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

AOPA UK

Current status of RNP approaches in UK

*The **current state of RNP approaches can be confusing**, so David Chambers – Chairman of AOPA's Members Working Group – explains all*

GIC REVISED
Nick Wilcock on the updates to the Ground Instructor Certificate

GLIDER SITE SAFETY
Chris Fox offers advice on how to fly safely when near gliding sites

THE RARELY SEEN 747
When Henry Simpson spotted a 747 on his flight radar app, he went investigating

MAGAZINE 12.2020
FREE TO MEMBERS
WWW.AOPA.CO.UK

BOSE

AVIATION

PROFLIGHT SERIES 2 AVIATION HEADSET

A20 AVIATION HEADSET

EUROPE HOLIDAY PROMOTION

Get a free set of Bose Alto or Rondo audio sunglasses when you purchase a Bose aviation headset.

Purchase between 30 November 2020 and 9 January 2021 to receive your free Bose Frames.

Exclusive Bose Open Ear Audio™ technology lets you listen to music or take a phone call with sound you'd never expect from your sunglasses. Get a free set of Bose Alto or Rondo Frames – an up to £199.95 retail value – when you purchase a Bose ProFlight Series 2 or A20 Aviation Headset.

PURCHASE AT YOUR LOCAL AUTHORISED RESELLER.

Redeem your promotional item before 14 February 2021 on Bose-Aviation.eu/Europe

Connect with us @BoseAviation

Offer valid with the purchase of a Bose ProFlight Series 2 or Bose A20 Aviation Headset from participating Bose authorised retail resellers in Europe. The promotion is valid from 30 November 2020 to 9 January 2021 and not to be combined with other offers, promotions and programmes, or applied to previous purchases. A maximum of one free-of-charge Bose gift will be available per household (same name and/or address), regardless of the number of Bose aviation headsets purchased. Offer is subject to change without notice. Void where prohibited or otherwise restricted by law. Terms & Conditions available at Bose-Aviation.eu/Europe.

GOODBYE 2020 WELCOME 2021

I'M SURE I'm not the only one looking forward to the New Year. We now have some good news to be optimistic about, at least three vaccines at the latest count, all nearly ready for rolling out. My condolences go to those of you who have lost family and friends from the outbreak of COVID-19, for whom the vaccine will be too late.

Collectively we've all learnt lessons from the pandemic. We might all be whizzes on Zoom and Microsoft Teams now, but that has also highlighted how much we miss the interaction of actually being in the same room as colleagues and relaxing together with friends.

Communities have come together to help the vulnerable in our society and long may that last. We've also learnt who is vulnerable and hopefully will continue to care more about them. Mistakes have been made but even for those of us lucky enough to feel we have escaped relatively unscathed we've all learnt something about ourselves, about human nature and what we may want from the future. Research is already beginning to suggest that people are starting to think differently about how they want to structure their lives moving forward and what they value most from life.

AOPA's challenge in 2021 is to support the recovery of the General Aviation sector, in particular the many businesses that have been hit by the lockdown of private aviation. These include the core constituents of AOPA membership, flight training schools, engineering and maintenance organisations, and flying instructors, whilst not forgetting the operations staff as well as the owners and staff in the airfield cafes we frequent.

Most of you will have read the regular communications from AOPA helping us all make sense of the rules that the DfT and the CAA introduced and where necessary pointing out the inconsistencies; whilst all the time weighing up the risks and promoting a return to private flying in a safe and sensible manner.

Nor should we forget Brexit; AOPA's aim is to reduce the impact of leaving EASA for all its membership. AOPA is, and will continue to be, involved in initiatives to support the growth of General Aviation in the UK. However, there is no doubt all of the aviation sector is facing a downturn and this will result in a ripple effect ultimately affecting General Aviation. There's never been a more important time to be a member of AOPA, to enable us to continue to work on your behalf to protect your rights and privileges and support our membership.

On that note, I want to thank all of you for sticking with us and continuing to be a member, at a time when you probably weren't able to exercise those rights and privileges of flight very much. However, I hope you saw the work that AOPA has been involved with on your behalf, during what has undoubtedly been a challenging time.

I'll take this opportunity to wish you all a merry Christmas with as many friends and family as you can, and a brighter and happier New Year. ■

Pauline Vahey
Chairman, AOPA UK
pauline@aopa.co.uk

AOPA UK

EDITOR
David Rawlings
david.rawlings@aopa.co.uk

ART EDITOR
Dan Payne
dan.payne@aopa.co.uk

SUB EDITOR
Lucy Debenham

CONTRIBUTORS
John Walker,Nick Wilcock
George Done, Henry Simpson,
David Chambers, Chris Fox

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

PRINTING
Ruddocks
56 Great Northern Terrace,
Lincoln LN5 8HL
+44 (0)1522 529591
www.ruddocks.co.uk

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 February 2021 issue should be received no later than 1 January 2021.

INSIDE THIS MONTH

CONTENTS
DECEMBER 2020

EDITOR'S MOMENT

A new year will be here soon and, as is often the case, a promise of trying new things and letting go of the old. So, this will be my last issue as editor of AOPA UK's magazine.

Firstly, I'd like to thank all the board members who have provided so many articles, features, photographs and support during my tenure as editor.

I'd also like to acknowledge all the members who have taken time to write to me with their adventures and suggestions for the magazine.

It's been a fun three years, but I feel it's time for someone to take the magazine in a new direction, one that's more fitting with the organisation, so that all members of AOPA can be proud of their magazine and look forward to it dropping through their letterbox every other month.

So, to all of you, Merry Christmas, happy New Year enjoy your flying, stay safe and blue skies.

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

POOLEY'S
FLIGHT EQUIPMENT

– EST. 1957 –

Official Dealer for Bose & Garmin

POOLEY'S is an Official Dealer for Bose Headsets & Accessories

BOSE AVIATION

A20

ProFlight Headset

ProFlight Headset

POOLEY'S is an Official Dealer for Garmin Mobile Products

GARMIN™

Aera 660 GPS

NEW

Aera 760 GPS

Ultra 30 VIRB Camera

D2 Delta S Aviator Watch

D2 Delta PX Aviator Watch

SHOP ONLINE AT WWW.POOLEYS.COM FOR ALL YOUR FLYING EQUIPMENT

Spark Plugs

Oil Filters

Aircraft Batteries

Bacoban PPE Products

AOPA Members get a 5% discount. Use the promotional code 'AOPA' online.

www.pooleys.com

Freephone: 0800 678 5153 | **Email:** sales@pooleys.com | **Web:** www.pooleys.com

WE'VE BEEN IN THIS SITUATION BEFORE

FROM 1 JANUARY 2021 we will have left the Customs Union, and as an independent sovereign state, EU rules will no longer apply to the UK, including the four freedoms: movement of goods, labour, capital and services. Whilst we are still waiting to hear if a trade deal will happen, the considered opinion of experts is that any deal is likely to be a very thin agreement and may be just a face-saving exercise for both sides.

There seems to be a collective belief in GA that everything will be alright. That may be true but the difficulty for business is in planning for next year and without a degree of certainty, investments will suffer. The UK institutions are preparing us for a no-deal exit and from 1 January 2021 the UK becomes its own customs and excise territory, which means there will be changes on how we fly in and out of the UK. AOPA is pushing for information to be made public by gov.uk so that you will be able to read what you will be required to do by the UK government. What we do not know is what the EU will require. European pilots flying into the UK will need to seek prior approval along with anybody wishing to visit the UK therefore it seems likely that the EU will require the same from us.

Those wishing to bring into the UK goods above a certain value, will be required to use customs-designated airports where you cannot use an aerodrome that has a Certificate of Agreement with Border Force.

When I look back over the past 30 years, I have witnessed first-hand how GA has always adapted to change and I'm certain that we will adapt again and adjust to a new environment, although it may take time to recover the previous activity levels due to the exit and the impact of COVID. I do know that at each major change, costs have increased and the assumed benefits have in some areas failed to materialise, for example, MEP aircraft ownership declined as did the number of night ratings and IMC ratings. These changes also led to a loss of experienced instructors and examiners due to the higher CAA charges and fewer courses and tests.

"The CAA needs to consider doing an in-depth review of existing regulations affecting UK General Aviation"

In 1990 the CAA was a member of the Joint Aviation Authorities (JAA). This was in effect a club of regulators where one of the goals was to achieve a high level of harmonisation in regulations across Europe. It was agreed that safety could be improved and costs lowered. However, the JAA system failed because of the different national legal systems, interpretation and difficulties with translation.

The European Union saw a way to improve the JAA system through the development of European regulations; the ones that are agreed become law in all EU member states without further ratification. However, there was a need for another body and in 2002/3 the European Aviation Safety Agency was established; its role was to develop the rules that underpinned the regulations, in effect making new regulations work.

During the period leading up to the establishment of the agency the different EU member states were 'horse-trading' on which agencies they wanted based in their domain. The UK was more interested in having European College of Police Training in the UK rather than EASA. Eventually Germany provided the location for EASA in Cologne whilst France effectively supplied the directorate.

Having been told for years that the new regulations would improve safety through a single rule book for Europe, we are now being invited by the CAA to suggest changes that may lead to a more efficient system for UK GA.

When you consider how much effort, manpower and money goes into improving flight safety, and all the years we have been doing this, it seems to be the case that the UK regulator may be saying we've over-regulated the activities of GA and now we want to do something about it.

The CAA needs to consider doing an in-depth review of existing regulations affecting UK General Aviation, keeping those regulations that actually provide benefits and removing those bits of legislation that just create additional bureaucracy and cost to our activities.

The UK is a signatory to the ICAO and so long as we maintain compliance with its standards we will be able to retain our international flight privileges. It will be difficult for the UK to establish bilateral agreements with other individual European states on aviation matters as the EU represents these states on a collective basis, which underpins the strength of unity. So I do think that we will see a change in how Europe treats the United Kingdom on aviation matters in the near future but I hope that we will soon be able to see constructive dialogue again. Even though we will not be members of the political European Union we are still a member of other European institutions, such as the European Civil Aviation Conference (ECAC) and Eurocontrol. In my opinion these institutions will play an important role in the activity of DfT in the years ahead.

As we approach Christmas and the New Year, I wish to pay tribute to all the frontline workers for the extraordinary effort and sacrifices made. It is all the people of this country who make it Great Britain so I look forward to a better year in 2021 and wish all our members a happy and safe festive season, wishing all greater success in the years ahead. ■

Martin Robinson
CEO, AOPA UK
martin@aopa.co.uk

HAYWARD AVIATION

SUPPORTING FLYERS, WITH CONFIDENCE

AVIATION INSURANCE BROKERS
WORKING FOR OUR CLIENTS SINCE 1992

For more information:
+ 44 800 138 7524 www.haywards.net

HELPING YOU STAY FLYING

Welcome to the **AOPA COMMUNITY** section of the magazine, bringing you all the **NEWS AND INSIGHTS** from the world of AOPA...

WORDS David Chambers

THE BIG ISSUES FROM THE WORLD OF GA

Despite the new lockdown looming the AOPA Members' Working Group meeting still went ahead, via Zoom

Saturday 27 October saw plenty of members online to discuss the issues affecting AOPA and the world of General Aviation

GROWING PARTICIPATION

Following our successful introduction of Zoom in July, I'm pleased to report an increased attendance of 35 in October. Without the need to travel, the meeting is much more accessible to AOPA members across the country and I'd encourage more members to give it a try. You are all invited and most welcome to attend, even if only to listen. Just email me (David.chambers@aopa.co.uk) any time before our next meeting (which lasts three hours) on Saturday 23 January 2021.

Once again, we made use of the chat facility to share comments, make points and suggest questions simultaneously with presentations. Most of the meeting documents were prepared and sent out a few days prior. The downside is the lack of those impromptu side-meetings and informal discussion that can only be done in person. Hopefully we'll be able to hold an in-person meeting next year but otherwise we'll continue with the Zoom format.

