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INNOVATION IN GENERAL AVIATION

Innovation is not a subject the average pilot thinks about, but without it inventions such as aircraft may have literally failed to get off the ground. Googling the word 'innovation' reveals a variety of definitions, but most results support that it is an action, starting from an idea or invention, of introducing new methods, or products that are fit for purpose and satisfy a market need. It is rare that 'innovation' appears in the title of an aeronautical conference, but on 15 March such an event entitled "Enabling Innovation in Aviation" is being held at the Royal Aeronautical Society under CAA auspices, and AOPA is participating. At the time of writing, the conference has yet to take place. However, this is an opportunity to mention AOPA's past and future contributions in the area.

AOPA's flight training products are well known, and derive originally from innovative ideas discussed by the AOPA Instructor Committee. These have included the IMC Rating, or IR(R) as it now is, the embryo NPPL, the Aerobatics Certificate and the Ground Instructor Certificate. It is generally recognised that the NPPL provided the basis for the EASA LAPL, and likewise the Aerobatics Certificate for the EASA Aerobatics Rating. The AOPA Wings Award Scheme came into existence in 2003 after some lateral thinking on how to make better and safer pilots. The committee, now known as the Training and Education Committee, has recently broadened its remit to include more general educational objectives.

Looking to the future, new technology provides exciting opportunities for innovation. For AOPA, the scene was set by the definition and completion of the EVA (Electronic Visibility via ADS-B) project under a NATS lead, funded by the Single European Sky ATM Research (SESAR) office, and described in the October 2016 issue of the magazine. This allowed the acquisition of know-how in the management of such projects and gave AOPA credibility in respect of EU funding and grants. It also provided a template for research by practical test and trial and error in flight. Closely following is the GAGA project, funded by the Global Navigation Satellite System Agency (GSA) in support of the European goal of more LPV (Localiser Performance with Vertical Guidance) approaches. Further projects have been established, as described briefly by Martin Robinson under AOPA Affairs in the February 2018 issue of the magazine. These are GAINS (General Aviation Infrastructure Navigation Surveillance) and GRIMASSE (General Aviation Rescue Capacity Improvement for the worldwide Adoption of a Safe Solution based on European GNSS), the overall objectives being defined by the unabbreviated titles. Both projects involve working with important strategic partners. Regarding the former, the February 2018 formal announcement from SESAR introduced the presentation with the words: "General Aviation is an important economic enabler in Europe and feeder to the airline industry." Welcome recognition indeed by this important airspace body of the role and place of GA. I hope you can continue to support AOPA in its work to ensure the future needs of General Aviation. ■



George Done
Chairman, AOPA UK
george@aopa.co.uk

AOPA UK

EDITOR

David Rawlings
david.rawlings@aopa.co.uk

ART EDITOR

Dan Payne
dan@aopa.co.uk

SUB EDITOR

Lucy Debenham

CONTRIBUTORS

Adam Winter, Nick Wilcock,
Pauline Vahey, Malcolm Bird
John Walker, Henry Simpson,
George Done

PUBLISHED BY

AOPA UK
50a Cambridge Street,
London, SW1V 4QQ
+44 (0)20 7834 5631

ADVERTISING & SUBSCRIPTIONS

AOPA UK
British Light Aviation Centre
50a Cambridge Street
London, SW1V 4QQ
+44 (0)20 7834 5631

HEAD OF ADVERTISING

David Impey
+44 (0)7742 605338

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EDITOR'S MOMENT

I recently attended a committee meeting at AOPA's London HQ and every issue under the sun that affects pilots was discussed. And it's easy to forget all the good work the faces behind AOPA do, and the efforts they go to to ensure you, the pilot, can keep flying.

You should be proud to be a member of AOPA. They are here for you when you need them, and strive to keep the skies safe, so that you aren't overrun by people trying to take away your right to fly.

In this issue Martin Robinson (page 7) goes into detail about the projects in which AOPA is involved, and in AOPA Working For You (page 10) there is even more insight into what happens behind the scenes. Even the Maintenance Working Group (page 16) has offered a reminder about the upcoming 8.33 and SDMP. So there's plenty of food for thought. The rest of the magazine is a celebration of flying, from air shows to fun two-seaters. There's something for everyone who has a PPL – or is even trying to obtain their licence. Enjoy!

David Rawlings

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



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AOPA'S CEO EXPLAINS CURRENT PROJECTS ON THE AGENDA

AOPA knows that the flying season is fast approaching and that you all want to get up in the sky.

The following projects showcase what AOPA has been doing over the last few months, and what we're currently involved in. Each of these projects aims to make our skies safer and ensure that we are in line with the thinking of not only the CAA, but also with EASA and Europe. Going forward, we still have lots of work to do.

PROJECT GAGA

We teamed up with Helios and applied for funds from the GSA in support of the European goal for more LPV approaches – Gloucester, Haverford West and Stapleford fall under the CAP 1122 process. This is a GSA (Global Navigation Satellite System Agency) funded project.

PROJECT GRIMASSE

General Aviation Rescue Capacity Improvement for the Worldwide Adoption of a Safe Solution based on European GNSS.

This project is developing the next generation of ELTs. Philip Church and I are working on this project which is led by Thales (France). So far only 'user needs' have been discussed, with a questionnaire being produced. Again we have teamed up with Pildo Labs.

The goals of the EU satellite navigation programmes (Galileo/ EGNOS) are to:

- Achieve technological independence from other satellite navigation systems
- Achieve European control over continuous availability of satnav services
- Facilitate the development of new products and services based on satellite signals
- Generate related technological benefits for R&D and innovation

I attended and presented at the GRIMASSE workshop and consortium meeting in Barcelona.

"These projects are research and development only and do not lead to any implementation or mandatory equipment fit"

PROJECT GAINS

General Aviation Improved Navigation and Surveillance –

The kick off meeting was held in Brussels with SESAR last month. This is an AOPA-led project managed by Helios.

The second meeting was held in February where 95% of the project was covered, and I am happy to say that SESAR is equally happy with the planned work.

The navigation work package is led by Julian Scarfe and the surveillance work by Bob Darby. Other consortium partners include Pildo Labs, Funke and Trig. In total there are six work packages to be completed by the end of 2019. We are also investigating how we can move forward with GAGA II.

These projects are R&D only and do not lead to any implementation or mandatory equipment fit. This should enable GA to move forward as technology improves. This is AOPA working for GA.

CAA MEETINGS

I met with Tony Rapson and his team to talk about GA and the future work of the GA Unit.

The GAU can only try and make sure that they do not have policies that create barriers of entry into GA for pilots and aircraft owners. I spoke about the general problems facing the industry and the need to modernise

the entire system of PPL training from updating how we train pilots, to updating cockpits in a way which is affordable. I found a lot of agreement with my views (I was not suggesting that the GAU could do anything about the problems), particularly with respect to affordability.

The mantra of *only regulate where we need* and *no gold plating* is still being quoted by the CAA. So I asked how they will meet the challenge of performance-based oversight given that EASA's view of regulation is that regulations are written in a way to achieve a safety outcome. Thus, if an entity is audited against the rules, and is found to be in compliance, then they will be deemed to be safe, as the rules are written with safety in mind. But the new basic regulation sets out the need for performance/risk-based regulations. It will be interesting to see how new regulations will be developed, as we could expect to see – along with the RIA – a risk analysis to support the proposal. EASA has five years to make sure that they are in compliance with the new basic regulation, but I doubt that the new regulation will require EASA to produce such statements. This will be something that the CAA will also need to address, because I think industry will, at each opportunity, ask for the risk assessment. AOPA sees the need to be proactive in these areas whilst also getting members involved.

This is an opportunity for you to influence some future technological developments. If you would like to comment on anything in this article, please email info@aopa.co.uk. ■



M Robinson

Martin Robinson

CEO, AOPA UK
martin@aopa.co.uk

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HELPING YOU STAY FLYING

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



WORKING FOR YOU

Latest on the EASA report



AIRFIELDS UPDATE

News from the UK's airfields



PPL CORNER

The magic of the whizz wheel



AOPA ADVICE

8.33 and SDMP reminders



WORDS Pauline Vahey IMAGES Alan Wilson

AOPA ENSURING THAT AVIATION IS IMPROVING FOR EVERYONE

The latest from the meetings within AOPA's Members Working Group and the Corporate Members Committee who aim to protect you, the pilot

The Members Working Group (MWG) and Corporate Members Committee (CMC) have regular meetings which AOPA members can attend so they can help influence our work, and that the businesses involved in GA are protected. In the latest MWG meeting, which took place on 27 January 2018 at AOPA's London HQ, the following subjects were discussed...

APPG GA UPDATE

Martin Robinson, AOPA CEO, participated in the Airspace and Taxation working groups of the APPG GA (All-Party Parliamentary Group on General Aviation). Pauline Vahey and John Walker participated in the Airfields working group which had had its inaugural meeting. John Gilder of the GAAC had been elected Chairman of the Airfields group. At the meeting, legal advisor to the APPG GA John Steel QC had been asked to compose a clarification of the brownfield site legislation in respect of airfields. Lord

Kirkhope had been elected Chairman of the Taxation working group.

Nick Wilcock drew the meeting's attention to page 18 of the National Infrastructure Commission report, *Drivers of Success*, concerning the Cambridge, Milton Keynes, Oxford corridor. Nick Wilcock had written to his local MP highlighting the lack of consideration of any air transport link. Wilcock encouraged others to do so.

