

Clued up



SAFETY MATTERS FOR GA PILOTS • SUMMER 2019



INSIDE

WEATHER EYE

Pitfalls for the unwary

TAKING THE TABLET(s)

Tips for using nav apps

RUNAWAY TRIM

It's rare, here's how to cope

RADIO CONTROL

Are you being served?

STRIP AWAY

Getting to grips with the unusual aspects of farm strip flying



HAYWARD AVIATION

PLANNING AHEAD, TO MANAGE RISKS

AVIATION INSURANCE BROKERS



HAYWARD AVIATION



+44 (0)20 7902 7800 | www.haywards.net



READING THE WEATHER – A PILOT’S GUIDE

I am delighted to be able to introduce this edition of Clued Up, my first since taking over from Tony Rapson as Head of the General Aviation Unit at the CAA. I hope to build on the great work Tony and his team have achieved over recent years and would really appreciate your feedback on anything safety related.

Whatever season you fly, the single most important part of your pre-flight routine should be a thorough weather check. Subjected as we are in the UK to some of the most changeable weather in the world, we need to take the elements very seriously indeed. We are lucky in this edition to have some expert advice from Derrick Ryall, Head of the Public Weather Service at the Met Office - and a GA pilot of 20 years. Read Derrick’s fascinating insights from page 20.

Also in this edition, we look at tips to make flying with navigation apps more enjoyable and relaxing, and the pros and cons of flying in the dark and getting a night rating.

Flying in Class G airspace requires minimal interaction with air traffic services, but when you do need to request a service, are you fully aware of what you will get? Ten years after a shake-up to ‘air traffic services outside controlled airspace’ there are indications that some pilots can be confused about the provision of services available. We shed some light on the situation on page 18.

Safety improves by learning from the past. A recent report from the Air Accidents Investigation Branch identifies trim runaway as the likely cause of a fatal accident involving a PA-31. On page 14 we therefore look in detail at handling pitch control problems and particularly how to disengage an electric trim.

Finally, if you haven’t already done so, download the latest version of the *Skyway Code*. It is packed with information and advice to help you stay safe whatever you fly – you can download it at caa.co.uk/skywaycode

Safe Flying.

Rachel Gardner-Poole
Head of the General Aviation Unit,
Civil Aviation Authority



To keep up to date on all airspace safety issues, follow [@airspacesafety](https://twitter.com/airspacesafety) on Twitter. General Aviation Unit – ga@caa.co.uk, caa.co.uk/skywise. Safety Regulation Group – CAA, Aviation House, Gatwick Airport South, West Sussex RH6 0YR. web: caa.co.uk



9 seconds to impact. Can you spot the airplane?



'See and avoid' is not sufficient: Around 40 aircraft are involved in mid-air collisions every year. Many more in near misses. Over 40,000 aircraft already use FLARM to avoid these situations.

FLARM is the collision avoidance and Electronic Conspicuity solution for General Aviation. Act while there is time.

www.flarm.com

CONTENTS

SAFETY MATTERS FOR GA PILOTS

Cover photo

With thanks to Huskyflyer

Publication content

Unless expressly stated as CAA policy, the views expressed in *Clued Up* do not necessarily reflect the policy of the Civil Aviation Authority. Articles are intended to stimulate discussion.

Advertising

The advertising appearing in *Clued Up* does not imply endorsement by the UK Civil Aviation Authority.

Free distribution

Clued Up is distributed widely free across the UK and at selected GA events during 2019.

Copyright

Reproduction in whole or in part of any item in *Clued Up*, other than material shown to be from other sources or named authors, is freely permitted, providing it is intended solely for the purpose of promoting safe aviation and providing acknowledgement is given to *Clued Up*.

Publisher

Civil Aviation Authority
Communications Department
Civil Aviation Authority
5th Floor, 11 Westferry Circus,
London E14 4HD
Tel: +44 (0)333 103 6000
Email: infoservices@caa.co.uk
Web: caa.co.uk

Consultant Editor

Nick Wall
Design lounge.design.co.uk **Contributors**
Irv Lee, Derrick Ryall, Phil Mathews Darren Lewington, Jon Cooke

Advertising Contact:

Richard Taylor
+44 (0)3301 383094
richard.taylor@caa.co.uk

Corporate Communications Department

Civil Aviation Authority
5th Floor, 11 Westferry Circus,
London E14 4HD



FOR FURTHER INFORMATION VISIT: caa.co.uk

What's inside

Clued Up magazine brings you the latest news in aviation safety, topical issues, advice and contribution from pilots, air traffic controllers and safety experts from across the UK's General Aviation community



06



08



14



18



20



29

06 GA UPDATE
BMAA go-ahead for first permit issues; Channel danger areas; New Listening Squawk cards and summer Red Arrows displays.

08 NAV DEVICES
Tips to get the best out of your tablet or navigation app to avoid making flying a bit of a bind.

14 TRIM RUNAWAY
Suffering a runaway electric trim is a rare event, but here's how to deal with it should the worst happen.

18 RT PROVISION
Are you sure you're getting the right Flight Information Service for your needs at the right time? Here's a guide to what to expect from the different services.

20 FARM STRIP FLYING
Going 'stripping' is a great way to expand flying horizons, but there are a few things to think about to get the best from it.

25 WEATHER
It's magnificently complex and always changing, but keeping on top of what the weather's up to isn't necessarily that difficult.

29 FLY BY NIGHT
Night flying is a whole new experience and it's worth getting the rating, here's a few pointers worth bearing in mind.

34 INCIDENT REPORTS
Slippery runways; metal fatigue; landing long; flying into cloud; low flying and speed; helicopter turbine troubles; stalling on take-off and fuel vaporisation.



BMAA GETS GO-AHEAD ON FIRST PERMITS

Certificates for an Initial Permit to Fly can now be issued by the British Microlight Aircraft Association (BMAA).

The move follows a period of high-level collaboration with the CAA after the BMAA requested an extension of their approval capabilities.

Permit to Fly certificates are generally issued to ex-military, kit-built and microlight aircraft that meet the appropriate airworthiness standards. Most other aircraft are issued with a Certificate of Airworthiness by the CAA on behalf of the European Aviation Safety Agency.

Following a change to the Air Navigation Order in 2016, the CAA for the first time, introduced a provision allowing the delegation of authority to other organisations to issue Initial Permits on its behalf.

The BMAA becomes the first general aviation approved organisation to receive this approval, recognising their capability to take on the task of both assessing and issuing the initial Permit to Fly certificate.

The agreement was formalised at the BMAA's Annual General Meeting at Popham airfield in May (2019), where CAA General Aviation Unit Policy Manager Mark Shortman presented the BMAA Technical Team with the approval certificate.

Speaking at the event, Mark Shortman said: "This is the culmination of several months of close collaboration with the BMAA.

"It further demonstrates the commitment of the CAA's GA Unit to work closely with the GA representative bodies to maximise the delegation of our regulatory activities and improve the regulatory environment for the GA community.

Rob Mott of the BMAA said: "The BMAA is proud to be the first ever organisation to hold this level of delegated approval and it is testament to the hard work put in by the BMAA technical team in close liaison with the CAA."

The BMAA is expected to begin issuing Permits for microlight aircraft with immediate effect.



WATCH OUT FOR THE REDS

There's little that gets general aviation more of a bad reputation than infringing a Red Arrows display and potentially getting it called off, disappointing those who have come to watch — what's more, it can be pretty costly for those who do infringe.

So here's a list of upcoming events this year (correct at June 1, 2019) to be aware of before the Reds head off for their tour of the U.S.

15-16/06/2019 Wings and Wheels
www.wingsandwheels.net

22/06/2019 Festival of Flight, N.I

23/06/2019 Weston Air Festival
www.westonairfestival.com

29/06/2019 Plymouth Armed Forces Day
www.plymoutharmedforcesday.co.uk

30/06/2019 Folkeston Armed Forces Day

05/07/2019 Goodwood Festival of Speed
www.goodwood.com/motorsport/festival-of-speed

06/07/2019 Wales Air Show
www.walesnationalairshow.com

07/07/2019 Goodwood Festival of Speed
www.goodwood.com/motorsport/festival-of-speed

07/07/2019 Wales Air Show
www.walesnationalairshow.com

13/07/2019 Royal Navy International Day
www.royalnavy.mod.uk/yeovilton-airday

13/07/2019 Flying Legends
www.iwm.org.uk/events/flying-legends-2019

14/07/2019 F1 British Grand Prix
www.silverstone.co.uk/events/2019-formula-1-british-grand-prix/

19-21/07/2019 Royal International Air Tattoo
www.airtattoo.com

LISTEN OUT, THERE'S A NEW SQUAWK CARD

A new version of the listening squawks card has been published setting out the new codes and frequencies.

Listening squawks have become popular since their introduction because they make life easier for controllers and pilots when flying near controlled airspace by helping to prevent infringements.

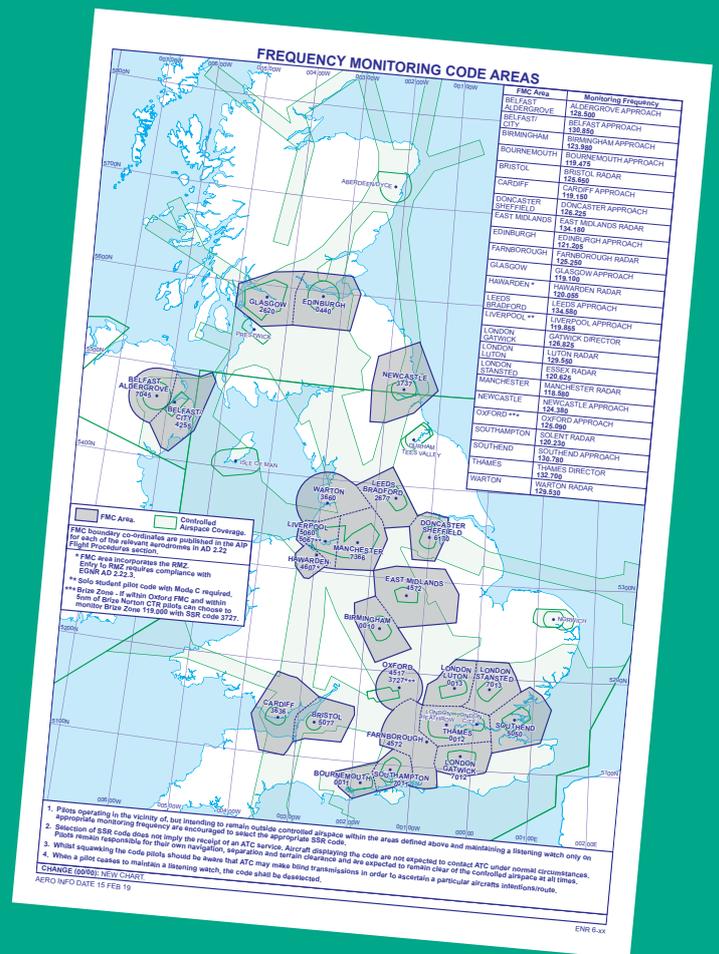
Pilots operating near controlled airspace and not requiring an Air Traffic Control (ATC) service are encouraged to monitor the relevant ATC frequency and dial in the appropriate squawk rather than simply relying on 7000.

