schools were very surprised when I explained the UK situation. I also managed enough time to go for a dip in the Black Sea.

22ND AUGUST

I went with George to present the Lennox-Boyd Trophy to Carol Vorderman for her work in promoting flying across all sectors of society. She may be a celeb, but this award is well-deserved in my honest opinion.

During the month of August I also had a number of members seeking help across a range of issues, including airspace infringements, insurance problems and medical issues. ■



M Robinson

Martin Robinson
CEO, AOPA UK
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HELPING YOU STAY FLYING

Welcome to the new AOPA Community section of the magazine, bringing you all the news and insight from the world of AOPA...



WORKING FOR YOU

What AOPA is doing for you



AIRFIELDS UPDATE

The latest from around the UK



PPL CORNER

Help with threading airspace



AOPA ADVICE

Why commercial is in charge



WORDS Pauline Vahey

GLOUCESTER AIRPORT HOSTS AOPA MWG

The latest news from the Members Working Group

The AOPA Members Working Group (MWG) was held at Gloucestershire Airport at the generous invitation of the Airport management, and in particular Operations Director Darren Lewington whose team helped make all the arrangements run smoothly.

There had been a good response from local members who wanted to come along and meet the AOPA team and hear what AOPA is working on to help keep them flying. The AOPA team were also keen to hear what issues are affecting its membership so they can inform the work that AOPA focuses on. A number

of attendees had planned to fly in, tempted by the offer of a free landing in exchange for fuel uplift and free parking. However the weather was not to stay that way; towering cumulus were forecast for just the about the time we'd all be going home, but some of the more intrepid of our members still flew.

Darren opened the meeting with an introduction to the airport, including some of its history. He talked about the business model of the airport which had enabled it to become sustainable and viable. He also explained how important the opening of the Jet Age Museum had been in making the airport accessible

to the local community. He mentioned some of the other activities they put on to encourage the local community, especially young people to come and use the airport, not just for flying. They also use social media extensively to connect with locals and those further afield. Did we know Gloucestershire was the 11th busiest airport in the country? An example others could learn from.

DOWN TO BUSINESS

First up was progress with the Wings and Mentoring Schemes. There are now two further airfields interested in joining up, and Mick Elborn will be talking to

both. A suggestion from the floor was to advertise them and the AOPA MWG more further afield than the AOPA magazine, perhaps as a 'does your association come out to meet you?' piece written by Pat Malone in his associations page in Flyer Magazine. The meeting also minuted a big thank you to Mick Elborn for all of his work, not only in producing a new-look website, but also undertaking the move to a new and more secure technical platform. Thanks were also recorded for the help given to Mick and members David Chambers and David Kriel on reviewing and commenting on the content of the site. If you take a look,



The Members Working Group managed to squeeze in a tour of Gloucester's Jet Age Museum – well worth a visit

you'll see that wasn't a trivial task either. There are still a few changes in the pipeline to make some of the areas available to members only, and other ideas are also afoot for members, such as AOPA Instructor Members being able to advertise availability and corporate members advertising vacancies.

AIRFIELDS

John Walker talked about his ever-lengthening list of airfields at risk, although there were a couple of good new stories from Halfpenny Green and Redhill. As Mike from Andrewsfield was in attendance, the situation there was discussed in some detail, the conclusion of which seemed to be that the financial case as proposed by the local councils was suspect when subjected to rigorous risk management stress testing. An approach that might be useful for others in a similar situation.

ENGINE THEFT

During the open discussion session, concerns about the rising numbers of thefts of Rotax engines was aired. Various strategies were being put in place, for example the BMAA now allow owners to use their corporate address on G-INFO so that it's less likely that the location of the engines can be gleaned from G-INFO, for others perhaps using PO box addresses (although this isn't cheap, but maybe cheaper than a new Rotax). The free use of the online GAR on the AOPA website was going to become a members only facility as it had been shown only 20% of the use had been by AOPA members. Mike Frost explained how he had started using a conspicuity device on a recent trip and had been delighted at the useful information he had been able to see.

People asked what the standard for conspicuity

devices was going to be and Bob Darby was able to help, assuring everyone that 1090 was the worldwide standard and that was the one to use. He was also able to update the meeting on work on conspicuity at EASA level and reported that EASA rules are not changing for the present.

DRONES

Darby also stated that at the next meeting he was attending, drones were to be discussed, reassuring everyone that it was accepted that drones would be giving way to light aircraft not the other way around. He also made the meeting aware that now local councils were to keep all of the business rates, increasingly airfields would become targets for revenue generation.

MUSEUM FUN

The meeting then enjoyed a delicious lunch provided by the Aviator Café and proceeded to visit the Jet Age Museum. At one time Gloucestershire had the most number of aviation manufacturing companies of any county in the UK. It was where the first ever jet engine flight took place, the Gloster E28/39. Other Gloster-built aircraft on display include such legends as the Meteor, the Javelin, and a replica of a 1925 Gamecock. Restoration projects of a Gladiator bi-plane and Hawker Typhoon are also under way. The Museum also benefits from its continuing connection with local people, many of whose relatives worked in the factories. Their stories are being recorded for posterity as a resource for the significant history of aviation in Gloucestershire. We then all started on our way home. Having listened to the thunderstorms raging overhead whilst we were in the museum hangar, we wished our intrepid aviators all the best for safe trips. ■

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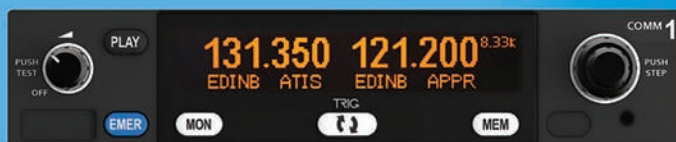
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TAKE YOUR PPL THEORY IN LONDON



Following the popularity of the first series of courses, AOPA is pleased to advise that it is running more evening Ground School courses for ab initio pilots. The PPL Ground School takes place at the AOPA offices at 50a Cambridge Street each Tuesday and Thursday evening, 7-9pm, on the dates shown below. The AOPA office is only five minutes' walk from Victoria Station. All nine subjects required for the PPL (Aeroplanes) are taught over a period of approximately 70 hours. The lecturer is Adam Winter, a highly qualified and experienced flying instructor who works for the Flyers Flying School at Elstree. You can read more about the training and subject matter at WWW.FLIGHTGROUNDSCHOOL.CO.UK

2017

AIR LAW	OCT 3, 5, 10, 12
OPERATIONS AND PROCEDURES	OCT 17, 19
HUMAN PERFORMANCE AND LIMITATIONS	OCT 24, 26
REVISION	OCT 31
EXAMS	NOV 2
NAVIGATION	NOV 7, 9, 14, 16, 21, 23
METEOROLOGY	NOV 28, 30, DEC 5, 7, 12
REVISION	DEC 14
EXAMS	DEC 19

2018

AIRCRAFT GENERAL KNOWLEDGE	JAN 5, 9, 11, 16, 18
PRINCIPLES OF FLIGHT	JAN 21, 23, 25
REVISION	JAN 30
EXAMS	FEB 1
PERFORMANCE & PLANNING	FEB 6, 8, 13
COMMUNICATIONS	FEB 15, 20
REVISION	FEB 22
EXAMS	FEB 27

It is not necessary to attend the full course and candidates can select the individual subjects they wish to study from the published dates. You do not have to be a member of AOPA to participate. Further details can be obtained from Mandy at the AOPA office on **0207 8345631** or mandy@aopa.co.uk

WORDS John Walker IMAGES jay-jerry

LATEST NEWS ON OUR UK AIRFIELDS

John Walker offers the latest news from the UK's aerodromes

There are airfields across the UK currently under threat of closure. Here are the latest developments, updated 29 August 2017.

CHALGROVE

Airfield occupied and operated by Martin-Baker Aircraft has been transferred from the MoD to the Homes and Communities Agency (HCA). Site included in South Oxfordshire District Draft Local Plan Second Preferred

Site Options consultation document for a 3,000 home development. Public consultation on definitive Local Plan expected to start in October 2017.

KEMBLE

Commercial Estates Group (CEG) proposal to build a 2,000-home sustainable village on this 'brownfield' site as an alternative to the draft Cotswold District Local Plan proposal for a greenfield

site near Cirencester.

Public consultation on the draft Local Plan has been completed.

NOTTINGHAM CITY

With the support of the land owner, site earmarked for up to 4,000 homes in Local Plan Core Strategy adopted by Rushcliffe Borough Council after approval from Planning Inspector. Public consultation on final draft Local Plan expected later this year

PANSHANGER

Site originally earmarked for housing by Welwyn Hatfield Borough Council but final draft Local Plan reduces housing element and allows the opportunity for a realigned grass runway on land to north of previous runway 11/29. Final draft Local Plan submitted to Planning Inspector for Public Examination commencing on 21 September 2017. Local press report that a planning application to restore the aerodrome is expected shortly.

SHERWOOD FLYING CLUB

Long-standing AOPA Corporate Member, the Sherwood Flying Club based at Nottingham City Airport, has been granted ATO status, enabling the club to extend its flying training activities to include Flight Instructor (FI) courses. The club's structure means it is able to offer FI courses at a competitive rate. The Club would welcome inquiries from qualified Flying Instructors willing to assist in the expanded training activity. sherwoodflyingclub.co.uk ■



Panshanger, one of the airfields on John Walker's list...

MOD SITES

MOD document *A Better Defence Estate* issued on 7 November 2016 lists the following aerodrome sites for disposal in the years indicated:

Abingdon 2029; Alconbury 2023; Arbroath, RMB Condor airfield 2020; Brawdy, Cawdor Barracks 2024; RMB Chivenor 2027; Colerne 2018; Dishforth

airfield 2031; RAF Halton airfield 2022; RAF Henlow 2020 – site earmarked for mixed use development in Central Bedfordshire Council Draft Local Plan; Mildenhall 2022; Molesworth 2023; North Luffenham 2021; Woodbridge, Rock Barracks 2027.

