The official magazine of the Aircraft Owner and Pilots Association www.aopa.co.uk

AOPA UK

IFR UPDATES
Our red tape destroyer, Nick Wilcock, unravels the latest regulations on IR approaches

WOODEN WONDER
Henry Simpson investigates the team trying to get a de Havilland Mosquito into the sky

BOOKS AND TECH
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VOLUNTEERS ARE EVERYTHING TO US AT AOPA

As is the case with most membership associations, AOPA relies heavily on many members who volunteer their support, advice and practical help. This can come in the form of participation in the AOPA Member Working Group that meets four times a year at various locations, normally an aerodrome on a Saturday, through to providing more specialist and professional input into the Education and Training Committee, the Corporate Members Committee and the Maintenance Working Group. AOPA Board members are volunteers too; their commitment is significant as it involves financial responsibility as well as review of the activity from the committees and groups with the aim of formulating future strategy. These AOPA pilot and owner members contribute in a variety of ways to benefit all GA pilots and owners, and help ensure the future viability of general aviation.

Whilst on the topic of volunteers, I am pleased to announce that long-standing AOPA member, Pauline Vahey, has agreed to become Vice Chairman. This position has been vacant since Geoffrey Boot retired from the Board in 2017. Pauline had been doing a sterling job chairing the AOPA Members Working Group since July 2012. An account of the recent WG meeting at Earls Colne appears on page 11. Pauline also chairs the Corporate Members Committee.

I am also pleased to announce that Malcolm Bird was elected to the AOPA Board at the September 2018 AGM. Malcolm has been a member of the Maintenance Working Group since 2011 shortly after its inception, and is well known for his articles in the magazine on maintenance and engineering matters. Another aircraft-owner member of the group, Brian Chambers, who has served for a similar length of time, has recently resigned, and we thank him for his dedication and support. We would like to find another aircraft owner willing to contribute to the group to replace Brian – ideally, someone who is, or has been, engineering coordinator for a group-owned aircraft. If any member is interested, please let me know at **george@aopa.co.uk**. The group consists of aircraft owners, maintainers and CAA representatives, and provides a forum for discussion, and subsequent resolution, of maintenance and airworthiness issues. The next meeting of the group is on Wednesday 31 October, 2018.

The committees and groups mentioned above enable AOPA to represent its views and lobby for desired outcomes. If you have strong views on topics such as airspace access, licensing, maintenance standards, etc, then by contributing to one of these groups your voice can be heard in the right places. Real power comes from the ability to influence, something that AOPA has been doing since 1965. If you are keen to contribute in this way, a good place to start is on one of the AOPA Members Working Groups. Members' views are literally taken on board as about half the AOPA Board normally attends. It is a great way to hear about the latest developments in general aviation and meet other pilots and owners, and you will be made very welcome! ■

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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 August issue should be recieved no later than 01 November 2018.

INSIDE THIS MONTH

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EDITOR'S MOMENT

The board members often tell me that the biggest hurdle in obtaining new members is that some people don't know what AOPA actually does. So, in this issue, Martin Robinson, AOPA's CEO goes into great detail to explain the big wins that AOPA has had over the year, as well as the work that he and his team do, to not only make sure you stay flying, but that you also are free from exploitation and that your rights are protected. Now when it comes to how expensive flying is, £97 for that peace of mind is a pittance.

There's an uncertain road ahead with Brexit as we still don't know what's going to happen, not only to our country, but to our skies as well. So it's best to nail your flag to the mast and be part of AOPA – even better if you can be an active member.

Also now's the time to get a friend involved. When you've finished with this magazine, why not pass it along to a friend, colleague or fellow pilot and tell them about AOPA? The bigger we are, the stronger we are.

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AOPA IS WORKING FOR YOU ACROSS MANY FIELDS

I sometimes hear people say, "What does AOPA do?" I am not sure whether these folks mean, "What does AOPA do for me", or the collective term 'us'. Of course this mostly comes from non-members, so I am calling on all existing members to help us educate those non-members about the value of a representative body, which is totally independent of government and regulators, leaving us to speak freely on any issue. Being independent is one of our strengths because real power comes from influence.

Through the pages of this issue you will see reports on activities from pilot licensing to maintenance. The association is run by pilots for pilots, ensuring the right decisions are being taken for all our futures.

AOPA responds to many consultations from airspace to taxation of fuel. There was in the past an attempt under European legislation to introduce VFR charges. This is a subject that raises its head every so often and AOPA has to go in to 'bat' to fend off proposals for the introduction of VFR fees. When the EU directive on the taxation of fuel was being discussed AOPA was at the fore of the debate. Between these two topics alone, for any pilot flying an average of 30 hours per year, AOPA's intervention has saved pilots approximately £600 per year – not a bad return on the £97 membership fee!

Of course some will say, "Well you do that regardless of whether I am a member or not." However the point relates to resources, and the better AOPA is resourced, the better representation and assistance we can provide.

Someone once said, "modify or mummify", because standing still is not an option. AOPA is very aware that any change can be difficult as well as costly – 8.33 radios come to mind – however that issue has been on the table since the early 1990s. AOPA had, for years, fought off its introduction and we also recommended to the CAA (Andrew Haines) that they sought EU funding – which they did, and were successful. 20% rebates have never before been achieved for GA. Whilst 80% of the purchase price had to be paid, the fact was it was EU regulation, which required compliance. Whilst some states were able to push back on the deadline, funding for GA was not achieved, and ultimately most of Europe's airspace will become 8.33. Therefore, as a result the UK is ahead of the rest of Europe.

"I am calling on all existing members to help us educate non-members about the value of a representative body, which is independent of government"

Over the last few weeks the Government and CAA have been consulting on the future of drones, and a modernisation strategy for airspace. Both have been responded to by AOPA. The airspace modernisation document issued by the CAA was well presented but it lacks ambition, particularly around the use of future technology. Over the next 10 years the airspace environment will evolve into Unknown/Known intent. This should result in better airspace access, better flight profiles, fuel saving (where applicable) and reduced environmental impact, all of which are high-level goals for Government, not forgetting improved safety for all airspace users.

As the airlines continue to expand and grow, particularly in the South East, airspace access will be an issue unless the Government takes some action. One of the concerns AOPA has is around DfT policy, largely aimed at increasing capacity and reducing delays (for the passenger). The CAA carries out its tasks through a set of 'Directives' emanating from the Transport Act 2000 (Section 70) and at the same time the UK has to meet its international obligations (ICAO) as well as European Single Sky legislation. At the high end the objectives include Environmental impact set against growth (emissions charging), capacity/delays, lowering Air Traffic Management costs and increased efficiency. All of this filters down and it's the lower airspace (10,000ft) that AOPA has the most concerns with. Airlines need to get in/out of regional airports and their passengers need protecting. This is where technology is likely to play a key role.

With any Airspace Change Proposal (ACP) there is a new process which has to consider the concerns of local people. The government is proposing a new Governance Structure for the airspace modernisation. However Section 70 of the Transport Act 2000 requires the CAA, inter alia, under a general duty, to 'satisfy the requirements of operators and owners of all classes of aircraft'. I question how the CAA did this at Farnborough?

With the continued development of drones the DfT has been consulting. The drone lobby has been pushing for airspace below 500ft (U-Space) for the specific operation of drones believing that there is very little manned aviation below 500ft. The question is: how will they develop an ACP, even if the airspace is autonomous?

ARTICLE CONTINUES ON PAGE 10...

Martin Robinson
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A smarter, simpler way to fly.

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IFD550, IFD440, & IFD100 iPad app shown.

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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
What AOPA is doing for you

AIRFIELDS UPDATE
The UK aerodromes in danger

PPL CORNER
A look at thunderstorms

ADVICE
Can you rent out your aircraft?

WORDS Martin Robinson **IMAGES** Clay Banks

WHAT AOPA IS DOING FOR YOU – PART II

Martin Robinson's explanation of what AOPA is doing behind the scenes that ensures you're able to fly safely ...

If you've skipped straight to this page, you've missed the first half of the article. Start on page 7 and work your way here.

AOPA recognises some of the business and societal benefits that drones can bring, but safety in the air has to remain a priority for government regardless of big-business interests. Also the government is updating its 'Aviation Strategy', and AOPA continues to make the case for GA in line with the Government Framework Objectives, as well as the airspace modernisation strategy, which we said was not ambitious enough because of the lack of thought around the use of technology. We said that the government needs to invest in the use of 5G technology as a part of the modernisation of airspace.

If you look at the diversity of airports in the south/south east, the growth in controlled airspace has largely kept pace with demand, but it's been done on an individual basis, the most recent one being Farnborough. But then consider Heathrow, which has been approved to build a third runway, as well as Gatwick, Southend, Luton, Stansted, London City, Biggin Hill, Farnborough and RAF Northolt. The traffic at these airports is mostly IFR Commercial or Business. In close proximity to these airports there are 12 GA aerodromes, all of which support VFR operations and most of which support the flight training industry.

Therefore with the expected growth in airline traffic and with the development of UAVs there is a pressing need for a fresh approach to air traffic management. We think more work needs to be done on the management of the traffic – this does not mean more air traffic controllers but how we best use technology. We need integration not segregation.