A general discussion expressed concerns about asset stripping of airfields, including Bournemouth, Coventry, Exeter, Blackpool, Fareham and Norwich, all owned or operated by the Rigby Group. It was noted that Southampton had reduced its prices for GA to £36 and GA pilots could now self-handle.

Walker was supporting the owners of South Moor Park in keeping the airfield open.

WINGLY

There was a spirited discussion about the merits and perceived demerits of the Wingly platform. Flight

"A general discussion expressed concern about asset stripping of airfields"

Training Organisations (FTO), airfields and clubs perceived it as a threat to business and safety standards. However, both the CAA and insurance companies had approved the legality of it and were prepared to insure the pilots using it.

It was suggested that FTOs and the like need to consider, and publish and implement the standards that they required for the operation of flights using the Wingly platform using their aircraft, as Wingly had also done on their website. The aircraft owners should also be encouraged to follow the same Standard Operating Procedures (SOPs).

EASA REPORT

Nick Wilcock took questions on his previously circulated report. Some successes were highlighted: flight time credit on Annex 2 aircraft (such as microlights, kit-built, gyroplanes and ex-military aircraft amongst others) could now contribute to hours required for an EASA licence. However, there was still no credit for Microlight time when

DATES FOR YOUR DIARY

Here are the list of upcoming 2018 dates for the Members Working Group and Corporate Members Committee.

MEMBERS WORKING GROUP: ALL SATURDAYS

April 7th	White Waltham
June 2nd	TBA - a Flyin to a Corporate Member
September 29th	White Waltham
November 24th	TBA

CORPORATE MEMBERS COMMITTEE: ALL WEDNESDAYS

28th March	50a Cambridge St.
27th June	White Waltham
19th September	White Waltham
28th November	50a Cambridge St.



Flight time credit on Annex 2 aircraft, such as Vans, can now contribute to hours required for an EASA Licence

going for a LAPL.

There had also been some recent unintended consequences of the now more complicated rules on medicals.

It was also noted that FTOs were not promoting LAPL training. There were now 4500 self-declaration medicals in the UK. AOPA was always for a risk-based and proportionate approach, and asked in what percentage of accidents in the UK had medical issues been a factor let alone a significant factor. The biggest risk was seen as mental health particularly when it came to the unintentional involvement of third parties.

MAINTENANCE GROUP

AOPA Chairman George Done reported that the self-declared maintenance programme was being taken up by the Maintenance Working group.

Lasham Gliding Society had the funding to go to judicial review on the Brize Norton and Farnborough airspace changes. A near miss involving an A330 and a paraglider had been

reported at Brize Norton.

The CAA was holding its GA awards ceremony at the House of Commons on 6 February.

The Maintenance Working group has also issued a reminder about 8.33 radios and SDMP, both of which can be found on page 16.

AOPA CEO'S UPDATE

As noted, Martin Robinson is working with the Airspace Working Group of the APPG GA. MR with the support of the head of NATS has put forward a vision for one class of airspace, as unpicking the current situation, which was mostly European regulation, would be nigh impossible.

This would lead to no infringements and greater access for all, including the integration of drones. New technology would enable integration not segregation. This would be put to FASVIG. Currently all airspace above FL195 is Class C.

On the Taxation working group Martin Robinson noted that the £15m raised in Avgas

Duty should be reinvested in the aviation infrastructure in line with taxation on vehicle fuel duty.

Issues had been posed by FASVIG on the implementation of GNSS approaches at GA airfields centred around the safety case. Otherwise the specific projects that AOPA was involved in were going very well. Robinson asked all to support the consultations for Haverford West and Stapleford. AOPA had succeeded in obtaining European funding for three projects and was now being encouraged to apply for further funding for five more.

There followed a general discussion around PINS procedures and GBASE.

A further discussion on FASVIG followed regarding its funding, future, communication and co-operation with those affected by its work.

Project GAINS had obtained funding of 1.4 million Euros. AOPA was partnering with Helios for delivery.

AOPA are involved in another

European funded project, with a 120,000 Euro budget, to consider the next generation of ELTs (not PLBs) and was 100% funded.

AOPA had written to the CAA regarding the general unease concerning the nature of the publicly-available information on G-INFO.

Whilst the CAA had originally responded that the ANO superseded other laws, the CAA lawyers were now taking a closer look.

The current rising statistic for infringements and Airproxes is being challenged since the number of hours flown is going down. The claim that 30% of infringements are risk-bearing is also being challenged. Cases of momentary loss of transponder signal as codes were being changed are being reported as illegal infringements. An over-reliance on automatic data was being blamed.

A meeting with the new Aviation Minister Baroness Sugg had been arranged for 28th February 2018. ■

SHUTTLEWORTH



Visiting Shuttleworth by aircraft is easy! Located in Bedfordshire, we have a grass airfield, an on-site restaurant, no landing fees, and pay-as-you-go fuel pumps. Fly-ins welcome. Visit The Collection of airworthy vintage aircraft from 1909-1950, and adjacent Swiss Garden with 13 listed structures (admission payable). Flying events run May-October, and camping is available. PPR required, read our airfield information at:

www.shuttleworth.org/airfield-info

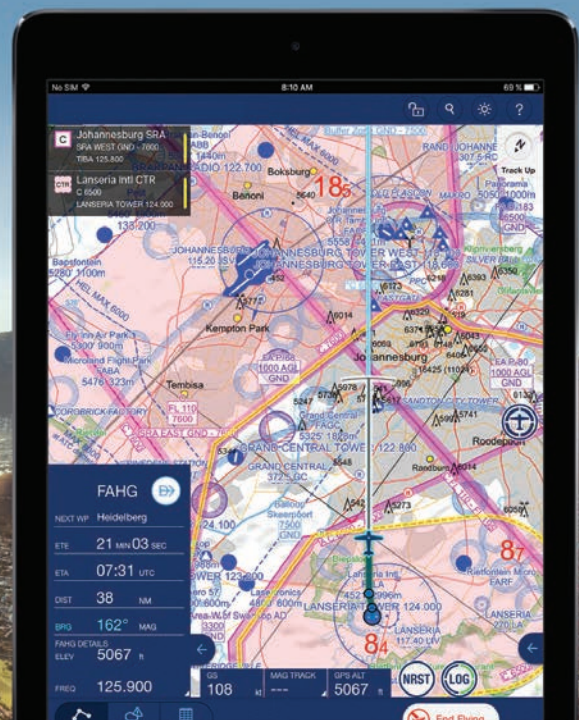
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WORDS John Walker IMAGES Andy Mabbett

LATEST NEWS ON OUR UK AIRFIELDS

John Walker offers the latest news and developments at the UK's aerodromes

There are airfields across the UK currently under threat of closure. Here are the latest developments, updated 23 February 2018.

BLACKPOOL

Balfour-Beatty sold their 95% interest in the airport and associated land to Blackpool Council (who held the remaining 5% interest) for £4.25 million with funds for the purchase coming from the sale of airport land for industrial purposes. A masterplan for both the adjoining Enterprise Zone and airport has been adopted ensuring continued airport operations until at least 2040!

CHALGROVE

Airfield occupied and operated by Martin-Baker Aircraft (MBA) has been transferred from the MoD to Homes England (previously

the Homes and Communities Agency). Site included in South Oxfordshire District definitive Local Plan public consultation document for a 3,000 home development with a new runway for MBA operations. Consultation ended on 30 November 2017. Media reports that Homes England will use their CPO powers if current negotiations with MBA, who wish to expand their on-site operations, are unsuccessful.

DUNSFOLD

Planning application for mixed-use development with 1,800 homes on site approved by Waverley Borough Council on 14 December 2016. Local Parish Council representations caused the application to be called in for a public inquiry and the Planning Inspector's report was submitted to central government on 12

"The former RAF Hullavington airfield has been sold to Dyson Ltd, who has planning permission to renovate two existing Type D hangars"

October 2017, with a decision now expected on or before 15 March 2018.

HULLAVINGTON

The former RAF Hullavington airfield site has been sold to Dyson Ltd, who has planning permission to renovate two existing Type D hangars as research centres. An outline planning application for a site masterplan is expected later in 2018.

PLYMOUTH

FlyPlymouth, a local social enterprise aerodrome support group, plans to reopen the aerodrome and start regional airline services. Sutton Harbour Holdings, the site lease holder, have proposed a mixed-use development, although the definitive Plymouth City / South-West Devon Joint Local Plan retains the site for aviation. The definitive Local Plan was submitted on 31 July 2017 for public examination with specific hearings on the airport held in early February 2018.

WYCOMBE AIR PARK

Site lease holder (Helicopter Aircraft Holdings Ltd) has agreed new leases with the land owner, Wycombe District Council (WDC). Draft Local Plan provides for an industrial / warehousing complex on south-eastern part of the site resulting in loss of a runway and relocation of gliding activities. The draft plan has been issued for public consultation which ended on 27 November 2017 and the council expect to submit the definitive plan for public examination in March 2018. ■



A planning application on Dunsfold aerodrome for 1,800 homes has been approved

WORDS Adam Winter

THE IMPORTANCE OF WEIGHT OF FUEL AND SPECIFIC GRAVITY

Calculating how much fuel weighs can seem a bit confusing, and certainly lethal if done incorrectly. In this article Adam Winter shows how to make a rough calculation so that if you need to calculate the actual weight, you'll have a rough idea to begin with.