The former RAF Wethersfield airfield site is being transferred to the HCA in 2020.

RAF Wyton airfield is being sold off - Defence Infrastructure Organisation and local property developer Crest Nicholson proposal for up to 4,500 homes on site. Due to road infrastructure issues, site deleted from Huntingdonshire District Council definitive 2036 Local Plan for mixed use development including housing.

In addition to the above, RAF Wyton airfield is being sold off - Defence Infrastructure Organisation and local property developer Crest Nicholson has submitted a proposal for up to 4,500 homes on site. Site earmarked in draft Huntingdonshire District Council Local Plan for mixed use development including housing but road infrastructure issues expected to result in scheme being deferred beyond Local Plan period.

WORDS Adam Winter

MAKING SURE YOU STAY OUT OF TROUBLE

Adam Winter is concerned about all the controlled airspace in South East England. Here, he explains how you can avoid it altogether...

Apart from in an emergency, there is never going to be a decent excuse for infringing controlled airspace. There is only going to be a reason it has happened.

The airspace around South East England can seem rather daunting with myriads of restrictions; Control Zones, TMAs, danger areas, military zones, temporary restrictions such as the Red Arrows, memorial flights, Airshows (found in the NOTAMs) and so on. Whilst it might look congested on a 1:500000 map, there is actually an enormous volume of uncontrolled airspace to manoeuvre in and many ways to get through. As a general aviation pilot, there are foolproof ways to either avoid controlled airspace or go through it.

NAVIGATION IS THE KEY

The key to avoiding infringing is good navigation, and the key to *that* is simply knowing where you are, and where you are headed. Knowing where you are is a function of keeping up with the aircraft, and knowing where you are going is all about keeping ahead of it. Then fly straight and level.

Let us imagine a short route. There is a minimum safe amount of preparation for the route you should be doing. The first thing is draw a line on a 1:500 000 map. The line avoids or goes through or around controlled airspace, and note the upper limits of the airspace for the route. Now look at the route

ADAM WINTER



Adam is a commercial pilot with more than 30 years' experience. His career has included bush flying in Africa and island hopping in the West Indies, as well as a stint in the airlines. He is also a physics teacher with three years' classroom experience.

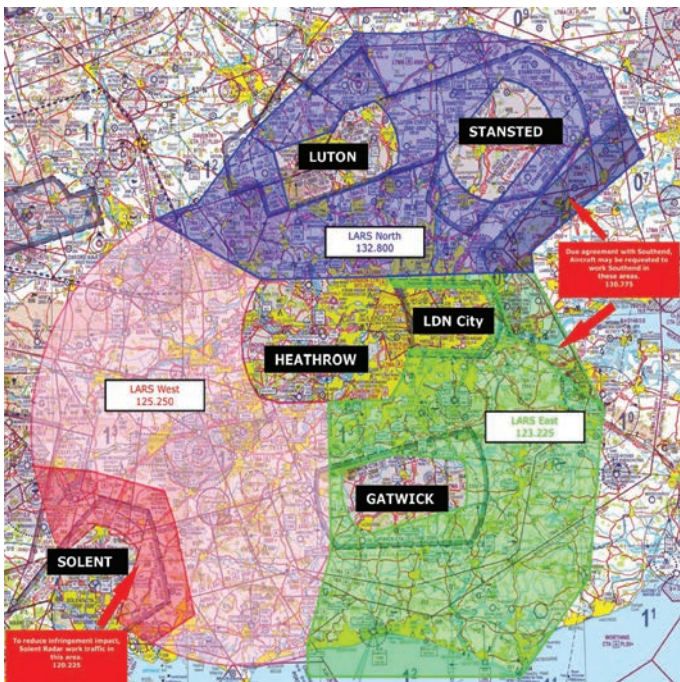
and note any distinguishing features along the it. Circle them and note the EET (estimated en-route time) to those features. Good features are towns, cities, roads, airfields, railways, forests and so forth. I tend not to use rivers, as they can be hard to spot, or dried out. So a typical navigation leg on my map will consist of a black line, with small circles along it around features, with a number representing the minutes it will take to get there. I don't believe in clogging up the map with fan lines and correction angles, not for a PPL-holding pleasure pilot, or student navigator. Now, in order to follow that line, you have either calculated the headings using your amazing and wonderful CRP circular slide rule, or you have printed the headings from some demonic website

(apps are useful tools – I always check and compare the weather and winds with the met office directly when using them). Either way you have a reasonable calculation and assessment of winds and drift angles, so you are well prepared.

FLYING THE ROUTE

You should be able to fly that route using time and heading as you have done the minimum but essential preparation. Don't forget this is visual navigation. Stay ahead of the aircraft by literally looking ahead and spotting the features you circled (and other aircraft). If you see the outline of a town that you estimate passing in four minutes, you are four minutes ahead, and can think about that forest you might be looking for after twelve minutes. Of course life is not always this simple, but by making these easy preparations you will have more capacity to make corrections when that first town is off to the right, or work out why it took five minutes longer than expected. You are giving yourself more of a chance of navigating successfully, and less of a chance of going into controlled airspace. Try always to prepare to navigate this way primarily, and then you can add layers of assistance on top, such as satnav or radio aids to help you confirm you are following your line. There are still other tools at your disposal to avoid controlled airspace.

There are some excellent ATSOCA (Air Traffic Service Outside Controlled Air Space) such as LARS (Lower Airspace Radar Service). I couldn't resist that. These services have been provided for us in order to help keep us out of controlled airspace and to keep controlled airspace safe. A lot of people use Farnborough LARS around the South East. Their best product for the PPL navigator is the 'Basic Service'. When you get that from them, they offer you a transponder code then monitor your progress as best they can on radar. If they are not too busy they will tell you about traffic if it is going to pass close by, but it is your job really to look out. If you do happen wander too close to controlled airspace and they see it, they will warn you and steer you away if they spot it in time. If you infringe, alarm bells go off for them, and they will steer you out straight away. They will be very calm and professional and will let you get on with the rest of your flight. You will probably be asked to call them on your return and will be asked to fill in a form which details the infringement. The reason they do this is to establish why it occurred, how it might be avoided in the future, and if you need any further training before flying again. With my infringement a few years ago (I'll tell you later), and a recent one by a student of mine, they have been very reasonable and forgiving because were talking to them. Getting a



This map shows the area of coverage of the Farnborough LARS sectors – the full LARS guide can be found online

basic service is very basic. Here is a typical call format: "Farnborough G-AOPA for basic service"

"G-AOPA Farnborough pass your message"

"G-AOPA is a PA28 from Elstree to Wellesbourne, South of Bovingdon 2000 feet, request basic service"

"G-PA squawk 5024 London QNH 1005"

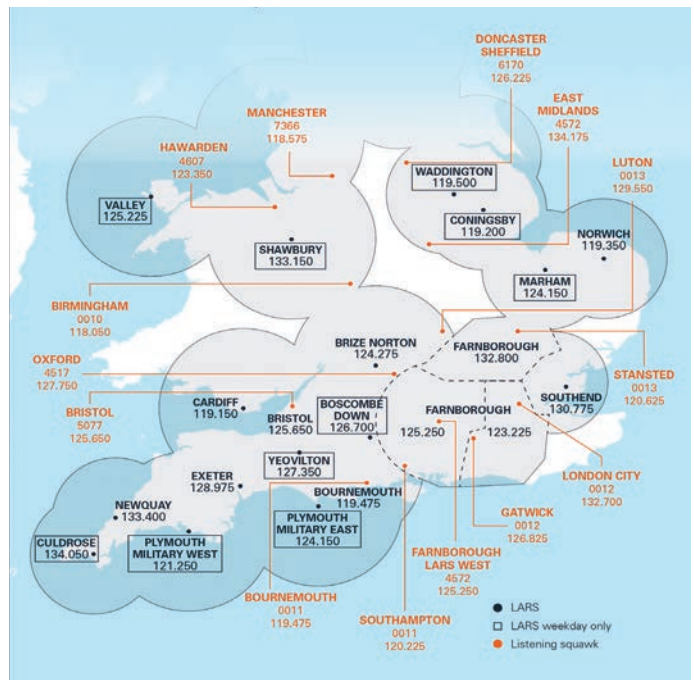
"G-PA squawk 5024 QNH 1005."

And that is about it. It is the same basic RT format used for most situations and you should be fluent with it. It is nice to get it all out in one short professional-sounding spurt of RT, but it is OK if you forget something or get it wrong. Often students say something completely random, or forget to state something. It doesn't matter, the controller will ask. It isn't just Farnborough that offer this service. Most large airports offer it such as Luton or Brize Radar (see map of Farnborough LARS coverage). As an instructor I use this service often, both to help me out and to get my students used to using it. I often hear controllers steering aircraft away from or out of controlled

airspace. Those are the cases that don't usually cause commercial aviation any problems because although the infringements occur, they are quickly diverted. The problems occur when the infringing aircraft aren't talking to ATC. When you are using a service, you have to listen out and respond to the controller if he calls. I am very familiar with our local training area and know visually where all the controlled airspace is. Sometimes ATC are very busy and I don't really need a basic service so I simply select the frequency and monitor it. I can let the LARS provider know I am listening in by squawking what is called a 'conspicuity code' (see map of areas covered). You can use these codes for cross country routes as well.

EVEN THE BEST FALTER

Unfortunately, just like avoiding parking tickets in central London, avoiding controlled airspace is something that can trip up even the most experienced of us. About six years ago I was flying as safety pilot with a friend who could still fly but no longer held a medical.