Timekeeping went well with the meeting including a couple of comfort breaks and closing on time after three hours.

BREXIT

Clubs and flight-training organisations have been quite busy since July although it is unclear how long that will continue for commercial training after the New Year, due to Brexit. UK ATOs cannot be approved to run EASA training courses until January although around 30 have applied to do so. It is unclear which EASA CAAs will provide oversight.

UK CAA will recognise foreign EASA licences and certificates until the end of 2022 and continue to operate using their own Part-FCL licences and legislation alongside existing UK national licences. A bilateral agreement with EASA will be sought.

Many commercial pilots have changed their state of licence issue (SOLI) to other countries, such as Ireland or Austria, to retain privileges to fly non G-reg aircraft and/or to instruct and examine for EASA qualifications. Most intend to hold a UK-issued national licence at the same time, although that will increase costs.

There is likely to be a Brexit Red Tape Challenge in 2021. Alleviations may include allowing Personal Medical Declarations for 'EASA' aircraft in UK airspace permanently and extension of the IMC Rating beyond September 2021.

Maintenance of G-reg aircraft abroad and of EASA registered aircraft in the UK is likely to become more difficult.

AIRSPACE CHANGE

The CAA is rewriting its Airspace Modernisation Plan

"However progress has been made and several new approaches are likely to be available from spring 2021..."

before the year end.

The CAA would like to mandate ADS-B out at 1090 MHz by 2024.

A subsidy for Electronic Conspicuity devices has been launched. This covers 50 per cent up to £250 for products such as SkyEcho and PowerFLARM. Strangely, the CAA has also chosen to subsidise PilotAware, which transmits a proprietary protocol rather than ADS-B out, issuing a confusing statement that it was up to pilots to determine what was most suitable for them. The concern is that it may lead to pilots having to spend more, should the ADS-B mandate come into force.

GNSS APPROACH PROCEDURES

There has been little visible progress on this despite a high-level directive from Grant Shapps to make progress. However, progress has been made and several new approaches are likely to be available from spring 2021 including Kemble, Bournemouth, Leeds East, Sherburn-in-Elmet, Haverfordwest, Cumbernauld and Denham. Read elsewhere in this magazine for more details.

FCL ISSUES

Nick Wilcock explained that the UK CAA has stated that it does not plan to issue any further COVID-related extensions.

The UK CAA has confirmed that Annex 1 aircraft approved for training may also be used for Skill tests, Proficiency

Checks and Assessments of Competence. It is planning to permit specific ex-CofA and ex-military aeroplanes to be used for paid-for ab-initio pilot training for non-owners, with the LAA delegated as the competent authority.

PPL theory exams have all been administered through the e-Exam system since 5 October. Only Ground Examiners are permitted to log-in and operate the system, during which time they must be present. Examiners do not see the questions themselves. Unlike ATPL exams, they are required to subsequently debrief candidates on the areas reported as deficient.

The introduction has exposed a shortage of Ground Examiners. The CAA fee has been reduced to £125 for three years, and any Flight Instructor (not CRI or IRI) supported by their ATO/DTO may apply to become one.

Alternatively, anyone can complete the AOPA Ground Instructor Course and qualify as a Ground Examiner. This may be useful for administrators and other support staff. Any ATO approved to run Flight Instructor courses can deliver this course, subject first to being approved by AOPA. The AOPA Training and Education Committee is reviewing the AOPA Ground Instructor Certificate, which the CAA has strongly welcomed.

The Members Working Group meetings have moved to Zoom

CHAIRMAN'S REPORT

Pauline Vahey discussed the sale of 50a Cambridge Street, which has been AOPA UK Headquarters for several decades; it is close to completion, and moving towards exchange of contracts. There were four offers, of which two were more than the asking price of £1.5 million. The property will revert to a domestic dwelling. AOPA staff have moved out and are working from home.

Owning a property has been very worthwhile, not just because of the enormous growth in capital value over that time but also because of the stability and continuity. We have not been at the whim of a landlord who could close down and require us to leave, nor tied in to a long leasing agreement.

Although no commitment has been made, we have been viewing a commercial property in a business park in Kemsing, about ten miles east of Sevenoaks. It is within walking distance of a railway station. This has flexible space for meetings or running courses, and we would plan to fully equip it with the latest video-conferencing technology so we can run Zoom meetings, with people attending both on-site and remotely.

COVID-19

One of the side-effects has been a huge demand for Flight Instructor courses, with waiting lists now stretching up to 12 months. This will lead to a surplus of FIs and subsequently drive down fees, but those who qualify may not find work easily.

CFIs may be wary of those who might return to commercial work as soon as any is available, those who are unrestricted and require supervision, and those who may have little recent experience in SEPs.

MAINTENANCE

Malcolm Bird reported on the Maintenance Working Group, emphasising how important it is for all parties to talk to each other to avoid misunderstandings and disputes. Buyers continue to be emotional and skimp on pre-purchase inspections. AOPA deals with various enquiries from members and assists on an individual basis, which is often not well known but of great value to those concerned.

The continued use of leaded fuel (AVGAS 100LL) is a potential time-bomb. Globally some 1,500 tons of lead is consumed annually, almost entirely manufactured from a facility in the UK. There have been various attempts to find a suitable replacement since 1990, specifically the US PAFI program. A Swedish solution has been developed but had no take-up in North America and has not been approved by EASA. UL91 could be used by 65 per cent of aircraft engines, although both engine and fuel systems require approval.

AOPA and LAA through GAAC (General Aviation Awareness Council) are jointly pushing the Department of Transport to adopt a four-pronged approach:

- Make it easy for pilots to know if they can use UL91 (placarding aircraft).
- Infrastructure to supply/store UL91 at airfields (e.g. subsidised bowsers). This could also be aligned with fitting charge points for electric aircraft.
- Remove or reduce VAT for unleaded fuel.
- Find solutions for incompatible aircraft (e.g. high-compression engines).

There was a lot of interest in this topic, prompting questions from members and subsequent follow-up.

WRAP UP AND CALENDAR SCHEDULE

We agreed that the next meeting of the Members Working Group will be held using Zoom, on Saturday 23 January 2021.

We also proposed dates for next year and they currently are: 20 March, 26 June, 23 October. All AOPA members are welcome and encouraged to participate. ■

WORDS George Done **IMAGES** Various

PROP STRIKE!

What you should and shouldn't do when something hits your propeller

THERE IS nothing quite like a propeller strike to cause sudden disruption to one's flying plans! The topic has come to the fore at AOPA recently with requests for information and advice from aircraft owner members who have recently suffered such an unfortunate event. There is insufficient evidence to show that the pandemic lockdown and subsequent loss of flying currency is a definitive underlying factor, but it could be.

The Fixed Wing Occurrence Listings from the CAA cover a multitude of events, most of them on infringements, but a small fraction involve prop strikes. Those for September 2020 reveal 18 such events, 14 (three-quarters) of which were landing accidents. Six of these resulted from a heavy landing and undercarriage collapse, four were from landing wheels-up, and another four from a runway departure or similar. The remaining four were from an over-enthusiastic take-off in a taildragger, taxying into a tie-down barrel, failing to remove a towbar, and an aircraft tug being driven into a stationary aircraft.

"Whatever the cause, unless the damage to the propeller is minor, the aircraft is rendered unairworthy"

INSPECTION NEEDED

Whatever the cause, unless the damage to the propeller is minor, the aircraft is rendered unairworthy and an engine examination must be undertaken to assess and repair any damage. Permanent deformation of the crankshaft, especially in the flange area and front end of the crankcase, is a possibility whether or not the propeller was rotating at the time. In the majority of cases with the propeller rotating, the sudden deceleration of the moving parts and subsequent high inertia loads makes it necessary to subject all relevant engine components to a visual inspection and non-destructive testing (NDT) where appropriate. The latter is aimed at detecting cracks that could otherwise lead to catastrophic failure through fatigue later on in the life of the engine.

This obviously involves removing the engine from the aircraft and shipping it to an accredited overhaul facility for a strip-down and shock-load inspection. Once all the parts have been cleaned, inspected as above, and laid out, a report on the condition can be produced, together with a programme of work and list of parts needed to restore the engine back to airworthiness. It is mandatory for some parts to be replaced by new ones (e.g. con-rod nuts and bolts, main and big-end bearings), but, leaving these aside, and the propeller, which would have to be replaced anyway, several other parts may be found to have suffered from 'wear and tear' and need either replacing or remedial work. Some of these can be expensive items. For example, it is not uncommon for the camshaft to be worn beyond tolerance with one or more lobes worn and maybe showing signs of spalling. This is likely to go hand in hand with worn tappet faces, possibly to the extent that visible pitting has occurred. These are obvious candidates for replacement, and it is not unusual for it to happen when the total engine hours are relatively low compared with the manufacturer's recommended life, especially if the pattern of use has been such that a degree of internal corrosion has been allowed to develop. Cylinder barrels may be found to be worn, allowing blow-by, and an overhauler would very likely recommend honing and fitment of new piston rings.

The majority of prop strikes occur with a heavy landing

MONEY MEN COME IN

It is at this stage that a loss adjuster, appointed by the aircraft insurer, enters the process to decide upon what the insurance company, under the terms of the schedule, will cover financially – and what it will not.

It is the cost of the non-incident related repairs that can come as a shock to an aircraft owner, who is already braced to paying the agreed deductible or excess.

This cost covers basically everything that has been subject to normal wear and tear, and needs either renewal or remedial work. Were it not for the crankcase having been split and the innards of the engine revealed, the wear and tear may otherwise not have been known about, possibly not for many hours of flight time, unless indicated by oil debris analysis at a regular maintenance check, or other evidence.

There are some circumstances in which the insurer's term 'betterment' may come into play – for example, if the camshaft were to have been found deformed as a result of the prop strike, then, as only a new one can be fitted, the owner has to pay proportionately for having received a 'better' item than the one it replaced.

It needs hardly to be said, but dealing with the aftermath of a prop strike is a salutary experience, whether the aircraft is under sole ownership or group-owned. Accidents happen, whatever the circumstances, but one way of minimising the risk, from the statistics mentioned above, is to keep on top of those landings! Whatever happens, a prop strike is a significant issue and should be properly reported to the Safety Reporting Portal as well as your maintenance organisation and then the proper remedial work carried out. Don't be tempted to cut any corners. ■

TOP THREE
TIPS AND ADVICE

1 TORCH AND TOUCH METHOD

When completing a walk-round check, use a torch and touch those parts of your aeroplane that are difficult to see, such as enclosed control surface mass-balances and in retractable undercarriage bays.

2 TYRE PRESSURES

Don't just kick tyres, use a tyre pressure gauge to see what the pressures actually are, check the owner's handbook, and pump them up if need be. Whilst there, check the creep marks. If the tyre has rotated more than a few mm, it might be placing huge stress on the inner tube.

3 MAINTENANCE AND ENGINEERING INFO

There is a wealth of useful information on the AOPA website www.aopa.co.uk, check out under 'Go Flying' then 'Aircraft and ownership' for aircraft purchase, pre-purchase engineering inspections and aircraft maintenance.

AOPA FLYING INSTRUCTORS REFRESHER COURSES

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 Course and pass an assessment of competence.

NEXT DATES

The next dates for the course are

9–10 March 2021

Approval has now been obtained from the CAA to run this Flight Instructor Refresher Course using Zoom on a one-off basis due to the current pandemic. It is therefore imperative that any candidate is up to speed on using Zoom prior to commencing the Course. Further information can be obtained from Course Administrator, John Pett, on 07754780335. Please book the Course online at www.aopa.co.uk

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 Matt Lane **IMAGES** Various

FOCUSSING ON YOUR MEMORY CHECKS

Matt Lane explains how to ensure you keep your memory sharp, which will make you a better pilot

IN AVIATION we have to remember and practice lots of drills, actions and checks – sometimes in quite time-pressured scenarios such as emergencies or near to the ground in the circuit. One of the common techniques is to use mnemonics.