There is a very simple reason that we have to calculate the weight of fuel precisely instead of just taking an average figure per gallon or litre, and that is because the volume of fuel changes significantly depending on its temperature.

If you fill a tank to the brim on a cool evening and the next morning the temperature rises as the sun beats down on the wing, the fuel will start to spill out of the vent. This is because the density of the fuel is greater when it is cold than hot, and fuel expands in the heat. The density of water also changes with temperature but the amount is negligible, however it is at its densest at 4°C.

When we talk about the specific gravity of fuel (or specific density), we are comparing it to a sample of water at 4°C. Water weighs 1 kilogram per decimetre (which is 10cm x 10cm x 10cm/or 1 litre at 4°C).

If we take a litre of fuel and it has a 'specific gravity' of 0.8, that means it will weigh 80% of the weight of water, so 0.8kg.

Calculating the weight of fuel in litres to kilograms is simple. In my head, if I added 78 litres of fuel to the tank, if it was water it would be 78 kilograms, and as it is fuel (hopefully not water!)

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.

we can multiply it by the specific gravity (in the UK in winter try using 0.8 and in the summer 0.75 as safe numbers – it is in fact 0.71 at 15°C). $78\text{kg} \times 0.8 = 62.4\text{kg}$. UK gallons to pounds also has a similar hack to work out the weight, because 1 (UK!) imperial gallon of water weighs 10 pounds. So add 45 gallons and the weight is $45 \text{ UK gals} \times 10 \text{ (if it was water)} \times 0.8 \text{ (as it is fuel)} = 360\text{lbs}$.

Be extra careful when using gallons because you fill up in the UK using one definition of the gallon and your aircraft manual – depending on where it was built – is probably quoting US gallons.

To do this on the whizz wheel I align number 45 under Imperial Gallons, then look where it says SP.G (lbs not KGS) under 80. The number is 36, and we know to add the zero because a gallon of water is 10lbs.

Converting between kilograms and pounds of fuel using your whizz wheel is straight forward as long as you know where to put the decimal point. As a rough guide for mental calculation, there are two pounds in a kilogram. So 120 kilograms will be roughly about 240 pounds, then a look at the whizz wheel shows us it is in fact just over 264 pounds, so we should call it 265 pounds.

The reason for the rough

calculation first is because the answer could have been 26lbs or 2650lbs and so on.

Finally, basic conversions of pounds to kilograms on the whizz wheel can be done but the units are not labelled (I think they are not labelled so that we don't calculate the weight of fuel as that of water by mistake).

If you look at the line showing specific gravity in kgs on the whizz wheel, you can see that if the specific gravity continued past 90, the 100% mark is where KM-M-LTR are positioned.

Similarly with pounds, if you go to 100% we have the Imperial Gallon. Place 10 under KM-M-LTR and under IMP.GAL you can read 22. This means that 10kgs is 22lbs.

Finally in this age of limitless information available on the internet, and complex calculations done by computers, you might see the flight computer as a redundant tool. What I like about it is that it forces you to understand the calculation you are making and to think about the answer before you start. It makes you think logically! ■

If you have any questions regarding any issues with flying, Adam is available to advise. Simply email: adam.winter@aopa.co.uk



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

MAY/JUNE 2018

AIR LAW	MAY 6
OPERATIONS AND PROCEDURES	MAY 6
HUMAN PERFORMANCE AND LIMITATIONS	JUN 17

AIRCRAFT GENERAL KNOWLEDGE	JUN 10
PRINCIPLES OF FLIGHT	JUN 3

NAVIGATION	MAY 13
METEOROLOGY	MAY 27

PERFORMANCE & PLANNING	MAY 20
COMMUNICATIONS	JUN 17

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



AOPA FLYING INSTRUCTOR REFRESHER SEMINARS



For revalidation of an FI certificate, the holder shall fulfil two of the following three requirements:

- 1 At least 50 hours of flight instruction during certificate validity as FI, TRI, CTI, IRI, MI or Examiner;**
- 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 next two dates for the seminars are **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.**

WORDS Malcolm Bird IMAGES Courtesy of Trig Avionics

UPDATES AND REMINDERS FOR 8.33 AND SDMP - MAKE SURE YOU'RE READY

A gentle reminder about the upcoming changes you need to be ready for

There's a problem in this modern, constant-communication age. We're bombarded with information all day everyday, so important information can be lost and forgotten about. Nobody at AOPA wants you to be grounded for an oversight, so with 8.33 and SDMP on their way, we thought we would give you the latest updates on what you need to be compliant. So the AOPA Maintenance Working Group, who have a whole plethora of members across the world of GA, have offered this easy-to-see-and-read update. Here you go:

8.33 READY?

- The change to 8.33 channels is underway – do not get caught out!
- Ground stations are changing to their new channels as their licences are renewed.
- Some ground stations will be accessed on 25kHz spacing frequencies. Others on 8.33 channel IDs.

Before each flight:

- Check AIP supplement: TRANSITION OF FREQUENCY ASSIGNMENTS TO 8.33 to see if any ground stations you plan to/ may need to speak to, are on new codes. Search: NATS UK Supplement index and identify latest update (S 009/2018 at

"Check that your radio is set for 8.33 and that frequencies and channel identifiers can be accessed"

time of writing).

- Check that your radio is set for 8.33 spacing and that frequencies and channel identifiers can be accessed. The ICOM IC-A220 can operate only in either 8.33 or 25kHz spacing mode. If you own one, make sure you know how to switch between modes. (Identifiers stored in a database can be in either format.) For further information see our article in AOPA Magazine (December 2017, P16): *Your new 8.33 radio*. And check out the CAA guidance – visit www.caa.co.uk and search for '8.33kHz radios'.

SDMP READY?

- All privately operated ELA1 aircraft should have had their Self Declared Maintenance Programme in place since September 2017. Have you?
- For aircraft that do not have SDMP in place by 31st May 2018 their CoFA (or EASA Permit) will become invalid. You may be grounded!

For further information see our article in AOPA Magazine (August 2017, P16): *Take an interest in your maintenance*. And check out CAA guidance, by visiting www.caa.co.uk and search for 'Self Declared Maintenance Programme'.

If you're still feeling lost, there is lots of information on both AOPA's and the CAA's websites where you can find all the help you need and can check you're compliant. ■



The change to 8.33 radios is underway, so don't get caught out

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AOPA NEWS

General Aviation news from around the world

The new
Ranger, from
the people
that brought
you Dynon



DYNON GO INTO THE AIRCRAFT MARKET

After years of working in the avionics sector, the American company has announced Vashon Aircraft and its first aeroplane – the Ranger

by **David Rawlings**

Dr. John Torode, the man behind Dynon Avionics, has been working on the Ranger aircraft, and believes it will be suitable for just about anyone.

In a statement the company said: "The Vashon Ranger R7 is the first aircraft designed to fill the gap between aging, under-equipped certificated aircraft and newer but expensive Light Sport Aircraft. The Ranger is a two-seat aircraft that features rugged, full metal construction to take real world usage like flight training. It has one of the most

spacious cockpits in its class, and is Always Fully Equipped. Even the base model, priced at \$99,500, includes a complete Dynon-equipped panel, two-axis autopilot, 2020-compliant ADS-B Out, and more."

The base model is fitted with a full Dynon glass panel avionics suite, including Autopilot, with features such as primary flight instruments, engine monitoring, 2020-compliant ADS-B Out, Mode S transponder, navigation and mapping, ADS-B traffic and weather, COM radio, two-place stereo intercom, angle of attack, Wi-

Fi, and so much more.

The Ranger's electrical system is managed by the Advanced Control Module, featuring EFIS-controlled electronic circuit breakers, from Dynon's Advanced Flight Systems division. Other standard equipment includes electric flaps and trim, full-size 600-6 tyres, and LED position and landing lights.

The Ranger is powered by the trusted Continental O-200-D, and provides over 70 years of world-tested reliability, with readily available parts and service support. This engine was

specifically designed to be lightweight at 199 pounds, dry weight. The O-200-D produces 100 HP as a result of higher maximum rpm.

It boasts a 46" wide cabin which the company claim would be perfect for schools.

"I started Dynon to bring affordable, advanced technology to the aviation community," said Torode. "There remains a need to innovate beyond the panel to bring affordable flight to more people. With Vashon, I hope to empower the next generation of pilots with the tools they need to take to the skies." ■

GAMA SAY PISTON IS UP AGAIN

by **Lucy Field**

GAMA recently released the 2017 year-end aircraft shipment and billings numbers, and piston aircraft sales are up 6.5%.

GAMA Chairman Phil Straub said that shipments globally increased 2.5% from 2,268 units in 2016 to 2,324 units in 2017, from the same reporting companies. Conversely, aeroplane billings declined 4.2%, from \$21.1

billion to \$20.2 billion.

Notable from these numbers is that the rotorcraft segment stabilised after several years of decline. Piston rotorcraft experienced the largest increase of all segments, with a 17.9% increase. Preliminary turbine rotorcraft data also indicates an increase of 3.9%, to 662 aircraft delivered.

Business jet airplane deliveries grew slightly, by 1.3%, rising from 667 to 676

units. Driving this growth are several new aircraft models that entered into service in 2017. Turboprop deliveries slowed to 563 aeroplanes, compared to 582 deliveries in 2016; a 3.3% decline, while piston aeroplane shipments strengthened by 6.5%, to 1,085 units.