Areas covered by Listening squawks and LARS across the South East of England

We were at the holding point for runway 26 at Elstree, mid August. The blackberry bushes a few feet off the wing tips were heavy with huge berries and was imagining a juicy warm crumble dripping with thick cool fresh cream. I was also vaguely aware of my friend doing the pre take-off checks and I saw him adjust the altimeter, set the DI, fuel pump, flaps and so on; only to be woken from my berry reveries as he was given the discretion to line up. We took off and climbed and turned towards the north-east. The top of uncontrolled airspace around Elstree is altitude 2500 ft. At 2400 ft I warned my friend and he levelled off and started to descend at just under 2450 ft. But looking out the local area, things didn't look right; we looked too high. Checking the QNH I'd written down earlier and the altimeter confirmed my suspicion and we had been flying on QFE. So 2450 ft height was in fact over 2750 altitude. We descended very rapidly and I contacted Farnborough straight away for a basic service and admitted the error. We continued the flight without incident and

contacted Farnborough by phone on our return. I filled in the online form and I stated that I had been distracted at the holding point and hadn't noticed the wrong altimeter pressure setting. I stated that it would never happen again and it hasn't. I remember the incident every time I set the altimeter now.

Finally, don't forget you can go through controlled airspace. Luton seem more than happy to let you fly over their thresholds. You just have to know where you are, sound competent on the radio, use the correct phraseology and ask. It is a good experience. If there is a jet on final, ATC usually ask you to orbit north or south of the runway until you see it. When you see it and report to them, they ask you to fly over the 26 threshold (if wind is westerly - 08 if easterly) and pass behind the jet. They also tell the jet pilot about you (look up 'D' controlled airspace). It's a good way to build confidence and is great fun! ■

If you have any issues regarding any flying, Adam can advise. Email him via: adam.winter@aopa.co.uk

WORDS Neil Monks IMAGES Courtesy of NASA

WHAT'S HAPPENING TO OUR AIRSPACE?

When we talk about airspace and what the political goals are, the entire system is geared around Commercial Air Transport

In 1999, Europe developed legislation known as Single European Sky (SES) to try and sort out the inefficiencies of the airspace system.

By removing airspace barriers associated with national borders it was thought that the fragmented system could make the system much more efficient, leading to fuel saving, less emissions and less system delays.

Underpinning SES are a number of regulations and packages. There was a desire to develop functional airspace blocks which has, to a large extent, not materialised even though work continues today with their development. These blocks of airspace were supposed to lead to a borderless single sky, enabling free routing airspace.

Aligned to this was the promise that no emission charging scheme would be adopted until the fragmentation issue was resolved. With Europe's ATM system costing billions, there was also a commitment to reduce the charges by 50%.

So back in 2004 when the world was different, everyone signed up to the modernisation of Europe's ATM system. As the US had developed Next Gen ATM Systems, Europe began to invest in ATM modernisation through SESAR (Single European Sky ATM Research) – a research programme which is under a Public Private Partnership.

Since the birth of SES 17 years ago, how much



It's a tough job in the Air Traffic Control tower

success has there been? Well it's hard to measure – certainly air transport has not stopped and it's still a very safe mode of transport. The programmes are still running, but maybe some of the original timescales were too unrealistic? Nor had anyone foreseen some of the industrial problems such as ATC strikes. Another part of the objective was to reduce the number of ACCs across Europe from the current number (67). The US only has 20 ACCs and Europe is only 4% larger. The US also has only one computer system whereas Europe has 35 – so trying to rationalise the European system has led to industrial action.

Whilst Phase 1 of SESAR has finished, we have seen the introduction of an EC Regulation mandating the carriage of 8.33kHz radios – although AOPA UK and IAOPA agrees and has said so since March 1995, the mandate was issued in 2012 supporting the vertical

extension – the reason is “capacity” and Eurocontrol convinced the Commission that if capacity was to be improved, more frequencies would be needed. So the regulation was born.

Back when the changing regulation was being discussed, IAOPA/AOPA UK managed to persuade the Commission to think in terms of system-wide benefits, with a view to financially supporting those parts of the system that were not going to directly benefit, ie GA. It's for this reason that the CAA was able to apply CEF funding, which it was successful in doing. But now all 18 EU Member States at the 11th hour are saying we don't need to implement the regulation. They have no capacity issue or frequency shortage! These are the same states who have been attending the Eurocontrol 8.33 meetings and who accepted the Regulation EC 1079.

So 8.33 is an expensive upgrade for GA and as all the

cost benefit studies showed, 8.33 for GA was pure cost and no benefit. This kind of regulatory action deepens GA's mistrust of this system, however there is still a high-level belief that in the long run, 8.33 will be needed.

IN CONCLUSION

The airspace across the UK and Europe is evolving and as with all evolutions those that don't change become extinct.

Clearly GA has to think about its activities and whether or not they have the potential to impact on the “network”. If the airspace planners focus on providing an integrated solution in the future rather than continuing with the segregated system of today, it could be the case that more airspace is available for all airspace users in the future. So if we start to address a known airspace environment and known intent environments we could see additional capacity gains for all airspace users.

Safety has to be our main priority for all airspace users, so if we can improve situational awareness with low-cost portable solutions, we should do it.

GA needs to improve its flight efficiency in some cases. Better fuel management and more direct routes also means lower emissions – some of the ATM tools in the future will be more connected and SWIM (System Wide Information Management) will play a major role. Parts of GA will need to have access to SWIM too. ■

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AOPA NEWS

General Aviation news from around the world



Vorderman
with the
Lennox-Boyd
Trophy

VORDERMAN COLLECTS AOPA'S TOP AWARD

TV star and aviator Carol Vorderman has been honoured once again for her sterling work in the world of aviation

by **Denise Parker Housby**

Carol Vorderman, an honorary Group Captain and Ambassador for the RAF Air Cadets has received the prestigious Lennox-Boyd Trophy aviation award from AOPA. The celebrity aviator was presented with the Lennox-Boyd Trophy whilst visiting young air cadets at RAF Syerston in Nottinghamshire.

The trophy is awarded to a person, club, group or organisation that has contributed significantly to

the furtherance of general aviation, flight training, club flying or piloting standards.

Vorderman received the award for her work in furthering interest in aviation with the RAF Air Cadets. Gp Capt Vorderman was visiting the RAF Air Cadet Aerospace Camp at RAF Syerston, where she also met 220 cadets who had travelled across the country to take part in a week of aviation and engineering themed activities.

The majority of the camp's training and activities were delivered

by the air cadets who have completed the Qualified Aerospace Instructors Course. Honorary Group Captain Vorderman said: "As Ambassador of the RAF Air Cadets I am delighted to be receiving this award from AOPA in front of the next generation of aviators at the Air Cadet Aerospace Camp. The Air Cadets is an inspiring organisation for 12 to 19-year-olds and with the help of adult volunteers delivers fantastic opportunities for young people across the country."

The award was presented by AOPA Chairman George Done, and CEO Martin Robinson.

Vorderman has a PPL and owns her own Diamond aircraft. She has been an ambassador for the RAF Air Cadets since 2014 and hopes to encourage more young people into science, technology, engineering and maths subjects.

More about the RAF Air Cadets, including how to join as a cadet or as an adult volunteer, can be found at www.raf.mod.uk/aircadets. ■

VOLOCOPTER COLLECTS A HUGE FINANCIAL BOOST WORTH €25M

by **Robert Care**

When setting out to develop a self-flying taxi, you want the world to take notice. But when a company like Daimler begins to show interest in your project, you must know you're on the right path.

Volocopter, the start-up company from Germany, recently received a huge shot in the arm with €25m of investment from Daimler and technology entrepreneur Lukasz Gadowski.

This isn't the first time Volocopter has been recognised for the work it's doing. This investment adds to other funding received from Dubai's Roads and Transport Authority; by 2030 Dubai aims to carry out 25% of its passenger transportation with the help of autonomous means of transport.

Utilising this fresh capital, Volocopter has said it will "further expand upon the leading technology in its

purely electrically driven VTOLs, (eVTOL), speed up the introduction process of the Volocopter serial model and conquer the market for flying air taxis."

"The safe, quiet and environmentally friendly aircraft, suitable for transporting two passengers, will revolutionise mobility in metropolises. In order to realise this vision Volocopter also invests in its team and plans to continuously develop it further." ■



The electric and self-flying Volocopter could be above the streets of Dubai soon

ALAN CROXFORD 1930 – 2017

by **George Done**

Alan Croxford, who died on 9 August 2017, was a long standing member of AOPA becoming a Board member in 1991. He retired from the Board in 2013 and was appointed an Honorary Vice President. Much of his flying was with the Civil Service Flying Club, of which he had been Chairman for many years, based at Rochester Airport. As the joint owner

of a Cessna 150 he toured Europe ranging from Ireland to Vienna, and in the club Cessna 172 reached Tangiers and the Barents Sea. Alan, using his own programme writing skills, developed and maintained the AOPA membership database which was extended to include label-printing and a completely automated direct debit system, at a time when such systems were not widely available. He was a regular visitor to AOPA

at Cambridge Street, much prone to witty comments, entertaining the office staff. He enjoyed posing mathematical teasers to anyone up for the challenge. Like many aviators, he was equally at home on a boat and regularly sailed the Mediterranean. He leaves his wife, Helen, brother Roger, daughters Katherine and Lesley, and granddaughters Catriona, Jenny, Anna and Louise. He will be sorely missed by us all at AOPA. ■

LOOK BACK... THIS MONTH 18 YEARS AGO



FINAL FLIGHT FOR SR-71

The 09 October 1999 was a day to mark down in history as it was the last flight of the Lockheed SR-71 Blackbird.

In 1957 Lockheed's Skunk Works started developing a plane to take over from the U2. Lockheed's goal was to create a plane that was untouchable by any fighter or missile in existence.

The SR-71 served with the US Air Force from 1964 to 1998. A total of 32 aircraft were built; 12 were lost in accidents but none lost to enemy action. It has held the world record for the fastest air-breathing manned aircraft since 1976; this record was previously held by the related Lockheed YF-12.

The SR-71 was well ahead of its time; it reached altitudes of 85,000ft and flew at M3.2.

The SR-71 was originally retired in 1989, due to costs, the development of drones and satellites, but was brought back into active service due to increasing tensions in North Korea (some things never change). It was forced to finally retire from military service in 1998, but NASA was operating two airworthy versions. The last flight took place on 09 October.