"AOPA supported a registration scheme for drones with a mass of between 250g and 20kg"

AOPA supported a registration scheme for drones with a mass of between 250g and 20kg when it was being proposed, as we felt that being known to the system would lead to better compliance, as well as there being a need for competence requirements amongst drone operators.

AOPA does not agree with the 1km restriction around 'protected aerodromes'. There are good safety reasons why such aerodromes have ATZs and it is our belief that drone operations should remain outside of all ATZs. For other flying sites such as helipads and farm strips, prior permission should be required.

AOPA can accept that there are particular societal benefits from the use of RPAS. However the government and the CAA must make sure that safety in the air remains the overriding priority.

The development of RPAS technology needs to meet safety standards that are consistent with other forms of aerial activity if they intend to operate BVLOS.

We have concerns with the 20kg to 150kg light unmanned aircraft category because the current rules of the air require visual separation when operating, which means that manned aviation must be able to visually acquire other aircraft, manned or unmanned under the see and avoid rules.

AOPA aligns its position with BALPA as they share similar concerns. ■

Drones; one of the big issues AOPA is helping to resolve

WORDS & IMAGES Pauline Vahey

LATEST FROM THE WMG AND CMC

The weather has been great, but it's time to get back to business!

MEMBERS WORKING GOUP

I hope everyone has been able to take advantage of the great summer weather we have enjoyed this year. Now it's back to business as usual. The last meeting of the AOPA MWG was held at Earl's Colne. Many of the local members were able to come along and hear our CEO talk about the work of AOPA on the Friday evening, and then join us for the regular meeting Saturday morning finishing at lunch-time with one of Norm's excellent burgers. The next AOPA Members Working Group will be Saturday 29th September from 10.30 am at White Waltham Airfield, aiming to finish by 3pm. The report of that meeting will be too late for this issue of the magazine, however, we'll be discussing the closure of Airfields, Airspace changes, EASA updates and hearing the CEO's report as to what's happening and what AOPA is doing to influence UK GA. All Members are welcome – just remember to let me know on pauline@aopa.co.uk if you would also like some lunch, provided free of charge.

CORPORATE MEMBERS COMMITTEE

Having just come through one of the worst winters for flying in over ten years the summer has been glorious. So no surprise that AOPA's Corporate Members have been working flat out and unable to attend the Corporate Members Committee. Having restarted the dormant committee at the back end of 2015, we're going to look at revamping the format to ensure it remains relevant and useful not only to those who have given freely of their time to date, but also how we can include more of our Corporate Members. We'll be back in touch in the next issue so watch this space. All suggestions will be considered so please get in touch at **pauline@aopa.co.uk**. ■

"We're going to look at revamping the format to ensure it remains relevant"

The groups meet regularly to discuss the important issues

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WORDS John Walker **IMAGES** Andy Mabbett

ALL THE LATEST NEWS ON UK AIRFIELDS

John Walker shares his latest findings on the developments of the UK's aerodromes

There are airfields across the UK currently under the threat of closure. Here are the latest developments, updated 5 September 2018.

LANGAR

Aerodrome put up for sale – currently occupied/operated by British Parachute Schools.

MANSTON

Application made by River Oak Strategic Partners for a Development Consent Order (DCO) to retain the aerodrome as a Nationally Significant Infrastructure Project was accepted on 14 August 2018 initiating a nominal three-month pre-examination stage. Site owners have submitted a revised planning application for mixed use retaining 1,199 metres of the existing runway for limited use by heritage aircraft. Thanet District Council definitive 2031 Local Plan public consultation document has not allocated the site for any specific purpose to ensure that the DCO process is not prejudiced. The consultation ends on 4 October 2018.

OLD SARUM

Site owner's planning application for a housing development and 10 additional hangars, amongst other work, has been objected to by various parties as being detrimental to the site's heritage and potentially limiting use of the aerodrome. Appeal made by owner to the Planning Inspectorate for non-determination of the application by Wiltshire Council with public inquiry hearings starting on 9 October 2018. The Council subsequently rejected the planning application.

"A protest group has been given leave to appeal these decisions in the High Court, with a hearing expected soon"

Dunsfold from the air, one of the airfields under threat in the UK right now

DUNSFOLD

Planning application for mixed use development with 1,800 homes on site approved by Waverley Borough Council on 14 December 2016 but called in for a Public Inquiry, the result of which was Central Government approval for the application on 29 March 2018. A protest group has been given leave to appeal these decisions in the High Court, with a hearing expected soon.

WELLESBOURNE MOUNTFORD

Gladman Developments in conjunction with the site owner have proposed a development of 1,600 homes on the site, although the Stratford-on-Avon District Council Local Plan adopted Core Strategy has earmarked Long Marston aerodrome (see page 1) as a preferred housing development site. A Core Strategy stated policy is to "Retain and support the enhancement of the established flying functions and aviation related facilities at Wellesbourne Airfield". Tenants notified by owner that flying activities would cease in December 2016 but action deferred pending tenant's legal action to obtain new leases. The court judgement handed down on 25 June 2018 has ruled against the tenants who are expected to appeal the decision by the deadline of 16 October 2018. The council has formally rescinded the owner's permitted development rights to prevent building demolition work and proceedings have been initiated to negotiate an agreed purchase of the site or, failing that, to acquire the site by a CPO. ■

WORDS & IMAGES Adam Winter, Commercial Pilot and Instructor

BRINGING THE THUNDER

In his third part on weather, Adam Winter looks at how a thunderstom forms

In the first article on water we looked at the exchange of energy when water changes between its three states and how that energy is stored and re-released as it undergoes these transitions. In the next article we saw how this store of potential energy in water manifests in the atmosphere as varying lapse rates and how these determine the stability of the atmosphere, cloud and precipitation. In this article I will describe how a thunderstorm forms.

Thunderstorms can feel, at times, like they appear out of nowhere

A quick reminder that when we talk about energy, we are describing the ability or potential to do work. If you wake up with 'no energy', you can't do work! Work and energy are given the same unit (joule), and so are closely linked. Energy comes in many forms, and they are divided into energy that is happening, like the energy of movement (kinetic energy) or heat energy, and energy that is stored, known as potential energy, like the energy stored in a stretched spring (elastic potential) or battery (chemical energy), or gaseous water molecules (latent heat energy). When energy is used or made to do work, the rate at which the work is done is known as the power. A thunderstorm is a bomb of almost unimaginable energy, and although less powerful than a nuclear bomb, it can contain a lot more energy.

Thunderstorms form when air is forced upwards in an unstable atmosphere. Air can be forced up by surface heating, orographic lifting, frontal lifting and thermal lifting. Convection is caused by surface heating. As the ground heats the air in contact with it, it becomes less dense, and is replaced by cooler air which forces it upwards. Air can be mechanically forced up by a mountain range or island. A cold front forces air upwards quite sharply as it undercuts the warmer air it is catching up with. Even the heat from a power station can cause cloud to form (see photo). Once one of these lifting actions or triggers takes place, two more ingredients are required, namely moisture and an unstable atmosphere.

"Thunderstorms form when air is forced upwards in an unstable atmosphere"

Heated air becomes buoyant and as it rises it cools at 3°C/1000 feet.* If it cools below its dew point the water it contains condenses. The condensation process releases latent heat, and so the rising air becomes even more buoyant and continues to rise and cools now at 1.5°C/1000 feet.** Generally speaking air cools as altitude increases up to the tropopause. This is the environmental temperature laps./*** How fast the air is cooling is the measure of atmospheric stability. If air that is forced upwards remains warmer than the surrounding air, then the atmosphere is unstable. A thunderstorm can develop.

Thunderstorms have three distinctive phases, or 'cells'. The Towering Cumulus stage is when convection has begun, and vast amounts of H_2O gas is condensing into thousands of tonnes of liquid water droplets. The process releases so much heat energy that the cloud itself warms up, becoming even more buoyant, sucking in more cooler surrounding air and forcing it upwards, to cool and condense. It is a chain reaction, a water bomb that explodes over several hours. The cloud at this stage is made entirely of liquid water, and large up-currents are present throughout. These convection currents go way beyond the operating limits of most light aircraft. You can almost

visualise the up-drafts and huge convection currents by looking at the texture of the cloud; the well defined crisp cumulus tops will continue to grow because the cloud is still condensing water, the phase change of which continues to release heat, fuelling the continued growth. It could continue to grow all the way up to the tropopause, where the temperature stops decreasing with height.

Once the cloud starts to rain, it has reached the Mature stage. Now it is producing both downdrafts and updrafts. Some of the liquid water has phase-changed again and becomes ice (a process that releases more heat). Once ice has formed, the water is no longer releasing energy, and the ice starts to fall and accrete. It might meet a large updraft and be propelled up again. At this stage the cloud appears fuzzy, and it starts to lose its earlier cauliflower-looking form.The electrical potential difference between the water and ice also causes static build-ups which discharge as lighting bolts.

During the final stage of the storm, the Dissipating stage, the updrafts and formation have ceased, and the cloud is dominated mainly by downdrafts. It might still be raining, but this will abate. The dissipating cloud is made up mainly of ice crystals.

A thunderstorm can occur in the sequence as laid out here, or it can be all three stages at once, if a constant source of moisture is present, for example at a cold front or by a relatively warm body of water.