"The 2017 year-end results were encouraging, especially with the delivery growth we saw in the business jet, piston airplane and rotorcraft segments," said GAMA President and CEO Pete Bunce. "Looking ahead, we're optimistic given some very positive economic indicators, stabilisation in the used business aircraft market, new manufacturing techniques spurred by additive manufacturing, and innovative aerospace technologies driving urban air mobility platforms, electric and hybrid propulsion, unmanned aerial vehicles and commercial space." ■



Piston aircraft sales are up more than 6% over 2016

DUXFORD HONOUR RAF'S 100 IN THEIR AIR SHOW SEASON

by **Robert Care**

Duxford has announced its 2018 season dates, which include a commemoration of the RAF Centenary.

Over the spring and summer months Duxford is hosting several events which will include tributes to the RAF's 100th birthday.

The events are, the Duxford Air Festival, 26-27 May, Flying Legends Air Show, 14-15 July, Battle of Britain Air Show, over 22-23 September, which celebrates Duxford's finest hour as an important WWII fighter station during the Battle of Britain in 1940.

"The roar of Spitfires and Hurricanes over Duxford's

historic airfield make this a hugely engaging historic experience and a great British day out for 2018. The Duxford Battle of Britain Air Show is an official partner of

RAF 100, commemorating the centenary of the formation of the Royal Air Force," said the organisers. Tickets must be bought in advance. www.iwm.org.uk ■



Duxford is famed for its amazing air shows during the year

**LOOK BACK...
THIS MONTH
106 YEARS AGO**



THE WORLD'S FIRST CLOSED COCKPIT AIRCRAFT FLEW

The Avro Type F was an early single seat British aircraft from Avro, of which only one was ever built. On 1 May 1912 the Type F became the first aircraft in the world to fly with a completely enclosed cabin for the pilot as an integral part of the design.

It was a wire-braced mid-wing monoplane with a tailskid undercarriage. The fuselage was teardrop-shaped with flat sides and cello windows. Oil leakage from the engine had been anticipated to obscure pilot view by coating cabin windows; so two circular windows at the pilot's head level could be opened for the pilot's head to protrude when flying, but their use proved unnecessary. Ingress and egress was via a sheet-aluminium trapdoor in the fuselage top. The cabin was quite cramped, being only 2ft (60cm) across at its widest point.

The Type F made a few test flights in mid-1912 until damaged beyond repair in a hard landing on 13 September, after which it was not repaired. Its Viale 35hp engine is on display at the Science Museum in London, and the rudder was preserved by the Royal Aero Club.

**AOPA NEWS
HIGHLIGHTS****NEW FLYING VAN**

Terrafugia, the flying car company set up by a group of MIT students, has just announced that it plans to build a new machine that can haul a flying pod that will carry either passengers or cargo. The new TF-2 flying minivan concept was unveiled at Heli-Expo and is aimed at short haul operators. With a detachable pod configuration, your passengers or cargo will be able to travel seamlessly from point A to point B.

INDIA FEMALE FRIENDLY

India has the most female pilots per capita with 12% of Indian airline pilots being women. Finland also boasts similar figures, but the rest of the world is failing to keep up. Looking at the figures, the worldwide average is just 5%. India's airline industry is relatively new, but were quick off the mark when it comes to hiring women. The first female FO started working in 1984.

SHUTTLEWORTH DATES

Shuttleworth's Season Premiere this year (on 6 May) will be part of the RAF 100 celebrations, marking the Centenary of the RAF throughout 2018. Organisers say to expect a thrilling air display, and ground activities with a STEM focus that will be engaging for the next generation of innovators, and provide plenty of entertainment for the whole family. The collection's own aircraft span 1909 to 1950, and its newly restored Spitfire is the subject of many chats.



The new M600
decked out in Team
Chambliss colours

AIR RACER RECEIVES CUSTOM M600 FROM PIPER

Kirby Chambliss of the Red Bull Air Race will fly a custom M600, after upgrading from a Meridian

by **David Rawlings**

Kirby Chambliss, the Red Bull Air Race pilot who currently holds third place in the World Championship, as well as performing in air shows around the globe, will be using his brand new Piper M600 aircraft to ferry him and his team around the US and Mexico as part of a hectic air show schedule.

Chambliss first purchased a Meridian in 2010 to support Team Chambliss' travel needs. Between moving team personnel and spare parts to events, Chambliss averages 200 hours of flight time in the support aircraft each year. "The Meridian has served our team great over the past seven years, but the advances in the M600 will suit our team even better. It's a much more capable aircraft," he said.

The Piper M600 features a new, clean sheet design wing and a sophisticated Garmin G3000 touchscreen-controlled glass flight deck (featured in AOPA UK magazine in August 2017).

The team's new aircraft displays a customised paint scheme made to resemble Chambliss' air show Edge 540. The cream and black interior

features Team Chambliss branding throughout, including the executive conference table and seat backs.

A final touch showcases a registration number fit for both the M600 and Chambliss – N600KC.

"Over the years, I've been fortunate to build a relationship with those at Piper. I can't express how excited our team is to announce the partnership with the company. They've gone above and beyond in customising the aircraft's appearance for us. The M600 is going to take care of our team's transportation needs for many years to come," stated Chambliss.

The aircraft will be on display at Sun 'N Fun April 11-13, in Lakeland, FL., and at EAA AirVenture July 25-27, in Oshkosh, WI. ■



The leather interior has
bespoke embroidery

LET'S BUILD ON THE POSITIVE PARTNERSHIP MODEL, SAYS BRENNAN

by **Robert Care**

On 1 January, Eamonn Brennan was appointed as Director General of EUROCONTROL. In a recent article, he explained where he is focusing his energy right now and in the coming months, and how partnerships and collaboration, like those exemplified in SESAR, can help address challenges facing air traffic management in Europe.

"When I arrived in the Agency, I was able to see first-hand the value that Eurocontrol can bring to all the different areas of ATM with both its operational excellence and tremendous technical expertise. However I can also see Eurocontrol will only be able to deliver a maximum contribution to

European ATM when a true and efficient partnership is in place with all our ATM stakeholders and when Eurocontrol's role is fully embedded in their strategy. From that perspective, the SESAR JU framework is clearly a role model, with Eurocontrol contribution being negotiated and agreed with all key players. I would like to see that level of cooperation in place with all our stakeholders," said Brennan.

Brennan was also asked about the main challenges facing air traffic management? "Traffic growth has taken off again in Europe, however productivity and lower costs are also critical and we still need to promote new ATM architecture and new business models to meet our objectives. Most



Brennan is keen to build on the positives

of the promising solutions delivered by SESAR are yet to be implemented in the real operational world. I believe a special effort needs to be made to accelerate the deployment of SESAR, with a particular focus on projects that promote defragmentation and interoperability, including its

civil-military dimension.

"New challenges are also arising with the proliferation in the use of drones. Security and more particularly cyber security are also topical issues that require new ways of exchanging data and developing architecture.

These challenges require stakeholders and experts come together to develop and then implement solutions at a speed which is unfamiliar in the aviation world. A framework like the SESAR JU has proven that it can bring together all the different parties around shared objectives. Discussions have already started on the future "post 2020 European ATM institutional framework". I want us to learn from the positive experience of the SESAR JU and build on it," he concluded ■

DAM BUSTERS TO CELEBRATE 75 YEARS AT ALBERT HALL

by **Lucy Field**

On 17 May 2018, 75 years to the day of the famous 'Operation Chastise (better known as the Dam Busters Raid), the Royal Albert Hall in London is hosting 'The Dam Busters with Dan Snow'

to commemorate the raid.

Broadcaster and historian Snow will reflect on the work of the mastermind behind the operation, Sir Barnes Wallis, whose 'bouncing bomb' was carried by 19 Lancasters for the attack on the dams of Germany's Ruhr valley. The

event will also pay tribute to Wing Commander Guy Gibson and his comrades of 617 Squadron, 53 of whom died in the raid.

The event will see families of crew members remember the raid's legacy, while a large screen will show never-before-seen images of the Dam Busters, as well as unreleased memoirs from the film's director, Michael Anderson.