**AOPA NEWS
HIGHLIGHTS****54,000 FT FOR GLIDER**

The Perlan 2 has set a new altitude record for gliders by soaring to 54,000ft. The Airbus-supported glider, which is based in Argentina, set the record in early September. The two pilots on board set the record with some 'imaginative flying' whilst being fed information from the ground.

ELIXIR TAKES FLIGHT

After five days of ground tests, the French-built Elixir took to the skies for its maiden flight in La Rochelle. In the first flight the Elixir climbed to 5000ft and then went on a 45 minute flight before returning. Reports say everything went very well. After the test it was flying again – this time to an air show!

PORTER PC-6 NO MORE

Pilatus has announced that it will cease production of the much-loved and versatile PTC-6. Production will stop in 2019, but support will continue for the next 20 years. Pilatus' Chairman said it was time to "admit every product has a life cycle which must come to an end."

GERMAN WEATHER

Dachser now act as first official distribution partner for the German Meteorological Service (DWD). It will also offer further extension through API for well-established cockpit architectures, sparing pilots the hassle of several weather contracts.
www.skynavpro.aero

Oshkosh was
as popular
as ever



OSHKOSH HAS ANOTHER SUCCESSFUL YEAR!

The annual pilgrimage that is the annual EAA Airventure at Oshkosh proves that GA is alive and kicking

by David Rawlings

Once again EAA's annual get-together proved what an amazing industry General Aviation is, and why we live it and love it so much.

Almost 600,000 aviation fans turned up to what has become known as the biggest aviation gathering in the world.

The week-long celebration of aviation, which was up five per cent on entries on 2016, a welcome boost for the industry. And the close of the festival EAA Chairman Jack Pelton said: "What an incredible year it was at Oshkosh. From the U.S. Navy Blue Angels and Apollo reunion, to new aviation innovations on display and two B-29s flying formation as part of 75 years of bombers on parade, it was a week

filled with 'Only at Oshkosh' moments. You could feel the energy as thousands of aeroplanes arrived early and stayed longer, pushing aircraft camping to capacity for most of the event. The aviators and enthusiasts who attended were engaged, eager, and passionate, demonstrating how Oshkosh is the best example of why GA is so vitally important to the country. I believe it's the best AirVenture week that I've ever seen."

Although many people arrive by road (the car parks were full), it's also one of the biggest fly-ins of the year. This year, more than 10,000 aircraft arrived at Wittman Regional Airport in Oshkosh and other supporting airports in east-central Wisconsin. At Wittman alone, there were 17,223 aircraft operations in

the 10-day period from July 21-30, which is an average of approximately 123 takeoffs/landings per hour.

Never one to rest on the success of the current year, Pelton was asked about plans for the 2018 EAA Airventure and said: "We're already talking to people about the possibilities for 2018 in all areas, from aircraft anniversaries to new technology and innovations. We saw new programmes, such as the Twilight Flight Fest following the afternoon air show, attract big crowds and show a bright future. We'll be announcing these features and attractions as they are finalised. We're also going to continue working hard on the visitor experience to maintain EAA's high standards. We're excited for the future and what's ahead for next year!" ■

HONDAJET IS BESTSELLER SO FAR IN 2017

by **Robert Care**

It seems as if Honda has current bragging rights over other companies in the HondaJet's class.

The company, based

in Greensboro, North Carolina, has announced that the HondaJet saw more deliveries than any other jet in its category in the first half of 2017, as reported by GAMA (General Aviation

Manufacturers Association).

Honda delivered 24 aircraft to customers in the first six months of 2017. The company is steadily ramping up production to meet customer demand, and is currently manufacturing the aircraft at a rate of around four per month at its world headquarters.

"Our customers are extremely pleased with the performance, comfort and the superior fit and finish of the HondaJet. The HondaJet is very high tech, sporty aircraft and it is like a flying, high precision sports car," said Honda Aircraft President and CEO Michimasa Fujino.

"We want to create new value in business aviation

and I hope to see many more HondaJets flying all over the world."

The HondaJet is one of the world's most advanced light jets, and its distinctive design incorporates advanced technologies and concepts including the unique Over-The-Wing Engine Mount (OTWEM) configuration.

The aircraft is the fastest, highest-flying, quietest, most fuel-efficient, and most comfortable business jet in its class. HondaJet also say its aircraft has "gained greater acceptance in the market, especially by corporate executives, business owners, corporate flight departments, charter companies, and aviation enthusiasts." ■



The HondaJet, more popular than a Cessna 172...

GB SECOND IN GLIDING CHAMPIONSHIP

by **David Rawlings**

The UK gliding team enjoyed huge success at the European Gliding Championship at Lasham Airfield earlier in the summer.

The UK team joined more than 60 competitors from 12 countries to enjoy ten competition flying days, each of which involved the competitors completing carefully briefed closed circuit task distances of between 150 and 600 kms.

The competition in Lasham was held for the 15m, 18m and open classes of glider.

The 60-plus gliders launched each day by a small fleet of tow-planes (typically DR400 or PA25) in a total time of 35 minutes. The gliders typically reached average speeds of about 110kph around the tasks.

Germany took the top spot in the championship, with UK in second, and the Netherlands taking the last step on the podium.

Although the UK team finished second, they took medals in all classes. The pilots enjoyed great success on the penultimate day resulting in five of the six pilots medalling with three silvers and two bronze.

During the competition, the foreign teams found it helpful to have their own allocated 8.33 frequencies. With many pilots operating for the first time in the UK's somewhat uniquely complex airspace environment, the allocation meant that all teams could keep in touch with each other in their native languages.

Glider flights are among the most scrutinised and analysed out there, both during and after flight. Any infringement – even by a metre – is very heavily penalised under FAI and BGA rules. As with all competitions, the pilots were briefed in detail each day before flight by an appointed airspace officer. There was one possible (mil) ATZ infringement by a foreign



Open class medal winners at the championship

pilot that was resolved with the ATC unit. He'll learn from that.

Pete Stratten, the Chief Executive Officer of the British Gliding Association said: "The German team aced it – they flew superbly and consistently, which is what it takes, of course."

The British team medal winners included two BA captains, a Virgin captain, and two managing directors

of their own companies, one of whom still finds time to be the volunteer BGA chairman (Peter Harvey).

"I'd like to pass on our thanks to all other class G airspace users who referred to the notification detail we published each day as well as perhaps the 'gliding activity' AIC, and to any operators who modified their operations. We hope you were not inconvenienced," said Stratten.

The latest design of 18m glider the 'New Ventus', proved itself, taking the top three slots in its class. "The manufacturer's order book is already full, including quite a few from British pilots," Stratten enthused.

The UK Junior Gliding Championships also took place recently, with the title going to Jake Brattle, who works for a gliding maintenance/avionics supplier. Brattle beat 45 other competitors, all aged under 25. ■



Rachel (l) and Claire (r) are ready to go

UK TRIP TO PROMOTE WOMEN IN AVIATION

Two Dundee-based pilots from Tayside Aviation are gearing up to circumnavigate the UK to entice women in to aviation

by **Claire Grainger**

Ten years after Evie Saunders bestowed an aircraft to Tayside Aviation, in which over 260 scholarships have now been completed, Rachel Foyle and Claire Birch are embarking on a special 10-day trip in Evie's honour to entice more women into all aspects of aviation.

At present, only 12% of UK pilots are female, with the worldwide figure even lower at just 6%.

Throughout her life, Evie had a great interest in aircraft and flying but did not take to the air until 1959. In 1985, by then aged 64, she began her studies and flying lessons, receiving her PPL in 1989 at 68.

Now, Rachel and Claire are preparing for 'Evie's

Grand Tour of Britain' to fly round the UK in G-EVIE. In between flights, the girls will be documenting their trip by blogging, as well as keeping people up to date on their adventures through social media channels.

Being awarded the British Women Pilots' Association (BWPA) Air Total UK Total Flying Future Scholarship was a great contribution to the funding and feasibility of the trip. The trip has been met with overwhelming enthusiasm, support and kindness by Lorraine Richardson, and the various airfields involved in the tour. Pooleys Flight Equipment has also made a generous donation of the equipment necessary for the tour.

Rachel (23), a University of St Andrews graduate,

began her PPL training at Prestwick aged 16, flew solo later that year and gained her PPL fixed wing licence at 18.

Meanwhile, Claire (35) from Buckinghamshire, who began flying at the age of 14 following a gift voucher lesson from her Dad, is a former RAF Navigator who spent 10 years in the back seat of a Tornado fighter including a detachment in the Falkland Islands. Claire then qualified as a PPL fixed wing pilot at Tayside Aviation in Dundee, and has also obtained her New Zealand PPL. Now Safety Officer at Tayside Aviation, Claire is working towards her Commercial Pilot's Licence. Evie's Grand Tour will also allow her to tick off the 450-mile cross country

trip which is a key part of her training.

Claire commented: "The trip is a fantastic opportunity to enthuse, encourage and inform women about the opportunities within aviation. I am looking forward to visiting new airfields and embarking on a trip of a much greater magnitude than anything I have done before."

Pauline Vahey, BWPA Ambassador added: "The BWPA wishes Claire and Rachel the best in their trip and is delighted to be helping them achieve their flying ambitions in an initiative we feel sure Evie Saunders, past BWPA member, would have supported wholeheartedly." ■

CESSNA BEGIN DENALI TEST BUILD

by **Lucy Field**

One year after unveiling a cabin mockup of its all-new, high-performance, single-engine turboprop, Cessna has made significant progress in bringing the Denali to market.

Manufacturing of the first test article has begun, and the team has started building tooling. The clean-sheet Denali is being designed to meet the needs of customers and outperform its competition in capability, cabin experience, ownership costs and pilot interface.

"This will be the first plane in its class to offer a FADEC-

equipped engine, which will make the Cessna Denali a best-in-class aircraft," said Brad Thress, Senior Vice President, Engineering. "We picked up great momentum when we debuted the Denali last year and now we're making excellent progress in the aircraft's development programme."