Hazards associated with thunderstorms are ... well, hazardous. And numerous. So let's imagine flying into one in a Cessna or PA28. Thunder is the noise made by lightning, so all thunder storms contain it. A lightning bolt can discharge a billion joules of energy. It can also strike you quite a few miles away from a storm cloud. Luckily they do not present a big hazard to aircraft; your eyes are more likely to be blinded by the flash. Lightning is not necessarily a sign of the severity of a storm. There are much more dangerous surprises lurking within.

Turbulence will be so severe in a storm that your aircraft structure is at risk. I should think your spine might be as well, and you'd be likely to hit your head unless you were well strapped in. So having been blinded by the flash, you are now being thrown around like a rag doll. If the aircraft structure is still intact don't worry, because the airframe is icing up anyway. Those large supercooled water droplets are mostly freezing on impact with the leading edges, but some of it is flowing back and freezing into a compact, heavy and aerodynamics-changing hard laminate. You will literally drop out of the sky soon. As a final insult, as your ice-covered, distorted aircraft does drop out of the bottom of the cloud, a final windshear will propel you on your way downwards. This is a microburst, an extreme change in wind direction and speed. There is often no way of telling a microburst is happening. A forecast of thunderstorms (TS) implies them and pilots will report them, but otherwise they have to be assumed to be present.

Unstable conditions right for the formation of towering cumulus (TC) and thunderstorms (TS) are often good VFR days. A large thunderstorm is a very obvious and visible hazard and easy to avoid. So do avoid them.

* The DALR or Dry Adiabatic Lapse Rate is 3°C/1000 feet.
** The SALR or Saturated Adiabatic Lapse Rate is 1.5°C/1000 feet.
*** The ELR or Environmental Lapse Rate is whatever is actually measured on a particular day, however the global average lapse rate, the ISA ELR is 1.98°C (2°C)/1000 feet. ■

WORDS AOPA web team **IMAGES** MAX LIBERTINE

RENTING: IS IT FOR YOU?

What to do if you want to make a bit of extra money from your aircraft

There is plenty of time throughout the year when your pride and joy is sitting in a hangar or on the apron. So here's some advice on how you might be able to make the most of the time when you're not flying.

Before we get started it needs to be said that Aviation Law is constantly changing (as we all know) and you should verify that any information given below is still valid. Fortunately the underlying principles tend to remain constant even if the paragraph and section numbering changes.

CAN I RENT OUT MY AIRCRAFT?

UK National Permit to Fly General Aviation (GA) aircraft can be used in certain circumstances for remunerated commercial training and self-fly hire, the UK Civil Aviation Authority (CAA) announced back in 2015. The move came after extensive consultation with the GA community.

Owners of 'permit' aircraft have always been allowed to undertake training in their own aircraft, as this is defined as non-commercial. The changes allowed other pilots who do not own UK National Permit to Fly aircraft to undertake post-PPL flight instruction and self-fly hire using aircraft with a Permit to Fly.

Pilots who do not hold a licence cannot take advantage of the rule to undertake ab initio training in rented permit aircraft, unless it is 'Type Approved'. But, if the pilot already holds a valid licence for the same aircraft category, then remunerated flight instruction and examination is allowed.

Ex-military aircraft that are operated under CAP 632 requirements are also not included under the new rules as they already operate under separate agreements.

Full details for the use of Permit to Fly aircraft for flight instruction and self-hire can be found on the CAA's website.

"Owners of 'permit' aircraft have always been allowed to undertake training in their own aircraft"

If you're thinking of renting your aircraft check the legalities first

EASA Aircraft must have either a Certificate of Airworthiness or be a type-approved Permit To Fly aircraft which is already permitted to be used for self-fly hire within the terms of the relevant exemptions. EASA EU Regulation applies.

Self-fly hire of an EASA aircraft is deemed to be a commercial operation if the following applies: Reference: Regulation (EC) No 216/2008 ('the Basic Regulation'), Regulation (EU) No 965/2012 on Air Operations.

The term 'commercial operation' is defined in Article 3 of the Basic Regulation as follows:

"Commercial operation' shall mean any operation of an aircraft, in return for remuneration or other valuable consideration, which is available to the public or, when not made available to the public, which is performed under a contract between an operator and a customer, where the latter has no control over the operator."

If your EASA aircraft is operating with an engine beyond TBO, or is older than permitted years, you may be restricted to private use only. In this case, an alternative would be for the hirer to have some level of share in the aircraft and operate it as a private group. Your maintenance organisation should be able to advise you.

Jointly owned aircraft can be registered in the name of each individual owner, but in cases where there are three or more individual owners of an aircraft it is recommended that you form a group of co-ownership syndicate for the purposes of registration. In this way, any member may leave or join the group without the need to re-register the aircraft every time (which would incur a fee).

One or two of the owners must be nominated as trustee(s) of the group. If a trustee leaves the group or ceases to act as trustee, the aircraft must be re-registered.

FROM THE CAA WEBSITE:

"Please note that 'non-equity' groups cannot be registered in this way as the group members do not hold any ownership of the aircraft itself. In this case, the aircraft should be registered to the owner.

The trustee of a group must supply a full list of names, addresses, nationalities and percentage shareholdings of the group members using a Trustee Grid form. This must be submitted along with the registration application.

The CAA must be advised by the trustee as soon as any members leave or join the group, which can done by submitting an updated Trustee Grid form by post or email."

If you are an AOPA member and need advice on forming a group on your aircraft or self-fly hire of your aircraft, please contact AOPA directly.

THE TAX MAN COMETH

To avoid possible tax benefit-in-kind implications, assuming that you use the aircraft yourself, if your aircraft is owned and operated as a limited company or trust you should only charge it out at the hourly rate that you pay yourself.

You need to make sure that any other pilot using the aircraft is covered by the aircraft insurance and can legally fly it.

CHARITY FLIGHTS

More UK private pilots will be able to offer flights for charity following a simplification of the Civil Aviation Authority's (CAA) requirements. The Air Navigation Oder (ANO) 2016 and the CAA have issued guidance in CAP 1330.

A blanket permission will now be available for pilots if they meet certain basic requirements. This removes any need for pilots to have to apply to the CAA to carry out individual flights. The changes place more emphasis on pilots providing a thorough explanation to passengers of the level of safety and risks prior to the flight taking place.

As well as simplifying the requirements, other changes include: extending the types of aircraft that can be used to include permit aircraft such as hang gliders, paragliders, microlights, gyroplanes and powered parachutes, and allowing flights to take place from unlicensed airfields.

To use the permission, pilots must ensure that they receive no payment for the flight. All money must be paid by the passenger directly to the registered charity and the charity cannot be the operator of the aircraft.

Pilots should also check that their insurance cover is adequate and ask the passenger to check that their own life insurance, and any private health insurance, covers the intended flight.

FLYING DISPLAYS

Before you can perform at an approved flying display you will need a display authorisation. This requires you to undertake an approval flight for a display evaluator.

You now need a behavioural and attitudinal fitness assessment.

CAP 403 has guidance for the organisers of these events and others that do not require CAA permission.

PARACHUTE DROPPING

All parachute dropping from civil registered aircraft over the UK is regulated by the CAA and must be conducted in accordance with the requirements set in the Air Navigation Order (ANO) 2016.

The BPA (British Parachute Association) has compiled an Operations Manual, adherence to which will ensure an acceptable operating standard.

As stated at the start of the article, ensure that you are up to date with the relevant information first of all. ■

AOPA FLYING INSTRUCTORS 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.

NEXT DATES

The next dates for the seminars are **7-8 NOVEMBER, 8-9 JANUARY** and **14-15 MAY 2019**.

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.

AOPA NEWS
General Aviation news from around the world

ANOTHER SUCCESSFUL OSHKOSH AS NUMBERS ARE BIGGER THAN EVER

Jack Pelton said this year's EAA AirVenture was as perfect as it could get

by **David Rawlings**

More than 600,000 aviation fans attended Oshkosh for the annual pilgrimage to aviation heaven, up two per cent on 2017's record.

After the event EAA Chairman Jack Pelton said: "A 'perfect' event may be unattainable, but AirVenture 2018 came about as close as one could imagine. The combination of outstanding programmes, aircraft variety, a robust economy, and good weather combined to complement the efforts of our staff and 5,000 volunteers throughout the grounds. The week was upbeat, exciting, and filled with many 'Only at Oshkosh' moments."

The figures in 2018 speak for themselves. The attendance was around 601,000, leading Pelton to say: "Our efforts to create unique attractions and aviation highlights across the grounds were incredibly successful. Attendance on opening day was the best in our history, as the vast majority of our guests came to Oshkosh early and stayed throughout the week."

More than 10,000 aircraft arrived at Wittman Regional Airport in Oshkosh and other airports in east central Wisconsin. At Wittman alone, there were 19,588 aircraft operations in the 11 days.

The 'one week wonder' was a success again

The number of showplanes was more than 2,900 for the second year in a row. And the campsite was packed. More than 12,300 sites in aircraft and drive-in camping accounted for an estimated 40,000 visitors.

There were also close to 900 commercial exhibitors and 75,000 people visited the workshops and presentations.