This allows the appropriate ATC Unit to be aware of aircraft on their frequency so that they can quickly contact any pilot who might be infringing (or are likely to infringe), rapidly resolving an actual or potential incident efficiently before it becomes more serious.

Pilots of non-transponder equipped aircraft are also encouraged to monitor the relevant ATC frequency. If a non-squawking aircraft is infringing or about to infringe, ATC will attempt to resolve the situation by making a 'blind transmission' with the aim of establishing two-way contact with the pilot.

Copies of the codes and frequencies can be downloaded from the Airspace & Safety Initiative (ASI) website: airspacesafety.com/listening-squawks

A separate download of Lower Airspace Radar Service (LARS) units is also available: airspacesafety.com/lars



CHANNEL CROSSING WARNING

A number of airspace restrictions and a temporary danger area will be in place over the Channel this summer to accommodate a large Remotely Piloted Aircraft (RPA) conducting atmospheric research.

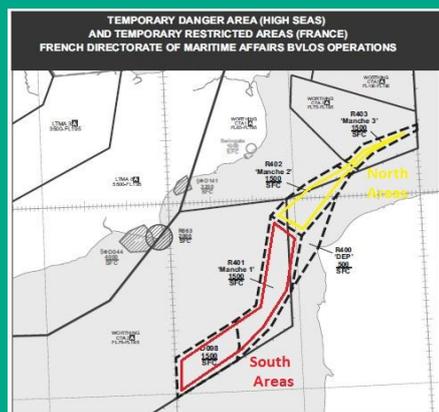
The Skeldar V-200 RPA will be operated on behalf of the European Maritime Safety Agency until 30 August to survey emissions from ships. It will be accommodated in four areas of restricted airspace implemented by French law as they fall within French territorial airspace, and a Temporary Danger Area, which lies within high seas airspace in the London Flight Information region.

"We have worked closely with our counterparts in France to follow the

principles of the Flexible Use of Airspace and reduce the impact on VFR traffic by putting in place an airspace structure that allows the different restrictions to be turned off and on as they are used by the RPA," said Tom Gratton, Airspace Regulator for Unmanned Aircraft Systems at the CAA.

The French Aeronautical Information Services will deactivate either the north region restrictions (R402 and R403) or south (R401 and EG D098) when not in use. This will allow lower than 1,500ft transits between the UK and France.

Pilots are reminded to brief thoroughly when crossing the Channel and familiarise themselves with both nations' Notam and the French law associated with airspace restrictions. For full details see the UK AIP SUP 016/2019 and the French AIP SUP 081/2019. The French DGAC will submit another AIP SUP for the dates between 1 July and 30 August 2019.





TABLET TRICKS

Are you getting the best out of your tablet or app to avoid heading for a bit of bother?

It might seem odd when there's some form of GPS in cars, phones and even watches that a few pilots still don't even consider it when flying, even though recent studies show "...correct use of a moving map could have helped avoid 85% of (General Aviation) airspace infringements".

Ask why and they'll usually say they know where they are with a chart and watch and are aware of any infringement risks – "Look, I know where I am, and I understand the airspace, but thanks for asking..."

What some might not realise is that GPS, particularly with the latest apps, need not simply be a matter of 'two-dimensional position', 'track to next point' and groundspeed, similar to car systems. It only takes a demo, often by a fellow pilot, of ideas such as pop-up warnings of airspace close by, ground proximity, even nearby traffic, or the vertical visualisation of their aircraft against terrain and airspace, to convert the pilot to include GPS in their flights as a safety net.

Take this case of a vintage pilot attending AeroExpo, a recent user of a popular GPS-App: "It (a very popular brand name) returned my flying to what it was 25 years ago," he said.

It turned out that in previous decades he'd been happy and relaxed in his flying, but recently had been considering another hobby because he'd become so stressed by all the extra airspace, restrictions, infringement publicity, warnings, etc. He then bought a subscription to the GPS-App which returned him to his old self of a quarter of a century ago – happy in flight and recognisably relaxed afterwards (much to the relief of his family).

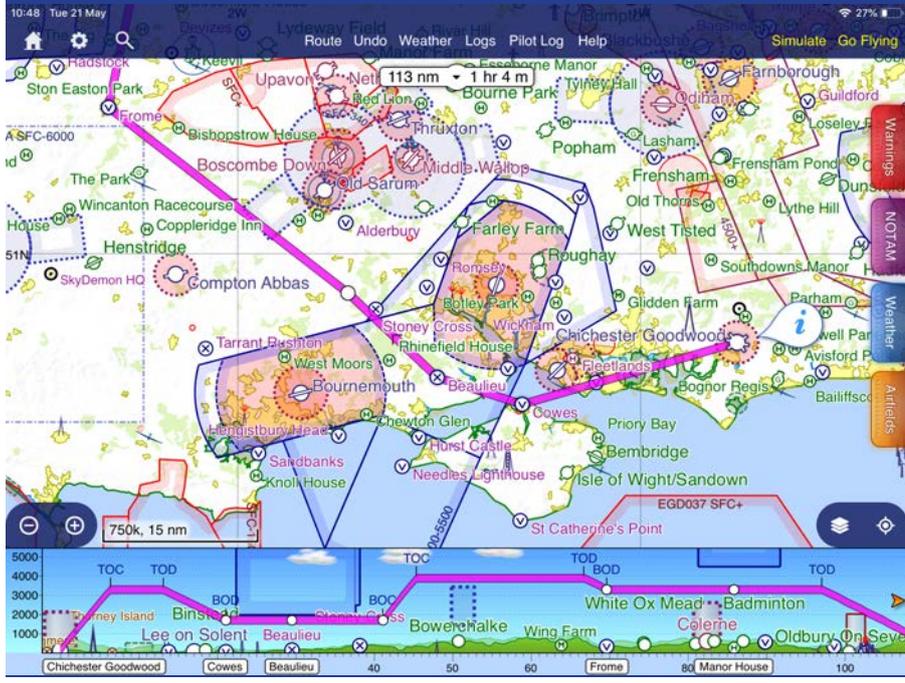
Digging deeper into his re-energised enjoyment in flying reveals some home-truths that are worth stressing, he was quite clear that it wasn't merely a case of just booting up a tablet and clicking on the GPS-App that solved all his issues, it was *intelligent* usage that made the partnership work so well.

The app he was using was capable of

far more than he knew — he 'knew what he knew' about the product so he limited its use to that extent. If he heard via the grapevine of other features that appealed, he tried them out on the ground, otherwise he flew with what he knew. In common with others, his app had a demo mode so he could try out functions in an armchair, rather than as a distraction in the air. Limiting himself to known functions and reducing distractions when airborne were two of the key factors in his new relaxed, trouble-free flying.

Importantly, he was running it on his own tablet and he didn't loan it out to others who would, probably while denying altering anything, change some setting from what it was previously.

Changed settings can, of course, be an issue if you're using a shared GPS (in a rental or syndicate aircraft, for example) and it's unlikely that you'll have anywhere near the time or willingness to check 'your' settings since you last used it; but one thing's for sure, one day, something



desktop without the right browsers, and that's not the time to discover you have forgotten your AIS password or how to actually run an 'old-fashioned' non graphical Notam check.

Yes, most preparation can now be done on screen more easily, electronically, graphically and, even better as far as most pilots are concerned, faster, but it still needs to be done. An infringement (and associated Airprox) of an airshow RA(T) (Restricted Area (temporary)) in the Midlands this year showed a pilot could not have checked the Notam properly prior to flight.

He'd used a software app merely for planning tracks and avoiding permanent airspace, but he didn't connect to the internet to check for up-to-date Notam just prior to flight. Some GPS units and apps do, of course, warn you that that Notam might be out of date if you try to fly even an hour later without connecting to refresh them.

This particular incident was an expensive way to realise that temporary airspace restrictions mean simple route planning without checking Notam isn't enough. Even a call to the NATS airspace upgrade free recorded message on the day would have solved the problem (in this case). The number is 08085 354802 (or +44 1489 887515) and if you've never used it, give it a try now and then store the number in your phone.

However, while calling the number

will have mysteriously (and silently) changed. So everything you depend on needs to be checked – a user way point of 'November' you created and used successfully a week ago might have been over-written to be a different place at a different airfield, for example.

The trick with using GPS is not to be distracted by equipment in the cockpit so that you can focus on flying, so why not minimise expected alerts during planning? Flying is even more enjoyable if you bear this in mind – why plan to skim airspace with multi-electronic airspace warnings interrupting your thoughts and lookout when you could actually design the route to minimise warnings, knowing that when you get one it's more of a rare occurrence which needs attention?

For a year or so, there has been a campaign about routing two miles laterally or 200ft vertically from regulated airspace

if possible, so why not use this, or even more, as a buffer for a more enjoyable and, if the warnings are audible, quieter flight.

Let's be clear, while GPS in flight can enhance your situational awareness, even to 3D and including 'other traffic', it changes nothing in the overall general process of flight preparation. There's still all the self-checking discipline of 'should I be flying?' (medical fitness, expiry dates, etc.), Notam and weather, fuel calculations, mass/balance and performance still need to be considered.

If using a simple GPS or an app, it's worth making sure once in a while that you can still use the official UK (text only) Notam site www.ais.org.uk to check a route, even for a test route that will never be flown. There will come a day, perhaps at a remote field away from mobile phone internet access, when your only means of Notam checking is via a hard-wired



VERSION 2



THE SKYWAY CODE

www.caa.co.uk/skywaycode

Printed copies available from AFE online
Download at www.caa.co.uk/skywaycode



life cover for pilots



Without specialist advice pilots can often face expensive premium loadings when applying for life cover.

We can usually secure standard rates with no aviation exclusions.

- Life insurance for your family, mortgage or business
- We help recreational, commercial, instructor and student pilots
- Cover can be arranged over the phone
- Our insurance advisor holds a PPL
- Online quotes

stein pilot insurance



FREEPHONE

0800 5999 101

www.flyingcover.co.uk



Could you cut the cost of your Aircraft Insurance?