A mnemonic is a tool that helps us remember certain facts or large amounts of information. They can come in the form of a song, rhyme, acronym, image, phrase, or sentence. Mnemonics help us remember complex things and are particularly useful when the order of things is important.

"Instructors should be rather more mindful of a diverse audience these days – a jokey rhyme may not be appropriate for all"

The word 'mnemonic' is derived from the Ancient Greek word mnemonikos, meaning 'of memory, or relating to memory' and is related to Mnemosyne (remembrance), the name of the goddess of memory in Greek mythology.

Most commonly we remember a phrase or string of letters that help us sequence through actions or considerations when we are flying. Common examples are the in flight routine 'FREDA' (Fuel, Radio, Engine, Direction, Altitude) checks, pre stalling 'HASELL' (Height, Airframe, Security, Engine, Location, Lookout) checks or 'CBSIFTBEC' (Controls, Ballast, Straps, Instruments, Flaps, Trim, Brakes, Eventualities, Canopy) pre-flight checks for the glider pilots amongst us.

Sometimes people also layer on a rhyme or saying to remember the letter sequence. Those of a certain age may have heard of 'My Friend Freddy Has....' etc. for Chipmunk pre-landing checks! However, Instructors should be rather more mindful of a diverse audience these days – a jokey rhyme may not be appropriate for all.

This also leads me onto

Matt believes adding 'location' to the FREDA checks could help students enormously

Memory checks improve your piloting ability

whether a generic mnemonic is always appropriate.
One of my pet hates is the generic 'downwind check' of 'BUM-FFF-ICHH' (Brakes, Undercarriage, Mixture, Flaps, Fuel pump, Fuel, Instruments, Carb heat, Hatches, Harnesses) which still seems to get used a lot.

PRE-LANDING BETTER THAN DOWNWIND

My first point is that it is better to consider a 'pre-landing' as opposed to 'downwind' check. Okay it may seem pedantic, but we do approach for landing from various positions and often not always from a downwind leg (even sometimes from instrument approaches).
I think it is best to get in the practice and language of a 'pre-landing' action from the start, especially with students, lest checks get missed during different approach types. My second point is that I think for the pre-landing check it should be tailored to the aircraft type and not generic. Often pilots merrily go through saying 'Undercarriage fixed' and 'Prop fixed' on types like PA28s which adds no value at all really. Moreover, there is a danger that lots of hours doing this can inbreed a subconscious skipping of this check so when our hapless pilot goes on to fly a retractable or variable pitch machine, they skip over a required element without a proper check or action.
It's a discussion point – I'm sure many out there may disagree?!

It is also worth considering that generic mnemonics can need modernisation.
I mentioned the gliding CBSIFTBEC check earlier. Well, for many years this used to be CBSIFTCBE. However, since January 2019, the British Gliding Association Executive Committee accepted a recommendation from the Instructors Committee to modify the BGA pre-flight check list to move 'canopy – closed, locked and doesn't open with applied pressure' to the end of the checklist. As a result, CBSIFTCBE changed to CBSIFTBEC.

The change followed an analysis of incidents and accidents related to inadequate pre-flight preparation and recognises the widespread practice (normalised deviance) of closing and locking the canopy just before launching, for example, in warm weather and during the winter where there is a risk of canopy misting ahead of launching.

Personally I also teach 'FREDAL' check to students. This adds Location onto the FREDA check. This covers:
- Where am I?
- What airspace do I need to watch here?
- Where is home or the nearest diversion?

I think this adds a useful situational awareness Threat and Error Management dimension to the routine checks, and can also be a useful prompt to safely bring a GNSS/Moving Map scan into the cockpit work cycle.

My recommendation to readers is to have a think about what mnemonics you may be using and check that they are still appropriate and useful to you. One operation I fly for has a detailed mandated rejoin check – the problem is that it is really for IFR recoveries and could be much simplified for a visual rejoin, two checks would probably be more appropriate.

WHAT'S IMPORTANT

It is also worth a think about what checks and drills should be memory items – sometimes called 'boldface' in checklists – and what can be done from a checklist. Some checks are important to be done from memory because of time pressures such as in an EFATO situation, or at a phase of flight when you need to be looking out and carefully handling the aircraft. However, some may be better taken in a more controlled fashion using the checklist rather than relying on memory – for example, many electrical failure or radio failure drills can be a little complex but are not that time sensitive; fly the aircraft then get the checklist out (or use a companion of available) to carefully run through and check your actions.

"A student once crashed a C152 because he experienced a Low Volt light illuminate and rushed an emergency landing, diving at speed onto an airfield"

A student once crashed a C152 because he experienced a Low Volt light illuminating and rushed an emergency landing, diving at speed onto an airfield without any checks or real analysis of the situation. It is worth watching some of the online videos you can find if commercial pilots in sim training or for real – their emergency handling is very calm, controlled and precise – initial memory actions and then backed up with checklist as appropriate.

As ever, I hope this stimulates some thought and debate. 'Adopt, Adapt, Discard' to your operation as you wish! ■

Don't rush your checks – make sure you're safe

WORDS John Walker

THE LATEST NEWS ON UK AIRFIELDS

THERE ARE airfields across the UK currently under threat from developers and local councils. Here are the latest developments, updated 11 November.

MANSTON

On 9 July 2020, the Secretary of State approved the granting of a Development Consent Order (DCO) to River Oak Strategic Partners (the site owner) for the aerodrome as a Nationally Significant Infrastructure Project. As the result of a successful claim, a Judicial Review challenging the Secretary's decision will take place. On 9 July 2020 Thanet District Council adopted its 2031 Local Plan that safeguards the existing use of the site as an aerodrome.

OLD SARUM

Site owner's planning application for housing development and 10 additional hangars refused on appeal in a Planning Inspectorate decision letter dated 11 July 2019.
The owner applied for a Judicial Review of this decision but in July 2020 the High Court refused to overturn it. Multi-year agreement reached with effect from 1 February 2020 for site to be used as a parachute centre. Aerodrome now unlicensed and closed, without express approval, to all movements.

RAF HENLOW

Future of the site being progressed by a partnership between the DIO and HE.
Site earmarked for mixed use/specialist employment development in Central Bedfordshire Council draft 2035 Local Plan Part 2, submitted for Public Examination on 30 April 2018 with public hearings ending on 25 July 2019. Flying operations notified as suspended until 26 December 2020.

MOD SPITALGATE 2024

Prince William of Gloucester Barracks.
Future of the site being progressed by a partnership between the DIO and HE.
The site has been earmarked for a Garden Village-style settlement in South Kesteven District Council 2036 Local Plan, adopted by the Council on 30 January 2020.

NOTTINGHAM CITY (TOLLERTON)

With the support of the landowner, site earmarked for up to 4,000 homes in Local Plan adopted by Rushcliffe Borough Council on 8 October 2019.

Public consultation ends on 20 November 2020 into development proposals to the north and east of the aerodrome in preparation of a planning application being made by Christmas, which will include a sitewide masterplan.

MONEWDEN

Due to close by Christmas 2020, with owner citing the main reason being the "constant gripes from the council re planning and moaning from the local few". ■

GIVE YOUR LEGACY PANEL NEW LIFE

Avidyne's FMS/LPV with ADS-B upgrade solution provides more features, increased capabilities, and a reliable performance proven by even the most experienced pilots. Upgrade your legacy flight deck in days not weeks saving you on downtime and installation costs.

Compatible with most legacy EFIS systems including Primus 1000 and Pro Line 21™.

CERTIFED, IN STOCK & READY TO SHIP!*

Visit **http://avidyne.com/business-aviation-europe** for a list of Authorized Certified Dealers.

See Avidyne's FMS/LPV upgrade solution in action **Avidyne.com/videos**.

* CITATION 500 SERIES, KING AIR AIRCRAFT

Call: **800.AVIDYNE (284.3963)**
Email: **sales@avidyne.com**
Visit: **http://avidyne.com/business-aviation-europe**

AVIDYNE®

CAA medical applications will soon be made online

CAA MEDICAL SERVICES MOVE ONLINE FOR 2021

From March pilots looking to self-declare medicals will be able to do it online

by **David Chambers**

UK PILOTS applying for or renewing a Class 1/2/3 or LAPL Medical Certificate and those wishing to make a new Personal Medical Self-Declaration will need to use a personal online CAA Customer Portal Account after February 2021.

The CAA plans to launch its new online CAA Medical Records System (Cellma) at the beginning of 2021. It will replace all existing paper-based application forms and allow Medical Certificate Holders to view their own medical records and track the progress of applications and referrals to the authority.

Many pilots already have access to online services through the CAA portal. It tracks all ratings for professional (ATPL/MPL/CPL) licence holders, administers exams and records results for all ATPL/CPL/IR. In October, the portal added all PPL e-Exam students and anyone applying for a rebate for an Electronic Conspicuity Device.

In order to regulate the flow of new CAA portal registrations, all Medical Certificate holders will receive an email at least 12 weeks before their expiry date. Full instructions will be given on how to create an account, which involves uploading scans or photos of two identity documents such as a passport, driving licence or utility bill.

"You will still be issued with a paper certificate by your AME in the same format"

When Cellma launches, the CAA charge for your Medical Certificate application will be paid directly to the CAA instead of being incorporated into the fees that your AME has to pay to the CAA. The charge, which applies to Class 1/2/3 and LAPL medical certificates, will be payable by credit or debit card when you complete the online application form, using the secure Worldpay payment site. There has been no change to the charges payable in the current financial year.

You will still be issued with a paper certificate by your AME in the same format. You can still visit your GP for a LAPL or visit a non-UK AME for your next medical, but in all cases you will need to apply through the new system first.

This is part of a longer-term CAA initiative to migrate services online, with the intention of delivering more efficient licencing processes.

Reference: https://www.caa.co.uk/medical/ ■

KLEIN AIRCAR FLIES CIRCUITS

by **Robert Care**

SLOVAKIA-BASED KleinVision's AirCar has successfully completed its maiden flight by soaring 1,500 ft in the air. Weighing 2,425 lb, this flying car is powered by a 1.6L BMW engine generating 140 hp, enabling it to hit a maximum speed of 124 mph. There's just one issue with the prototype: it requires at least 984 ft of runway to take off, but once in the air, its single propeller does the job, while the unfurled wings help it fly through the skies.

Once flight testing is completed, they will fit the prototype with a more powerful engine and hope to start selling the flying car by May 2021. There's no word yet on pricing, but the company says the AirCar will allow you to arrive at your destination without the hassle of getting a ride to the airport and passing through commercial security. ■

The cool-looking KleinVision AirCar

VOLTAERO SELECTS SONACA TO DEVELOP AIRFRAME FOR ITS HYBRID AIRCRAFT

by **AOPA News Team**

THE AIRFRAME for VoltAero's Cassio hybrid-electric aircraft will be developed by Sonaca Group, applying this Belgium-headquartered company's expertise in optimised aerostructures to the VoltAero family of 4, 6 and 10-seat aeroplanes.

Under terms of the agreement, Sonaca Group will transition Cassio from its current design status into a production-ready definition, and will oversee the aircraft's manufacture by an aerostructures producer to be announced at a future date.

"Our partnership with Sonaca Group takes us one very important step closer to production," said Jean Botti, VoltAero's CEO and Chief Technical Officer. "It continues our excellent progress in evolving a family of hybrid-electric airplanes – building on the flight evaluations now underway with VoltAero's hybrid-electric power module aboard our Cassio 1 testbed aircraft."

VoltAero's proprietary design for Cassio is based on a sleek, aerodynamically-optimised fuselage with a forward fixed canard and an aft-set wing with twin booms that support a high-set horizontal tail. Propulsion will be provided by a hybrid-electric power module in the aft fuselage "pusher" position, which integrates a cluster of electric motors with a high-performance internal combustion engine that serves as the range extender.