But the EAA isn't one to rest on its laurels, claiming that next year will be even bigger and better. "We are celebrating our 50th consecutive year in Oshkosh during 2019, so we'll be looking back on a half-century of unforgettable highlights at Wittman Regional Airport, and planning activities that involve EAA's hometown and its unique place in aviation history. While 2018 is barely in the record books, we're talking to many groups and individuals with intriguing new ideas for aircraft, innovations, exhibits, and events. We're already planning for 2019 and are looking forward to announcing attractions very soon." ■

601,000 people attended this year's Oshksoh. Were you there? Can you see yourself?

CAA CONTACTS OWNERS OF GIPSY MAJOR ENGINES

by **Lucy Field**

The UK CAA has identified a trend in technical occurrences involving rough-running engines and even engine failures in Gypsy Major engines, and is encouraging all owners to ensure they check their engines properly and regularly.

On hearing the news of engines running rough and complete engine failures, the CAA was concerned enough to conduct and carry out some analysis. This revealed an emerging trend of problems with the engines. The use of 100LL Avgas fuel in these engines could be causing reliability problems particularly with cylinder heads, valves and valve seats, especially where bronze cylinder heads have not been modified to incorporate stainless steel valve seats and result in a reduction of component life.

Tiger Moths, Chipmunks and Austers are amongst the aircraft fitted with Gipsy Major engines.

The engine is generally simple and reliable and with the right amount of care should provide operators with hours of trouble-free use.

Owners of these aircraft should be vigilant, especially if the engines appear to be running rough or there is low compression when turning the propeller by hand. Always ensure that only experienced people or companies carry out routine checks on your Gipsy Major engines. This is to reduce the risk of rough-running engines and potential engine failure.

For more information visit the CAA website. ■

IMAGE: Konflikty.pl

Tiger Moth is one of the aircraft types that is fitted with a Gipsy Major engine.

GASCO ELECTS NEW CHAIR

by **Robert Care**

At the General Aviation Safety Commission's (GASCo) recent AGM, Professor Michael Bagshaw was elected as its new Chairman.

Michael Bagshaw is visiting Professor of Aviation Medicine at King's College London and visiting Professor at Cranfield University. He has been an active supporter of GASCo since gaining his PPL in 1965.

After 16 years in the Royal Air Force as a medical officer, Hunter and Jaguar pilot, flying instructor and medical test pilot, he worked as an NHS consultant at St George's Hospital and as a GP in Berkshire. Mike then spent 12 years as Head of Medical Services for British Airways before becoming Director of Aviation Medicine at King's College London. He continued to fly part-time as an RAFVR QFI with Oxford University Air Squadron and a Hawker 800 corporate jet captain at Farnborough. Bagshaw follows Rick Peacock-Edwards who served in the post of Chairman for the maximum-permitted term of six years. ■

LOOK BACK... THIS MONTH 104 YEARS AGO

THE FIRST ARMED AIR-TO-AIR KILL

World War I provided the first opportunity for one airplane to down another. On 5 October 1914, French pilot Joseph Frantz and mechanic/observer Louis Quénault were returning from a mission in a Voisin III biplane bomber. Their aircraft had just been outfitted with a Hotchkiss machine gun, and Quénault, sitting in front, had been instructed to try it out. At 6,500 feet over the French village of Jamoigne, he got his chance. A German Aviatik B.1, flown by Sergeant Wilhelm Schlichting, had been flying reconnaissance over French positions when Quénault spotted it below. Frantz manoeuvred his plane to within 10m of the German. Quenault fired the machine gun, but the gun jammed, so then fired with a rifle. Suddenly, the German plane flipped onto its back and dived towards the ground before exploding.

A flurry of invention and ingenuity followed as the Allies and Central Powers vied for aerial domination. The necessity of war always spurs designers and airmen to test fledgling technology to the limits – and the principle still applies today.

AOPA NEWS HIGHLIGHTS

DRONE MIND FLYING

According to researchers at the Defense Advanced Research Projects Agency, a person with a microchip implant can now pilot drones by sending signals directly from their brain – an ability that also should work for full-scale aircraft. "The signals can be delivered directly back to the brain so that the brain of that user can also perceive the environment," said Justin Sanchez, director of DARPA's biological technology office.

SUKHOI SUPERJET BACK

Following a series of consultations with authorities, suppliers and customers, Sukhoi Civil Aircraft (SCAC) and its patron United Aircraft Corporation (UAC) have begun design work on a completely indigenous version of the Sukhoi Superjet regional jet. The companies have undertaken the development within the framework of a broader import-substitution program ordered by the Kremlin.

THE WHEELS COME OFF

17-year-old student pilot Maggie Taraska had to land her PA-28 without the use of any wheels, after one fell off during takeoff. At the Beverly Regional Airport in the US, Taraska had just lifted off Runway 09 on a solo flight when a Waco that was holding short for departure alerted the tower that "the right main wheel strut and wheel just fell off the plane." Despite being just a student, Taraska walked away with little more than a few aches and pains.

If you don't fly often, this insurance could be for you

PAY AS YOU GO INSURANCE LAUNCHED

There is now a policy for the pilot who doesn't fly frequently

by **Lucy Field**

If you're not flying very often but still want to be safe in the knowledge that your aircraft is protected, then new company FlyCovered could be what you're looking for with their 'on demand' coverage – basically a pay as you go scheme.

The policy from FlyCovered offers comprehensive annual ground cover, protecting the aircraft when it is not in the air for physical loss of or damage to the aircraft (for example: theft, malicious damage or storm damage). This section of the policy also covers the legal liability to others arising when the aircraft is on the ground, including when you are moving the aircraft or running the engines.

Included in the policy is seven days of full flight, which offers cover for private and pleasure purposes – including incidental business or professional purposes – and advanced instruction of the pilots named on the policy, but not for hire or reward. There is also the option to buy additional flight cover; FlyCovered gives you a fixed daily rate that's shown in your quote.

No matter how many flight days you buy, you never pay more than the annual Frequent Flyer quote you receive when you purchase your policy. And if you can't fly, cancel flight cover before midnight the day before you were due to fly and your account will be credited that day.

You manage your policy online 24/7. You will have access to your documents and can do anything from adding flight cover to adding or removing a pilot or aircraft. And you can do it anywhere, on your smart phone, PC or tablet.

"Customers are increasingly demanding more flexible, cost-effective insurance and pilots are now able to benefit from on-demand insurance through the FlyCovered platform," said Paul Brown, chief technology officer at Covered.

"Regulations require pilots to have public liability cover when flying and this cover can be added to the policy even on the same day as you intend to fly.

"Many pilots only get to fly 15 to 20 times a year and traditional insurance policies do not offer the flexibility required for this market.

"With FlyCovered, pilots have access to the benefits of a fully comprehensive policy and can save money by only paying for the flight days they need," he concluded. ■

BIGGIN HILL OFFERING TWO PPL SCHOLARSHIPS

by **Robert Care**

The London airport wants to enable two more young people (between the ages of 16 and 26) to learn to fly and ultimately qualify to the standard of a full PPL.

Applications from young men and women aged between 16 and 26 seeking a professional career in aviation are now invited by the trustees.

The original scholarship winners back in 2014

One scholarship is funded by the family of the late BA Captain Nick Davidson who died of cancer in 2012. Nick's initial pilot training had been at Biggin Hill Airport.

The second scholarship is the Biggin Hill Airport Award, funded by the company that owns and manages the well-known south London airport.

The scholarships, worth £10,000 each include; 45 hours of flying, ground school examinations, instructional books and equipment, and a skills test as well as all the landing and circuit fees needed to complete a PPL.

Those looking to win will need to be able to allocate sufficient time during 2019 to complete the 45-hour PPL course, the associated ground examinations and the final flying test.

Applicants will be expected to explain in a covering letter the particular reasons why they should be granted the scholarship and to provide a CV of career to date.

Short-listed applicants will be required to undergo aptitude tests and a basic pre-medical exam to establish suitability for flight training and award of a PPL.

Applications for the Nick Davidson Memorial Flying Scholarship should be sent by 30 November 2018. Email ndmfs@bigginhillairport.com. ■

WIN A FLIGHT IN A SPITFIRE

by **Robert Care**

The British Aerobatic Association has announced another lottery for a chance for one lucky person to win a flight in a TR9 two-seat Spitfire.

For just £20 a ticket you could win a Spitfire flight experience in the Boultbee Academy's TR9 two-seater. But that's not all. The winner will be taken on one of Boultbee's 50 minute trips, that includes 40 minutes in the air – enough time to head out to the coast from Goodwood and do a full lap of the Isle of Wight, including passing the iconic white cliffs of The Needles.

What's more you'll get the full 'royal treatment' with an overnight stay at the 4-star Goodwood Hotel and dinner for two included in the prize, letting you make the most of the very best this one-of-a-kind Sussex Estate has to offer.

The proceeds from the lottery will be going towards the British Aerobatics team's power and glider training and support fund. This will help the very best of British aviators to prepare for the upcoming European and World Championships. Furthermore a donation will be made to the charity Aerobility, long time friends of both the BAeA and Boultbee, which offers flying training and experiences to disabled individuals.