An on-stage 'bouncing bomb' experiment will show how Wallis realised his invention, and music from the Glenn Miller Orchestra will transport audiences back in time while honouring those who perished on both sides of the war. Tickets: www.thedambusters75.co.uk ■

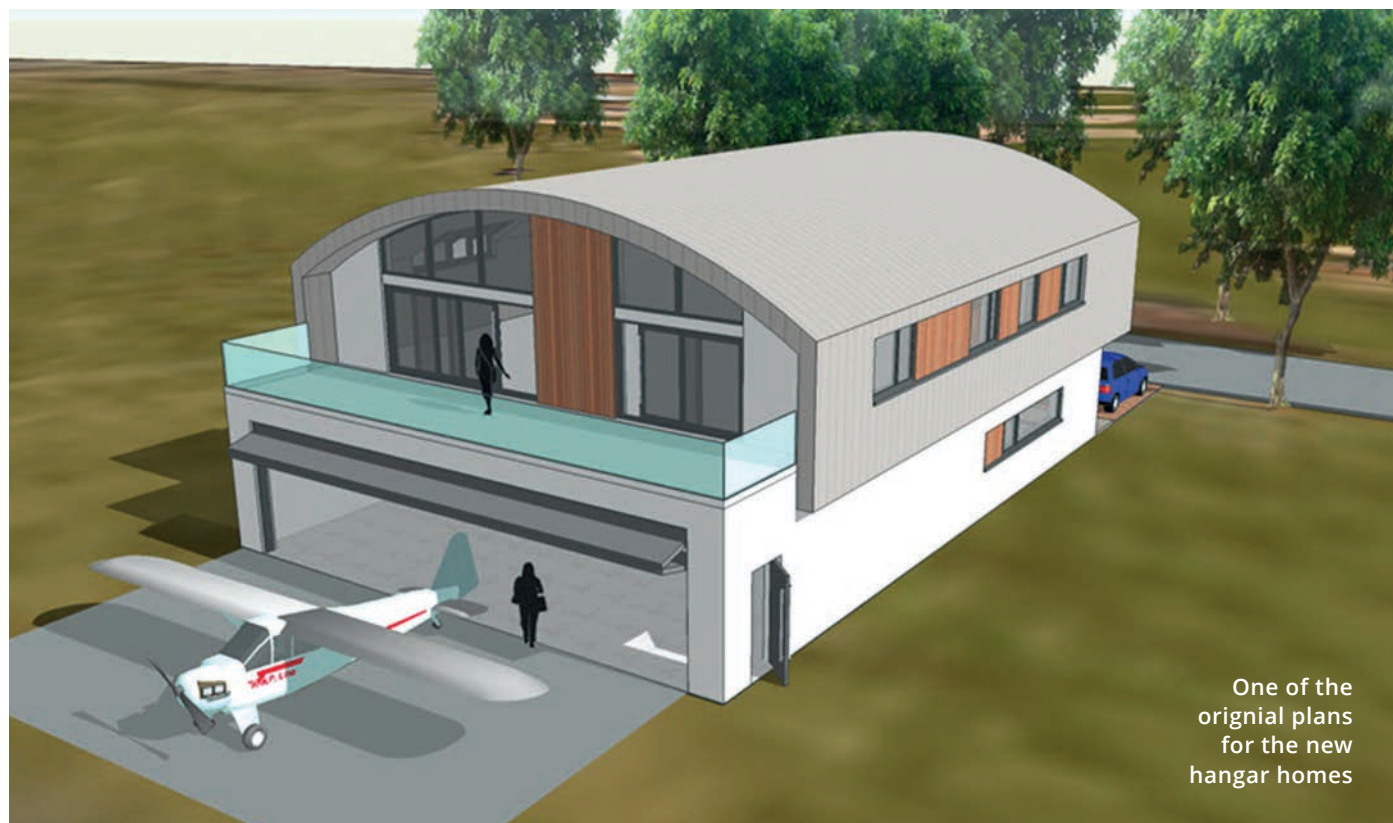


A still from the 1955 classic film

SELF MEDICAL

by **Robert Care**

At the recent CAA's General Aviation Partnership meeting, it was announced that the self-declaration of medical fitness using the Pilot Medical Declaration would be extended to EASA licences for flights within the UK. This is on a temporary basis for 12 months from 8 April 2018. This will be welcomed by the many pilots who currently fly EASA aircraft on an NPPL, or a UK PPL with the self-declared medical, who would otherwise have had to continue their flying on Annex II aircraft and/or sell their EASA aircraft. It is however necessary to hold an EASA licence to fly an EASA aircraft as from 8 April 2018. ■



One of the original plans for the new hangar homes

HANGAR HOMES AT SOLENT A STEP CLOSER

Local council vote in favour of granting planning permission for 'live/work' hangar homes at Solent Airport

by **Lucy Field**

Everyone would love to live at an airfield above their aeroplane and it might soon be possible at Solent.

At the recent planning meeting Gosport Councillors voted eight to six to grant planning permission for the

five 'live/work' hangar homes on Solent (Daedalus) Airport – the first time at any UK airfield. The focus now turns to Fareham Borough Council (FBC), who owns the airport, to allow them to be built.

Hopefully FBC will respect the will of 90% of the local residents and 100%

of the business and flying community, who voiced their support for these hangar homes on the airfield. Also, the proposed site is unsuitable for conventional homes or business units, so the 'live/work' hangar homes will provide both uses and will be aimed at aviation-related businesses that will bring jobs and investment to the area. In addition, the hangar homes will help safeguard the airfield for flying operations and make it more sustainable as each unit would contribute financially to the airfield operation for a landing card and a charge for airside access.

FBC could refuse on the grounds that they want to use the proposed site for a 'Heritage Hangar', but they

could build on the space allocated for it alongside the hangar homes.

If allowed, one of the units will be used by Hangar Homes Ltd where the first Velocity kit aircraft will be built in the UK by the engineering students from CEMAST, also based on the airfield, with the prospect of more in the future, otherwise it will be built at Newtownards Airfield by their technical college.

Solent Airport could have the kudos of being the first GA airfield in the UK with hangar homes, which will help to establish them elsewhere in the UK and benefit GA generally. If you want that to happen, please email Sean Woodward, the leader of FBC, on: swoodward@fareham.gov.uk. ■



Five homes have been planned for the site.

BOMBER COUNTY GATEWAY TRUST

by **Henry K. Simpson**

Plans have been announced by the Bomber County Gateway Trust to construct a full scale Lancaster bomber mounted on a plinth close to the A46. The structure is proposed to act as a monument to the over 55,000 members of bomber command who were killed during the Second World War as well as to provide an iconic symbol to welcome people to "Bomber County".

The structure will represent Lancaster R5698 which crashed close to the proposed

site in 1942, claiming the life of crew member Sgt J R Gibbons.

Land has been promised to the trust by a local farmer and the chosen site is close to the former RAF base Swinderby.

Ken Sadler from the trust said that they had "not expected the public to be so overwhelmingly in favour of the project," and that fundraising would commence once planning permission for the structure has been granted. Presently they are seeking a structural engineer and will be looking for more public support soon. ■

TOPNAV 2018

by **George Done**

AOPA supports the visual navigation competition TopNav organised by the General Aviation Navigation Group (GANG) of the Royal Institute of Navigation (RIN), both financially to a small extent and by providing one of the awards. This year's TopNav is being held on 12 May, with a weather reserve of 19 May. The competition takes place simultaneously at four venues, Peterborough Conington, Lee-on-Solent, Bodmin and White Waltham to serve entrants from various parts of the country. It is for a two-person crew - pilot and navigator.

Marks are awarded for timing and accuracy of tracking and finding the waypoints, usually about 8 in number. You will be asked to take photographs to show you really did find the waypoints. Additionally, you'll carry a GPS tracker which can be downloaded later to show the actual route flown, but you need to leave your own GPS on the ground - the competition is all about

navigating your way around the country by forward planning using map-reading and timekeeping skills alone. Aircraft categories are aeroplane, helicopter, microlight and SLMG. There are also separate categories for youth and military entries, and separate routes for slower aircraft. The entry fee of £30 for a two-person crew covers refreshments for the day, including lunch, and you do not need to pay a landing fee. Winners will be invited to the RIN Annual Meeting and Reception to receive their prizes.

It's a lot of fun, and makes a change from the £100 hamburger day out. For several years there has been an AOPA entry in the form of Martin Robinson and George Done - they have even managed to win an award on occasion. The track illustrated is from the 2013 competition flown in a Piper Cub and it shows just what you can do with an aircraft slow enough to see where you're going over the nose. Have a go! Entry details can be found on the RIN website. ■



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WORDS Henry K Simpson **IMAGES** Jim Russell and Bob Savoury

WHEN THE SWEDES COME TO TOWN...

Due to current regulations, foreign jet display teams are unable to display in the UK. Henry Simpson went to the Jersey Air Show and met with the Swedish Air Force Historic Flight team to learn more about the pilots and their aircraft



HENRY K SIMPSON AOPA EMPLOYEE STARTED FLYING AT 13 STUDYING AT KEELE



I arrived in Jersey Airport praying for clear and bright weather, but the clouds wrapped close around the airport, and me, as I left the terminal headed for the Social Club. I was there to meet a very interesting and exotic display team – at least to UK mainland air show goers – and a very special group of pilots, who unfortunately don't tend to visit the mainland UK anymore.

Once out of the grey skies and in the warmth of social club I met with Mike Higgins, the organiser of the Jersey Air Show, who introduced me to Stellan Andersson – the man I was there to meet.

Stellan occupies a rather interesting position; he is the head of flight operations and Saab Viggen display pilot for the Swedish Air Force Historic Flight, an organisation that operates a range of historic types, of most note, several afterburning Saab fighter jets,

all of which are operated under civilian registrations.

Stellan has spent 20 years with the team, having been one of its founding members since its inception in 1997. He and all the other display pilots originally trained in the military, where Stellan flew the Viggen operationally as part of his 23 years of service, before joining the historic flight.

Originally the team formed around a de Havilland Vampire, but with the help of the Swedish armed forces, began

to operate several other historic jet types.

After the restoration to flight of the Viggen in 2012, the decision was made to move all the aircraft to the civilian register.

Stellan said it is much easier to operate the aircraft on the civilian register with no diplomatic issues arising when taking the aircraft to shows abroad. However it has been a slow process, as several modifications are required for the aircraft to operate under a



civilian licence – primarily this involves updating the avionics to include new radios and transponders.