Hugues Langer, Sonaca's Chief Technology Officer, added: "Through our teaming arrangement, VoltAero will benefit from Sonaca's capabilities as one of the world's top 10 aerostructures companies, bringing our experience to transition Cassio from design into a production-ready aircraft."

Cassio aircraft will be built on a final assembly line in the Nouvelle Aquitaine region of southwest France, with VoltAero leading a growing team of world-class partners and suppliers. Licensed production opportunities will be pursued in North America and Asia.

Deliveries are targeted to begin in 2023, starting with the four-seat Cassio 330 version. ■

LOOK BACK... THIS MONTH 79 YEARS AGO

P-38 LIGHTNING TAKES FLIGHT

Before the advent of the Lightning, American fighter design had changed little since the earliest all-metal monoplane designs. But Kelly Johnston's P-38 would be twice as big, nearly twice as powerful, and have twice the firepower of any other fighter of its day. The Lightning arose from a request that was designed to circumvent stringent Army Air Corps guidelines for pursuit aircraft that limited them to a single engine and no more than 500 lb of armaments. The request called specifically for an interceptor that would have a minimum of 1,000 lb of armament, excellent high-altitude performance, a maximum speed of at least 360 mph, and the ability to climb to 20,000 ft in just six minutes.

The design was indeed radical, but the Army found exactly what it was looking for in the Lightning, and it became the first American fighter to exceed 400 mph; it was also extremely manoeuvrable for a fighter of its size. Lockheed developed the P-38 in secret, using $600,000 of its own money to build it, but the Army was so thrilled with the fighter that it ordered 13 YP-38 prototypes.

P2010 TDI ACHIEVES EASA CERTIFICATION

Turbo diesel receives Type Certification from EASA

by **Lucy Field**

THE P2010 TDI certification is just the latest achievement of Tecnam's continuous development and innovation programmes, adding the diesel/JetA1 engine to the already-wide range of choice of Avgas and Mogas-powered TECNAM aircraft.

The P2010 airframe, with its wide, composite, sleek fuselage design and the all-metal wing and stabilator, has proven to be the perfect platform to match the diesel engine performances and capabilities. The consolidated comfort, accessibility, safety and reliability of the "P Twenty-Ten" are now accompanied by the flexibility granted by the use of Diesel/JetA1 fuel and the extremely low operating costs provided by the dual FADEC-controlled Continental engine.

Along with the 180 hp Avgas/Mogas and 215 hp Avgas engines, certification of the 170 hp TDI widens the range of choice for P2010 customers. This latest engine development brings the aviation market unbeatable fuel efficiency and performance: the turbo diesel/JetA1 powerplant offers an outstanding cruise-fuel burn that ranges from 4.5 USG/hr (17 litres/hr) at 55% power, to 7 USG/hr (27 litres/hr) at 75% power. This provides consistent performance up to 8,000 ft and allows operations up to 18,000 ft, raising the P2010 to "new heights" (for which an optional oxygen system is provided). Moreover, the standard P2010 fuel tanks ensure an unrivalled range in excess of 1,000 n.m. and endurance of up to 15 hours, all monitored through the state-of-the-art standard G1000NXI avionics package.

"The certification of a new aircraft is always a great achievement for us and for the aviation community"

The Tecnam design team has paid particular attention to maintaining the P2010 series characteristics of great comfort, low noise and minimal vibration. Some of the many options available include premium leather interiors with electric seats; the GFC-700 autopilot, which ensures smooth and precise autopilot operations; and the additional safety that can be provided by the Garmin GTS-800 TAS system.

The P2010 TDI is a culmination of all the very latest technologies, where Tecnam's ability to manage both metal and composite components has shaped a unique solution in terms of efficiency, load-carrying structure and unique Italian style. The fuselage and vertical fin, entirely made of pre-peg carbon fibres, provide the best use of space, while wings, horizontal tail and rudder, as well as all the load-carrying structures, are built with 70 years' experience of light alloy structures.

Flight safety is self-evident in the latest certification requirements, followed by the electrically operated, adjustable-height seats with 26G-capable crashworthiness. Flying experience is the ultimate with the Garmin G1000 NXi glass cockpit and GFCTM 700 autopilot, entirely integrated and tuned around the Continental CD-170 engine.

"The certification of a new aircraft is always a great achievement for us and for the aviation community, especially when it involves the best professionals of the Authority and from our company, setting the latest standard for safety and innovation," says Paolo Pascale, Tecnam CEO. "The P Twenty-Ten remains a modern aircraft for flight schools and private owners. And now, with the Continental JetA1/diesel engine, the P2010 TDI is simply the 'ideal aircraft', combining a modern, sleek, 'green' design with consistent, robust power." ■

AOPA GROUND SCHOOL STILL OFFERING FREE COURSES

by **AOPA Ground School**

THE AOPA Ground School site includes courses that all pilots really ought to take a look at. These include the Infringement Avoidance Course (which is free) the Best Navigation Practices Course, and for those who want to ensure their knowledge is up to date, the PPL Updater Course. The system offers a range of courses for things such as the Night Rating and Restricted Instrument Rating (IRR – or IMC). All of the courses offered include practical application and best practice, and not just the knowledge required to pass a given test or exam.

For the student pilot, the system includes the nine required subjects for the PPL (all as separate courses), and includes realistic mock exams (in the same style and format as the new CAA PPL e-exams). The system also automatically produces a theoretical examination readiness certificate for a student to present to their training organisation to allow the official exam to be undertaken. Nigel Wilson of the AOPA Training and Education Committee explains further, that through using the AOPA system, pilots are helping themselves and AOPA as an organisation: "The system is not restricted to AOPA members; it is available to everyone. That way, people can see the good work being done by AOPA, and the value of becoming a member as a result. Even those courses that have a fee are not going to break the bank!" Fees are typically £9.99 for one month's access to a course.

"The system works across all devices irrespective of operating system"

The system works across all devices irrespective of operating system. It has superb end-user support at both a technical and course material level. The AOPA system is brought to you in association with Easy PPL Ground School. The site has a wealth of useful information available to everyone straight away. Free registration is required to enable courses to be undertaken via a simple, straightforward process.

You have nothing to lose in registering on this system and doing the FREE COURSES. We think you'll like the easy-going style so much, you'll be back to increase your knowledge further in other subjects.

At the time of going to press, Nigel is offering a 50 per cent discount on the paid-for courses during the lockdown.

groundschool.aopa.co.uk ■

ROLLS-ROYCE AND TECNAM PARTNER UP

by **Robert Care**

TECNAM IS partnering with Rolls-Royce to develop an all-electric version of its P2012 Traveller mini-airliner called the P-Volt.

Also involved in the project are several North American and European airlines interested in a twin electric motor, as well as short and medium range passenger aircraft.

The P-Volt will be based on the 11-seat P2012 Traveller airframe. It will seat up to nine passengers, and can be configured for a number of other roles including cargo, medical evacuation and special mission.

The Tecnam P-Volt propulsion system and avionics will be targeted at commercial operations. All-electric motors, avionics, heating, air conditioning and state-of-the art de-ice/anti-ice systems, will provide fully sustainable and pollution-free transportation.

Tecnam and Rolls-Royce are already in partnership for the H3PS project, a parallel hybrid electric version of the P2010 four-seater aircraft.

This pairs an electric motor from Rolls-Royce with a combustion engine from Rotax. ■

AOPA NEWS HIGHLIGHTS

STUDY FINDS PILOTS' BRAINS ARE DIFFERENT

Chinese researchers have determined that the brains of pilots are wired differently to deal with the unique environment of the cockpit.
The researchers determined that pilots' brains have greater connections between the 'central executive network,' which is the part of the brain that makes sense of various bits of information, and the parts of the brain supplying the raw data.

737 MAX COULD RETURN TO SKIES SOON

Boeing's 737 MAX could return to service this month, according to reports, which, along with the general stock-market boost in the wake of the US election, carried Boeing's share prices to levels not seen since June. FAA Administrator Steve Dickson told Reuters that "this process will be finished soon, once the agency is satisfied that Boeing has addressed safety issues."

BRANSON IN SPACE BY MARCH 2021

Sir Richard Branson hopes to become the second billionaire to go to space in early 2021 to kick off his space tourism business. Branson, the owner of Virgin Galactic, will be on the first flight after the operation is certified by the FAA to take "space tourists" to the edge of space in a reusable six-passenger spacecraft. Those flying will pay $200,000 per flight to 62 miles in altitude, and to experience weightlessness for a few minutes.

2019's Flying Legends airshow

SYWELL TO HOST FLYING LEGENDS IN 2021

The world-famous airshow is ending its 25-year run at Duxford as it finds a new home in Northamptonshire

by **Dave Rawlings**

THE FLYING LEGENDS Airshow is moving away from Duxford after 25 years and heading to Sywell Aerodrome for 2021. Next year will see the event at the Northamptonshire airfield in July.

Flying Legends is one of the world's top airshows and is staged by The Fighter Collection, which said in a statement that it was a mutual decision with the Imperial War Museum to end the airshow's 25-year run at Duxford.

Jane Larcombe of The Fighter Collection said, "Sywell retains the ambience we have always sought to capture with the Flying Legends brand – it is an historic aerodrome with a resident collection of warbirds and is well versed in delivering high-quality events.

"Michael Bletsoe-Brown and his team along with Richard Grace at Air Leasing have gone out of their way to accommodate us, and we can't wait to extend a warm welcome to our many thousands of loyal followers, as well as some first-time visitors, to what we're certain will be another memorable Flying Legends in 2021."

The first Flying Legends to take place at Sywell is on 10–11 July 2021. Tickets will go on sale once the future path of the current coronavirus pandemic becomes clear. A new website for Flying Legends is currently under construction. ■

Flying Legends is a must-see airshow

A FAMILY OF AIRCRAFT CRAFTED FOR AVIATORS

The world's fastest single engine turboprop and the most advanced 10-seat STOL are now under one roof. Each aircraft is crafted with precision by Daher, one of the most respected names in international aerospace with factories in the US and France.

Meet us at

AERO FRIEDRICHSHAFEN

Friedrichshafen Germany
April 1 – 4
Hall/stand A3-321

Speak to a Daher expert:
TBM (Americas) (954) 993-8477
TBM International +33 5 62 41 77 88
Kodiak Europe (RAS) & TBM (Austria & Germany): +49 178 2550 246

tbm.aero | kodiak.aero

KODIAK

TBM

CRAFTED FOR AVIATORS

FLYING FEATURE

WORDS Henry Simpson IMAGES Various

RETURNING AN EARLY 747 TO THE SKIES

When Henry Simpson spotted a rare sight in the sky, he looked into it

DURING THE depths of lockdown an aircraft flying overhead became a comparatively rare sight but it was in the midst of the pandemic that I had a chance encounter with a particularly interesting type which set me onto uncovering its story.

The collapse in passenger air traffic this year resulted in a substantial increase in freighter operations as the market experienced an upsurge in demand coupled with the drastic reduction in cargo capacity of normal commercial flights.

The keen-eyed may have noticed that the few aircraft that were passing during lockdown were primarily cargo services, often using a diverse range of older types rarely seen in the packed commerical world these days.

A chance look at a transponder radar one afternoon yielded a great surprise when it indicated that a classic 747, a 747-200, was approaching Stansted. I just had enough time to head outside with my camera and watch it fly very low overhead (a result of flight path pattern changes during the lean lockdown times).

This was quite a treat as I believed that no classic 747s remained in operation outside of military use (predominantly those used by the USAF as the VC-25A presidential transport and the similar E-4B airborne command post). As such I was intrigued to learn more about how this aircraft had returned from seeming extinction.

The 747-200 was designed as an improvement on the earlier -100 model, featuring a stretched upper deck for seating, greater range and notably being the first variant to offer the Rolls Royce RB211 engines. British Airways received its first 747-200 in 1977.