Thress said airframe design for the Cessna Denali is nearing completion and the engineering team has started to release the drawings to continue assembly of test articles and prototypes, as well as detail tooling and assembly bond fixtures. ■



Airframe design for the Denali is nearing completion

TRAINER SALES UP

by **David Rawlings**

Piper announced that sales of their PA-28 trainers have grown to their highest level in 14 years. Piper has been steadily regaining market position since 2012. This year Piper is on track to deliver 87 PA-28s – a combination of single-engine Archers and single-engine complex trainer Arrows. This increase represents a 15% increase in market share over the past five years. In addition to the success with Piper's PA-28

products, sales for the twin-engine Seminole continue to be strong. With the current demand and pace of sales, Piper is on track to continue to increase trainer delivery volume for 2018.

"Our complete line-up of training aircraft, along with their advanced avionics, offers flight schools the ease of doing business with a single vendor, as well as the economies of scale that come with a standardised fleet," said a Piper spokesperson. ■



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WORDS AND IMAGES David Hastings MBE

COAST TO COAST IN THE USA

You may remember David Hastings' epic journey across the USA (AO&P Oct 16). Here, he tells another amazing tale about his second stint of flying from one side of the country to the other – including a flight interrupted by UFOs





fter my first long haul flight in the USA from San Francisco to New York to attend the Annual Convention of the 2nd Air Division USAAF Association at the end of the week, it was time for my second flight all the way back to San Francisco in the C-337 with my flying partner David Patterson – a fantastic B-24 Liberator pilot.

The weather man did not hold out much hope for early departure, as the awful weather had caused a huge snarl-up of traffic in the entire New York area. He advised us to file for a departure time of 1500hrs, so at least we would be in the queue. Hearing my accent, he also asked if we would like him to try and get us a low-level clearance all the way back to San Francisco, so I could enjoy the scenery. We said yes, but never dreamt he would achieve it. We then walked out to our great Cessna

C-337 "Sarah", made an initial pre-flight and loaded up, before retiring to the airport restaurant for lunch to watch the driving wind, rain and low cloud outside.

1430 hrs and we were strapped in, the delays were still bad, but thank goodness we had booked our departure slot in the morning, as we were told that with luck, we would get clearance by 1500 hrs. In the business aircraft park we were surrounded by the big jets and our neighbour was a lovely Grumman Gulfstream, whose captain tried to make us envious by holding up a cup of coffee. He called for taxi clearance, but we were delighted when the tower informed him that his clearance would be after ours. We gave him a cheery wave as we taxied down a very wet perimeter track towards the hold for runway 23. The weather was improving at last, with some

breaks in the cloud already appearing. At 1535 hrs we started our take-off run, leaving a huge queue of other aircraft behind us. The next thing that I noticed was that the Airspeed Indicator (ASI) suddenly dropped to zero. I told David "no airspeed my side" to which he calmly relied "continue". Gear and flaps up as we climbed away on our instrument departure to the west. I did express my surprise that we had not made an immediate return. David's response was to say that surely I was used to flying on a limited panel, I knew my engine revs for climb, cruise and approach, so what was the problem? And ATC had enough difficulties on their hands without us demanding a return.

Air Traffic lived up to their

word and we were given flight level 5.0 on airway Victor 12 and soon I found that flying without an ASI was not such a big deal. The evening was now perfect as we crossed the Allegheny mountains, but as we approached Pittsburgh and the wide Ohio river, the clouds began to build beneath us and we were cleared up to flight level 8.0. Air Traffic advised us of conflicting traffic as a BAC 1-11 in the descent to St. Louis passed ahead of us with a very friendly greeting and then at 1900 hrs we were talking once more to Dayton International Airport and we were radar vectored onto the ILS for runway 24L. Now came my test, as with no ASI I had to use the engine rpm to judge speed, but David reminded me that we had a very good stall warner so not to worry. I eased Sarah down to a smooth landing and we taxied back to the Business





Sarah was a fantastic companion, here at her home base in Concord San Francisco

Executive Terminal. Someone offered to look at the ASI as we refuelled. The aircrew transport then arrived, full of airline captains and we joined the big league, as they took us to the hotel – what a life.

Next day we had an early breakfast, as David wanted to get all the way to Albuquerque in New Mexico in one day. Strapped in, we obtained our start-up and taxi clearance at 0745 hrs and then joined the queue with all the big jets heading for runway 24L. Airborne at 0800 hrs on a VFR clearance to the west and again the Air Traffic honoured our low level request, as we are given flight level 6.5 which offers us a great view of St. Louis with the Mississippi River. These early morning starts are great fun in the silky smooth air. Just as we established ourselves in the climb our ASI vanished again, so back to the limited panel, much to David's amusement.

Flying the low level airways

"These early morning starts are great fun in the silky smooth air"

from VOR to VOR with a "radar following service" was very easy and good old Sarah just purred along. By 1030 hrs when we were thinking of making a fuel stop, our minds were made up as we approached Jefferson City and saw, to our amazement, a B-17 Flying Fortress in the circuit. We just could not miss seeing this piece of history, so called the tower for permission to land. We landed, refuelled, then walked over to see the B-17 which was parked beside us and it turned out to be a Confederate Air Force aircraft with a great crew who welcomed us.

We were airborne again and given low level clearance, so I could enjoy the rivers and lakes in this beautiful part of the USA. Our forecast weather front is still there, the remains of Hurricane Elaina, but our track keeps us just south of the clouds. In the smooth air you could trim Sarah for hands-off flying and we settled down to enjoy the great Dayton lunch

boxes and soft drink cartons. Now in the plains of Kansas and as we approach the city of Wichita, we meet one of the forecast storms on route, so we get permission from the centre to fly around the clouds and remain VFR. At 1430 hrs we have our next refuelling stop in sight, the huge wartime B-24 training base of Liberal and the tower clears us to descend. Now refuelled we were offered the usual coffee and cookies. For a British pilot, the service we received at every airport, large or small, was quite amazing – I just wish we had this in Europe.

The last leg of the day was going to be the very large international airport at Albuquerque, over 5,000ft up in the Sierras and just under three hours away. Once more our call-sign brings us a special low level clearance. Airborne at 1510hrs and the air is still delightfully smooth as we fly over many of the old wartime training airfields. What a sight it

The still
unexplained
UFO that briefly
joined David on
his journey

must have been in the '40s with the skies full of B-24's, B-17s, Stearmans and Harvards but now we have it all to ourselves.

1630 hrs and we could see the majestic Sierras ahead. With building clouds we are cleared up to Flight Level 8.0 over this totally barren part of the USA. Once into the Sierras and the rough air begins, as we both look for the pass leading to our destination. We start the descent with a 757 ahead and a 737 behind, but again this is the big difference of flying in the US; we are a small six-seat twin but we are treated just the same as the big jets.

Here I tell David that I really have had enough of limited panel flying, so he gets Cutter Aviation to deal with the ASI problem, but reminding them that we have an early start booked for the next day. At supper we have with our usual de-brief and enjoy a stunning sunset, but we do wonder what all those high clouds will mean for us tomorrow. David

"This is the difference of flying in the US; we are a small six-seat twin but we are treated the just the same as the big jets"

is teaching me so much about flying and navigation and I am really lucky to be flying with a wartime pilot of his experience. Also there is no doubt that the twin-engine Cessna-337 Super Skymaster is a real joy to fly in the wide open skies of the United States.

UFO SPOTTING

Early morning we run through our flight plan for the final leg of our 3,000 mile flight. However, David has planned a surprise for me, as we are going to leave the airway at Flagstaff, so that I can fly up the mighty Grand Canyon – what a treat. When the controller hears my voice, she says that she presumes I want to fly the Canyon. I confirm that this is a hope, but she then advises us to fly it before landing at Grand Canyon Airport, because otherwise, if we land first and then ask, they will say no. She also confirms that yet again we have a low level clearance, how can we ever thank that guy

at Morristown? ASI problem cured, we're ready for take-off.

0820 hrs and we are airborne and can see a group of hot air balloons lifting off from the town. Back to the airway flying and the white painted VOR beacons are great landmarks for low level navigation in the US, as we pass the one at Zuni in this very barren and wild part of the Sierras. At the Flagstaff VOR we turn north off the airway and I get my first sight of that awe-inspiring Grand Canyon, one of the seven wonders of the world, where the Colorado River has carved through ten million years of the earth's history. The colours are breathtaking and the new camera that I have been using throughout the trip works overtime. We cruise along the rim, enjoying the stunning views, not realising that in just under a year, this would be banned after a nasty accident. As always in the Sierras, I am glad that we have two powerful Continental

IO-360 fuel injection engines, but what a view! Thousands of holidaymakers pay a fortune to see this, yet here am I just flying myself up the Canyon. David has really spoilt me today.

1100 hrs and we are talking to Grand Canyon Airport with its single 9,000 ft runway at an elevation of 6,000 ft and I turn base leg, lowering gear and flaps, as we go and getting ready to cope with quite a strong cross-wind. Still safely down, the Air Traffic Controller asks if I intend to fly the Canyon. With great politeness I say no, as I came on the way! We taxi back out for the next leg of our journey across the Rockies to Bakersfield. We pass over beautiful Lake Mead, in still perfect weather. Sarah is a really delightful aircraft to fly and we have no conflicting traffic at our altitude, which was all part of the radar service. Then a few minutes later as we approach the Mojave Desert it happens. We suddenly see a dot on the horizon approaching us at very high speed in the opposite direction in our 12 o'clock and same height, which starts to grow rapidly. We both push hard down on the control columns and are convinced that there will be an almighty bang, when a huge black shadow passes over us with no noise or turbulence. Then two very shaken pilots both slowly come up from below the cockpit coaming, and ask each other: "what the hell was that?". We discuss if we should report the incident, but after having only just been told we had no conflicting traffic, we decide not to, in case they think the old pilots are seeing things. Hardly had our pulse rate got back to normal, then we both felt that we had something out to port but we could not see anything. The sensation was so strong, that I suggested to David that I unstrap and go back aft to collect my camera. Back to the seat still with the sensation that something is on our Port wing, I take two photographs and eventually the feeling of another

aircraft beside us goes, but we are still shaken and puzzled.