Tickets are available now and can be obtained by emailing lottery@aerobatics.org.uk. The BAeA requests no person under the age of 16 years is permitted to purchase or sell lottery tickets. ■

Look at this aircraft and try and convince yourself you don't want to fly in it

The Elixir made waves at the recent LAA rally

NEW COMPANY RECIEVES FIRST FLEET ORDER

Start up company Elixir Aircraft has received a new order for 10 aeroplanes

by **David Rawlings**

Airways Aviation Academy, a global flight-training academy, has signed an agreement to pre-order 10 Elixir Aircraft. This pre-order is the recognition of four years of teamwork; it demonstrates the relevance of the Elixir specifications for flight training, as well as Airways' steady growth among top-tier pilot training schools. With hundreds of thousands of commercial pilots needed in the coming years, Airways Aviation Academy is expanding its global footprint, and positioning itself to participate in the global growth with new-generation training aircraft available on the market.

Marwan Atalla, Executive Chairman of Airways Aviation, says:

"The Elixir is a safe aircraft, and has been designed taking into consideration safety, ease of maintenance, low operating costs, and suitability for flight training, which matches our goal to provide optimal training for our students."

Atalla was a shareholder and a board member at Cirrus Aircraft during its development, certification, and eventual production phase, along with a series of primary posts in the global aviation industry in the past 20 years. So far, 51 Elixirs have been pre-ordered, bringing the estimated delivery of the first Airways Aviation Academy's aircraft to 2022. The Elixir fleet will reinforce the teaching capabilities of the school and provide the best in class tools for future commercial pilot students. Founded in 2015, Elixir Aircraft is designing, manufacturing and selling new-generation certified light aircraft. Its project started from a very simple observation: the current fleet of training aircraft is aging. Costly to maintain, with performances and fuel consumption from another century, current trainers do not meet today's flight schools' expectations. In these conditions, to train the 700,000 new pilots needed over the next 20 years is a challenge. To help them, Elixir Aircraft offers more safety, at a lower cost with more polyvalence. How? By making it simple. Usual costs are coming from airframe and systems complexity. Too many parts, too much time spent assembling them. ■


So far 51 aircraft have been ordered

XCUB IN CANADA

by **Lucy Field**

CubCrafters announced that the XCub, has secured type certification from Transport Canada Civil Aviation. The approval allows the company to begin deliveries of both land and seaplane versions of the aircraft to Canadian buyers immediately. A Type Certificate was also issued for the XCub by the Japan Civil Aviation Bureau, and the first XCub delivery has already completed.

CubCrafters obtained FAA Type Certification for the XCub in June 2016.

Certification from EASA followed in April of this year, thereby clearing the way for XCub to enter into service on the European register.

"XCub is finding an ever-larger audience in international markets," said Brad Damm, Vice President of Sales and Marketing at CubCrafters. ■

The XCub is being certified around the globe

FASVIG TO BE RENAMED A4A

by **Robert Care**

In what seems like a rebranding exercise, the Future Airspace Strategy VFR Implementation Group Ltd (FASVIG) has been renamed the Airspace4All Ltd (A4A), which is a lot easier on the mouth..

FASVIG was incorporated in June 2015 to be the legal entity behind applications for funding for what was then the Future Airspace Strategy (FAS). That strategy is now being changed in line with the CAA's new Airspace Modernisation initiative.

The FASVIG name implied implementation and benefits for VFR operations alone. The name change is part of a move to demonstrate commitment to support a wider range of users as well as the Airspace Modernisation Programme. John Brady, a Director of A4A, says: "VFR operations are an essential part of the new Airspace Modernisation Strategy to allow all parts of the United Kingdom aviation to integrate efficiently and seamlessly. Working with the CAA and with NATS, the architect of the modernisation work, Airspace4All will be a focus for policies and plans to deliver that. Integration rather than segregation should be a cornerstone of the UK FIR of the future." ■

VFR is essentinal for GA

WORDS Henry Simpson **IMAGES** Various

RETURN OF THE WOODEN WONDER

With the skies currently void of flying de Havilland Mosquitos, Henry Simpson investigates the team trying to right that wrong

HENRY SIMPSON AOPA SHOP EMPLOYEE TRAINING FOR PPL **18 YEARS OLD** FULL TIME STUDENT

On a bitter February evening I reached the RAF Club where I was to hear about plans to return one of the most adaptable and versatile aircraft ever built to the UK skies. The aircraft is of course the de Havilland Mosquito.

The evening was run by the Mosquito Pathfinder Trust, which received charity status in July 2017. Their aim is "to ensure that the skies over Britain and Europe are once again graced with the sight and sounds of a de Havilland Mosquito." The Mosquito first flew on 25 November 1940 and was one of the most versatile aircraft of the Second World War. Originally envisaged as an unarmed fast bomber, it proved its worth as a pathfinder, a night fighter, a fighter-bomber and even as an anti-shipping strike aircraft when armed with

an impressive 57mm cannon.

It was the largely wooden construction that made it lightweight, allowing it to carry a bombload equal to a B17. Yet the Mosquito could achieve a top speed of 415mph, with the ability to hold its own. Whilst the plywood nature of its construction and its astounding performance gave it the nickname, 'the wooden wonder', the usage of wood also reduced pressure on aluminium supplies which were in desperately short supply.

The evening began with an introduction from the co-founder of the trust, John Merry, who set the tone by stating unequivocally, "There is a hole in our sky". He was keen to express to me afterwards that "nobody is doing it for the money, none of the trustees is drawing anything; it's all about getting that aircraft in the sky." Several veterans were present, amongst whom was Colin Stuart Bell DFC who flew Mosquitos with 608 squadron on Pathfinder missions over Germany. He described how in February 1945, on one of the last of his 13 missions over Berlin, he was intercepted by an Me 262 night fighter. The German fighter was directed by a ground station but once at close range it would switch on its own air-to-air radar set. The Mosquito however, was equipped with a warning device known as a 'Boozer' which told the pilot when he was scanned by the 262's Neptun radar. Colin dived the aircraft downwards in an attempt to shake off his pursuer and only managed to lose him when he was close to rooftop height!

"Our organisation is currently working to build and deliver an airworthy de Havilland Mosquito to the UK. Our fundraising efforts are geared to creating a financial model that will allow the restoration to commence on one, and possibly two, Mosquito projects. The funds will be applied to the appropriate resources, build requirements and flight operations of the aircraft," said Jaques Brooks, principal officer of the trust.

To accomplish their goal the trust has teamed up with Avspecs, the company based in New Zealand responsible for two recent Mosquito restorations.

MAIN: The much-loved de Havilland Mosquito could return to the skies above the UK as soon as 2020

Warren Denholm, who runs Avspecs, showed us around their current project, Mosquito FBVI PZ474, via a livestream. When completed it will be the fourth restored Mosquito to fly. Currently all airworthy Mosquitos are based either in the USA or Canada and there is significant support to see one flying in the UK. The build itself would be contracted to Avspecs and the estimated cost of the project is around £4.8m. Of the two projects currently being considered, the first, a solid-nose trainer variant, would require a 20-month build time and delivery to the UK by mid-2020; while the second, a 'glass-nose' bomber variant, would require a build time of 36 months. At time of writing the identities of these aircraft had not yet been revealed but the trust hopes to make a public announcement within three months.

The trust is grateful to have the president of the de Havilland Aircraft Museum, Philip Birtles, on its board of trustees and discussions are underway to establish an affiliation between the groups.

The decision has been taken to base the aircraft at Duxford, for two main reasons: the first is that the trust stated that it "would like to ensure that the wider British public can have as much access to the aircraft as possible." With Duxford the home of the IWM museum the public can easily access the aircraft. Secondly the trust has entered into an agreement with the Aircraft Restoration Company (ARC) based at Duxford, to provide design authority oversight. ARC, who recently conducted the deep servicing of the BBMF's Lancaster, has industry-leading credentials and "will be working in coordination with Avspecs during the build phase of the project and will be providing services to receive and validate the aircraft for flight in the UK".

It is now looking ever more likely that we will indeed fill the 'hole in our sky', but public support is needed to attain this goal. The trust's principal officer, Jaques Brooks, stated that people can help out by "donating to the project and indeed by spreading the word as far afield as possible."

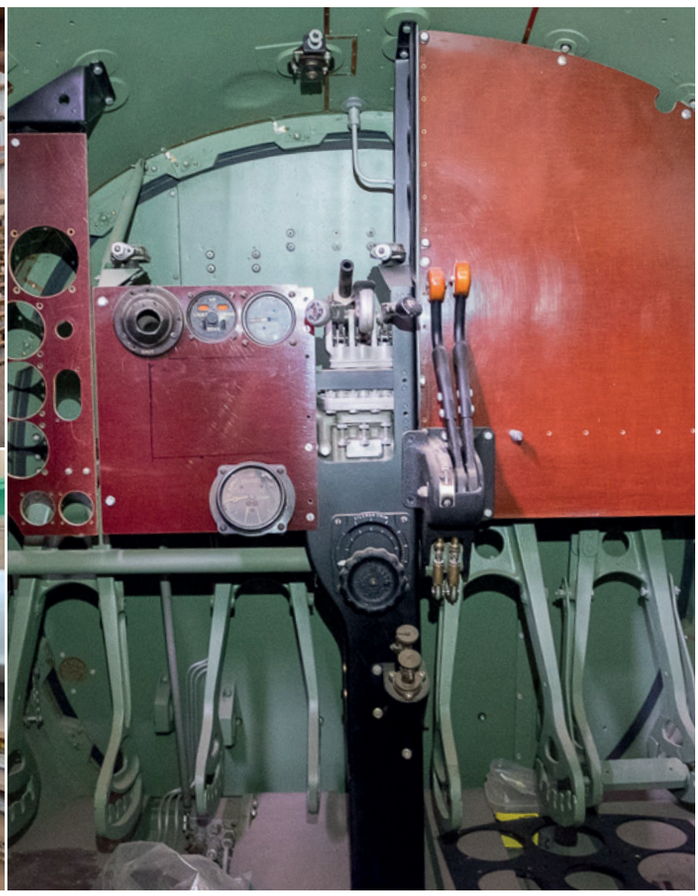
"It is now looking ever more likely that we will indeed fill the 'hole in our sky' but public support is needed"

He adds that: "Many of our followers are now generating exposure for us, which has seen an increase in donations".