"This was quite a treat as I believed that no classic 747s remained in operation outside of military use"

AN INTERESTING LIFE

This particular aircraft, I subsequently discovered, was built for British Airways and delivered in 1987 as the airline's 14th –200, registered G-BDXN and named 'City of Stoke on Trent'. The aircraft was retired from passenger service in 2002 and sold to be converted as a freighter with the addition of a loading door aft of the wings. It is then registered as having been leased by the Icelandic charter firm Air Atlanta Icelandic, during which time it also operated services for Malaysian Airlines cargo between 2006 and 2007, but by 2012 it had joined many other classic 747s in desert storage at Marana Regional Airport near Tucson in Arizona.

LEFT OUT TO FALLOW

Here the aircraft remained for eight years until its fortunes were to dramatically change.

Geo-Sky, a Georgian cargo

BELOW CLOCKWISE: The 747-200 cargo plane coming into land

The view our author saw from his garden

airline based out of Tbilisi and founded by Zauri Kortoshidze, is one of the last civilian operators of the classic 747. With the storage of one of their existing 747s, (4L-GEL), a former United Airlines Pratt & Whitney JT9D-7-powered example, the airline sought a replacement aircraft.

Due to the company's experience with the -200 and parts commonality the decision was made to acquire another in January 2019, commencing an ambitious project to return the former G-BDXN to the skies. The restoration was carried out by Ascent Aviation Services at Marana, involving an in-depth survey and maintenance on the airframe as well as engine replacements.

Nearly a year of work was required before the aircraft returned to the skies in December 2019 after eight years on the ground. The newly registered 4L-GEN was then flown to Tbilisi on a 14 hour ferry flight.

"Nearly a year of works was required before the aircraft returned to the skies in December 2019"

After eight years the 747-200 returned to the skies

In terms of operating the older type the airline states that parts are not an issue as there are still plenty of spares, for the airframe and the RB211, on the market.

Predominantly operating between its base of Tbilisi and Frankfurt its visit to the UK was a rare treat and a welcome surprise. Alongside its stable mate 4L-GEO, these aircraft are indeed the only RB211-powered 747-200s still flying in the world, the restoration of an example to flight is a very rare reversal of the otherwise rapidly dwindling numbers of classic 747s.

With the sad announcement this summer of the premature retirement of British Airway's iconic 747-400 fleet, it is worth noting that several may live on as freighters and could continue to be around for a great many years, remaining a welcome presence in the sky. ■

The 747-200 that Henry saw, being loaded and refulled for its next journey

Current status of RNP approaches in UK

WORDS David Chambers
IMAGES Various

The current state of RNP approaches can be confusing, so David Chambers – Chairman of AOPA's Members Working Group – explains all

SOMETIMES REFERRED to as GPS approaches and formerly known as RNAV (Area Navigation) approaches, the recently renamed Required Navigation Performance (RNP) instrument approaches offer a high level of safety, greater accessibility and lower cost than conventional equipment.

Their lower cost to install and maintain benefits both large commercial airports and smaller aerodromes alike, increasing accessibility of airports and airfields in poor weather conditions.

Training is required to learn and maintain currency to fly these types of approach, and for these reasons alone there is a growing demand for access to more RNP training approach capacity. Since the beginning of the process, AOPA has been involved because we believe that this is a major improvement in safety for GA and ultimately will benefit the UK economy.

The technology has been widely adopted worldwide, with the UK lagging behind other European countries such as Germany or France, and more similar to Portugal, Ireland or Italy. However, it can be argued that the UK does have more airports, more privatisation and a somewhat more noise-sensitive population.

After a recent formal directive to the CAA from the Department for Transport (Dft), there has been more focus and resources applied, although visible progress remains very slow. The CAA has created a dedicated Airspace Change website to report the status of airspace changes, however it publishes data that is difficult to navigate, incomplete, inconsistent and hard to assess. This makes it hard for casual observers to track developments and identify where the bottlenecks are. There remains an underlying impression that some CAA staff are very much against adopting this technology and especially making it accessible for non-commercial use.

"The technology has been widely adopted worldwide, with the UK lagging behind other European countries"

WORLDWIDE DRIVE FOR PERFORMANCE-BASED NAVIGATION

ICAO prioritised deployment of Performance-Based Navigation (PBN) in 2007 (Resolution 36/11). The UK DfT committed to it (or at least did not decline) but did not instruct the CAA to implement it. The European Commission initially tasked Eurocontrol in 2012 and subsequently instructed EASA to develop an Implementing Rule in 2013.

EASA recommended that every state publish a Performance-Based Navigation (PBN) plan for its airspace before 3 December 2020, which would be prepared by each country's ANSP (Air Navigation Service Provider). These plans cover PBN in its entirety, including en-route airways, SIDs and STARs as well as RNP instrument approaches to replace all non-precision approaches. A later deadline of 2024 applies to other airfields.

In many European countries, the state directly operates a single ANSP. Within the UK, NATS is the primary ANSP but many airports are their own independent ANSP. Each should have published its plan stating how all

instrument runways will be equipped with either LPV or ILS. It is believed that no UK airport has submitted its own PBN plan to date. The CAA has not been proactive about communicating the deadline and progressing the work.

AIRSPACE CHANGE PROCEDURES (ACP)

An ACP is now mandated for all airspace changes, even for what seems trivial such as removing the restriction of Approved Operators Only at four Scottish airports operated by HIAL.

The ACOG (Airspace Change Organising Group) was formed in 2019 by NATS and the CAA to actively review and revise how airspace changes are administered. An overall Airspace Modernisation Masterplan is due to be published and until then all new airspace change proposals are suspended. COVID-19 has undoubtedly delayed work but at the time of writing there is no target date for the masterplan to be published.

ACPs previously submitted can continue to progress to full approval, and there is a large backlog which has been in the pipeline for several years.

EVOLVING AIRSPACE CHANGE PROCEDURES

Several CAA publications document relevant airspace change procedures:

Airspace Change Proposals (ACPs) were originally dealt with using CAP725. In 2018 this was replaced with CAP1616, developed to overcome major shortcomings. While an improvement, it can be excessive and costly for smaller and simpler changes. ACPs previously submitted were allowed to continue using CAP725 and many remain in progress.

CAP1122 was introduced in 2016 to address the needs of RNP approaches at GA airfields without full ATC but was later withdrawn. It was superseded by CAP1961 in August 2020, which streamlines the existing CAP1616 process. It is believed the CAA is re-examining elements of CAP1122 with a view to incorporating parts into CAP1961.

"Several airports have instrument approaches available for use while a FISO is on duty"

CURRENT STATUS

The UK has 125 licensed aerodromes of which 69 have at least one instrument approach. ILS remains the most popular technology, with 81 runways served, compared with 45 using LPV. There is an overlap of 20 runways with both and these include all LPV200 approaches.

Four airports with only non-precision instrument approaches are Benbecula, Carlisle, St Mary's/Scilly Isles and Stornoway. All are said to have applications for RNP approaches in progress, but the Scottish airports do not appear on any ACP status reports. Benbecula's need is becoming urgent because NATS wants to switch off the VOR but there are technical issues involving the missed approach and terrain. St Mary's is perhaps the least safe with just a timed NDB.

Eight airports have a non-precision instrument approach on one runway end: Blackpool, Cambridge, Cranfield, Gloucester, Hawarden, Humberside, Norwich and Oxford.

One airport, Biggin Hill, has an instrument approach only at one runway end.

AVAILABILITY OF RNP TRAINING APPROACHES

RNP approaches come in two flavours:

- LNAV, which doesn't have a certified glidepath although an advisory indication may be displayed
- LPV, which displays a glidepath with increasing sensitivity closer to the runway, similar to an ILS.

For RNP training purposes including skill tests, an LNAV approach can be used, although clearly an LPV with lower minima increases the safety and utility in all weathers and additionally provides a more demanding training environment.

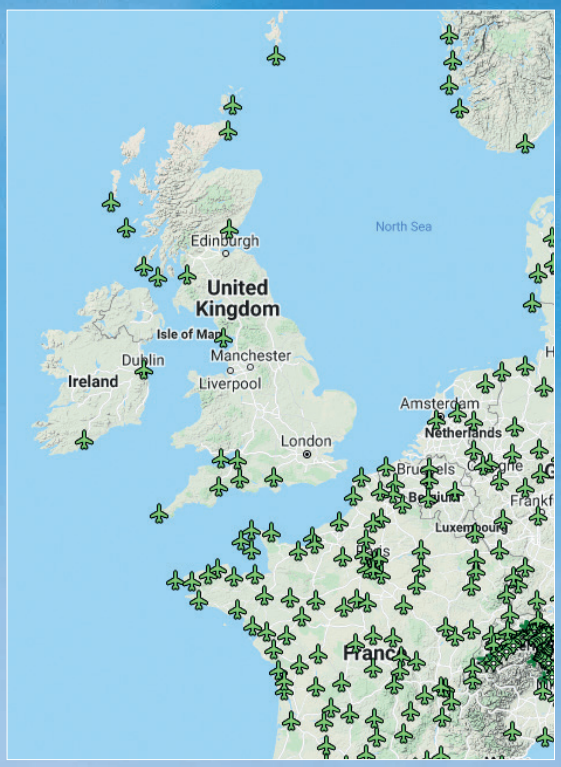
This leaves at most 22 airports available for RNP training, of which perhaps eight serve the areas of greatest demand across Southern England. Six of those eight are LNAV rather than LPV.

RNP APPROACHES AT NON-ATC AIRPORTS

Ideally a full ATC approach control and tower service within controlled airspace would be provided everywhere, as is the case at major regional airports. In the UK, IFR flight is permitted outside controlled airspace, enabling access to smaller and diverse airfields. The UK has a lot of Class G airspace, whereas other countries have adopted Class E and resourced ATC to manage all IFR flights in those areas. It has largely been a political decision not to fund a national ATC service for GA and instead have a piecemeal LARS capability that is confusing, complex and available only at certain times of day and days of the week.

Several airports have instrument approaches available for use while a FISO is on duty. These are mainly airports in Scotland operated by HIAL and include Barra, Campbeltown, Islay and Tiree currently limited to use by Approved Operators only. The full ACP process is mandated to be used to remove this restriction, but the application to do so has been in progress for more than a year.

One GA airport, Northampton/Sywell, has been approved for LNAV but with minima of 500 feet AGL. I understand that an LPV with lower minima is planned during 2021, but again there is no information or progress published on the ACP portal.



FAR LEFT
RNP Training Approaches
LPV shown in green, LNAV-only shown in magenta
LEFT
Map of operational LPV approaches throughout Europe. This excludes the simpler LNAV approaches with higher minima

BELOW
The UK has 125 licensed aerodromes of which 69 haveat least one instrument approach

One GA airport, Northampton/ Sywell, has been approved for LNAV but with minima of 500 feet AGL

NDB NO LONGER MANDATORY FOR NEW RNP APPROACHES

When RNP approaches were first introduced, the CAA mandated that an alternative method of navigation must be available for the missed approach. This was usually based on an NDB and required an operational ADF in the aircraft to be legal to fly the approach.

Many smaller airports do not have NDBs and the CAA relaxed the requirement to include these, more recently even for airports with NDBs such as Bristol.

There still remain many approaches with NDB missed approaches, making it difficult to legally train and fly RNP approaches without an ADF. For those based in the south of England, Lydd and the Channel Islands are the only practical choices.

The CAA has resisted calls for GNSS fix substitution, which would allow RNP navigation equipment already approved to fly an approach to be used for a missed approach to an NDB.

GLIDESLOPE INDICATION FOR ALL LNAV APPROACHES

A significant breakthrough was achieved in June 2020, when the CAA removed a restriction which prevented an advisory glideslope being displayed for all LNAV approaches.

An LNAV/VNAV approach uses barometric pressure to increase accuracy but relatively few GA aircraft are equipped with this capability. Previously, modern navigation equipment was required to disable the advisory glideslope indication only at airports with both LNAV and LNAV/VNAV approaches.