For an
instant quote
go to Visicover.com

Visicover is a unique service that lets you arrange and manage your aeroplane, microlight, autogyro or helicopter insurance online when it suits you.

- Buy your insurance online instantly
- Only pay for the cover you choose
- Spread your premium payments for free
- Change your cover whenever you need
- 24 hour claims hotline service included

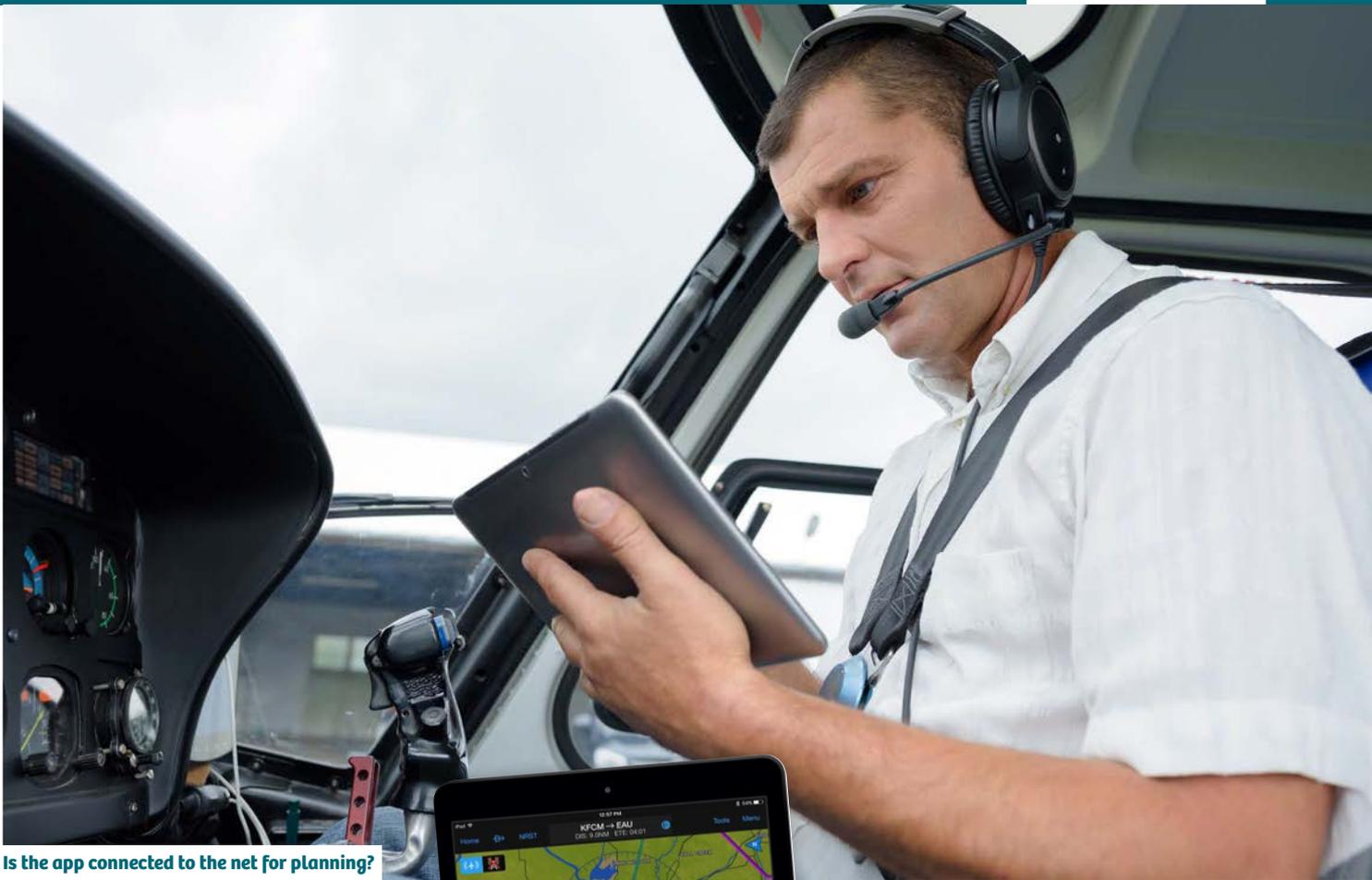
We have helped thousands of aircraft owners across Europe to reduce their premiums, so why not see if Visicover could also help you cut the cost of your aircraft insurance?

Fair, Flexible & Affordable

Authorised and regulated by the Financial Conduct Authority - 585660



To find out more go to Visicover.com



Is the app connected to the net for planning?

would have alerted the pilot about the RA(T) he infringed, and hopefully would have avoided the infringement and subsequent Airprox, it's important to realise that it isn't a substitute for a proper check, it merely lists the upgraded airspace on any day – for example for Royal Flights – and any temporary restrictions such as an airshow or Red Arrows display.

Just as an example as to why it isn't a substitute for a Notam check, a one-day parachute drop event would certainly be Notam'd, but not be listed on the freephone number because no airspace change is involved.

For flying, the discipline of integrating GPS use with traditional VFR navigation needs to be learned, so that switching between the two is relatively seamless. Don't fly on the basis of 'GPS never fails for me', because what you really mean is 'GPS never failed in the past for me', and you are flying now, not in the past. Even if GPS satellites keep transmitting unjammed signals 365/24/7, tablets do overheat and shut down; they can run down quickly, and for traditional GPS users, alternators can fail and warning red lights not be noticed, leading to lack of panel electronics later in the flight.

Long before considering any particular flight for preflight planning, there's a little bit of 'Threat and Error Management

(TEM)' to bring into play — always a good thing for converting future regretful hindsight into current intelligent foresight. Two things come quickly to mind, both based on recent infringements which left two pilots with undergoing expensive and time-consuming processes they could have so easily avoided.

Firstly, what about carrying an official paper chart (that you can reach) in the cockpit...? It might feel good to sit in the bar and pontificate that no regulation specifies a paper chart, and anyway, the information can be up to a year old, can't it? Well, for one thing, it's a great safety net. In a recent different infringement a pilot had relied on a GPS, and even printed out a chart of the route, 'just in case'.

Sadly, not only did the GPS shutdown

'Even if GPS keeps transmitting 365/24/7, tablets do overheat and shut down, and can also rundown'

in flight, weather forced the aircraft well off the intended route, beyond the pilot's pre-printed (fairly narrow) route. It was an expensive way of saving about £16 on a paper chart as back-up. What it actually cost was a navigation flight test with the CAA Staff Examiner to restore his suspended licence. As an aside, an early call to alert 121.5 or his service provider to his developing situation would have been great airmanship and no doubt saved the day.

While on the subject of paper charts going quickly out of date, that's true if you don't realise that you can receive email updates during its validity period to update the chart yourself using NATS' VFR Chart Newsletter & Update Service (www.nats-uk.ead-it.com). So if a glider winch site opens up or closes down, either of which might amend your intended route, an email can inform you with plenty of notice to update your chart.



Routing wide of complex airspace...



...can make flying more relaxed

What about electronic charts going out of date? First, the easy bit; it would be rare for GPS-Apps not to refresh their charts every 28 days, coinciding with official updates (known as the AIRAC cycle) but you might need to open the GPS-App while connected to the internet to be offered a chart update. So an internet connection with the GPS-App opened needs to be a task shortly before any flight, not only for Notam, but to check for chart updates.

As for traditional GPS units, as many instructors helping out individual or syndicate owners know, it's much more common to see databases out of date because they often need extra effort to update. Clearly, if out of date, airspace depiction can't be relied on, but it doesn't mean the GPS itself is completely useless – far from it, the real navigator will always be interested in track and ground speed and general position in relation to permanent features. The prize for the 'most aged database' that I have seen goes to a syndicate in which it was well over 15 years out of date...

Planning a route? Remember, the risk of a GPS-enhanced head-on airprox (or worse) is greatly enhanced by flying exactly on track between two 'obvious' points, especially those such as airfields, navigation beacons or 'coasting out/in' points in Class G. If you are using a traditional GPS and your track line is between two 'obvious' points, why not check for any terrain or airspace to the right of track, and then use the magenta line as the equivalent of an old-fashioned railway line and choose to stay right of it, or perhaps introduce a

very minor dogleg into the magenta line route that will avoid the danger of meeting someone doing the same in the opposite direction.

If the planning has been done properly on a route designed to minimise alerts and avoid cockpit workload and distraction the flying can, as we've said, be relaxed, so why do pilots seem to use GPS to deliberately plot routes to 'skim' airspace boundaries meaning more distraction and extra concentration? They wouldn't skim over hills with only a few feet of vertical separation from the ground, yet when hills are replaced by regulated airspace above, below or to one side, they seem quite happy to do so?

Another point worth thinking about while flying is that the scale of the display is sometimes critical: 'zooming-in' on the aircraft can cause awareness problems and extra work a few miles ahead, an oncoming airfield, for example. Again, if you avoid tight 'skimming', the visible chart picture can often be expanded more, allowing tasks (e.g. radio calls) to be made in good time rather than being left to the last minute.

Equipment shutdown in flight might not be common, but it isn't unknown, so absorb in-flight information early while it's still being offered, there's nothing worse than looking at the display and finding it's locked. Note it and compare it with your preflight planning values and expectations. Drift requires a minor effort of simple arithmetic, comparing GPS track to aircraft heading (comparing GPS magnetic track to a recently-checked DI) while groundspeed can be read directly.

Away from coastal or mountain effects, if your planning was good, you should only see minor differences, but major ones need to be noted and intelligent consideration given to why that would be.

Sampling the data over a few miles should help to decide whether the mismatch was a local temporary effect or the pre-planned values were wrong, in which case noting the measured values at this early stage will prevent severe embarrassment should equipment fail later in the leg due to overheating or power problems. Including groundspeed and drift comparisons into regular FREDAs checks can even alert a pilot to changes in winds, a possible early indicator of deteriorating weather.

Using GPS and associated apps intelligently can, as the vintage aviator at AeroExpo found, make flying even more relaxed and enjoyable.

Irv Lee is an Flight Instructor/Flight Examiner mentoring GA pilots in the UK

Resource Search / Address
CAA's Skywise
www.caa.co.uk/skywise (or Skywise App)

CAA's Safety Sense Leaflets
www.caa.co.uk/safetysense

Airspace Safety
www.airspacesafety.com

Airspace for All (Airspace4All)
www.airspace4all.org

WWW.STARTPAC.COM



TOLL FREE 844.901.9987

YOU NEED POWER!