Now into the Mojave Desert, where your airway flying has to be accurate, as you are surrounded on both sides by military restricted areas, as we approach the famous Edwards Air Force Base. David suggests that I try my best RAF accent and ask if they will allow us off the airway to have a close look at the huge eighteen mile-long space shuttle runway in the desert. I have nothing to lose, so we give them a call and ask if an ex-RAF member might be allowed into their zone. We are told "wait one" and then to our amazement back comes a clearance to overfly the base. Then the end of the Sierras are in sight as we leave the testing airfield of Palmdale.

We then talk to Bakersfield and are cleared for a straight in approach to land on runway 30R. At 1500 hrs we get our last start-up clearance of the trip from the Bakersfield Tower. As we fly up the Californian plain, it is just unbelievable. We can see the great landmark of Mt. Diablo in the distance and on being handed over by Los Angeles Centre to Oakland, the hectic R/T chatter reminds us that we are back to civilisation. All too soon the airfield is in sight and I am sad to think that my 3,000 mile flight is nearly over. We land smoothly and shut Sarah down for the last time.

Driving back home, we stopped to get the film that I had taken of 'our UFO' processed. To our utter amazement, we had the two pictures. The first showed our port wing and the mountains below, but in the second picture we had exactly the same view, but with a flat object with a heat efflux coming out of the bottom. We took it to a great friend in the US Navy who asked if he could keep it for a few days. When I collected it later, all we could get from him was "no comment". Many years later the film was computer analysed and I gather the scientists involved

"We suddenly see a dot on the horizon approaching us at very high speed in the opposite direction"

were delighted, as there are two UFO's and they have ionised air coming out of the bottom. All this means something to them, but to me it is still a mystery.

For a British pilot it was a dream. Six days, 3,000 miles of unbelievable flying and I was learning so much. The thrills and fears of mountain flying, the frightening rough air of the Sierras, the huge open space of the US, the ability to land at large or small airports and be treated just the same as a 747, the amazing service received from all the FBOs, the kindness of ATC when they heard an English voice, the excellence of the Met service, to fly Grand Canyon, the kindness of the US Air Force to let me see Edwards AFB, the great fun of low level airways flying from VOR to VOR, the experience, kindness, tuition and skill of my co-pilot, the superb engineering service from Pacific States Aviation who kept us safe, and finally the joy of being able to fly that great C-337. Little did I know that this was just the start of my 29,000 miles of flying in the US. ■

Below from top: Grand Canyon Airport, after a welcome break experiencing one of the seven wonders from the sky; and the breathtaking view of the mile-long Grand Canyon



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- 2 Attend a Flight Instructor Refresher Seminar within the validity of the certificate; and**
- 3 Pass an Assessment of Competence within the 12 months preceding the expiry of the certificate.**

For at least each alternate subsequent revalidation, an assessment of competence must be undertaken. In the case of a renewal you should, within 12 months before renewal, attend a Flight Instructor Refresher Seminar and pass an assessment of competence.

The last Seminar in 2017 will be held on **7-8 NOVEMBER**. The 2018 dates are **17-18 JANUARY, 2-3 MAY** and **7-8 NOVEMBER**. All Seminars are now run at the AOPA offices at 50a Cambridge Street, London SW1V 4QQ - only 5 minutes walk from Victoria Station.

To register for a place on any of the Seminars please call the AOPA office on 020 7834 5631 or join online at WWW.AOPA.CO.UK. The Seminars start at 1100 and end at 1800 each day to facilitate travel.



The Siemens-powered Extra, perhaps one of the most stylish electric aircraft

WORDS David Rawlings IMAGES Various

Electric dreams

There's no getting away from it – electric aircraft are here to stay. In this feature, we look at some of the models already out there, and what might be in the pipeline. Read on, it's shocking...

Electric aircraft are nothing new, but they are going to become more prevalent in the near future. The way electric cars are flooding the market, GA can't be far behind the electric revolution.

The thing holding aviation back is battery weight. And the technology is a few years behind the auto industry. In a recent Wired magazine interview, Richard Pat Anderson, who runs the Flight Research Center at Embry-Riddle Aeronautical University, said: "I think everyone looked at electric cars and thought it would play out the same with electric airplanes, but they have different requirements. Cars need batteries to be affordable and compact, but with airplanes we don't care about cost as much, or even volume. It's weight that's critical."

Battery energy density is rising by two to three per cent each year. At this rate of progress experts estimate

that anything close to an airliner won't be fully electric until around 2045. But for us in the GA world, things are already ahead. Here are a few of the aircraft already making a difference...

SIEMENS POWERED EXTRA

Siemens has developed a new type of electric motor that, with a weight of just 50 kg, delivers a continuous output of about 260 kilowatts – five times more than comparable drive systems.

The Extra 330LE aerobatic plane, powered by a propulsion system from Siemens, recently set two new speed records. At the Dinslaken Schwarze Heide airfield in Germany, the electric aircraft reached a top speed of around 337.50 km/h over a distance of three kilometers. The speed achieved by pilot, and Extra owner Walter Extra, was 13.48 km/h faster than the previous record, which had been set by U.S. pilot William M. Yates in 2013. The World Air Sports

Federation (FAI) officially recognised the record flight in the category 'Electric aeroplanes with a take-off weight less than 1,000 kgs.' The Extra also set a new FAI world record in the category 'above 1,000 kgs' in a slightly modified configuration with an overall weight exceeding one metric ton. Test pilot Walter Kampsman flew the electrically-powered plane at a speed of 342.86 km/h.

The Extra 330LE recently gave another memorable performance by becoming the world's first electric aircraft to tow a glider into the sky.

The nearly-silent aerotow piloted by Walter Extra took a type LS8-neo glider up to a height of 600 meters in only 76 seconds. "This aerotow provides further highly visible evidence of our record-setting motor's performance capabilities," said Frank Anton, head of eAircraft at the Siemens venture capital unit next47. "Just six such propulsion units would be sufficient to power a typical

19-seat hybrid-electric aeroplane."

The new propulsion system from Siemens only completed its maiden flight, which took place in July 2016. In addition, the lightweight electric motor for aircraft already held a world record for power-to-weight ratio; weighing just 50 kgs, it supplies a constant electric output of 260 kilowatts, which is five times more than comparable propulsion systems.

The Extra 330LE, which weighs about 1,000 kgs, serves as the flying testbed for the new propulsion system.

As an aerobatic aeroplane, it is particularly well suited for taking the components to their stress limits and for testing and enhancing them. Currently, Siemens state that there are no plans for series production of this electric aircraft.

Having signed a collaboration agreement, Siemens is also contributing

its technology to its joint project with Airbus, in the area of electrically-powered flight.

Electric propulsion systems are scalable, and Siemens and Airbus intend to develop hybrid-electric regional aircraft on the basis of this record-setting motor. "By 2030, we expect to see the first planes carrying up to 100 passengers and having a range of about 1,000 kilometers," explained Anton. Siemens is determined to establish hybrid-electric propulsion systems for aircraft as a future area of business.

THE LILIUM JET

The world's first electric vertical take-off and landing jet has already had its maiden flight and is causing ripples in aviation. The company says that its primary use will be as an air taxi for five people.

The Lilium Jet consists of a rigid winged body with 12 flaps. Each one carries

"Just six such propulsion units would be sufficient to power a typical 19-seat hybrid electrical aeroplane"

three electric jet engines. Depending on the flight mode, the flaps tilt from a vertical into a horizontal position. At take-off, all flaps are tilted vertical, so that the engines can lift the aircraft vertically. Once airborne, the flaps gradually tilt into a horizontal position, leading the aircraft to accelerate. When they have reached complete horizontal position, all lift necessary to stay aloft is provided by the wings as on a conventional airplane.

According to Lilium, the beauty of this system is its simplicity. In comparison to existing concepts, Lilium Jets require no gearboxes, no foldable or variable pitch propellers, no water-cooling, and no aerodynamic steering flaps. Just tiltable engines.

The Lilium Jet also has good structural efficiency. "As we can provide differential thrust from the engines in cruise flight, no stabilising tail is necessary," said a spokesperson for Lilium.



Lilium claim that they will be the future of air taxis and will carry up to five passengers



Clockwise from above: The E-Fan before its record breaking flight; crossing the English Channel; the E-Fan can now be seen at many exhibitions across the globe as it continues to be operated by Airbus

The Lilium Jet uses an integrated high-lift system. The objective is to increase the lift of the wings even at low speeds to save energy. While hovering is very energy-consuming, as an aircraft must provide thrust equal to its own weight, dynamic lift of wings consumes much less energy to stay aloft. So, it is important to create as much dynamic lift from the wings as possible, even at low speeds.

The Lilium Jet engines have only one moving part – the central shaft of the rotor holding both the fan in the front and the magnets of the electric motor. This ensures highest reliability in operation and low maintenance costs of the propulsion system. The

redundancy of the system allows large inspection intervals to keep costs lower than for helicopters or reciprocating engines.

The large open rotors of a helicopter induce vibrations into the cabin. The whole vehicle vibrates in the frequency of the rotor blades passing. Lilium's electric jet engines, however, run smoothly. This ensures a quality passenger experience during the entire flight. Likewise, a big advantage of electric jet engines is their low noise signature for people on the ground.

AIR BUS E-FAN

As a concept, the E-Fan has been around for several

years now. It made history in 2015 when it crossed the English Channel. Travelling in the opposite direction to the pioneering Frenchman and powered by lithium-ion batteries, the E-Fan took off from Lydd on the English south coast, completing the 74 kilometre flight east to Calais, France, in around 37 minutes. Flown by test pilot Didier Esteyne, the all-electric plane weighs around 600 kilogrammes and travelled at an altitude of about 1,000 metres [3,500 feet].