"A significant breakthrough was achieved in June 2020, when the CAA removed a restriction"

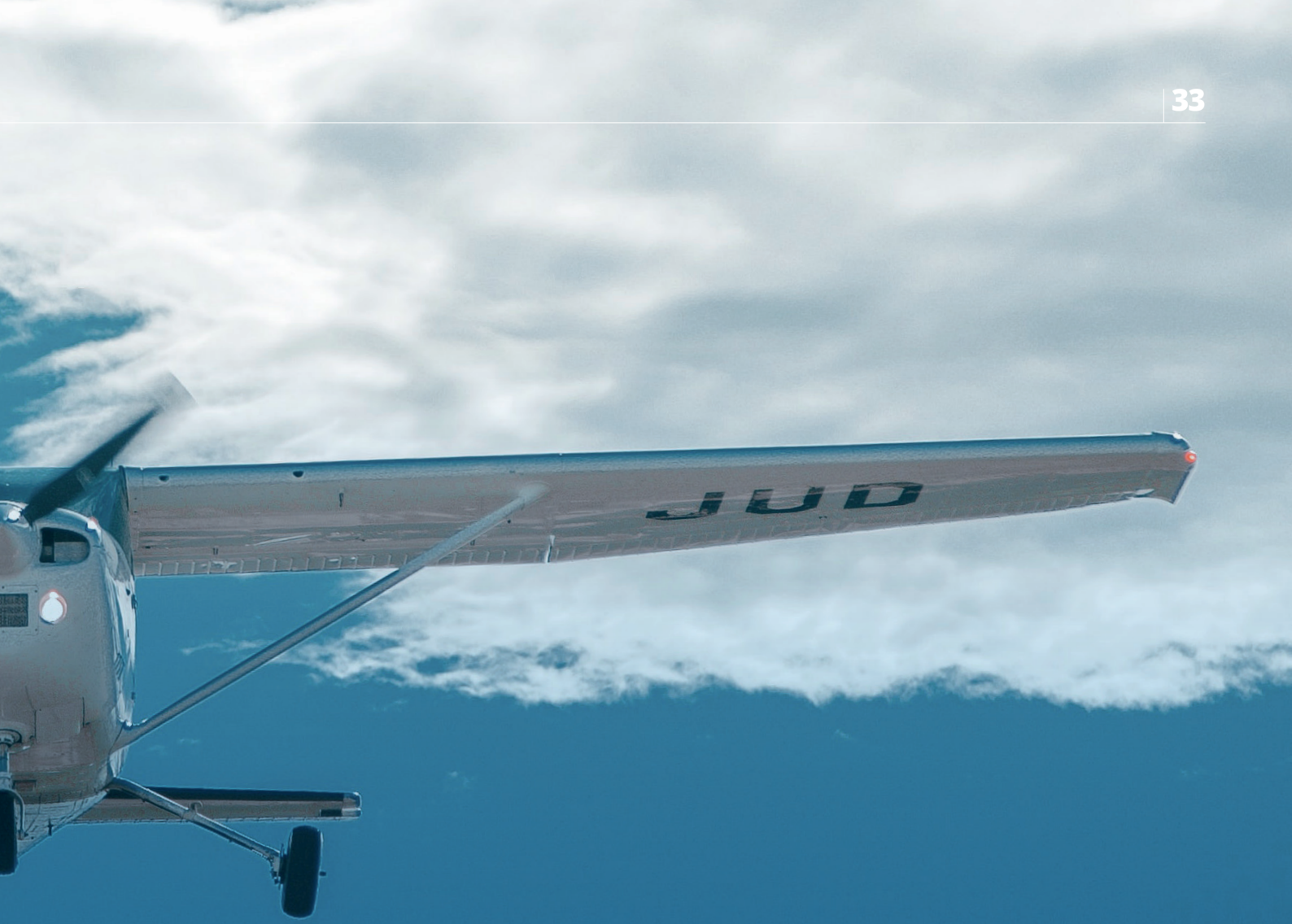
Earlier this year, the CAA issued a notice which updated the coding of these approaches. You'll now find a glidepath displayed at airports such as Cambridge and Liverpool when using modern equipment.

PROJECT GAGA

AOPA was granted funding from the European GNSS Satellite Navigation Agency for a project to pioneer GA airports developing RNP approaches at three airports. A technical consultant was sub-contracted, working closely with the CAA throughout many changes of the approval process. AOPA hopes the project will bear fruit soon.

GAINS PROJECT

In 2019 this project, conducted jointly between AOPA and PPL/



IR and supported by the CAA, recruited private pilots to fly RNP instrument approaches at Duxford, Cambridge and Sywell. New techniques were demonstrated, such as Radius-to-Fix (similar to a DME Arc) and steep glideslopes. These expand the toolkit available to approach designers and may be incorporated into RNP approach designs in the future.

RATE OF NEW LPV APPROACH APPROVALS

The first LPV approach was approved in 2011 in Alderney. The most recent was July 2020 at Prestwick.

This total includes many upgraded from LNAV to LPV or LPV200, but reports only the date the LPV was published. An LPV200 approach can have lower minima of 200 feet vs at least 250 for LPV, and to date have only been published where ILS approaches already existed.

PUBLISHED STATUS OF PROPOSALS

There are two separate websites which report the status of ACPs, one for CAP725 and another for CAP1616. These are difficult to navigate and extract information from. Information is incomplete, out of date and inconsistent. They don't present a positive view of what might be happening behind the scenes, understating recent progress made.

From the CAA Portal, the status of CAP725 applications in progress lists 21 submissions between 2013 and 2017. Three have been approved (Doncaster, Sywell and Newcastle) leaving 18 remaining outstanding.

"The first LPV approach was approved in 2011 in Alderney. The most recent was July 2020 at Prestwick"

While some of these have fallen by the wayside, such as Wolverhampton and Wycombe, I'm told there is more optimism that several of these will come to fruition in the first half of 2021. In particular, Blackbushe, Haverfordwest, Hawarden, Sherburn-in-Elmet, Carlisle and Southend are all actively being progressed. Stapleford may take a little longer for technical reasons. Leeds East has reached an advanced state but has had objections from the local gliding community.

The new CAP1616 process was introduced in late 2017 and has a more extensive set of stages of approval. The web portal covers all airspace change proposals and does not categorise LPV approaches so they can't be filtered. There is no option for summary status reports, requiring each

proposal to be opened up to find out the status.

The most trivial of these ACPs involves permitting the use of RNP approaches to all qualified operators at four HIAL airports in Scotland, rather than being restricted to Approved Operators. Despite the clear safety improvement for all IFR-rated pilots, this change has been blocked for over 12 months and is still reported at the earliest stage.

Bournemouth and Kemble are the most advanced applications, reaching stage 5a, which precedes the formal approval by the CAA to accept and implement.

Cumbernauld and Denham will be able to take advantage of the new CAP1961 process and shortcut some of the paperwork and consultation. Cumbernauld is hemmed in by two blocks of airspace for Glasgow and Edinburgh that were originally for now-closed runways. Denham is reported on the portal as having withdrawn its application but has moved to CAP1961 with an initial assessment meeting held 28/09/2020.

It may be that the reporting system is simply showing old data, but it does appear that very few new applications have been submitted and those in the system are progressing extremely slowly.

THE BOTTLENECKS

I spoke to some involved in the industry who recounted issues in the past which have now been overcome. There have been many reasons for delay, ranging from poor process design, staffing, resourcing and priority. One major procedure design consultancy lost its CAA approval in 2018 and only regained it mid 2020.

At present, it seems that a major capacity constraint within the CAA relates to Procedure Regulation, where two staff oversee all procedure changes nationwide including within terminal areas, SIDs, STARs and approaches, both for new and five-yearly maintenance. There is a business case for four additional staff, but whenever new staff have been recruited and trained, they have left before becoming productive.

ACP project management is conducted by military personnel on secondment, where staff rotate regularly and their knowledge of case history is lost when they leave.

To address this, Grant Shapps directed the CAA to focus more on delivering these approaches and has allocated funding which led to the CAA hiring a specialist whose role is to make sure these applications are seen to fruition. Shapps has also promised further investment funding up to 50 per cent of the costs of phase two.

The CAA is currently interviewing to recruit a team of three or four people for 'airspace challenge' positions. I would hope that this new team will also provide focus and drive for ACPs and reducing delay.

On the practical side, FISOs at RNP-enabled airfields will be require to be trained and qualified as Meteorological Observers so they can provide more accurate wind and weather reports. Training capacity for that has now been augmented by outsourcing some elements.

SUMMARY

In the past, progress for RNP approach approval has been very slow in the UK for various reasons. An acceleration due to a DfT directive to the CAA to prioritise RNP approach approval, combined with additional funding and staff to progress the work, should start to deliver visible results in 2021.

It is not up to the UK CAA to develop or design RNP approaches, which is initiated and funded by individual airports. However, its their role includes providing a clear regulatory framework and an efficient, effective and appropriately resourced process to gain approval. Many in the GA community still perceive a reticence within some at the CAA to approve RNP approaches at GA airfields.

"It is not up to the UK CAA to develop or design RNP approaches, which is initiated and funded by individual airports"

Some of the previous issues have been dealt with by publishing improved procedures. Actions have been taken to address staff shortages but more needs to be done. A dedicated team being recruited to focus on ACP progress will help enormously.

For those outside the CAA, the ACP portal simply doesn't provide the information in an accessible and useful format. Perhaps a brief monthly status report on RNP approach approval would help communicate progress being made?

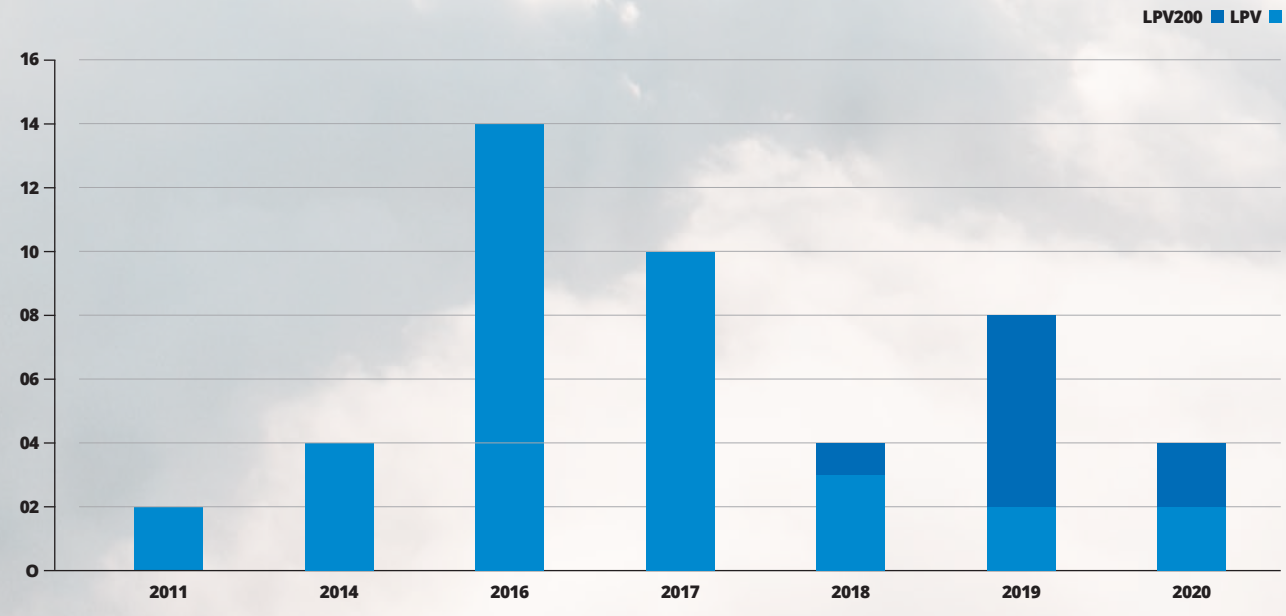
The need for every change to require the full ACP process seems inappropriate. Surely technical improvements from LNAV to LPV, or removing restrictions for use, could be done more simply?