All the work on the aircraft is carried out in-house at F7 Sätenäs Air Force Base in Lidköping, Sweden, where they have been based since founding in 1997.

Despite the team's many successes over the last twenty years, not everything has been problem free. In the aftermath of the Shoreham crash in 2015, the UK CAA no longer accepts Swedish PDAs (Pilot Display Authorisations) and as a result they have been unable to perform at UK mainland events. "It's a pity," says Stellan, who along with his team have tried to resolve the issue with the CAA but so far they have had no luck.

In the past the UK air show circuit encompassed a large part of their display audience and they receive a great reception from the UK public. "They're always keen on seeing something other than a Spitfire and Hurricane!" he laughs.

"Presently the Swedish Air Force Historic Flight team have a total of 15 aircraft at their disposal"

BELOW: The instantly-recognisable Saab 37 Viggen, flown by the Swedish Air Force Historic Flight

It is hoped by many, including the team, that the issues will be straightened out over time and they can once again perform in the UK.

Presently the Swedish Air Force Historic Flight team have a total of 15 aircraft at their disposal in their hangars, making them larger than The Battle of Britain Memorial Flight over here in the UK. Their fleet consists of: three Saab J32 Lansens, one Saab AJS 37 Viggen, one Saab SK 37 Viggen (two-seat), one Saab 35 Draken, one Saab SK 35 Draken (two-seat), one Saab 105E, one Hawker Hunter MK58, one Saab J29 Tunnan, two North American Harvards, one Saab SK50, one Scottish Aviation Bulldog and a PA 23 – which is used as a short-range support aircraft.

The team is also currently working on a single seat S35 Draken and two-seat SK 37 Viggen.

They are getting them up to the required civilian standard and as soon as they're ready they will be on the air show

circuit in due course, with another Lansens due to follow.

As Stellan and I are chatting, the flying display director arrives to say that the weather is improving slowly but the CAA can validate tomorrow if the historic buildings (referring to the Elizabeth Castle in St Aubin's Bay) are closed due to their proximity to the display line... though he hopes validations can continue today if the clouds clear enough. And though rain still lashes the airfield, I ask Stellan about flying the Viggen. He regards it as his favourite aircraft to fly, despite having flown all the other aircraft in the team's possession.

"It is powerful with good handling characteristics," he says, and he has flown a great many hours on the type. It is also the only aircraft with reverse thrust on the team, something rarely found on combat jet aircraft.

This was a necessity borne out of Sweden's proximity to the Soviet Union during the Cold War, when it was



A stunning machine
that you'll only
be able to see
flying outside the
mainland UK





anticipated that the large, vulnerable air bases would quickly be destroyed in any conflict, meaning the aircraft would have had to utilise roads and other makeshift landing grounds.

Indeed the Viggen's reverse thrust gives it a very short landing run, which is often completed at displays with a 360-degree reverse on the runway. Stellan goes on to say that he prefers the aircraft to the Draken, which is slippery and goes faster with less thrust but at the expense of manoeuvrability.

It is Stellan and the team's 10 year anniversary of displaying in Jersey and they remain firm favourites with the spectators.

The rain stops and the sky shows some signs of improvement, so the team head out to their aircraft.

The aircraft blend perfectly with their soggy environment, the dull silver reflecting the grey sky above and damp concrete below. Stellan climbs into the Viggen as all the team prepare for start up.

Today it's the Viggen, Lansen, Draken and Tunnan.

A gust of wind, however, brings more fine rain and lower cloud begins to once again encroach on the edge of the airfield. Checks complete, Stellan assesses the sky. A Flybe Dash 8 lifts from the main runway only to disappear almost immediately into the thick cloud. Too low, I think, and Stellan clearly agrees as with a turn of his head he signals to call it off.

Several photographers and a few hardy visitors ignore the weather and continue to observe the aircraft as the pilots climb out and stroll back towards the social club. With a twist of fate, as they do so, the low cloud passes and sun soon shines through.

The validation was completed the next day and the team performed their display in the afternoon. The close four ship jet formation made an eye-catching opening as they came across Elizabeth castle. The combination of two swept and two delta winged jets is

ABOVE: The aircraft of the Swedish Air Force Historic Flight are affectionately known as the Silver Streaks

an impressive sight to behold, and many look forward to seeing the second Draken and Viggen joining the routine. After two formation passes the team split, and each aircraft performed a solo display. The small Tunnan gave the most energetic aerobatic routine, whilst in comparison, the larger Viggen performed mainly closer passes.

The recent restrictions put in place by the UK CAA may have sadly exiled these aircraft from our mainland shores for the foreseeable future. Hopefully the rules will change in the near future and we'll be able to see them soon. However, they still provide a draw for enthusiasts and are a delight for show goers on Jersey, where they help to make the Jersey Air show a continuing success.

I would like to thank Stellan Andersson, the whole team of the Swedish Air Force Historic flight and Mike Higgins for allowing me to produce this article. Additionally, I thank Bob Savoury and Jim Russell for providing some of his photos. ■

"The combination of two swept and two delta winged jets is an impressive sight to behold"



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WORDS David Rawlings IMAGES Bristell

Doing it your way

When you can't find an aircraft you want, build your own.
That's what Milan Bříšťela did when he designed the Bristell



The Czech Republic is not short on aircraft manufacturers. Back under Soviet rule, a large part of the USSR's aircraft companies were based in what was then called Czechoslovakia. When the Iron Curtain fell, the designers, engineers, manufacturing facilities and everything else in between stayed, and a plethora of small, independent companies began to pop up around the country, producing GA aircraft.

Milan Bříšťela studied aircraft construction at the Military Technical Academy in Brno. After he graduated in 1983 he went straight into the aviation sector. Bříšťela began in LET company, working in the aircraft fatigue analysis department. The nine years spent between LET company and fatigue tests at the Aeronautical Institut in Prague (VZLU) was a key period for his future design

work. His designs are created using experience from the fatigue analysis and tests results. After years spent in several aircraft companies as chief designer and chief of manufacturing, Bříšťela decided to open his own company, and in 2009 BRM Aero began and the Bristell was born.

AOPA went to visit Farry Sayyah, the UK distributor for Bristell, in the countryside on the outskirts of Guildford to look over the Bristell. "In aviation if you have one design that is successful then you stand still and everybody else will take over, but Bristell aren't standing still," said Farry when we first met. And he has a point – in a very short term Bristell has developed and produced several versions. There are already the tri-gear, the retractable, and the tail dragger models – and now the company is working on a 750kg night VFR version, designed for schools and training. It will be a lot beefier

"Bristell has developed and produced several versions. There are already the tri-gear, the retractable, and the tail dragger models"

and stronger and be able take the punishment dished out by ham-fisted students. "You can use the current model, but the 750 is much better and it's almost ready. They're just finishing the paper work. The design and build is done and they're just getting the approvals, which can take forever!" Farry said. "Bristell is also planning to bring out a four-seat version – so Milan and his company aren't standing still," he added.

THE LOOK

The Bristell is striking on the apron in the winter sun and as Farry is quick to show me, it's just as pretty under the cowling as it is on the outside, mainly thanks to a Rotax 912 under it. "The Bristell is quite beautiful, it's strong and it really ticks all the boxes. Whenever you're buying an aircraft you make a wish list. And this one ticks everything apart from it's not a four-seater. It's very pretty, it's very light," said Farry.



To keep moving forward, Milan developed several models of his aircraft, including the retractable undercarriage

With a 46" wide cabin there's plenty of room



ABOUT MILAN BRISTELA - OWNER

Milan Bříšťela is the founder and CEO of BRM Aero. He has had an illustrious career in aviation. He graduated in aircraft construction and aircraft producing on the Military Technical Academy in Brno, Czech Republic and has worked in aviation since 1983. Milan founded BRM in 2009 with a goal to develop the best aircraft in the world in its category.

The development and production of the first aeroplane began in rented space together with his son Martin, who is an integral part of the company today. After the successful certification of the first Bristell prototype "OK QAR 24" he has developed a network of global distributors. The company began selling the first version of the fixed-gear aircraft, the Bristell Classic,

in 2011. In 2012, Milan developed a retractable gear aircraft, and in the following year produced the Bristell TDO, with its spur gear. The growing production was moved to its own facilities after five years. Production capacity was more than doubled over the next two years. Today, the company manufactures two planes every week.





Bristell's state-of-the-art facility now boasts more than 50 employees across the company

It's all aluminium, with a composite rudder, cowlings and fairings. Unlike many other manufacturers, everything here has been designed for aviation. It's an incredible piece of kit. And when flying with the standard 100hp Rotax 912ULS, figures show that the aircraft will get about 14l an hour on economy cruise and you have near enough seven hours' duration. "There are also 20kgs worth of luggage in each wing and 15kg behind the passengers. That's seven hours of travel at 110kts, which is incredible. You can do 125kts, but you'll get less than seven hours," explained Farry. "We flew one from Germany, near Munich to Red Hill in five hours and five minutes, which isn't bad going for a light aircraft," he added.

The Bristell Farry showed me around was blessed with leather seats and tinted glass. The leather seats are stunning and when the cockpit is opened you can

smell the richness, and the luxuriousness of the Bristell is clear to see. It's also very comfortable "It's two inches wider than the Cirrus, and I've had a guy in there looking to buy, and he was 7'2". There was at least five inches above his head, so it's roomy," said Farry.