Jaques himself has a personal connection to the project. "I have for many years now, had a keen passion for aviation. I studied aircraft engineering and now also work in the private aviation industry. Heritage aviation came into my life when I discovered the BBMF and started to attend air shows with the single intent of seeing them display," he continues. "The Mosquito is the one key element missing from the UK Heritage Flight. I cannot express how much I want to see a Mosquito fly in the UK."

I was grateful to be able to separately arrange to talk to William "Bill" Edwin Evans DFC, a former squadron leader and Mosquito veteran of No. 8 (Pathfinder Force) Group. He confessed that he had never thought about flying until he

BELOW: More than 7,700 Mosquitoes were built from 1940 to 1950 – it was a game changer



ABOVE: The work on the Mosquito will take 20 months from the time the team finds the appropriate aircraft

volunteered, however he soon found himself out in Canada, training under the British Commonwealth Air Training Plan in 1941. In 1944 he volunteered to fly the Mosquito with the Pathfinder Force due to the experience he had acquired in blind flying. Soon he was posted to No. 692 squadron at RAF Graveley, which was part of the 'Light Night Striking Force', formed as an extension of the Pathfinder Force to carry out harassment raids across Germany as well as partaking in bombing raids.

The squadron was equipped with the Mosquito BXVI that had bulged bomb-bay doors to carry a single 4,000lb 'cookie' blockbuster bomb. Bill explained: "We had two weeks flying the Mosquito to get used to the type. We had to do two long-distance flights at high altitude before being declared operational." Due to poor visibility on both his trips Bill never dropped a practice bomb, lest he hit Boston or one of the surrounding towns, so he had never dropped ordnance before his first operation. The story of his first operation in the Mosquito is one of his most memorable and stands as a testament to the aircraft.

The operation in question was to Frankfurt on 26 September 1944, flying at 27,000ft, above the main bomber at 23,000ft. Five minutes from the target Bill opened the bomb doors as he began the run in, however over the target the bomb failed to release and so he went around again with the hang up, they tried again to release the bomb but to no avail. On the third pass he asked the navigator to give him a countdown to bomb release so that at the appropriate moment he could pull the manual release to drop the bomb. This time the bomb was dispatched and they turned for home. The next morning he was summoned before the Station Commander where he learned that the aircraft had returned without the bomb-bay doors! This was later attributed to a known fault with the doors in which they would open wide enough to indicate the doors were open, but not enough to trip the switch to allow bomb release. So when the bomb was jettisoned it took the doors with it. It stands as a testament to the aircraft that without the bomb-bay doors, with essentially a large hole in the underside of the fuselage, the aircraft flew faultlessly!

"He was summond before the Station Commander where he learned that the aircraft had returned without the bomb-bay doors!"

After the end of hostilities Bill flew mail runs in Mosquitos from Blackbushe for the Nuremberg trials. On one such flight his aircraft suffered an undercarriage collapse on take-off at RAF Gütersloh; both engines caught fire and the aircraft was destroyed. Luckily, he escaped unharmed through the roof hatch. Despite what he remarks was the Mosquito's one vice – its tendency to want to swing off the runway due to the torque produced by its two Merlin engines – Bill's overall impression is that it was a "... brilliant aeroplane, beautiful to fly", and he wishes the trust the best of luck with their endeavours to rightly return one to the skies of the UK. ■

WORDS David Rawlings **IMAGES** Magnus Aircraft

Hungary for the future of GA

An in-depth look at one of Hungary's newest and most forward-thinking aviation manufacturers – Magnus Aircraft


HA-XEK
MAGNUS
AIRCRAFT

There are plenty of companies around the world that have one good idea that they subsequently live off for the rest of their days, but not every business models itself on this approach. Some want to develop and improve their product range – they strive not only for perfection, but know they can do better. Some even want to adapt for a brighter, cleaner future. One of those companies is Hungary's Magnus Aircraft.

You may never have heard of Magnus Aircraft, and that's nothing to be ashamed of (visitiors to Aero Friedrichshafen may recognise the aircraft). In aviation terms, they're a 'new' company, founded in 2014 in Kecskemét, Hungary, by Gábor Tarány and Imre Katona.

The fledgling company hit the ground running, and its aircraft – the Fusion 212, a two-seater, fully composite sport and training aircraft (we'll get to the aircraft in a little while) – was just the beginning. Since 2001 the Hungarian manufacturer has not only developed the 212, but it has also expanded.

GLOBAL DOMINATION

The popularity of Magnus' aircraft saw the company quickly grow and decide it needed a much larger global footprint. In 2015 the team made a plan to expand beyond Europe. In 2017, Magnus Aircraft made several large-scale investments; it has set up partnership deals in both Kenya and Australia, and is also constructing factories, assembly plants and offices in Hungary, North America and China, with the aim to '[be] able to satisfy thousands of potential orders in accordance with the requirement of the various markets.' Magnus is also moving to a larger head office in Hungary towards the end of 2018.

"The Fusion 212 is a side-by-side two-seat, fully composite sport and training aircraft"

The Fusion 212 made its US debut at this year's Oshkosh and created a lot of interest. The American version will have the parts manufactured in Hungary but will be assembled at Magnus' US base in Virginia.

THE AIRCRAFT

The Fusion 212 is a side-by-side two-seat, fully-composite sport and training aircraft that has basic aerobatic capabilities. With these features Magnus believes it has created an aircraft in which 'all these qualities haven't been seen together in an aircraft before.'

The Fusion is powered by a 100-horsepower Rotax 912 ULS or iS Sport engine, and a Rotax UL Power 260iSA. It is available with DUC or MT three-blade fixed-pitch, ground-adjustable propellers that conform to SLSA requirements.

The 212 has been built to

Magnus Aircraft is growing on a global scale and has assembly plants in Hungary, the US and China

The Fusion with a traditional Hungarian 'matyó' paint design

A good looking aircraft with aerobatic ability

have the aerobatic load limits of +6/-3G with the UL version able to fly at +4/-2G.

Inside the cockpit it has a single Dynon Skyview Classic 10-inch-diagonal electronic flight information system (EFIS) as standard on the basic aircraft, along with an angle of attack system with a heated probe. It also has steam gauges as back-up. The Fusion benefits from a ballistic parachute recovery system which is also standard on the aircraft.

"When you're on your own you can go out and have some fun. It's very dynamic"

FLYING

Out in America, Magnus Aircraft's Chief Pilot is Charlie Snyder. When he spoke to AOPA.org in the US, he had this to say about the aircraft: "It's a marvellous aircraft," he stated, adding: "This is almost a STOL aircraft." Manoeuvring speed is 110 knots, while the stall comes at 48 knots clean, or 45 knots with full flaps. Seating is semi-reclined and fixed, with adjustable rudder pedals. The UL version has a range of 1200km.

I spoke to Sandor Hazafi, the Sales and Marketing Director of Magnus, who has been a PPL holder for 20 years. He explained that when flying, the aircraft is very stable: "Thanks to its symmetrical wing profile, the machine provides a stable and dynamic flight experience. In addition to this, due to its structure the machine can easily withstand the load +6/-3G, which makes it possible to perform basic aerobatic exercises." He went on to explain that it's very much like a motorbike. "When you have a passenger or pillion, you fly or ride very stably and conservatively, but when you're on your own you can go out and have some fun. It's very dynamic. You move the stick and although it reacts quickly, it also reacts smoothly, it's very nice. I'm not an old guy, but I can remember when I used to move faster and this aircraft reminds me of that. It takes you back to your younger days, but is also smooth," explained Hazafi.

"The first thing that surprised me was the engine. You can take off in a very short distance. When I first flew it, I was expecting it to take a lot longer to get off the ground. We just lifted the nose and we were off the ground quickly," he added.

The aircraft is currently certified in the US and Magnus is currently working on CS-LSA certification, which is expected soon. "We are aiming for the highest certification," explained Hazafi. "This is so people will be able to use the Fusion for commercial flying and flying schools as well. We think that it will be perfect for airliners looking to train pilots. But we believe our main customer base will be private owners."

The Fusion has apron appeal and one of the first

The Fusion is perfect as a tourer, but if you want to crack it up a notch, you can!

things you notice is the big canopy offering a fantastic field of vision. So you can enjoy the view and it is also comfortable so you can fly the 1200km range without getting cramped.