Support should be provided to airports and airfields so they can develop and publish LPV approaches at GA airfields in a straightforward and streamlined manner. Templates with examples of suitable applications and guidance on best practice might be provided. EU funding that has been used in the past will no longer be available but the DfT has indicated that government funding may become available.

Overall, there is some hope we will see substantial output during the next twelve months. AOPA continues to lobby for progress, especially for GA aerodromes. Once the industry sees these types of approach being published, with the cost and timescale to obtain one being predictable and viable, then I would hope more will follow and deliver the improved safety and cost benefits they provide. ■

When RNP approaches were first introduced, the CAA mandated that an alternative method of navigation must be available for the missed approach

LPV YEAR-ON-YEAR IN THE UNITED KINGDOM



TRAINING FEATURE

WORDS Nick Wilcock **IMAGES** Various

AOPA GROUND INSTRUCTOR CERTIFICATE REVISED

The AOPA GIC has been updated to move with the times

THE INTRODUCTION of LAPL/PPL e-Exams in October 2020 exposed a lack of suitably qualified and experienced personnel to manage, invigilate and debrief the e-Exam system at Declared Training Organisations in accordance with the CAA requirement for all such personnel to hold Ground Examiner (GR) authorisation. The CAA's Standards Document 11 states that a GR examiner is required to hold or have held either a UK or Part-FCL Flight Instructor Certificate or an AOPA Ground Instructor Certificate (GIC); however, the AOPA GIC was overly demanding as it was originally intended to achieve credit for aspects of the JAR-FCL FI(A) Rating and far exceeded EASA requirements for theoretical knowledge providers. Under the EASA Aircrew Regulation it can no longer be credited towards requirements for the Part-FCL FI or CRI certificate and hence very few GICs have been issued in recent years.

After discussions with the CAA, the AOPA GIC requirements have now been revised and simplified. The CAA has fully supported the decision and has confirmed that the revised version of the GIC will facilitate the provision of personnel who meet EASA requirements for Theoretical Knowledge Instructors and CAA requirements for GR authorisation. This will mean that ATOs and DTOs should find it much easier to provide suitable ground examiners to look after the e-Exams without the need to involve FIs.

The GIC course will be available at those AOPA Corporate ATO members who already provide aeroplane or helicopter FI/CRI training and who wish to add the GIC to their list of available courses. The cost and specific content of the course will be entirely at the discretion of the ATO, but must include teaching and learning instruction, and assessment of the applicant's theoretical knowledge and his/her ability to explain and deliver LAPL or PPL theoretical knowledge to typical students. The ATO Head of Training will make a final assessment of the applicant's suitability to apply for the GIC and will sign a Course Completion Certificate for the applicant to submit to the AOPA office.

"The AOPA GIC details are now included on the AOPA website and the GIC application system is entirely an online process"

AOPA GIC details are now included on the AOPA website and the GIC application system is entirely an online process; this has resulted in a reduction of administrative support effort and so the GIC issue fee has been reduced to £20 for AOPA members or £25 for non-members. GIC holders who subsequently wish to apply to the CAA for GR authorisation will need to be sponsored by an ATO or DTO, but will be pleased to note that the CAA has reduced the fee for GR authorisation, by around 50 per cent to £125 for a three-year validity period. The GIC will remain valid provided that GR authorisation is maintained; alternatively, it may be revalidated by attendance at an AOPA instructor refresher seminar.

Course applicants must be at least 18 years of age and (normally) hold or have held at least a LAPL or PPL with SEP or TMG privileges or, for helicopter applicants, a LAPL(H) or PPL(H).

Full details may be viewed at https://www.aopa.co.uk/training-safety/aopa-ground-instructor-certificate-gic-course.html

The Ground Instructor Certificate has been revised

HOW TO STAY SAFE AROUND GLIDERS

WORDS Chris Fox – glider and helicopter pilot, UK Airprox Board gliding member **IMAGES** Various

SINCE MARCH 2019, the British Gliding Association has been collecting reports of aircraft overflying gliding sites from its member clubs.

We've been astonished as to how many of these there are. From March to December 2019, we recorded 118 incidents, from all over the country. 2020 has been much quieter, for understandable reasons, but we have still seen 44 events.

We'd known anecdotally that these events happen, but until we started collecting the data centrally, we didn't realise how common they were. Helicopters are involved in just over 20 per cent of the reports.

DON'T RELY ON SPOTTING THE WINCH LAUNCH HAPPENING

As a pilot in a powered aircraft, you're very unlikely to see the cable itself. The glider will go from ground to 1,000 feet in about 20 seconds, so spotting it in the climb is too late.

When the glider has released, the cable descends under a small parachute – much more difficult to spot, and the cable is effectively invisible.

Don't forget that most gliding sites also operate aerotow launches, so there may be a tug and a glider connected by about 60m of rope climbing out from the site, sometimes several in quick succession.

HOW TO SPOT A GLIDING SITE

Gliding sites are clearly marked on the charts. Do you know what the symbol means? Take Lasham (see chart below), which has 50,000 movements a year.

- The G indicates a gliding site.
- The "/3.7" after the "G" shows the potential maximum winch launch height in thousands of feet. At Lasham, launches are permitted to 3700' AMSL, or about 3100' AGL.
- If there's a dedicated radio frequency available, it's shown. At Lasham, it's 131.030. There's a 1NM radius blue circle, within which winch launching will be contained. It does not indicate the limits of gliding activity!
- And in particularly busy areas, there's a warning of Intense Glider Activity

If you overfly Lasham below 3,700 ft, not only might you meet a winch launching glider – who is likely climbing at close on 3,000 ft/minute and with very limited ability to see and avoid you - you may also encounter a winch wire, which descends on a parachute after the launch. Flying into either is likely to be fatal for all concerned.

ELECTRONIC CHARTS

Most of the current VFR Moving Map apps will show you and warn about gliding sites. Some may use different symbology. Please make sure you haven't inadvertently turned off 'Sporting Aviation' sites.

PLEASE KEEP CLEAR!

So please give gliding sites a wide berth, unless you have positively confirmed by a radio call that they are not operating. Even if they are not launching they may have gliders returning at the end of the day.

One of our members has published a handy reference card of the radio frequencies used by gliding sites: www.ruskin.me.uk/BGA-FRC

AIC Yellow 036/2020 gives more general information about gliding activity in the UK.

There is also a downloadable poster available from https://bit.ly/3e7kFOq should you want to display it in your clubhouse. ■

Top left: Lasham on the chart. Bottom left: a winch cable, you don't want to get to close to them. Above: a non-threatening glider

Be careful when passing glider sites

GARMIN'S NEW PILOT'S WATCH

The company that brought you smartwatches for the cockpit now offer the cheaper D2 Air

What D2 Air pilot's watch
From Garmin

GARMIN HAS launched the D2 Air, its latest GPS smartwatch for pilots with a new touchscreen design. The newest addition in the D2 aviator watch series offers tools for all phases of flight, including weather, direct-to navigation, airport information, flight logging, Pulse Ox, and much more. The D2 Air incorporates connected features like smart notifications, Garmin Pay contactless payment solution and phone-free music, along with enhanced health monitoring, and animated workouts.

Carl Wolf, Vice President of Aviation Sales and Marketing said: "The D2 Air offers a bright and striking display with valuable capabilities that benefit pilots in the air while offering advanced smartwatch features on the ground, placing the D2 Air aviator smartwatch in a category of its own."

The D2 Air includes several pre-flight features and tools, including the ability to display multiple time zones including Zulu time, and METAR and TAF aviation weather reports and forecasts. Additionally, airport information such as runway orientation with wind components, runway lengths, airport frequencies and traffic pattern altitudes are easily accessible for each airport.

The new D2 Air

Preloaded with a worldwide navigation database containing NAVAIDs and Intersections, a waypoint info page, direct-to navigation, a three-axis compass with a horizontal situation indicator (HSI), and an altimeter with adjustable barometric setting, the D2 Air is packed with features to assist aviators in navigation and enhance situational awareness.

The D2 Air utilises Garmin Pilot flight plan transfer, allowing for an easy way to access flight plan information by seamlessly transferring flight plans into the watch. Aviation alerts such as speed, time, distance, elevation, and a fuel timer are available on the D2 Air watch during flight. For post-flight ease, the D2 Air integrates with flyGarmin.com logbook to sync post-flight data such as date, duration, and route of flight.

The D2 Air boasts a battery life of up to five days while using smart notifications and pre-flight planning tools, and up to 10 hours of battery life when continuously using GPS and Pulse Ox while flying. ■

Where garmin.com
Price $499

GET READY FOR 2021

What Pooleys 2021 Flight Guide
From Pooleys

The Pooleys United Kingdom Flight Guide has been a pilot's staple for more than seven decades. It is produced once again in full-colour. Pooleys sets the standard in aeronautical information and presentation. Published annually, this guide is produced by, and with the support of, aviators across the UK.

The guide contains the definitive information on 982 UK aerodromes, 570 landing charts and multi-coloured area charts, private airfields and farm strips, helicopter landing sites (now available online as a free download), microlight sites, glider sites, parascending sites, free-fall parachute sites, notified controlled airspace, airspace classification, VFR criteria & VMC minima, specified minimum weather provisions, ATC regulations & procedures, air traffic control services, controlling authorities & comms frequencies, MATZ & LARS, DACS & DAAIS, meteorological services, landing fees, sunrise/sunset tables and many other items of useful aeronautical information – perfect stocking filler.

Where pooleys.com
Price from £26.99

HAYNES CONVAIR B-36 PEACEMAKER OWNERS' WORKSHOP MANUAL

Henry Simpson reviews the Haynes Manual and finds it a thoroughly enjoyable read – even though he doesn't own one, we think...

Author David Baker
From Haynes

THE LATEST edition in Haynes' popular aviation manual series focuses on the mighty 10-engined Convair B-36 Peacemaker, one of the few operational military aircraft to have had a mix of piston and jet power. The book is written by former NASA scientist and prolific aerospace engineering publisher David Baker. The immediate first impression of the book is that it is larger than other Haynes manuals; at 220 pages it is noticeably thicker than the average (around 170) for these publications. Compared to other Haynes manuals it feels far more comprehensive in its focus on the aircraft's history and design, though lacking the restoration focus that books about airworthy or under-restoration types are able to provide.

Considering the aircraft was in service for over 10 years with more than 300 built, and that it retains the record for the longest wingspan of any military aircraft, there are comparatively very few books published about it. Its role in the cold war nuclear arsenal is largely forgotten outside the USA but this book certainly makes up for that.

Comprehensively informative, the publication covers all types and derivatives of the aircraft including featherweight examples, nuclear reactor and jet derivatives, whilst maintaining the balance between technical detail and general readability that has made this series so successful.

Particularly fascinating facts include the 84 ft tunnel connecting the forward and rear compartments, the aircraft's ability to carry 2 x 43,000 lb T-12 bombs, (larger derivatives of Barnes Wallis' 22,000 lb Grand Slam), the development of retractable remote gun turrets and the damage suffered by the aircraft participating in the Operation Castle nuclear tests. The latter is an interesting albeit brief segment, especially when considering the detail provided elsewhere. Equally interesting but also brief is the mention of the B-36 modified to carry parasitically what would become the XB-58 (later the Convair B-58 Hustler), a very Gerry Andersonesqe concept. These limitations are minor though, in view of the book's otherwise thorough and insightful nature.

The publication features an eclectic range of photographs (over 300), covering the construction and operational service of the aircraft as well as photos from inside preserved examples and plentiful diagrams from the original Convair manual. In addition to charting the type's development and operational history there are welcome first-hand accounts of flying the aircraft, including one from the late Wing Commander Ken Wallis who flew the RB-36H whilst on secondment.