START PAC - THE BEST THERE IS.



MODEL Li2800QC
WEIGHT 20.9KG
OUTPUT 28 VOLTS



MODEL 53200
WEIGHT 4.9KG
OUTPUT 28 VOLTS



MODEL SUPER PAC
WEIGHT 32KG
OUTPUT 220 VOLTS

WWW.**STARTPAC**.com

OR TOLL FREE 844.901.9987



TRIM RUNAWAY

Electric trim runaway is fortunately a rare occurrence but it does happen — could you handle it if it did?

Ask a bunch of pilots if they could handle an electric trim runaway in flight, and the likelihood is that some will say “Yeah, sure, how hard can it be...?” The answer to that is ‘potentially very hard indeed’.

Just ask anyone who’s simply flown by error out of trim, manual or electric, and they’ll tell you precisely that, depending on things like the size of the elevator, the aircraft’s speed and the control mechanisms, the pull or push on the yoke or stick can be worse than you might think.

Some accidents have occurred where forces of around 20kg have been needed to keep the aircraft straight and level – some might think ‘Is that all?’... But when did you last try lifting that for a sustained period of time while trying to fly accurately? Don’t believe it? If an electric trim runs away, it happens quickly. Depending on the type, just three seconds can put you significantly out of trim, and within five seconds an aircraft can be almost unmanageable.

Just think about that for a moment: if left badly out of trim mid-flight, how would a pilot on their own cope with the heavy yoke/stick forces, while trying to manage the myriad other tasks such as engine management, navigation and radio? This abridged report by Robert I. Snow* of a flight in a light aircraft type answers some of those questions and provides a sobering insight into the issues involved.

“At lift-off I was holding an annoying amount of forward pressure to maintain the proper climb angle,” he says. “It didn’t seem excessive, but I was immediately aware that there was no way we could do this all the way to our destination.

“Returning to the airfield, even at reduced speed, the amount of forward pressure needed to maintain control, inconsequential at first, had become exhausting by midfield on the downwind leg. I needed both hands to control the pitch.

“I thank my lucky stars that there were two of us aboard. The boss handled the throttles, landing gear and radio. By the time we turned base, he was helping me on the yoke, taking off some of the pressure whenever he didn’t need his hands for something else. Relief did not come until we started the flare. Finally, I was able to ease off forward pressure to raise the nose. Although I knew



‘As more and more weight suddenly and progressively comes onto the yoke, some pilots will be confused’

philosophically that the trim is a powerful part of the control system, I had never really experienced its potential before. Trimming away pressure had become such a reflex that I virtually never had to use more than minimal force on the yoke.

“If you are the kind of person who has to see things on your own, try it in flight some time. While straight and level (at sufficient height), roll in enough trim in either direction to force you to exert some effort to maintain pitch attitude, and then hold it for a while. You will quickly learn the lesson.”

That scenario related to a nose-up trim malfunction. In the nose-down case, the forces could make it difficult to slow the aircraft down, and/or configure it for landing.

The problem with electric trim malfunctions is that, as more and more weight suddenly and progressively comes onto the yoke, some pilots will initially be confused while trying to understand what’s happening. As the situation quickly worsens, coping with the problem becomes harder by the second — it’s an issue that needs immediate action.

To see how a pilot would cope we gave an unsuspecting trainee commercial pilot, who was flying straight and level in a simulator, a runaway trim in the nose-up sense. It was fascinating to watch.

At first, as the yoke came backwards the pilot reacted (as most would) by instinctively pushing forwards. As the yoke continued to push back with increasing weight, the pilot’s thumb went instinctively onto the forward trim





Light Aircraft Association

SYWELL 2019 INTERNATIONAL RALLY

30th Aug to 1st Sept



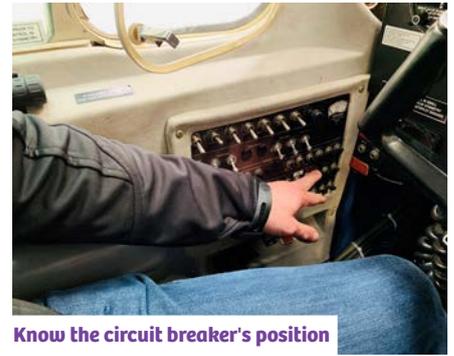
BRITAIN'S BIGGEST INTERNATIONAL FLY-IN EVENT

1000+ aircraft • 'Aerobats' themed marquee • Latest Designs • Kit & Homebuilt
Vintage • Classic • Microlights • Gyroplanes • Trade Exhibition • Seminars
Evening entertainment • Camping • Airside access

Flying in is strictly PPR via pre-booked landing slots and adherence to the published AIC.
See www.laa.uk.com/rally



How long could you hold full elevator for?



Know the circuit breaker's position



Would manual trim override?

switch to try to ease the load. However, it quickly became obvious that the switch was having no effect, because the load continued to increase — that's when you could almost see the thought bubble saying "what the heck's going on..." meanwhile, the seconds ticked by.

Realising that the trim button wasn't working, as the aircraft moved out of stable flight, the pilot went for the red 'electric trim disconnect' button on the yoke. This solved the immediate issue before they then (correctly) pressed the 'electric trim off' button on the panel, to be sure. With the electric trim off, manual trim restored and a stable flightpath, some problem-solving went on. This meant checking the circuit-breaker location in case it needed to be pulled.

In total, the event took the best part of a minute to resolve and there was a clear 15-20 seconds of "what's going on?" confusion, as height and heading started to wander. In reality it was quite a quick response, but then this was a pilot going through commercial training, who had already learned about this malfunction.

But how quickly would the average GA pilot react to the surprise and take the correct steps to deal with it before the situation became much worse?

First of all, make sure you know the checklists and procedures for your autopilot and trim systems. Most electric trim and autopilot systems have multiple methods of disengagement and pilots need to know them all.

The first, and closest, is often the disconnect button or switch on the yoke (if fitted), as our pilot showed. There might also be an 'electric trim off' button on the panel, as with the simulator aircraft.

Electric trims operated by an autopilot can also sometimes be disconnected via the mode buttons on its control panel. The electric trim in some types can also be overridden by using the manual trim wheel if fitted, though that can be challenging because it means taking a hand off the yoke at a potentially difficult

'Prepare for a trim malfunction by thinking through the actions you'd take and practising them'

time. However, in some failures simply 'switching off' won't completely solve the problem. With the loads increasing, altering speed can ease some of the yoke pressures. However, remember that an airspeed which is physically more comfortable, might not be appropriate for approach and landing.

In some types it can be essential to know from memory which circuit-breaker to pull to stop the trim motor

before the loads become too high. Some owners make the relevant circuit breaker identifiable, to ensure it is easy to locate.

Bear in mind, though, that some circuit-breakers can power more than one function. Check the flight manual and only pull the circuit-breaker if it says to do so. Remember, too, that valuable information about the autopilot and trim systems might not only be in the main body of a flight manual or set of procedures, but might be contained in supplements.

Pre-take-off, don't just check the electric trim for full and free movement, also check that the trim wheel is moving in the correct sense and that the disconnection mechanism works (on both yokes, if fitted). Know the emergency procedures, and if that involves pulling a circuit breaker know where it is. Prepare for a trim malfunction by thinking through the actions you'd take and practising them for each type you fly.

Electric trim malfunctions and runaways are quite rare, but they can and do happen. Trim runaway was a possible scenario identified by the AAIB in a report into a 2017 Piper PA-31 fatal accident. The pilot reported pitch control problems and diverted to Caernarfon Airport where the aircraft crashed on an attempted landing. The elevator trim was found in a significantly nose-down position. You can read the full AAIB report in the AAIB March 2019 bulletin.

** Robert I Snow writes for AOPA in the U.S.*



GETTING THE BASICS

Confused by the Flight Information Services or not sure you're seeking the one you need? Here's how to be well served

G ABCD is 20 miles north, 4000ft, passing west abeam Gloucester, can you give me a Basic Service and do you have any conflicting traffic?

This particular pilot has plied this route for more than 25 years in a couple of different aircraft, following the reciprocal track a day, or two later. His dulcet tones are familiar to the ATC staff, as is his seemingly innocuous request. Technically, the answer to his question, however, is "Errr....not really!" This perhaps highlights that the 'new' UK Flight Information Services are still causing a bit of confusion among the GA community.

The current suite of Flight Information Service was introduced ten years ago with the intention of standardising the provision between civilian and military units. The services have had a few tweaks since introduction but the broad principles are the same. They meet the ICAO requirements but are unique to the UK. Ask for a Basic Service in Europe and you'll probably be met with "Say again?"

So what can you get? Where can you get it? Is it what you really need?

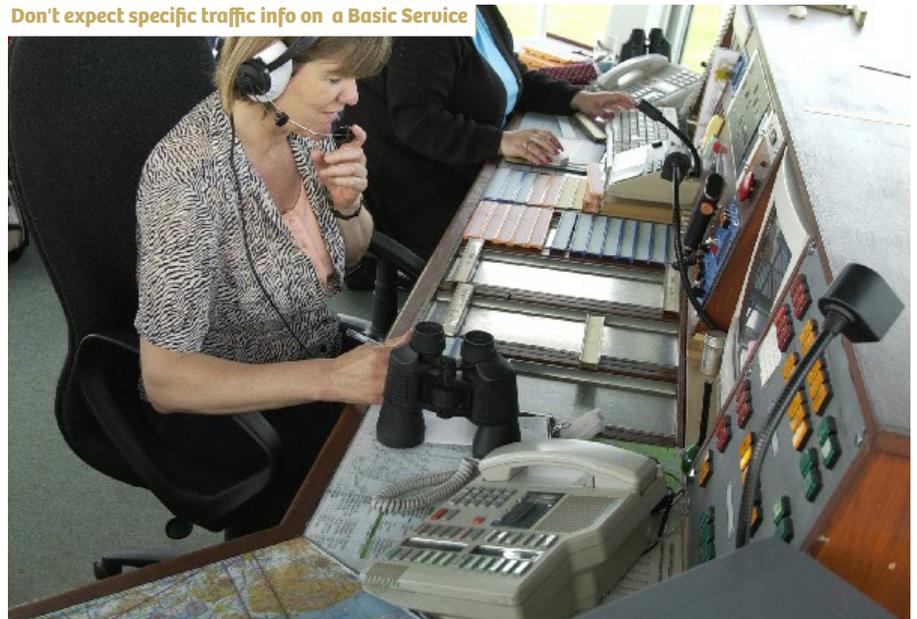
BACK TO BASICS

The clue really is in the name. Replacing what we formerly knew as Flight Information Service, Basic Service will be provided by all ATC Units (Callsign 'Radar' or 'Approach') that operate outside controlled airspace and all AFIS stations

(Callsign 'Information'). Provided to everybody, whether IFR or VFR, VMC or in the cloud, all you can realistically expect is probably the weather.