While the E-Fan had already made more than 100 flights prior to cross-channel flight, preparations for this very special trip were extensive and included a dedicated test

and verification programme put together by French flight authorities, Airbus, and its partners.

"That is something which may not have been necessary 100 years ago, when Blériot's flight was just a race to be first. But today, following rules and obtaining certifications is of crucial importance for the future of safe, reliable and certifiable electric flight," explained Jean Botti, the former Airbus Chief Technical Officer who launched the E-Fan programme.

E-Fan is bringing more electric propulsion to the aviation industry. Developed in an Airbus-led European programme, the E-Fan's



The instantly recognisable Solar Impulse on its epic adventure

history-making first version was designed specifically for electric power – an important stepping stone on Airbus's electric aircraft roadmap and toward the future of electric and hybrid flight.

In a second step, E-Fan was transformed into an updated "Plus" version with a hybrid configuration for longer flight endurance. E-Fan Plus – which debuted during the summer of 2016 – incorporates an internal combustion engine as a range extender in addition to the aircraft's on-board lithium-ion batteries.

These two propulsion system configurations – and ongoing innovation – highlight the aircraft's role as a technology demonstrator

that allows the company to make important advances on its electric aircraft roadmap.

Ken McKenzie, senior VP of strategy and corporate development for Airbus, said what started with a quirky rear-engine ducted fan demonstrator called the E-Fan could be headed for full-scale development into a product line of electric aircraft. That, he said, depends on shareholder support and regulators but he noted that "fossil fuels aren't going to last forever."

SOLAR IMPULSE

Our penultimate aircraft is the solar-powered Solar Impulse. This aircraft has gone from strength to strength since the project

"The E-Fan could be headed for full-scale development into a product line of electric aircraft"

first began with Bertrand Piccard's vision that clean technologies and energy efficiency can reduce our emissions and improve our quality of life.

It ultimately led to the first round-the-world solar flights in July 2015, with Andre Borschberg's 5-day, 5-night record-breaking flight from Japan to Hawaii using only the power of the sun. Not sci-fi, but eccentric enough to appeal to the people's emotions and get their adrenalin pumping. It would have made a great Jules Verne story a few decades back.

NASA'S X-57

With 14 electric motors turning propellers and



Above: A rendering of the X-57; NASA's rather rustic-looking engine testbed for its aircraft's 14 engines.

all of them integrated into a uniquely-designed wing, NASA will test new propulsion technology using an experimental aircraft, now designated the X-57 and nicknamed "Maxwell." An artist's concept of the X-57 shows the plane's specially designed wing and 14 electric motors. NASA Aeronautics researchers will use the Maxwell to demonstrate that electric propulsion can make planes quieter, more efficient, and environmentally friendly.

"With the return of piloted X-planes to NASA's research capabilities – which is a key part of our 10-year-long New Aviation Horizons initiative – the General Aviation-sized X-57 will take the first step in opening a

"The General Aviation-sized x-57 will take the first step in opening a new era of aviation"

new era of aviation," said NASA Administrator Charles Bolden, during his speech at the American Institute of Aeronautics and Astronautics (AIAA) annual Aviation and Aeronautics Forum and Exposition.

NASA's aeronautical innovators hope to validate the idea that distributing electric power across a number of motors integrated with an aircraft in this way will result in a five-time reduction in the energy required for a plane to cruise at 175 mph.

Several other benefits would result as well. "Maxwell" will be powered only by batteries, eliminating carbon emissions and demonstrating how demand would shrink for lead-based aviation fuel still

in use by general aviation.

Energy efficiency at cruise altitude using X-57 technology could benefit travellers by reducing flight times, fuel usage, as well as reducing overall operational costs for small aircraft by as much as 40 per cent. Typically, to get the best fuel efficiency, an aeroplane has to fly slower than it is able. Electric propulsion essentially eliminates the penalty for cruising at higher speeds.

Finally, as most drivers of hybrid electric cars know, electric motors are quieter than conventional engines. The X-57's electric propulsion technology is expected to significantly decrease aircraft noise, making it less annoying to the public. ■

WORDS Nick Wilcock IMAGES MORS

DEALING WITH AIRSPACE ISSUES

Despite everything, airspace infringements are not dropping. Nick Wilcock is here to explain how we can reduce them



Not again, I hear you cry! Well, yes – according to a NATS brief, airspace infringement statistics aren't improving.

People are still entering controlled airspace without clearance, causing huge disruption to other traffic and stress to the ATCOs trying to second-guess the intruder's intentions as it ambles uninvitedly across their screens. So here are some ideas to try to reduce the likelihood of *you* becoming another statistic.

PLANNING

Most people will probably agree that smart devices that display your route and current position are a wonderful thing. Yet even some people who use them – often sniffily dismissed by traditionalists as 'those magenta line crawlers' – are entering CAS without clearance. But why is this? Although you are legally permitted to fly within one molecule of the CAS boundary without speaking to ATC, it is much wiser to give yourself a safe margin for error. Few light aircraft can couple autopilots to a NAV mode, allowing the aircraft to follow the track with high precision, so it may only take a couple of moments for a distracted pilot to wander off

the planned track and into CAS unannounced. I suggest that you shouldn't normally plan to route past CAS within 3 nm of the boundary, unless you plan to request clearance to enter. That's a couple of minutes at 90KIAS in still air – plenty for you to be able to sort yourself out and regain track.

MAPS AND CHARTS

Although the electronic chart data overlaid on the background mapping used in smart devices is generally very good, do remember that the only real guarantee of airspace boundaries is the CAA aeronautical chart. If the electronic chart database designer has made an unfortunate error in stating the base level of an airway, for example, it'll be your problem if you infringe it. In flight you also need to be very careful if relying on a GPS height-based vertical profile display to show your cruising level proximity to the base of CAS. So even if you don't use the laminated CAA chart for any other purpose, just drawing your route on it and carefully checking airspace limits is definitely to be encouraged. Make sure the chart is in date!

FREQUENCY MONITORING

Otherwise known as 'listening squawks', these are established

"People are still entering controlled airspace without clearance, causing huge disruption to other traffic"

near major aerodromes and are of considerable help to ATCOs. All you have to do is to set the squawk and listen out on the associated frequency – you don't even need to check in. So, for example, if you're near Birmingham and are not in contact with any other agency, squawking 0010 means that you're monitoring 118.050, so if the controller sees you getting close to CAS, he/she can call up with something like: "Unknown aircraft approaching (wherever), you are approaching controlled airspace, please state your intentions". If you've got Mode C or Mode S, always use it – and if you think that you've entered CAS inadvertently, never be tempted to switch off the transponder thinking that you won't have been noticed and can quietly slip away. You will have been observed and tracked to destination by other means!

Lost? If you're really uncertain of position, do remember that squawking 0030 and going to 121.5 will alert our good friends at D&D, who are willing to help.

CLASS D VFR

Please remember that in the UK and elsewhere in Europe, you must not enter Class D airspace under VFR without positive clearance to do so. Merely checking in on frequency is insufficient, you must receive





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a clearance before entering. Remember that the controller has to make a calculated risk assessment before deciding whether or not to let you into CAS, so a mumbled "Err, Golf Alfa...err...err" from someone who can't even remember their own call-sign is less likely to achieve an entry clearance than a call from someone who knows what they're doing. If you can't recall the exact CAP413 phraseology, do what we used to advise in the RAF – just say 'who you are, where you are and what you want!' Anything else the ATCO can ask for after.

ALTIMETRY

Some years ago, the CAA proposed a Harmonised Transition Altitude plan, which also included fewer but larger altimeter setting regions, based on actual pressure values rather than the archaic Regional Pressure Setting. RPS is actually the weather guessers' most pessimistic forecast for an hour

or so ahead, minus a couple of millib... hectopascals. So if you fly on a nearby aerodrome's QNH, you are far more likely to be at the height you think you are than if you use RPS. Unfortunately the HTA plan is now on the back burner, but until the revised ASRs come into effect, it makes much more sense when flying near CAS to use an appropriate aerodrome QNH rather than RPS.

REGAINING TRACK

There are many navigation techniques taught to pilots during training. Some of these require difficult mental arithmetic and aim to provide you with the heading required to fly direct to your next turning point, rather than back to the original track. But if you were some way off your planned track, such a technique might cause you to cut the corner of the CAS you'd planned to avoid and also means that your pre-planned visual fixes are less

likely to be seen in degraded visual environments. Garmin systems can provide a 'CTS' value, which they describe as 'The recommended direction to steer in order to reduce course error or stay on course. Provides the most efficient heading to get back to the desired course and proceed along the flight plan.' Which is fine, but where will it actually take you? After a lot of research, I discovered that CTS aims you at a point mid-way between your next turning point and the point on your planned track directly opposite your current position. As the aircraft continues towards track, the CTS value will progressively change until the aircraft reaches the planned track, at which point CTS and DTK, the desired track angle, should have become equal. Moreover, as the GPS is doing all the computation, your ETA at the turning point will also have been continuously revised.

One technique which I strongly recommend is the 'Standard Closing Angle' technique – see boxout below.

INSTRUCTORS

Regrettably, 15% of infringements occur in aircraft which have instructors on board. In his article '*Sortie Management for Instructors*' (AO&P June 2016), Matt Lane, Head of Training for the Royal Air Force Flying Clubs' Association, provided useful tips to help reduce airspace busts. Training organisations should make it essential reading.

Modern smart navigation systems are excellent, but always have a plan in case your device fails in flight. It's probably being too clever for your own good with a smart navigation system which will get you lost in CAS quicker than anything else if you don't learn to use it prudently! So yes, it is another infringement article, but I hope it has helped. ■

HOW TO: STANDARD CLOSING ANGLE

IF YOU realise that you are a miles off track and wish to fly b miles back on to track, then you need to turn through an angle ϕ whose sine is equal to a/b . Now the 1 in 60 rule tells us that ϕ is more or less equal to $(a/b) \times 60$ and if you fly your distance b at v miles per minute for t minutes, then $\phi = (60/v) \times (a/t)$. If a and t are made numerically the same, that is you fly for the same number of minutes as your number of miles off track, then $a = t$ and a Standard Closing Angle ϕ of $(60/v)$ can be used where v is expressed in miles per minute. Hence the SCA at 360 kts is 10° , at 120 kts it is 30° and at 90 kts the SCA is 40° .