It is very pleasing to see a book that does justice to this incredible unsung aircraft and it encompasses far more than traditional Haynes manual publications.

Undoubtedly the best book about the type in years and a strong entry into the Haynes Manual series, it is a recommended read of value to enthusiasts, engineers and historians alike.

Other releases in the series include the Hawker Siddeley/BAe Harrier, de Havilland Mosquito, Boeing B-52 and Douglas A-1 Skyraider. ■

Where amazon.co.uk
Price £17.49

DIRECT TO YOUR DOOR SIX TIMES A YEAR

Your **AOPA membership** opens up **a whole world of aviation** to you, including the bi-monthly magazine

CLASSIFIED ADS

AIRCRAFT FOR SALE

DERRICK INGS
AIRCRAFT SALES

offer a professional, friendly & individually tailored service to both business & private clients to suit your specific requirements & budget

PERCIVAL PROCTOR 5 (1948)

A classic British aircraft, fully and meticulously restored over 10-years for former owner Air Atlantique on a 'no-expense-spared' basis. The work packs include 7 volumes of detailed documentary evidence backed up by colour photos of all the work.
G-AKIU had a fresh Permit to Fly in May/2020 and is ready to fly away to a proud new owner.
This is an iconic piece of Britain at its very best.

GBP£110,000 or best near offer, No VAT

PIPER SARATOGA II HP (1997)

This is an IFR equipped Saratoga II HP with Oct/2019 overhauled engine. A rare and extremely well equipped aircraft which the owner is rightly very proud of.
Upgraded avionics - GTN650, Aspen EFIS, AoA indicator, and so much more bring this aircraft into the modern age.
Originally UK Registered, now Belgium based and FAA N-Registered.

EUR€239,000 (Plus VAT where applicable in Europe)

CHECK WEB SITE FOR LATEST LISTING - WHICH CAN CHANGE AT SHORT NOTICE - IF YOU ARE A SELLER – DON'T FORGET TO CHECK THE WANTED PAGE ON THE WEB SITE.

For further information contact:

DERRICK INGS AIRCRAFT SALES
PO Box 1559, Gillingham, Dorset, SP8 4WB, UK.
Tel: +44 (0)1747 825378 Mobile: +44 7836 708564
Email: sales@derrickings.com

www.derrickings.com

G-BBDM – AA5 Traveler **1/4** Share **£3,500** £110 pcm and £80 per tacho hour (wet). Excellent availability - internet booking.
Four seater, full IMC fit - Based Thruxton (EGHO).
Contact: Tony Harris (0777 5504526 or anthonywharris@hotmail.com)

Cirrus SR22 - Guernsey £123,000 N852CD G1 S/N 0219 Date MFG 2003 Full Service Records - ASG - Guernsey Annual March 2020 Engine - TSN - 1980.00. Propeller - TSN 889.10 Avidyne Entegra EX5000C DFC90 Digital Auto pilot 2 Garmin 430W ,Garmin GTX335, ADS - B "Out" Garmin 340 Cover, headsets, liferaft, jackets, tug

WOODY MILROY 07781-123144

Cruise at 120 Knts
Well equipped with auto pilot and Garmin 430 avionics.
Engine over 2000 hours remaining.
New Prop this year. Annual until June.
Currently based at Halfpenny Green, Wolverhampton.

Contact on 07968 718613 or ive.dering@yahoo.com

FOR ALL ENQUIRIES

Please contact
CHARLOTTE PULHAM
at
charlotte@aopa.co.uk
+44(0)1487 830105 or **+44(0)7583 140127**

CLASSIFIED ADVERTISEMENTS

AIRCRAFT FOR SHARE

Thruxton based, mode S. 8.33 radio
£75 per hr, wet. £60 pcm no engine fund
Engine time, 780 of 2000, annual usage 170 hrs
Airframe time 6666 of 10,000
Well run and friendly group - £1500 or offer.

CONTACT DAVE LEDDY 07973161906

Equity shares available in a well maintained 2006 Cirrus SR22 GTS with the usual GTS enhancements including Avidyne PFD/MFD, dual GNS430, S-Tec 55X, GTX330, GMA340, Stormscope, Skywatch, EMax, CMax, TAWS-B, TKS and oxygen. Zero-timed engine and prop, healthy fund.

DAN COLLINS phone 0118 907 6468 or dan@vermilionaviation.com

LIBERTY XL2

Friendly Liberty XL2 group based at Biggin Hill looking for buyer for 20% share of IFR equipped aircraft. Great international tourer. The Liberty is FADEC controlled, with a 115 kias cruise at 6 US gallons/hr. Current costs £160/month and £80/hr. Further details and demo flight available on request. FAA licence required for flights outside the UK. Trial period possible. Ideal candidate will have 200+ hours.

Contact **Bill Roberts** at 020 7564 5461
or at williameroberts2@aol.co.uk.

1978 Piper Navajo PA31-310C. ¼ equity share for sale, competitive price. Based North Weald. TTAF 4405. 100 hour check completed March 2019. Co-pilot panel. Extensive avionics including Garmin GNS430, Garmin MX20, King KLN90B second GPS, King RDR2000 weather radar, radio altimeter, Shadin fuel computer, altitude alert

Contact **RON** 07771 841613 ron.priorhouse@gmail.com

MOONEY 201 HANGARED AT BOOKER WITH GTN 750

Share £2,999 Monthly £130 Hourly £170

Contact details @ www.zitair.aviators.net

Hangared at Goodwood, Full IFR Avionics.
Extremely well maintained tourer.
Very good availability and online booking in a well run group.
Share: £6,000, £200/month and £90/hr wet
CONTACT ANDY ON 07798 834758 or andy.leahy@bpglimited.co.uk

Navajo 1978 TTAF about 4000 G CBTN
based at Biggin Hill EGKB - Share in region of £25000

PLEASE CONTACT CHRIS WOOD
07770398274 durbandentalcentre@btinternet.com

CLASSIFIED ADVERTISEMENTS

BOLKOW BO 209 MONSUN

SHARES IN THIS SEMI-AEROBATIC TOURER BASED AT ROCHESTER UK. ESTABLISHED AND FRIENDLY GROUP STARTED IN 1975. GOOD AVIONICS, 2 SEATS, 115K CRUISE, 4 HRS ENDURANCE, GOOD AVAILABILITY.

Garmin G5 EFIS 2x 8.33 Comm, 2 Nav, ILS, Mkr, DME, Mode S Tx, PLB, OAT, Htd Pitot, Life raft & Jackets, Cover, G meter etc etc.

Currently £135 per month, £85 per hour.
(We also run a voluntary account to pre pay your flying costs)
SHARE PRICE £3000 EACH

FOR MORE INFORMATION
Call **David Hall** on 01462 743799 or
talk to **Bob Bushnell** in the Rochester Tower
(generally on Mondays) or on 07787 852855.

This very well-maintained BAe Bulldog is a real pilot's aeroplane. With a one sixth share available/ it comes with all AD's complete, inc. fresh hand-grips & engine bearer inspection. Avionics comprise: GNS430/8.33hz, second radio, separate VOR/ILS, DME & Garmin Transponder. Fly with the friendliest of groups, price £10,800.

For details contact **ROGER HAYES**
01825 851311 - 07860 257333 - roger@skysport-uk.com

Semi aerobatic 2 seat tourer based at Biggin Hill. 160hp engine approx 1150 hrs Prop 205 hrs. Constant speed prop & retractable nose wheel. Good avionics with Mode S & new Trig 8.33 radio. Always hangared. Good availability.

£110 PM £125 PH WET. OFFERED AT £2500.00
Contact Gary 07785340368 or papaechogroup@gmail.com

Comfortable 4 seat aircraft with long range tanks. Hangared at Fairoaks and carefully maintained. £125/month fixed costs (includes hangarage,insurance,landing card and maintenance)

£115/hr Share price £4000 ono. 80 hours P1 required. Small friendly long established group. Online booking with good availability. Non equity share also available.

Contact **Nick Brown** 07702 975348 or **Arun Sarwal** 07971 481012

RUTAN LONG EZ

G-RAEM. Permit to Nov 20.
One of the best handling Ezs.
160 hp Lycoming IO-320 B1A. 1600 lbs MTOW.
Vortex generators. Roncz canard. Wilhelmson nose-lifter.
TTAF 440. Engine/propeller 27 SMOH.
Trig 91 dual control kit.
£24,000. Based Tatenhill.

PLEASE CONTACT G SINGLETON
07739 582005 gphly@gmail.com

New at Cotswold Airport, this British Classic has an extremely low houred engine; new Trig 8.33 VHF Comm and flight duration of 4.5 hrs. With its excellent handing qualities at £85phr this is an ideal touring or hour building aircraft. Two £3k shares remain. We even have our own dedicated instructor.

CONTACT ROGER HAYES
01285 851333 or 07860 257333 or roger@skysport-uk.com

£4000 plus costs renewing N reg Trust, £170/month and £90/hour wet

- Airframe 5768hrs - Engine TSN 4193hrs, TSO 1950 hrs (we have an engine fund) - Cruise at 130-135kts true at FL090 - Fully IFR equipped - Bendix/King KLN89B IFR GPS - Garmin GTX330 Mode S transponder - Piper Autocontrol III autopilot (tracks heading, VOR, LOC, GPS) - Digital CHT monitor/Fuel flow computer

A friendly and well established 5 person group based at Denham is looking for a 5th member to join them.

PLEASE CONTACT andrewflyboy1@aol.com or 07956 282 940

CLASSIFIED ADVERTISEMENTS

AIRCRAFT ENGINES FOR SALE

FOR ALL CLASSIFIED AD SALES ENQUIRIES

Please contact
charlotte @aopa.co.uk
or
+44(0)1487 830105
+44(0)7583 140127

TECHNICAL

INSURANCE

CLASSIFIED ADVERTISEMENTS

INSURANCE

HANGARAGE

OTHER

MENDELSSOHN

THE UK & EUROPE'S AVIONICS SUPPLIER

Lightspeed ZULU.3 Headset

Meet Zulu 3, the most comfortable, most durable headset Lightspeed has ever made. Build on the performance and features that have made the legendary Zulu line the choice of private and professional pilots worldwide.

Bose A20 Headset

The Bose® A20 aviation headset is our most advanced pilot headset yet. Its breakthrough innovations reduce more noise and provide even greater comfort than previous models, without compromising the clear audio you expect from Bose. Now includes auxiliary audio input and Bluetooth phone connectivity.

David Clark DC ONE-X

The DC ONE-X headset provides advanced comfort and technology features in a sleek, low-profile design. You'll have the sound performance and durability you need, with the comfort you demand.

Avmap Ultra EFIS

Designed for light-sport, ultra light and experimental aircraft, the AvMap Ultra EFIS contains solid-state gyros, accelerometers, magnetic field sensors, air data sensors and UAV Navigation motion processor. Compact, light and easy to install, providing reliable and advanced ADAHRS.

Dynon D3 Pocket Panel

Portable Touchscreen EFIS with Synthetic Vision

Featuring improved brightness, a new intuitive touchscreen interface, new synthetic vision display, and an even lower price point, the D3 is the most advanced portable safety device Dynon has ever made.

Garmin G5 Electronic Flight Instrument for Certificated Aircraft

Boasting a bright, 3.5 inch sunlight readable liquid crystal display (LCD), the G5 is approved as a primary source for aircraft attitude or turn coordination information and secondary source for altitude, airspeed and vertical speed in a single instrument.

Visit our website to see our full and comprehensive supplies of aviation products

GPS.CO.UK

+44 (0) 131 447 7777

Suppliers of all leading manufacturers BOSE TRUTRAK LIGHTSPEED ICOM

GARMIN. BendixKing DYNON AVIONICS David Clark rc allen instruments f.u.n.k.e. AvMap SATELLITE NAVIGATION TRIG Bad Elf