Some units, especially those with full ATC, might be able to tell you about danger areas or closed aerodromes etc, but don't expect much more! On a gin clear day when everyone's airborne, it's little more than a callsign collection service and

Don't expect specific traffic info on a Basic Service





The trick is knowing what you really want and asking for it

you won't get it at all from an A/G service (Callsign 'Radio')

What you should not expect on a Basic Service is specific traffic information. You might be told about generic stuff, like 'XXX gliding site is active' or intense activity in the vicinity of XYZ'. At best, you might be told if another pilot is estimating the same position at the same or a similar time and altitude, but if you want more you need a different service.

Here's where it gets a bit complicated, however. Some ATS units might identify you by giving you a squawk. This helps them monitor your progress but you shouldn't assume they will be, or that a different service is being provided.

Furthermore, if an ATS unit is providing you with a Basic Service and the controller or FISO thinks that there's a definite risk of collision they must actually pass you specific traffic information after all. Why? Well, in addition to the vast amount of paperwork a mid-air collision creates, Controllers and FISOs have a legally defined 'Duty of Care' to you as their customer. It is, in fact, these legal obligations of individuals and companies that form the basis for the services. In an 'uncontrolled' environment, however, it is recognised that not every eventuality can be covered and they need to exercise their professional judgement to suit the circumstances.

By its very nature, application of this is open to a fair amount of interpretation. While controllers are actively discouraged from passing specific traffic information under a Basic Service – so that the services are applied consistently – the interpretation of 'a definite risk of collision' can be somewhat subjective. Without radar, (e.g. Cranfield, Shoreham, Carlisle, Redhill) and sometimes those with radar (e.g. Gloucester, Cambridge, Exeter) they'll

probably be more inclined to tell you about aircraft at the same level. Lookout and avoiding action remain the pilot's responsibility. You'll probably only be told once. Not comfortable with this? Traffic Service might be the answer.

TRAFFIC, TRAFFIC

Similar to what used to be 'Radar Information Service', Traffic Service will only be provided by units with access to radar equipment. There's no point asking 'XYZ Information', they don't have the kit or qualifications to help you with this.

The AIP will tell you which aerodromes have radar and the Notam will tell you when it's not available. Provided to both IFR and VFR flights, ATC will 'identify' you with a squawk or, in rare cases, a turn and generally give you traffic information on relevant aircraft coming within 3nm and 3000ft. If the other traffic is passing behind or diverging this might be omitted and, in theory, you'll be passed information that is pertinent to you in sufficient time for you to think about avoiding action.

Here's the nub; if avoiding action is needed, it's still your responsibility. You will not be given avoidance advice on a Traffic Service. Hazy day, busy airspace, this is probably the safety blanket you need.

DECONFLICTION SERVICE

Only available to IFR flights (in IMC or VMC), the controller will give you headings and levels with a plan to achieve the appropriate 'deconfliction minima'. It's their job to try to assist you in not bumping into other aircraft by generally keeping you 3 or 5nm laterally and/or 1000 or 3000ft vertically from everyone else. The distances will depend on what radar equipment they have. This is the only service under which avoidance advice is given. Outside

controlled airspace, this is still not guaranteed and, ultimately it remains the pilot's responsibility to avoid a collision.

PROCEDURAL SERVICE

Again, this is now the domain of IFR flights only. Usually provided by airfields without radar, or when radar is not available, the controller will allocate routes, timings and levels that provide standard deconfliction minima (most often 1000ft vertically) between other aircraft on a procedural service. You may also be given traffic information on other Basic Service traffic if a confliction exists but, as always, collision avoidance is your responsibility.

BENDING RULES?

The basic premise of the services was that we all stick to the rules and no-one gets confused about what it is they're getting. In the 'bandit country' that is uncontrolled airspace however, this doesn't always work and the level of service you request and receive is the 'contract' between you and the controller.

Sometimes, ATC might ask you to take a particular course of action, such as 'not below/above' a level or to route via a particular point (e.g. north of the Danger Area) for co-ordination purposes – if you agree, you'll be expected to stick to the agreement. These types of 'agreement' are generally for short-term tactical reasons.

SERVICE LEVELS

Controllers should endeavour to give you the service you request. Practicalities and pragmatism need to be considered, though. If it's a clear, cloudless day and it's taken you ten minutes to get your call in on the frequency, the controller's workload is likely to be too high for the more sophisticated service levels. By the same token, if you find yourself unexpectedly in the murk, you can request to change to a more appropriate service.

The trick for all parties is finding the balance. Know the services, know what the unit you're talking to is capable of providing and think about the situation you're in and you should have a reasonable chance of getting what you need. Your pre-flight planning really needs to include a thought process about the optimum service, and what your contingency is, if that's not available.

Darren Lewington is an ATC instructor at Global ATS.

An aerial photograph of a rural landscape. A large, dense forest of green trees dominates the left and center. To the right, a green field with a horse in a paddock is visible. In the background, there are more fields and a line of trees under a clear sky.

STRIPPING OFF

Thinking of expanding your horizons? Flying to farm strips can be an enjoyable challenge but there are a few things to think about

Let's be honest, strip flying is fun. There's no doubt that for some pilots there comes a time when airfields, however good, just don't cut it anymore and thoughts turn to finding new, more interesting destinations.

While licensed airfields are constructed in accordance with CAP 168 which lays down runway standards, obstacle clearance, signage and surface markings, many unlicensed ones have their own individual and sometimes quirky facets and conditions which is, of course, what makes them intriguing to visit.

But as with many challenges in flying there are often a number of extra factors involved if you want to avoid an unseemly interaction with, say, a hedge or tree...

Aircraft flight manual performance figures for landing and take-off might generally be based on basic, hard surface nil wind figures, but when it comes to strips you'll need to factor in the effects of temperature, tailwind, slope, altitude and surface state, all of which make quite a difference to the basic hard surface, nil wind figure.

So let's talk factoring. How long is the strip? What's the surface like? Is it smooth grass or rough, how long is the grass, has it recently been cut, is it wide enough? Will it be dry or wet? And how about obstacles? Trees, wires and buildings can be a lot closer to the centreline. At some strips crops might be grown right up to the edge of the strip area, so will your wings be clear of the (sometimes tall) crop?

One strip I went into was 500 metres of grass and easy for my Cub, but that same strip would be a problem for a PA-28. The owner usually has cattle in the field and keeps them off the strip with an electric fence. Trouble is the fence is only just outside the width of the strip. So, while it was easy in a Cub because the wing would be above fence height, it wasn't necessarily so good for a PA-28 where the fence and the wing could have an argument with each other. The moral of that story is don't be complacent, know how much width you need.

Is the ground level or is there a slope to consider? Some strips will require landing uphill and take-off downhill, irrespective of wind direction. Lateral slopes can be dangerous and should be avoided without experience of them.

Then there's the general terrain around

the site and it's likely effect on the wind. Will there be turbulence or a crosswind just where you really don't want it, will obstacles — a gap in trees, for example — affect the wind direction or speed over the strip area.

However hard you look, a flight guide's layout diagram might not necessarily give a full feel for the terrain around, nor will it necessarily show the contrast in different field surfaces, but a good way to find out is to head over to Google Earth, or similar, to have a good look at the terrain; it's also good for spotting useful landmarks to orient yourself with the strip.

Remember too, however good a flight guide is, its picture might not always give the full story. At one strip there were trees across the approach end standing about 20ft tall, what the diagram didn't show was a power wire running level with the tree tops on the strip side which you couldn't see until you'd almost flown over the trees.

Maximising the landing distance there could tempt you to get the wheels as close to the tree tops as is sensible, but in this case that meant there would be a good chance of the wheels catching the wire. The moral is, when landing at strips always expect the unexpected.

Because of their very nature, strips don't always stand out well against the fields surrounding them, so make sure you get the correct field, landing in the crops in the wrong field alongside is embarrassing at the very least (yes, it's been done)... Grass cutting can change the look of the land too, so make doubly sure before committing to a landing.

What about checking for a website? Some of the more regularly used strips have their own and there's usually plenty of useful local information on them for planning purposes, and possibly warnings such as the power line behind the trees mentioned above.

Aircraft noise is always a hot topic, so check for noise sensitive areas and keep clear of them. Built-up areas should also be avoided, which means the approach might not be the nice rectangular circuit you're used to. Needless to say, a phone call to the strip owner is a must to obtain PPR and also to get any additional briefing required.

If you're planning to stay for a few days or even just a few hours, consider carrying intake blanks, pitot cover, tie downs, etc. and use them. Wildlife and birds (of which, surprisingly the countryside is plentiful...) 

'Strip flying is great fun and sharpens the skills, but some preparation is required'



can be very clever at finding ways to get inside and cause varying degrees of havoc.

Having looked at the preparation process and deeming yourself ready to go, can you really say to yourself 'I'm ready to fly this plane into strip X'? Operating off a relatively long and wide hard runway is very different to the short, narrow strip you are planning to fly into — incidentally, are you sure you can get out again?

At licensed airfields we get used to having space to land, or float along if we're a bit fast before touching down. Maybe we've ballooned the landing and re-establish the flare further up the runway before touching down. Out in strip-land you might not have the space to float for long and the width might require better attention at keeping in the middle.

At some strips there might be a point on finals where you're committed to land because there's simply no go-around option. That was the case at a strip in western England. It had two runways, one a bit less than 400 metres, one a bit over.

My aircraft was capable of landing or taking off in around 300 metres.

The field was on a hill which meant landing uphill and taking off downhill. Noting the wind direction I saw it would be a crosswind whichever runway I used. The slope would, however, help slow the landing rapidly while helping the acceleration on take-off. The wind direction also meant that there would be a slight tailwind for landing, but that would be cancelled out by the effect of the slope.

There weren't any significant obstructions to worry about, but there would be some turbulence at low level induced by the airflow over the sloping ground, so I needed to be prepared for power adjustments to control the sink. Once below about 100 ft there was no go-around because the aircraft couldn't out-climb the slope, so the approach had to be absolutely bang on — tricky, that one.

Before setting off for your chosen strip, ask yourself a few questions: can you handle the aircraft safely to the tolerances

needed for your chosen strip? When did you last do a proper short-field take-off or landing? If the answer is 'some time ago', do some practice circuit work, maybe with an instructor, to hone up those skills. What about crosswind practice? Are you really comfortable handling differing, perhaps unexpected, wind conditions?