CHOICES, CHOICES, CHOICES

There are lots of options when it comes to buying a Bristell; you can have a turbocharged version from the factory, or choose from unlimited avionics, fixtures and fittings options. "You can have Garmin or Dynon, and you can have it with or without autopilot. The sky's the limit. This aircraft has more instruments in it than a 747. It's a lot more technical and refined," explained Farry.

If you're feeling adventurous and want to build your own, Bristell offers a quick-build version of the aircraft. The factory states that it takes 370 hours to build. The kit comes

"You can have Garmin or Dynon, and you can have it with or without autopilot. The sky's the limit"

with a near-complete fuselage, complete wings, and complete controls. The fuselage has some temporary rivets in, as does the wing. Currently there are 32 flying in the UK and there are another five or six currently being built.

FLYING

As Farry showed me around the Bristell, it was clear that with a waterlogged taxiway we weren't going to be able to take it flying, so I had to take the man's word for it. "It's a dream to fly. It's very hands off," explained Farry. "It's not a workman's aircraft – you don't have to work at it. And without autopilot you can trim it and just let it go. It will just sit there.

"And when you step out of it, even after you've been in it for five hours, it doesn't feel like you've been beaten up. The seats are very comfortable and you have all the luxury you need. It's also very benign, it stalls at 30kts, which you can land in 50 metres. I can get

OPPOSITE: The Bristell is offered in three styles and any colour of your choice – the options are endless



The trail dragger is a very popular option in mainland Europe



airborne in about 20 metres – and that's on grass. They get airborne very easily thanks to their variable pitch prop. 30kts and you're airborne. They're very simple to fly you have electric aileron and elevator trim and they're on both control sticks, and you don't need to spin any wheels."

"They get airborne very easily thanks to their variable pitch prop – 30 kts and you're airborne"

WHO BUYS THE BRISTELL

It seems as if the Bristell is an all-inclusive aircraft and suitable for everyone, "We have a lot of retired people, farmers, rock stars – I shan't name names – and film stars. All types of different people purchase a Bristell. But I would say that 40% of them are either retired or commercial pilots and they want a toy, mainly for touring. It's the perfect touring vehicle – you can actually take more luggage on this than you can on a commercial aircraft – and on top of that the wing storage can hold 12 bottles of wine, I've tested that myself," joked Farry. And at just £99,000 for the base model, you get a lot of tourer for your money. ■



It's an easy to fly hands-off aeroplane and very comfortable, even on long cross-country trips



Currently There are three engine options for the Bristell, all of which are based on the Rotax 912

TECH SPEC BRISTELL

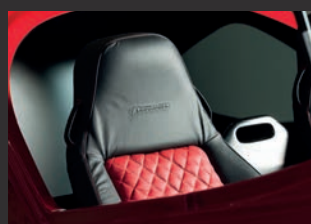
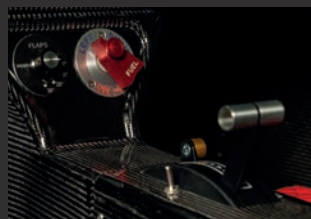
DIMENSIONS & WEIGHT

Wingspan 26.8ft/8.13m
Length 21.16ft/6.45m
Height 7.48ft/2.28m
Cabin width 4.2ft/1.3m
Empty weight 320kg

MTOW 600kg
Useful load 280kg
Fuel Tank Capacity 120l
Luggage compartment 15kg
Wing luggage compartment 2x20kg
Load Factors +4/-2g

PERFORMANCE

Stall Speed (with flaps) 28kts
Stall speed (without flaps) 43kts
Max Cruise Speed 155kts
Powerplant options Rotax 912, 914 and 915 iS



WORDS Nick Wilcock IMAGES Various

ZERO ZERO THIRTY

Getting lost can feel terrible and embarrassing, but Nick Wilcock builds on his RAF experience and explains there's always a way back



NICK WILCOCK BOARD DIRECTOR IAOPA FCL REPRESENTATIVE AT EASA FORMER RAF PILOT

Zero Zero Thirty! Back in my RAF days, that was usually the time when either an exercise was called, or Station Ops rang to scramble me and

a few others off into the night to go chasing Ivans in the mighty Vickers FunBus (VC10K for those who might wonder). But today 0030 has a rather more down to earth meaning, as we shall see.

UNCERTAIN OF POSITION

No pilot really likes to say that they're lost, merely that they're perhaps temporarily ever so slightly unsure of their precise location. But pride has its price in today's skies; many years ago

I was taught that, if 'uncertain of position' you could construct a circle of uncertainty based on your last known position then follow a line feature to a landmark somewhere within the circle. Which was probably

all very well and good in the days of non-radio Tiger Moths and the like, before Beeching had destroyed all the railways which made such good line features, but in today's skies that isn't a terribly good idea and I hope that nobody still teaches it as the recommended procedure. Blundering about in such a way will probably mean that you soon arrive uninvited and unannounced in someone's controlled airspace, earning yourself the dubious distinction of becoming yet another infringement statistic. All because you were too proud

to admit that you were actually LOST!

PRECAUTIONS

There are still those who reckon that unless you can navigate with a quadrant, cross-staff, lodestone and astrolabe (Google those or contact the RIN), you're not a real pilot. I beg to differ; proper pre-flight planning will of course help you on your £100 hamburger trip to another aerodrome, but there are also many pilots who may simply want to slip the surly bonds of earth to bumble about in the local area for an hour or so without having

planned anything specific. GNSS and moving map enabled iThings are superb devices for positional situational awareness, even if you're not following a pre-planned route, but even so I recommend that you always have some form of back-up available. A couple of years ago I was on my way to Stapleford Tawney in rather nasty weather, with a nice magenta line on the Garmin showing me exactly where I was. But then it froze; I couldn't even turn it off to reboot it. I had a back-up GPS, but that was in a contingency bag in the luggage compartment.

Fortunately I was in my car rather than in an aeroplane and I'd also taken the unusual precaution of printing off my route from the M25 exit ahead to the aerodrome. But the lesson was equally applicable; if relying on an electronic device in particular, make sure that you can actually reach your back-up system in flight.

OPTIONS

If despite everything you realise you're LOST, what is the best course of action? First and foremost, admit it, then seek help. There are those who think that calling for a



If it doesn't look right
out of the window,
follow Nick's advice to
get you back on track



Training Fix on 121.5 MHz is an easy option, but I don't agree. It was something I always demonstrated to students, but only as a way of introducing them to the Distress and Diversion (D&D) system. There are better options open to you:

MONITORING CODES

If you're flying in much of the UK, you can listen out on certain specific RT frequencies, and can indicate to the controller that you're doing so by selecting the frequency monitoring SSR code ('listening squawk') associated with the frequency. Calling the controller and advising him/her of your predicament is certainly an option, but there may be others with the same squawk and it could take a while before you are positively identified.

D&D

Suppose you're pottering happily along wearing a 7000+Alt squawk, talking and listening to no-one in particular, when you realise that you don't know quite where you are. In the UK, the wonderfully helpful

D&D (Distress and Diversion) cell can assist. If you ever get the chance, ask to pay them a visit. Come along to the Duxford Safety Day on Sat 14th April and have a chat with them too. Back when they were still at West Drayton, I visited the cell as part of my RAF pilot training. Whilst we were chatting with the staff, a Canberra crew called up from somewhere over the North Sea with an engine fire warning. In those days the auto-triangulation wasn't quite as Gucci as it is today, being somewhat analogue, but the flying coffee cups and speed of reaction as the D&D folks sprang into action made a lasting impression. Most people know that 7700 is the emergency SSR code and 7600 indicates that you've lost your radio, but there is another code which you can use to attract D&D's attention without causing quite the same level of drama.

0030

From recent conversations, it seems to me that surprisingly few people, including FIs, FIC

"Nobody will treat you as a fool, they will be far happier that you had the good sense to seek navigational assistance early"

instructors and FEs, are aware of the existence of the 'lost in space' code 0030. Selecting that code will alert D&D to expect a call from a lost aircraft, but will also indicate that the pilot isn't declaring an emergency. So, if you think that you're experiencing positional uncertainty, or in other words that you're actually lost in space:

1. Admit it!
 2. Select 0030+Alt.
 3. Call D&D on 121.5MHz.
- Don't worry too much about what to say: "London Centre, London Centre, this is G-nnnn squawking 0030 uncertain of position" will probably suffice as an initial call. Nobody will treat you as a fool, they will be far happier that you had the good sense to seek navigational assistance early rather than becoming an infringement statistic later.

Finally, if you are an instructor, please ensure that your students are aware of 0030. Perhaps it would also be a good topic to cover during dual refresher training flights for Class Rating revalidation. ■



It's better to get on the radio, admit your mistake and ensure you don't become another infringement statistic

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GARMIN'S NEW GFC 600H HELI FLIGHT SYSTEM

Garmin announces the GFC 600H, citing it as a 'breakthrough in cost-effective technology'

Product GFC 600H
Maker Garmin

At the recent Heli-Expo Garmin stole the show by announcing its GFC600H. This attitude-based (AHRS-derived) flight control system offers a number of safety features, including stability augmentation system (SAS), dedicated return-to-level (LVL) mode, hover assist, as well as overspeed and low speed protection. The 600H can operate as a full-featured standalone flight control system, but also offers integration with compatible flight displays, instruments and navigation sources.