This method is really only completely accurate when TAS equals G. The error will be greater at lower speeds, but is quite acceptable as the SCA technique assists pilots in reducing cross track error to a point from which readily identifiable pre-planned visual fixes can be observed and overflown. Similarly, timing errors will be introduced with a large SCA as the aircraft's along track velocity is $v \cos \phi$ rather than v . This can be overcome

either by reducing the SCA and increasing the correction time correspondingly, or by making an appropriate timing correction. In practice it is better to return to track as soon as possible, but only if a simple method for correcting the timing error can also be achieved.

Considering an aircraft with a 90 kt cruising speed, things now become quite simple. The SCA is 40° and $\cos 40^\circ$ is 0.766 which is as near as makes no odds $3/4$, so what should have taken 3 minutes along the planned track will now take 4 minutes on a 40° SCA correction towards track, i.e. $1/3$ longer.

It is also necessary to examine why the aircraft was off-track in the first place. Having regained track, due correction can also be made for the change in drift which can best be deduced by reference to a drift line drawn on the map (if a paper map is being used). Because, if the pilot flew the aircraft accurately and yet discovered a track angle error of ψ° , then when back on track and with the DI re-aligned, the heading may be altered by the same angle ψ to correct for drift. In

the correct direction, of course!

Let's imagine that we've been accurately flying the first leg of our route at 90 kts on a heading of 040° when we notice that we are 4 miles left of track with some 7° of drift error as deduced from our single 10° fan line. The first correction is to turn right onto a heading of 080° and then to time for 4 minutes as we head back towards track. During this 4 minutes we can first reassess that it really was a 4 mile error and then jot down on the log that our ETA at the turning point will be $4/3$ of a minute later than previously calculated and that there'll be a 7° drift correction to apply when we're back on track. When our 4 minutes are up, we turn back onto our original heading plus our drift correction, i.e. on to 047° in this example and recheck that the DI is properly aligned with the magnetic compass. With any luck and assuming that the wind doesn't change yet again, our navigation should now continue pretty well on track and we should only need to note the passing of visual fix points to revise the ETA at the next turning point.

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DYNON AIMING HIGHER

Dynon sets its sights on the Certified market

Product SkyView HDX
Maker Dynon Avionics

Amongst home-built and LSA fanatics the name Dynon is synonymous with high quality avionics, but the brand is unfamiliar in the world of Certified GA aircraft.

However, at Oshkosh this year the company announced it is launching a certified line of integrated retrofit avionics systems for type-certificated GA aircraft. "For years, thousands of light-sport and amateur-built aircraft pilots have benefited from Dynon's intuitive, affordable, and safety-enhancing integrated avionics systems," said John Torode, founder and CEO of the Woodinville, Washington-based company. "We're ready to bring the Dynon approach to the rest of the GA fleet."

The Dynon Certified line features SkyView HDX, Dynon's flagship integrated

touch-screen avionics platform, providing primary flight display with synthetic vision and angle of attack, autopilot, engine monitor with all EGTs/CHTs, lean assist, and fuel computer. The line also includes a flight-planning mapping feature, ADS-B traffic and weather, an electronic flight bag, a Mode S transponder with 2020-compliant ADS-B "out," and more. The touch screen can also be operated with ergonomic knobs and buttons, offering positive, intuitive controls for all flight conditions. Additionally, the system is compatible with popular IFR navigators like the Avidyne IFD series and

the GTN/GNS series, and includes an independent backup EFIS.

Installations are expected to begin by year's end in the US. Dynon Certified products will be priced identically to the LSA/experimental versions, with STCs priced separately.

To date, Dynon avionics have been installed in more than 20,000 such aircraft, representing hundreds of platform types, according to the company. Dynon will continue developing and supporting products for its experimental aircraft customers, underscored by the four employee-owned experimental aircraft. ■

NEED TO KNOW

- Proven track record in the experimental market.
- Complete avionics packages at competitive prices.
- Small list of STCs so far.
- Maybe a long wait for your aircraft.

Where www.dynonavionics.com **Price** Various



COMM ONLY AIR BAND TRANSCIVER

Product FTA-450L
Maker Yeasu

Yesu has just launched a new air band handheld transceiver – the FTA-450L. The new model is a comm only version transceiver, providing 5W TX power output and has a Large 1.7in x 1.7in Full-Dot Matrix Display featuring the Easy-to-Operate icon driven menu system.

The 800mW internal audio speaker guarantees the call will not be missed. 8.33kHz narrow band compatible, and with a programmable 200 channels up to 15 alphanumeric characters, all channels can be easily stored and retrieved with just a few button presses.

The 450L comes with 110VAC and 12VDC chargers, headset adapter, USB programming cable, and a rechargeable battery.

The company has also launched the new SEP-11A as one of the optional accessories for all Yaesu FTA Series air band transceivers. The SEP-11A is a simple monaural earphone which can be connected to the transceiver directly.

Where www.yaesu.co.uk
Price £219.95 +VAT

EVERYTHING YOU NEED TO KNOW ABOUT THE M.52

Nick Wilcock discovers the story behind the secret M.52

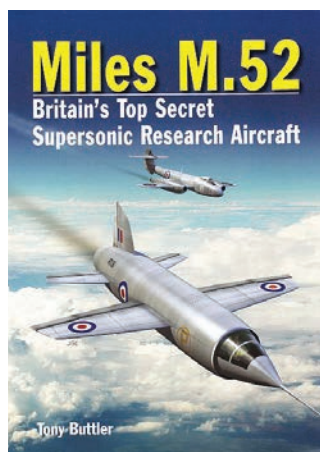
Book The Miles M.52

Author Tony Buttler

Many readers will already be familiar with the late Capt Eric 'Winkle' Brown's earlier book about the M.52, which was intended to be Britain's first supersonic aeroplane. But Tony Buttler's book provides even greater detail about the project. Conceived during World War Two, largely as the result of evidence gathered concerning Germany's development of jet and rocket powered aircraft including a proposed long range supersonic bomber, the Miles design was to have been a supersonic research aeroplane, intended to reach no less than 1000 mph at a time when contemporary fighters were nudging less than half that figure.

This book takes the reader through the entire M.52 story, although as with TSR-2 some 20 years later, the true story of the project's cancellation will probably never be known.

Technical details of the aeroplane are covered comprehensively, although much of the detailed description of the aircraft's aerodynamics is probably rather deep for the average PPL holder. For example, the effect of the transonic shift of the centre of pressure on longitudinal stability, the estimation of optimum climbing speeds by partial climbs and the assessment of the static margin are



mentioned without any real in-depth explanation.

Nevertheless, the difficulties facing Miles in estimating the aircraft's performance in the transonic region and the difference of opinion between the designer's and the Royal Aircraft Establishment's (RAE) estimations of transonic drag rise is well described. In the pre-computer age and with very limited access to supersonic wind tunnels, it is truly amazing that Miles was able to design this high-speed aircraft in such a relatively short period of time.

In addition to the aeroplane itself, the revolutionary augmented jet engine with its afterburning system (quite unlike any system

used in later years) – the testbed 'Gillette' Miles Falcon, fitted with the same bi-convex aerofoil wing as intended for the M.52, as well as the Vickers test model programme – are fully described. Much of the information in this book has never been made available previously and it makes for fascinating reading. It also dispels the long-held myth that the Americans somehow stole the M.52's all-moving tailplane design for the famous Bell X-1.

But if it hadn't been for the dilatory behaviour of the Supersonic Committee and the RAE, perhaps 'Winkle' Brown would have taken Britain into the supersonic age at the helm of the M.52, beating Chuck Yeager in the air-launched Bell X-1. That's one to discuss another time in the clubhouse.

I recommend that you read Tony Buttler's book and ponder at what might have been, were it not for the lack of enthusiasm and courage shown by politicians at the Ministry of Supply and the RAE.

Although you might perhaps find it useful to brush up on your principles of flight knowledge before you do so! ■

NEED TO KNOW

- ✦ Even greater detail about the project than in Eric 'Winkle' Brown's book.
- ✦ Takes the reader through the entire M.52 story.
- ✦ Some of the aerodynamic descriptions are rather in depth.

Where www.crecy.co.uk **Price** £24.95



THE MOST VERSATILE AIRCRAFT

Book JUNKERS Ju 88: The Luftwaffe's Most Versatile Aircraft, Blitzkrieg to Barbarossa

Author Chris Goss

Designed as a fast bomber that could out-run the fighters of the era, the twin-engine Junkers Ju 88 became one of the most versatile aircraft of the Second World War. Such was the success of the design that its production lines operated constantly from 1936 to 1945. In this selection of images collected over many years, and now part of Frontline's new *War in the Air* series, the operations of this famous aircraft are portrayed and brought to life by Chris Goss, a former RAF Wing Commander. Goss is a regular and highly sought after contributor to major aviation publications in the UK, France and Germany, as well the author of fourteen critically acclaimed books covering the air war between 1939 and 1945. Chris completed an MA with Merit in War Studies in 2001.

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1468h TT, 154h SMOH, 12h PROP, 180kts, 280hp TCM IO-550-G, speed brakes, full IFR panel with Garmin 530 and Sandel 3308 EFIS, KFC-150 flight director, KX-165, KN-62A DME, KR-87 ADF, KT-73 mode S transponder. Shadin fuel computer, Insight GEM-602 engine monitor and SF-2000 Strikefinder. Wingtip recognition lights and electric standby vacuum pump. Fresh annual August/16. VAT paid. Further details available from David Abrahamson, email david@cs.tcd.ie or telephone +353 1 896 1716.

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