And what about the aircraft? If you fancy becoming a regular 'stripper' have you really got the right tool for the job? Where the strip is long and smooth, it's not such a big issue, but where the ground is rougher a tailwheel is the better option; unless handled properly, a nosewheel can easily be damaged by hitting a runway ridge.

Strip flying is great fun and sharpens the skills, but sensible preparation is required before you start and make sure that you don't do anything that will cause problems for the strip owner. But, above all, enjoy it.

Phil Matthews is the owner and CFI of Cotswold Aero Club and has more than 20,000 hours experience in light aircraft.



DO'S AND DON'TS OF STRIP FLYING

I used to base my private flying at a large airport for nigh on 17 years, but am now an avid strip flyer with some five years' experience.

I wouldn't dream of landing on anyone's private property (read farm strip) without asking permission and getting a briefing of sorts unless it was an emergency. If I was to help myself and simply turn up unannounced, the word trespass springs to mind and, let's face it, that could get you shot in some parts the world.

Look at it another way: many homeowners don't take kindly to drivers turning in their driveways, so how do you think strip owners would feel if you turned up unannounced? I've seen a pilot display their 'airmanship' by landing at the strip I use, do quick 180 and depart again making a racket over a local conurbation that we, as good neighbours, avoid.

Quite apart from consideration, there are many other factors to bear in mind when flying into strips.

- **What will be its conditions on the day?**
- Do any footpaths cross it? – It might come as a surprise, but ramblers would have the right of way.
- **What local residences/villages/areas should not be overflowed.**
- Do pilots from the strip use safetycom?
- **What is the strip's elevation (what altimeter sub-scale are you using)?**
- Have any crops been planted?
- **Is there any livestock likely to graze on the strip?**
- What hazards exist – especially in terms of obstacles/cables etc on the approach or climb out?
- **What are the surface conditions generally like? If it's undulating an area**

might, for example, launch you if you mistakenly land on it.

- Are there any fences, electric or otherwise, to contain farm animals? Temporary fencing might be used at times to segregate part of the strip for livestock - how close could you get to landing into a low sun before spotting it?
- **How would your insurers react to a claim if anything untoward happened and you had not spoken to the owner.**

It's not that hard to find contact numbers for many of the strips and, surprisingly, many are all too pleased to say "yes, do come and visit, just let me have some details". So please do the right thing.

Thanks to HuskyPilot



Flying Support with an AOPA Membership

Whether you are an aircraft owner or pilot **AOPA** is your Association.

We will keep you up to date on all issues relating to your flying – through our monthly eNews and the website and your own personal copy of **Aircraft Owner and Pilot magazine**. (the highly acclaimed magazine from AOPA).

The association is **run by pilots for pilots** and whether you have questions in relation to pilot licenses and medicals or aircraft purchasing to maintenance AOPA is here for you.

We can also provide **expert help on a range of issues** including investigations and legal action taken by the CAA.

Our pledge is to provide you with the support you need that gives you peace of mind so you can get on and **enjoy the activity you like best** – FLYING!!

As an instructor member of AOPA you will be eligible for a **discount on AOPA FI refresher seminars**.

Student pilots learning to fly at one of our member flying clubs or schools will benefit from free membership for up to two years.



Office 0207 834 5631 Monday to Friday 10:30 to 18:00

 AOPA.CO.UK  [AOPA.UK](https://www.facebook.com/AOPA.UK)  [@AOPAPILOT](https://twitter.com/AOPAPILOT)

50a Cambridge Street, London SW1V 4QQ

KEEPING A WEATHER EYE

It's complex and always changing, but staying on top of what the weather's up to isn't necessarily difficult

I'm lucky enough to have enjoyed flying for 20 years now, passing the 1000hr mark a few years ago. For more than a decade I have been flying out of Exeter in Devon with the well run Robin Flying Group that operates a fleet of Robin DR400s and a Super Decathlon. The Robin is highly capable with outstanding visibility from which to observe the weather – and as a weatherman that's terrific. I'm also fortunate to be able to fly a somewhat more weather sensitive 1941 J3C cub from a small Devon grass strip.

A few years ago I tried a completely different type of aviation with even greater weather sensitivity, learning to paraglide with my 17-year-old old daughter Katherine in the Alps. Underneath a paragliding wing you feel every lump and bump of turbulence, and that gusting 15-20kt wind that wouldn't trouble you in a Robin would be a complete no-go.

Flights in the Robins range from short

locals and breakfast runs, to overnight trips to northern France and occasional longer tours, with destinations including Scotland, Denmark, Italy, Spain and the highlight – Morocco. These have been demanding yet rewarding, with weather often posing challenging decisions, often with limited weather information.

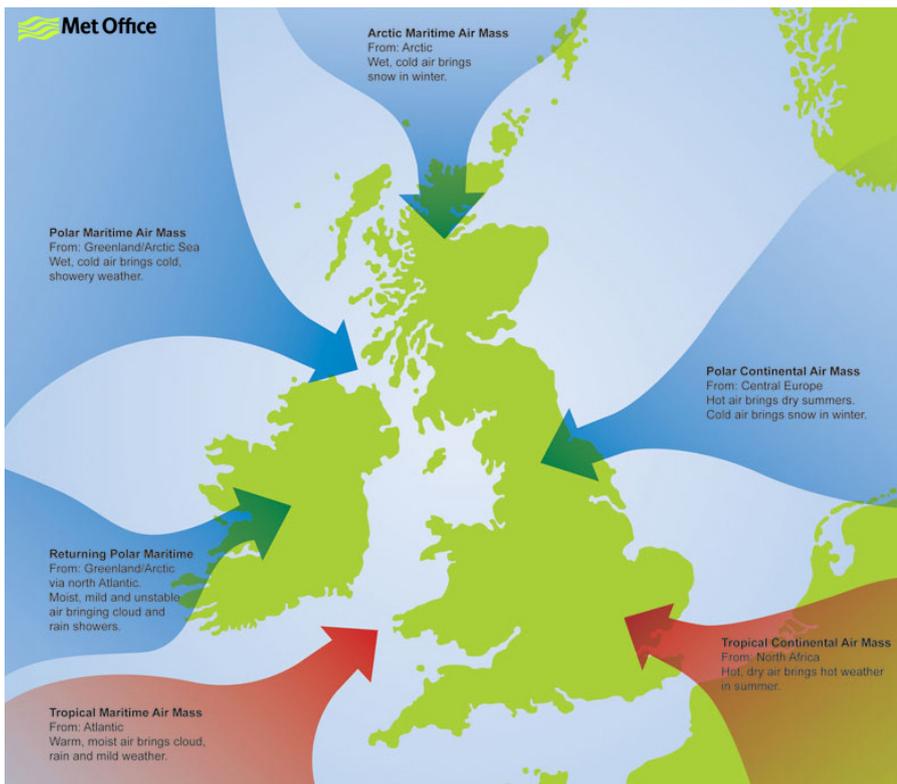
A pilot that always waits for perfect conditions will find themselves frequently grounded, or missing the best weather and the wonder of a stunning cloudscape. They will lose currency and enter a spiral of declining confidence. Sadly, many new pilots give up flying soon after gaining their licence. There are various reasons but I suspect a key one is a fear of the weather, possibly made worse by an unexpected weather challenge.

Weather is to be respected, not feared, and developing an understanding of it and how it might change can only help in developing confidence and enable pilots to

expand their flying horizons safely and take to the air when many stay on the ground.

When it comes to weather, understanding the context is an invaluable tool. Air masses – essentially where the weather has come from – are a good example of this. Weather which reaches the UK from the south over Europe is more likely to be dry, but may be hazy and polluted. Weather from the south-west is likely to contain moisture bringing rain and low cloud, while weather from the north-west is likely to bring clear air following a cold front, but with a higher risk of showers. This level of understanding will help pilots prepare, respond and react to weather accordingly.

With advances in science, computing and satellite technology, weather forecasts have dramatically improved over the years – a four-day forecast now is as good as a one-day forecast was just 30 years ago and forecasts contain far more local detail. However our weather is extremely



'However, with all its complexity, weather continues to surprise'

showers and thunderstorms – and therefore how big the risk is. Again, looking at a rain radar can help build up a much more comprehensive picture.

Having worked at the Met Office for more than 20 years I'm lucky to have been immersed in the weather and have built up a reasonable understanding of the drivers of it. However, with all its complexity it continues to surprise and I have made my fair share of mistakes and sometimes have been caught out by fast-changing situations, even when good forecast information has been available. Reflecting over the years the weather challenges of note can be grouped into: lowering cloud and reducing visibility, showers and thunderstorms, fog, wind and turbulence and performance.

Lowering cloud – either due to an approaching front, but also due to moist air being forced up over hills. METARs and TAFs reflect weather at or near an airfield, but do not capture the risks that a nearby range of hills may bring.

Taking off from Exeter for a short flight to Compton Abbas or Old Sarum, for example, it's not unusual to hit lowering cloud and poor visibility just 20 miles to the east as you approach the Blackdown Hills, particularly in a warm sector, behind a warm front and ahead of a cold front.

One tip I picked up from Sparky Imeson's 

variable and changeable, both in time and geographically.

In training we're taught the basics of weather and how to read and interpret standard aviation forecasts and charts including METARs, TAFs, 214 and 215s, and ASXX and FSXX charts. However the age of the internet and mobile apps – such as the Met Office General Aviation app – has brought ready access to a wealth of weather information. The challenge is to make the best of the information available to build a 'weather picture' that makes the go/no-go decisions more straightforward and weather changes en-route less of a surprise.

While METARs and TAFs are an invaluable resource, and should always be consulted before a flight, they cannot convey the full weather story with all its complex variations in time and space. It's our responsibility as pilots to build that picture, both through experience and by building an understanding of the weather and its many drivers. Watch the forecasts on TV, keep an eye on METARs and TAFs even when not flying, study radar and satellite imagery, talk to fellow pilots, share your weather experiences, read books and articles, attend courses and never, ever, be afraid to ask questions.