"Garmin designed the GFC 600H to reduce inflight workload, fatigue and stress levels for helicopter pilots who are often faced with complicated missions in adverse weather conditions or degraded visual environments," said

Carl Wolf, Garmin Vice President of Aviation Sales and Marketing.

With its advanced AHRS technology and redundant, cross-checking sensors, the 600H was designed for smooth handling. It includes SAS that provides inputs to help stabilise the helicopter while hand-flying. The corrections provided by SAS serve to improve the helicopter's basic handling characteristics by maintaining a commanded attitude. Designed with the pilot in mind, its cyclic-mounted trim controls allows for interactions without taking a hand off of the flight controls during

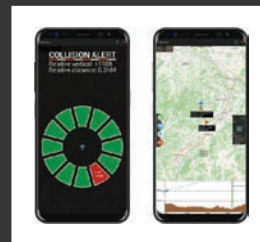
basic operations, including system initialisation of the SAS in attitude mode, adjustments of the pitch and roll trim, and much more. While flying with SAS, pilots can easily "fly through" the flight control inputs for smooth manoeuvres beyond the preset trim condition.

With its extensive features and advanced technology, the 600H offers unprecedented value at a competitive price in a flight control system for helicopters. Initial Supplemental Type Certification (STC) for the Airbus AS350 B2/B3 is expected in Q4 2018. ■

NEED TO KNOW

- ✦ Dedicated return-to-level mode
- ✦ Has plenty of helicopter-specific safety enhancements
- Will have the usual Garmin price tag
- Not available until the end of this year

Where garmin.com **Price** TBA



SKY NAV PRO NOW FOR UAVs

Product SkyNavPro
Maker Dacher

SkyNavPro, the mobile device-based flight planning app, has taken another step forward, gaining even greater popularity amongst pilots. The app currently offers n-flight weather, planning and navigation, collision avoidance, tracking and monitoring, and the platform is set to become available on UAVs.

At a recent event Dacher Systems, SkyNavPro's parent company launched its new data communication and control system for UAV. Communication between mission control stations and the UAV is enabled, allowing for tracking via the SkyNavPro network, which conducts and surveys autonomous flights.

Thanks to reliable satellite technology, the missions of every vehicle can be managed, controlled and monitored – even in extremely remote regions void of any terrestrial infrastructure. The team of the Aviation Solutions Department welcomed interested guests and representatives from civil industries, governments, monarchies and the military at their stand.

Where skynavpro.com

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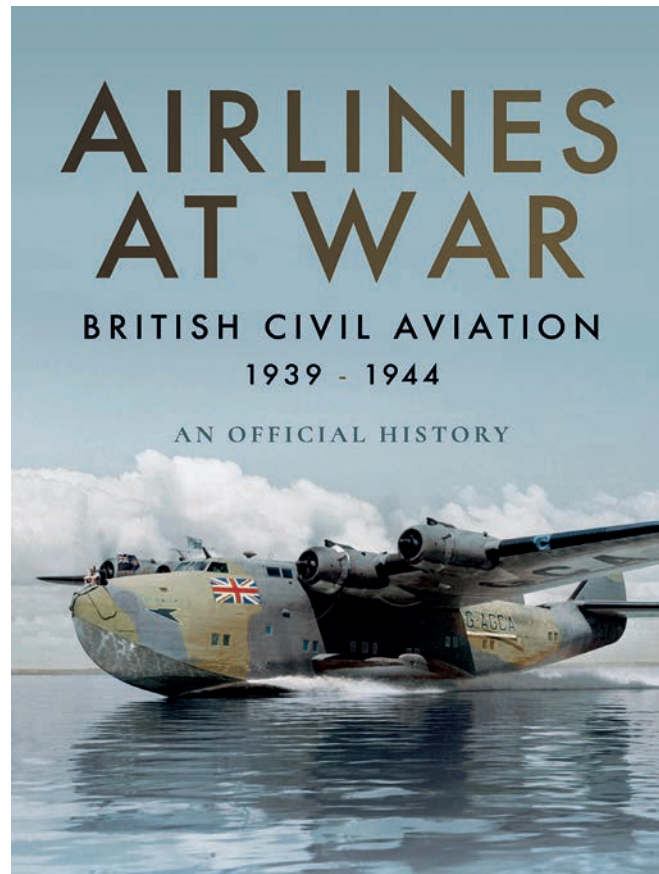
THE LESSER KNOWN PILOTS

We all know about the daring-do of the war pilot, but what about the men and women of the airlines in WWII?

Book Airlines At War
Author Air World

Enter any bookshop and you'll be surrounded by books about WWII and those that bravely served in the armed forces. There are plenty (of great) books about the efforts of the pilots and crews of the RAF, but there was another body of aviators who played a significant role in the conflict – the men and women of the civilian airlines.

The British Overseas Airways Corporation (BOAC) was formed in November 1939, shortly after the outbreak of the war, by the amalgamation of Imperial Airways and British Airways. During the war BOAC operated as directed by the Secretary of State for Air, initially as the transport service for the RAF and with no requirement to act commercially. The inaugural BOAC had eighty-two aircraft, a large proportion of which were seaplanes and flying boats. With 54,000 miles of air routes over many parts of the world, ranging from the Arctic to South Africa, from the Atlantic coast of America to the eastern coast of India, the aircraft of the BOAC kept wartime Britain connected with its colonies and the free world, often under enemy fire. Over these routes, carrying mail, cargo and personnel, the men and machines of BOAC flew in the region of 19,000,000 miles a year. There can rarely have been



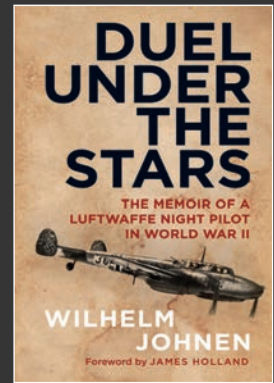
a moment, throughout the war, when aircraft of the British Merchant Air Service were not flying somewhere along the routes, despite losses from enemy action. This book explores much of their war history between 1939 and 1944 (the year that marked the 25th anniversary of British commercial aviation), something of their lives and their achievements

in linking up the battlefronts – at times cut off from any direct land or sea contacts with the Home Front – and in transporting supplies through the new, dangerous and often uncharted regions of the air. With the 'Speedbird' symbol or the Union Flag emblazoned on its aircraft, the BOAC really did fly the flag for Britain throughout the wartime world. ■

NEED TO KNOW

- ✦ A little-known look at the other pilots during WWII.
- ✦ Kindle version available.
- ✦ Very in-depth
- ✦ More pictures would've been better.

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Book Duel Under The Stars
Author Wilhelm Johnen

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Former Luftwaffe night pilot Wilhelm Johnen recounts his experiences of the war years, and traces the story of the ace fighter pilots from the German development of radar to the Battle of Britain.

Johnen flew his first operational mission in July 1941, having completed his blind-flying training. In his first couple of years he brought down two enemy planes.

The tally went up rapidly once the air war was escalated in spring 1943, when Air Marshal Arthur Harris of the RAF Bomber Command began the campaign dubbed the 'Battle of the Ruhr'.

After several more missions, Johnen's unit moved to Hungary and by October 1944 his score was standing at 33 aerial kills. His final one came in March the following year, once Johnen had moved back to Germany.

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First registered in 1985, serial no. 518, the aircraft has a factory replacement Textron Lycoming IO-540-C4D5D fuel injected engine developing 250hp at 2,575-rpm fitted in 2000, a Hartzell constant-speed propeller fitted with new blades in 2001 and retractable undercarriage. It has been in the same ownership since 1992, is VAT paid and is now available for purchase on the retirement of its owners.

Avionics upgrades include a Garmin GNS430 VOR-ILS/GPS moving map driving the HSI, providing FM immunity and 8.33 spacing, Garmin GTX330 Mode S Transponder and Garmin GTR225A 8.33 COM2 radio.

Airframe 4,217 hours and engine 1,650 hours with new ARC and all ADs completed, the aircraft is fully maintained by its CAMO, Shipping & Airlines at Biggin Hill

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The aircraft has an analogue panel plus Garmin 430 with built-in terrain warning, a Garmin 328 Mode S transponder and a Garmin intercom. It is already 8.33kHz capable. The Tecnam P2002JF is also authorised for flight training. The STOL and grass

performance is very good and handles the relatively short 520m runway at Brimpton with ease even at full load.

TECI is comfortable and has enough luggage space for long trips.

I have flown her to Munich and to Scotland.

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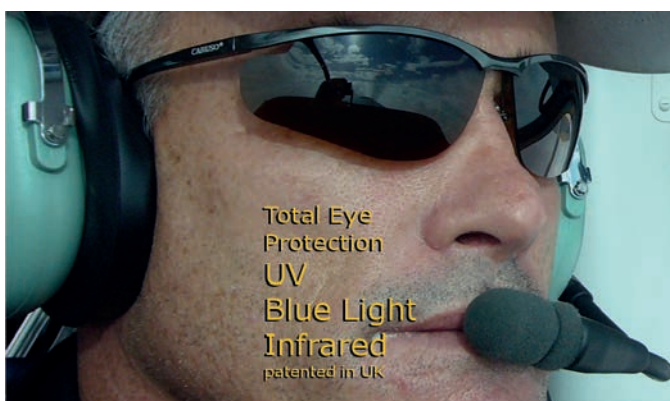
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