ELECTRIFYING

Magnus seems to be pushing forward in many other ways. The company is currently working on an electric version of the Fusion – the eFusion – believing that customers will appreciate how similar it is to the 212 and UL versions of the plane.

The eFusion is based on the piston engine-powered Fusion aircraft, with its symmetric wing profile, a titanium firewall, and a centre section made of chrome-molybdenum alloys.

The aircraft is powered by a 60kW Siemens electric drive system. The electric propulsion system including motor and batteries were designed by a Hungarian subsidiary of Siemens. The aircraft is entirely battery-powered and has an endurance of approximately one hour.

"When its new production facility in Hungary comes online Magnus will be able to produce 220 aircraft a year"

The eFusion has an empty weight of 410kg and a maximum take-off weight of 600kg. It requires a take-off distance between 120m and 130m, and landing roll from 150m to 200m.

Magnus sees the development of the eFusion as what they claim to be the 'world's first electric, two-seater, sport and training aircraft with basic aerobatic capabilities.' This project has been in progress since 2014 and Magnus has been making rapid progress on it ever since. In under two years since its initial development, the eFusion has made its maiden flight on 11 April 2016 at the Matkópuszta airfield in Kecskemét, Hungary. Magnus believes it will have the eFusion on the market in the near future. "During the design process, the goal was to find such an environmentally friendly replacement for high-performance aircraft that could reduce the harmful emissions, along with the air and noise pollution of the aviation industry. The eFusion is suitable for flight schools as well as for commercial and military for basic, advanced and emergency training," claims Magnus.

THE FUTURE

Along with the eFusion, the company is testing the Fusion 212 with optional accessories that would enable the aircraft to perform agricultural operations, wildlife management, and various monitoring tasks; a Sentinel edition is planned and will include aerial surveillance camera system options. The base model is currently priced at £110,000. The company said it has sold more than 20 aircraft and currently can produce two per month; however, when its new production facility in Hungary comes on line, Magnus will be able to produce 220 aircraft a year.

Magnus won't stop there though – it is also developing a four-seat version, so keep an eye on this company. ■

TECH SPEC MAGNUS FUSION 212

PERFORMANCE
Powerplant: Rotax 912 ULS 2
Propeller: DUC Inconel Flash 3 Blades
VNE: 151kts
Max Range: 1200km
Consumption: 16-21lph

WEIGHTS
MTOM LSA: 600kg
MTOM UL: 472.5kg
Baggage Room: 20kg
Max. Usable Fuel Capacity: 90l
G Limit Load: +6G/-3G

DIMENSIONS
Length: 6.62m
Cabin width: 1.17m
Wingspan: 8.44m
Seats: 2
Max Altitude: 3650m

WORDS Nick Wilcock **IMAGES** Various

THE LATEST ON IFR ROUTES

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

Nick Wilcock has been working hard to explain the latest news and ideas from those that like to change the rules. Here he talks about Performance Based Navigation

On 25 August 2018, the EU regulatory requirements for IR holders wishing to fly in accordance with Performance Based Navigation came into effect. But what is this 'PBN'? Put simply, the idea is that more aircraft in a given time can access IFR routes or fly IFR approaches if the ground infrastructure, aircraft equipment and pilot can meet higher levels of accuracy than was the case in earlier days.

Also some of the older ground-based navaids are becoming very expensive to maintain or replace, so the option of a non-terrestrial-based instrument-approach environment is financially attractive to airport operators, and those responsible for maintaining the navigation infrastructure.

All this has led to the development of GNSS-based approaches of one type or another. Currently, there is a bewildering variety of associated terminology, such as RNAV, LPV etc. However, the bottom line is that if an IR holder wishes to fly any type of GNSS procedure or approach after 25 August, then he/she must have a PBN endorsement included in his/her licence. This can be achieved by meeting the requirements of the CAA's comprehensive guidance regarding PBN endorsement stated in IN-2017/034, which may be viewed as a PDF on the CAA's website.

Basically this states: to fly any PBN procedure an IR pilot must have PBN privileges endorsed in his/her licence.

At the next IR revalidation, if the pilot wishes to be granted PBN endorsement, he/she must submit a copy of the Performance Based Navigation (PBN) declaration form regarding PBN Instrument privileges and areas of knowledge to the Examiner.

On successful completion of the proficiency check (including PBN elements) and oral assessment, the Examiner will endorse the applicant's Certificate of Revalidation as stated in the IN. The Examiner will send the report form and the applicant's PBN declaration form to the CAA, but it is recommended that the applicant keeps a copy.

It is relatively straightforward to identify whether or not an approach is GNSS-based, as the relevant approach chart


PRO 101
.C-GJLP.
134.65
125.60
122.10
373
FEATHER

will obviously state it and will list the relevant aerodrome operating minima. As regards airways though, according to the UK IAIP, the ATS routes catalogued in the table in ENR 3 of the UK IAIP are designed to cater for non-PBN aircraft navigating to RNAV 5, unless stated otherwise. RNAV 5 requires a track-keeping accuracy of not less than 5nm during 95% of the flight time. This value includes signal source error, airborne receiver error, display system error and flight technical error.

IR(R) / IMCR AND PBN

Unlike the IR, requirements for the UK IR(R)/IMCR are regulated by the ANO rather than the Aircrew Regulation. After discussing the situation with the CAA, I have been advised that there is no intention of mandating PBN endorsement for IR(R)/IMCR holders who wish to fly PBN approaches.

This is because the existing guidance to receive appropriate training for a new type of approach from a qualified instructor, and for the avoidance of any doubt, to annotate the pilot's personal flying log book accordingly, is considered adequate. However, IR(R) / IMCR pilots are strongly recommended to demonstrate their PBN proficiency during their next revalidation proficiency check. And why not – provided that you know what you're doing, it would probably be much easier following the information from a modern GNSS navigation system with the correct approach loaded, than battling it out with a rotting old NDB of dubious serviceability with a DI and magnetic compass bouncing around in turbulence!

BASIC IR

About a year ago the draft Comment Response Document for the EASA BIR was submitted to the Agency. Since then they have been working through it. Although, as one of those in the Task Force charged with developing the BIR and drafting the CRD responses, I had zero feedback from the Agency until recently, I have now been advised that EASA is aiming to publish the BIR Opinion in October 2018.

It then has to go to the Commission before it can come into effect; regrettably that has not been a particularly quick process in recent times, so please don't ask me when you'll be able to train for the BIR as I won't be able to tell you. For those who might not understand the purpose of the BIR, you can think of it as an IR(R) / IMCR which also includes flight under IFR in all airspace throughout all EASA Member States. However, unlike the 'recommended' approach minima of the IR(R)/ IMCR, approach minima for the BIR will be mandatory. Theoretical knowledge requirements will also be less than those required for existing EASA instrument ratings and credit will be available for those with previous instrument flight time, such as IR(R)/IMCR holders.

ABOVE: New IFR regulations have now come into effect

"As many of you will now be aware, the regulations for Declared Training Organisations are now in effect."

BIR AND THE DTO?

As many of you will by now be aware, the regulations for Declared Training Organisations are now in effect.

The scope of training permitted at DTOs does not currently include training for the BIR, for the simple and obvious reason that the BIR doesn't yet exist. DTO requirements do not affect national qualifications such as the IR(R) / IMCR and the UK fully intends to maintain the IR(R)/

NCO.OP.110 AERODROME OPERATING MINIMA - AEROPLANES AND HELICOPTERS

(A) For instrument flight rules (IFR) flights, the pilot-in-command shall select and use aerodrome operating minima for each departure, destination and alternate aerodrome. Such minima shall:
(1) not be lower than those established by the State in which the aerodrome is located, except when specifically approved by that State; and
(2) when undertaking low visibility operations, be approved by the competent authority in accordance with Annex V (Part-SPA), Subpart E to Regulation (EU) No 965/2012.
(B) When selecting the aerodrome operating minima, the pilot-in-command shall take the following into account:
(1) the type, performance and handling characteristics of the aircraft;
(2) his/her competence and experience;
(3) the dimensions and characteristics of the runways and final approach and take-off areas (FATOs) that may be selected for use;
(4) the adequacy and performance of the available visual and non-visual ground aids;
(5) the equipment available on the aircraft for the purpose of navigation and/or control of the flight path, during the take-off, the approach, the flare, the landing, the rollout and the missed approach;
(6) the obstacles in the approach, the missed approach and the climb-out areas necessary for the execution of contingency procedures;
(7) the obstacle clearance altitude/height for the instrument-approach procedures;
(8) the means to determine and report meteorological conditions; and
(9) the flight technique to be used during the final approach.
(C) The minima for a specific type of approach and landing procedure shall only be used if:
(1) the ground equipment required for the intended procedure is operative;
(2) the aircraft systems required for the type of approach are operative;
(3) the required aircraft performance criteria are met; and
(4) the pilot is qualified appropriately.

IMCR at least until the BIR is available at your local DTO. Whether there is any possibility of a UK AltMoC allowing BIR training at DTOs to be achieved quickly is difficult to say.

That's because of the unfortunate politics surrounding the June 2016 UK/EU referendum (which I personally regard as utter folly) and its possible effect on pilot licensing requirements in the United Kingdom.