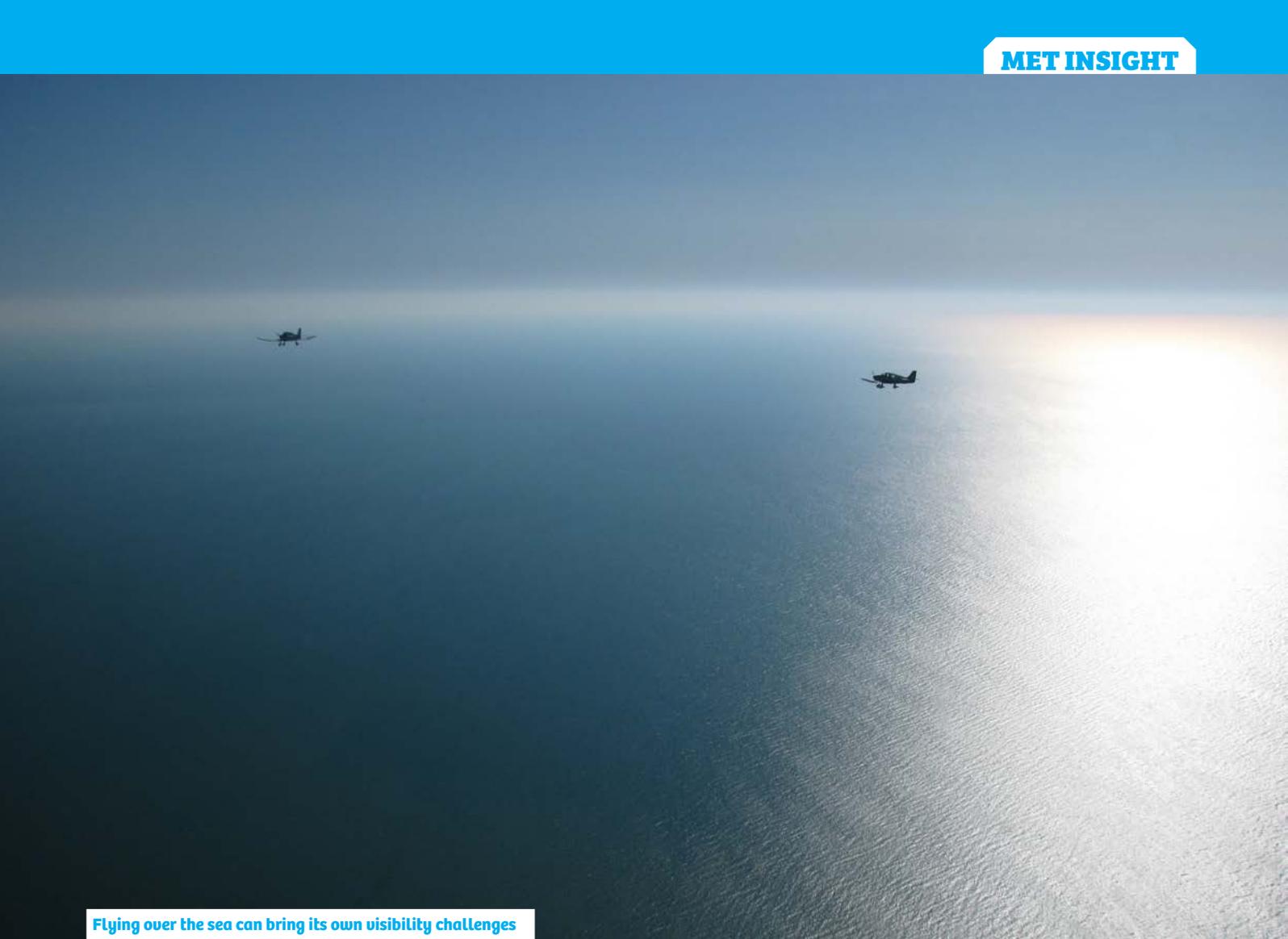
By consulting an array of information sources in the days leading up to a flight, pilots can achieve a greater understanding

of how the weather is evolving, which reduces the chance of any surprises on the day, or worse – during the flight.

To give another example of the importance of this context – a TAF can only inform of the chance of a challenge developing. A Prob 40 reading (a 40% probability of rain) may not be hugely useful – but, in contrast, consulting a rainfall map allows a pilot to see how showers are developing and have a greater understanding of how rain might impact a flight. A TAF can also be lacking when it comes to understanding the intensity of

Warm sector, lowering cloud and poor viz





Flying over the sea can bring its own visibility challenges

✈️ excellent book *Mountain Flying* is to try to leave a good spacing between you and the cloud base above. If you 'scud run' just below cloud to try to maximise ground clearance you run the risk running into the cloud if it lowers further, visibility is reduced as humidity approaches 100% and the risk of carb icing rises. Drop just a couple of hundred feet and the view ahead can be much improved.

Heavy showers and thunderstorms – An 'I learnt about weather and flying' moment was flying out of Madrid for Cordoba on our trip to Morocco. Six of us in three Robins had enjoyed perfect flying weather and fabulous views all the way down from Exeter. Madrid had proved a difficult arrival, with complex airspace, mountains to cross, and poor radio reception with difficult to understand controllers.

Having landed safely we were keen to fuel up, deal with the 'please call the tower' request, complete the long list of paperwork needed and press on to our overnight stop in Cordoba. Lulled into a false sense of security by perfect weather we departed over the Spanish mountains, happy to be

'I hadn't checked the weather properly, after all what could go wrong, it was CAVOK?'

in the air again. Visibility unexpectedly deteriorated, the cloudbase lowered and then a flash of lightning ahead and to our left focused our minds.

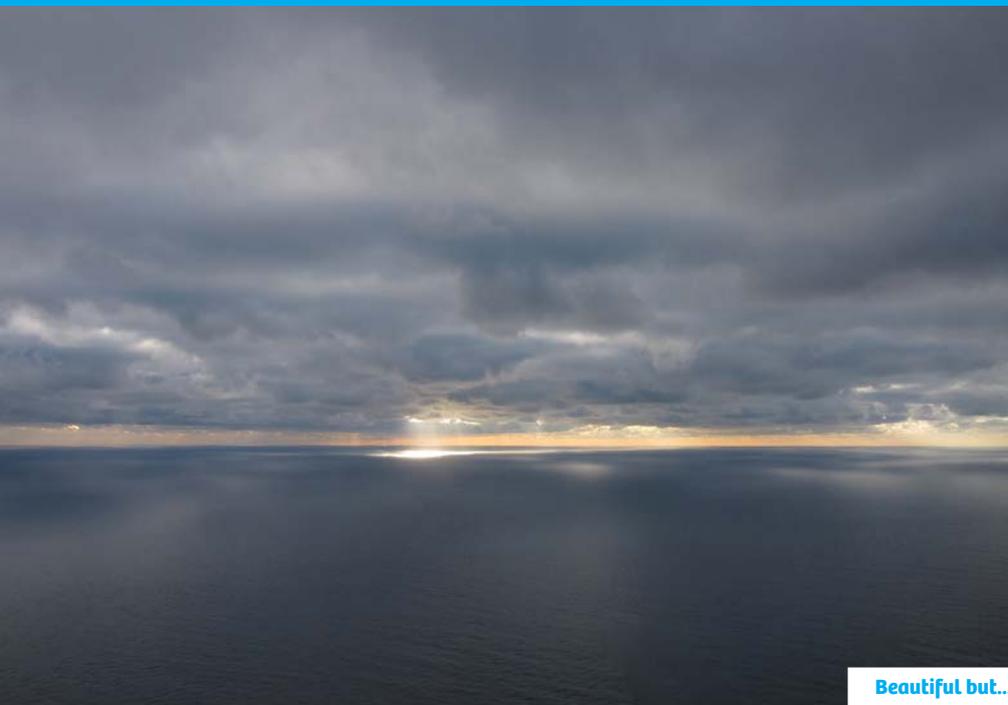
A tense flight followed as we routed around the weather, eventually landing in Cordoba with a beautiful hazy sunset. As we landed the lady from air traffic ran out to say they had lost contact with one of our planes, an even more tense wait followed before we heard the welcome sound of a distant Robin approaching. It turned out that the loss of contact had been due to transponder finger trouble and each of the aircraft had successfully weaved their way through the weather. In the rush to get airborne I hadn't checked the weather properly, after all what could go wrong, it was CAVOK?

Looking back all the clues were there, afternoon thunderstorms over the mountains are frequent, and the thunderstorm risk was obvious from even

the most basic inspection of charts and TAFS. A year on this was definitely in the back of my mind when suggesting we stay on the ground in Albenga in northern Italy rather than press onto Sienna late in the day, over the mountains with limited weather information.

Wind – I learned to fly at Compton Abbas and it remains a favourite destination, surrounded by the best of English scenery and not far from family. However you soon learn that just 10kt from the south can result in challenging turbulence as air spills over woodland to the south, whilst 20kt+ from the north is far more manageable with much of the crosswind easing as you flare.

Learning to look at and read the terrain is a valuable skill for anticipating turbulence and local changes in wind direction, particularly in hilly and mountainous regions. I won't forget the turbulence immediately downwind of Ben More



Beautiful but...



Paragliding brings a whole new appreciation of the weather



From Exeter to just about everywhere

flying out of Glenforsa in a 20kt breeze, or the turbulence experienced crossing the Gibraltar Straights as the wind is funnelled through the Gap between Spain and Morocco.

Flying out of Exeter in the summer a gentle into runway wind can turn into a stiff crosswind from the south as an afternoon sea breeze cuts in. This shouldn't be a surprise on a warm summer day, but may put you out of personal or aircraft limits.

Fog – either radiation fog forming as the sun goes down or banks of sea fog or low cloud being drive inland by a gentle breeze. It has caught me out approaching Le Touquet necessitating a return to the UK, and it has caught me out approaching Brighton to clear customs from Kortrijk in Belgium. Just 20 miles out it was CAVOK but rapidly turned into OVC002 approaching the field. The result was an initially tense diversion onto Exeter. Again this should not have been a surprise with the charts showing the remnants of a weak occluded front with wind from the south.

Heading home late in the day I'm sure many pilots will recognise that slight worry as the haze appears to thicken in the valleys and visibility into the sun all but disappears. The TAFS and forecast charts will help identify the risk, but there is nothing like having a back up plan in your mind.

Performance – a short runway may rarely present a problem in winter, but a windless summer's day makes a huge difference to performance, sometimes doubling the take-off roll. A friend and I once flew a 180hp Robin into Truro for a fly-in on a warm summer day. With 500m available it is usually well within the Robin's capability. On the ground we were asked if we minded giving a lift home to a couple of stranded passengers. The departure was slightly uphill, with a hint of tailwind. The clearance from the fence at the end of the runway was less than we would have liked... With the benefit of hindsight a quick calculation would've highlighted the risk and we should have insisted on a downhill into-wind departure.

Whatever your flying habits, a sound understanding of the weather can only make it safer and more enjoyable. Just as flying currency is important to keep your flying skills up to date, so is 'weather' currency.