HEALTH WARNING

With the advent of highly accurate GNSS navigation systems, some pilots are becoming tempted to fly personal DIY approaches in IMC to personal minima, regarding the UK IAIP as being merely advisory. However, Part-NCO* of the Aircrew Regulation applies to 'other than complex motor-powered aircraft' (i.e. typical GA aeroplanes) and is indeed 'hard law'. Amongst other things, see the boxout for its statement.

Which means that flying self-designed DIY instrument approaches to an aerodrome without published procedures contravenes EU law. As does using some personal GNSS back-up method when the weather is below the minimum specified for the actual approach you've declared that you're using. It should also be remembered that a VFR-only aerodrome operator might well submit an Occurrence Report if an aircraft makes some form of IFR approach when the weather is below VMC criteria.

AOPA is working to develop GNSS approaches at certain aerodromes and it is hoped that many more aerodromes will soon have some form of GNSS approach in place, but until then you must stick to the published procedures in IMC, no matter how clever you and your navigation system might think you are.

Using it to descend to 1000ft above the highest obstacle within 5nm of your position before continuing under VFR is one thing, but anything more than that requires a published procedure.

* For further reading on this subject, please refer to NCO.OP.100 Use of aerodromes and operating sites, NCO.OP.135 Flight preparation, NCO.OP.160 Meteorological conditions, NCO.OP.205 Approach and landing conditions – aeroplanes and helicopters, and NCO.OP.210 Commencement and continuation of approach – aeroplanes and helicopters. ■

Make sure you're up to date with the current regulations when it comes to IR

MICHELIN'S NEW GA TYRE TO KEEP YOU ROLLING

The company has announced a new, high-performance tyre for piston and turboprop aircraft – the Michelin Pilot

Product Pilot tyre
Maker Michelin

Michelin is launching a new high-performance tyre, the Pilot, designed for piston and turboprop aircraft to provide extra-long tyre life, exceptional tread life and all-weather protection.

The extened tyre life is the result of an improved carcass construction that delivers increased durability and improved resistance to foreign-object damage. The tyre incorporates the latest high-technology, ozone-resistant compounds into the sidewall rubber, whilst the natural contour-mould profile promotes casing equilibrium for improved footprint-pressure distribution in the contact patch.

Commenting on the launch, Robert Sevener, global lead for Michelin general aviation tyres said: "The Michelin Pilot offers state-of-the-art features for piston and turbo-prop applications, and reflects Michelin's proven history of developing ultra-high-performance tyres." He added: "Our customers want a deep tread to achieve more landings and a lighter tyre to improve fuel efficiency and increase range. The new Pilot tyre provides both in this aircraft sector."

The tyre, crafted with highly-durable rubber compounds, has up to 21% deeper skid depth. A natural contour carcass line reduces ply stresses and the tubeless-tyre design reduces the combined tyre-wheel weight and helps eliminate tyre creep (the tyre moving around the wheel hub on touchdown). Michelin claims that this tyre can also be used with a tube, delivering the same performance to pilots who use tube-type rims.

Long-term ozone and UV light protection incorporated into the tyre provides all-weather protection. The two wide grooves in the tyre tread evacuate water efficiently on wet runways, and promote resistance to aquaplaning for safer ops.

The Pilot is currently available in two sizes: 15x6.00-6 6/160 and 5.00-5 6/160. Three additional sizes will be available later in 2018, with a final sixth size currently targeted for 2019. ■

Where michelin.com
Price POA

NEW PILOT WATCH

Product D2 Delta watch
Maker Garmin

Garmin is continuing in its quest to make the perfect pilot's watch with the launch of the D2 Delta PX, D2 Delta S and D2 Delta aviator watch series. New to the D2 aviator watch series, the D2 Delta PX incorporates built-in wrist-based Pulse Oximeter1 for oxygen saturation awareness. Additionally, all D2 Delta watches come with wireless connectivity with compatible Garmin avionics, storage for music playlists and more. These features offer more flexibility, greater connectivity and utility in a compact aviator watch. Carl Wolf, Vice President of Aviation Marketing and Sales said: "Whether you're climbing into a single-pilot cockpit or flying professionally, the D2 Delta transforms the market with exclusive aviation functions and connected features that appeal to every pilot." The D2 Delta PX features an elegant titanium grey diamond-like carbon (DLC) finish on a large, 51mm bezel. Especially useful in-flight and during high-altitude activities, the D2 Delta PX exclusively incorporates wrist-based Pulse Ox to help monitor oxygen saturation levels.

Where garmin.com
Price From $899

A BOOK THAT EVERYBODY SHOULD OWN

Nick Wilcock evaluates the latest book from the CAA – The Skyway Code – and says go get it, it's FREE

Book The Skyway Code
Author Civil Aviation Authority

As stated in the introduction of the book, the CAA's *Skyway Code* is intended to provide General Aviation pilots involved in non-commercial and flight training operations with practical guidance on the operational, safety and regulatory issues relevant to their flying.

Its primary focus is on safe aircraft operations and safe use of airspace, orientated towards the VFR pilot, but it is nonetheless a most useful reference for GA pilots of all aircraft categories.

The *Skyway Code* is composed of sections covering a Pre-Flight Checklist, UK FIR Communications Information, Requirements for the PIC, Pre-flight Preparation, Airspace, Aerodrome Operations, GA risks, Emergencies, Tables and Codes, International Flight and a section titled 'Finding Out More', which provides links to additional material produced either by the CAA or other aviation organisations.

I cannot stress the excellence of this publication too highly! Whether one chooses to browse the electronic version online, to download it free as a PDF or to buy the printed version in handy paperback form from AFE, the *Skyway Code* should form part of every General Aviation pilot's library. Although the CAA intends to keep the online version fully up to date – not an easy task in today's constantly evolving regulatory environment – the vast majority of the information will remain entirely relevant and readers of the printed version can simply refer to the CAA website for any significant updates or amendments.

Those pilots out there who have attended a recent GASCo Safety Evening will have been fortunate enough to have been presented with a printed copy of the Skyway Code free of charge, an added bonus for attending such a thoroughly worthwhile event.

So, if you haven't done so already, go to https://caa.co.uk/General-aviation/Safety-information/The-Skyway-Code/ and download your free copy.

It's not often that you get something from the CAA without needing to pay a penny, so don't delay – do it today! ■

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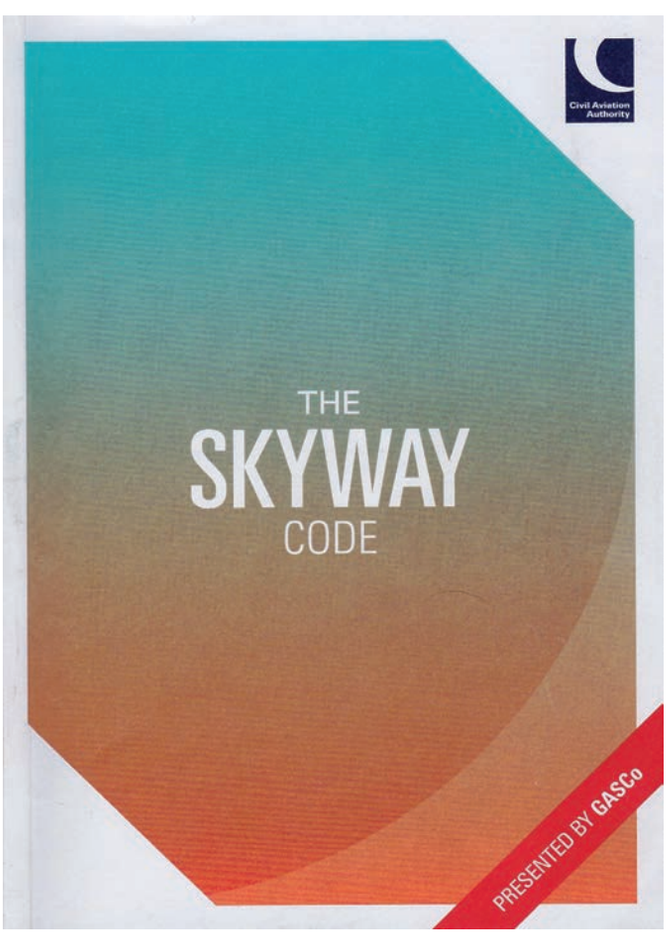

THE FIRST JET FIGHTER

Book The Gloster Meteor in British Service
Author Martin Derry, Neil Robinson

This book covers the full history of the Gloster Meteor. The Gloster F.9/40 was Britain's first jet fighter and as the Meteor F.I became the first jet-powered aircraft of any description to enter service with the Allies in World War II. Several early Meteors were dispatched to Europe in the hope that 1945 might witness the first ever jet-on-jet combats between the first British jet fighter and the much vaunted German jets – a contest which, in the event, was never to occur. Post-war, the Meteor became the backbone of the UK's day-fighter defences, progressing through successive Marks as it did so, until finally being replaced on the front line during the mid-1950s. With its operational career over, the Meteor's adaptability and ruggedness was put to sterling use as an advanced trainer and as late as 1982, a handful were still soldiering on. This book covers it all.

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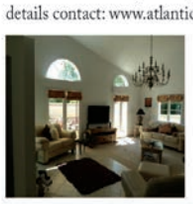

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