Derrick Ryall is Head of the Public Weather Service at the Met Office and has more than 1,000 hours in more than 20 years of GA flying



FLY BY NIGHT

Night flying offers a whole new experience, but there are a few dark matters worth bearing in mind

It had been a great day out. Accompanied by a few work colleagues, we had eaten lunch at 'Sharky's On The Pier' before spending the afternoon in the glorious Florida sunshine relaxing on the beach where sharks' teeth can be found in the sand giving credence to the restaurant's name. As the sun set across Venice, Florida, we walked back to the flying club to get showered and changed before climbing aboard our trusty chariot – a rented, and somewhat sun-faded, Cessna 172.

Despite having flown a reasonable number of night flights across many countries, this one was memorable because of the ability to extend our day out and enjoy the incredibly still air and clear moonlit sky on our return. In those pre-GPS days, the flight back was more relaxed than normal as navigation was kept simple by keeping the Gulf Coast out of the port



window and the starboard side lit up by the bright lights of Sarasota which drifted serenely past as we flew northbound.

Night flying offers a whole new experience to the private pilot, with magical views of the airfields and cities below. Features you might use for navigation during daylight can all but

disappear, providing a whole new aspect to your airfield and the surrounding areas. Towns and cities become prominent features, with water masses, smaller roads and terrain disappearing into the night sky.

Night can bring calmer winds, quieter radio communications and much smoother flying conditions. Colours of the airfield, 

taxiway and runway lighting are now more relevant as the detail we are used to seeing becomes lost to the darkness. With shorter days and more changeable weather during our UK winters, flying at night also means there will be more opportunities to maintain existing proficiency while learning or consolidating new skills.

Where possible I try to conduct pre-flight inspections in daylight prior to a night flying sortie, however there are occasions where this needs to be done in the dark. Rotating propellers are almost impossible to see, so additional care is needed when heading out to the aircraft. Relatively simple tasks, such as checking the fuel sample for water or refuelling, require a bit more thought as to how to perform them in the dark.

Many airports and airfields have poor lighting, so there's a real risk of striking other aircraft or obstacles while taxiing out. Some older pilots will remember the 1970s public information film telling drivers 'Don't dazzle – dip your headlights'. Delving into my Human Performance books, I'm reminded that we have rods and cones in our eyes to provide vision and colour. Rod cells are used for night vision and require a dark adaptation period before reaching their maximum retinal sensitivity; typically, a period of 30 minutes or more. Looking at bright lights such as camera flashes can destroy night vision: the modern trend of obtaining a 'selfie' might require a further period of night adaptation before setting off...

For those still using a paper navigation log and chart, a suitable red light will be fine in the cockpit. Electronic charting and navigation aids should be turned to night mode, with the brightness and colour adjusted to adequately display the route and airspace.

When planning, it's worth considering airfield options in case of a diversion. Many airfields in the UK will only be open and available for night flying on set days of the week and before a specified time. You might also include in route planning a path that takes advantage of the fewer available airports en-route that are open. Pilot Controlled Lighting (PCL) is now approved for use in the UK but not yet common, so you might need to check which airfields are going to have the lights turned on.

As well as a less direct routing, with the recent introduction of Part-NCO you might need extra fuel to satisfy the minimum fuel requirements for EASA



Just how bright should cockpit lighting be?



Ground obstacles can be harder to see



Gyro pilots can now get a night rating

aeroplanes conducting VFR flights at night. Whereas the day requirement is for a minimum of 30 minutes, at night NCO. OP.125 mandates planning more generous fuel reserves requiring a minimum of 45 minutes of fuel on landing.

ILLUSION

Without clear visual reference, our vestibular system (the sensory system that plays a major part in controlling a sense of balance and spatial orientation) can produce a somatogravic illusion under high acceleration or deceleration. This can be described as feeling a strong pitching sensation which might be experienced during a take-off or go-around at night or in IMC. Training and recent experience in night flying helps overcome this sensation that tells us, incorrectly, to pitch the nose down.

In the absence of a bright moon and clear skies, it can often be difficult to see unlit terrain. This can lead to the 'black hole' phenomenon which is evident at my local airfield where, from one of the runways,

the departure path is towards rising ground making it difficult to determine pitch attitude after take-off due to an absence of a visual horizon. Where a well-lit area, such as a town, appears to blink or suddenly disappear, there may be something between you and those lights that you can't see such as cloud, an obstacle, or rising terrain.

A significant issue at night is that you often can't see clouds until it's too late and you've already flown into them, so additional care should be taken when planning, and while gaining experience, to allow greater margins for VFR flight at night than for daylight flying to avoid inadvertent flight into IMC.

For anyone who has flown, or intends to fly, single-engine piston at night, I'm sure you'll have considered the possibility of engine failure and the subsequent actions. Inevitably, it will also be a topic of discussion with fellow flyers. Statistically, it's no more likely to occur than during the day, with ground and flight training including risk management and appropriate in-flight actions.

Airfield and runway lighting can be



Pre-flight checks...



...take on a new meaning

somewhat dimmer than the surrounding town and city lighting, so do be prepared to search for a while. Circuits can be more demanding as the airfield disappears into the darkness when downwind.

In visual conditions where the runway lighting is difficult to see, you might be able to ask the controller to increase the intensity of the lighting. I've also had occasions where I've asked for it to be turned down because it had been too bright.

CHALLENGES

At night, the vertical profile can be more difficult to assess by runway aspect alone, with visual slope guidance often being provided. Under the guidance of an instructor, part of the flight training includes landing without aids such as VASIs and PAPIs.

Although new pilots might be a little apprehensive about the challenges night flying presents, it's enjoyable and rewarding – and not as difficult as you might think. Flight training includes a mixture of instrument and visual flying skills over a relatively short course. For those fearful of examinations (and examiners!), there's a syllabus of ground and flight training to complete, yet there are no theoretical or practical examinations to pass at the end of the course to obtain the Night Rating.

Training for it consists of just five hours' flying with a Flight Instructor at a Registered Facility or Approved Training Organisation. Before commencing training, UK NPPL(A) and LAPL(A) holders must have completed the basic instrument flight training required for the issue of the PPL. The course includes a minimum of three hours dual instruction training in operations at night, navigation, visual circuits and dealing with emergencies. Dual navigation training must be at least one hour of training, with at least one cross-country flight of 50km (27nm) or more. Solo training includes at least five solo take-offs and five full-stop landings.

Unlike a SEP Class Rating, a Night Rating doesn't have an expiry date, so if you don't manage to do any night flying during the year you'd do well to regain proficiency with an instructor before acting as PIC next winter – but there are no further tests or checks. To carry passengers at night, you must hold a Night Rating and have completed three take-offs and landings in the preceding 90 days including one take-off and landing at night. Holders of an Instrument Rating are exempt the night recency requirement.

With or without a Night Rating there are a number of additional planning considerations when flying in the winter months. Following a delayed instructional sortie I recently landed back at a farmstrip

rather later than planned, and was reminded of the fact that deteriorating light conditions can be difficult to judge from altitude and occur somewhat quicker in the winter months. Reducing visual definition or resolution, cars with their headlights on and street lighting, are all good clues as to the lighting levels at ground level.

Following a number of amendments to the Air Navigation Order, there have been some exciting developments in the UK. NPPL holders can now add the Night Rating to their licence. Congratulations must go to Ian Bryant and Steve Boxall who obtained the first UK gyrocopter Night Ratings.

Overall, obtaining a Night Rating is a great way to develop and expand skills, and provides an amazing flying experience while improving on the usability and utility of your licence. For those who already hold a Night Rating, keeping it current is a gratifying way to maintain your flying proficiency through these darker winter months.

Jon Cooke is Head of Training and Pilot Coaching Scheme chairman for the Light Aircraft Association. He is a commercial pilot on the Boeing 747-400, having flown and instructed on a wide variety of vintage and modern aircraft. Jon specialises in instructor and examiner training with On-Track Aviation based at Wellesbourne.

NIGHT FLYING TIPS

It's dark out there – so let's look a little more deeply at the hazards related to night flying

In the UK many aerodromes have operational hour limitations that might be set down in planning regulations or just to be good neighbours to local residents, so the opportunity to fly at night can be limited to the winter and early spring months.

So what hazards are there when operating during these months and at night?

WEATHER

On nights suitable for flight there might be high pressure leading to clear skies or a high cloudbase with good visibility and light winds.

But welcome as this weather is for flying, it can lead to a rapid air temperature drop when the sun goes down, so it's important to be aware of the freezing level as any amount of moisture on the airframe might freeze.

Never fly in known icing conditions unless the aircraft is cleared for it, and even then it might only be cleared for light icing conditions.

If you do need to descend from an icing level to try to melt ice from the airframe be wary of high ground you simply can't see – use the Maximum Elevation Figures (MEF) depicted on the chart.

We all know it's the season of mist and fog, but the forecast should warn of it: the trend indicator 'BECMG' means significant change in conditions is forecast during the two hours after the observation. It may also be followed by a time group and 'FM' from, 'TL' until or 'AT' at.

PREPARATION

Night pre-flight inspection also takes on a new meaning: do the nav lights, landing/taxiing and anti-collision beacon(s) all work? Any airframe ice needs to be removed, but be careful to not push it into the control surface hinges or the pitot-static system. As there can be a greater risk of water condensing in fuel tanks, ensure fluid is removed from all water drains.

For comfort you'll want to ensure the cabin heater/demist is working, but think about the last time you used it, a fault might allow carbon monoxide into the cabin (the first signs are often a headache).

For engines with a carburettor, the alternative air or carb heat control should be used as per the Flight Manual or Pilot's Operating Handbook, but it's worth using full carb heat periodically anyway – and keeping it on for long enough to be effective.

VISUAL ILLUSIONS

While the visibility on night flights can be stunning, there are also illusions (referred to in the main article) to be aware of, especially on approach.

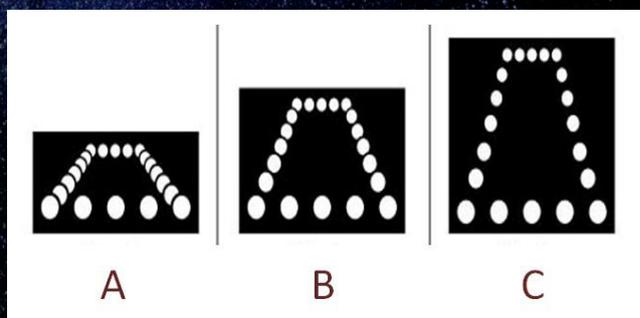
Any unlit areas can lead to the 'black hole' scenario. This effect, sometimes called the 'featureless terrain illusion',

fools pilots into thinking they are higher than they actually are, leading to dangerously low approaches.

Perception scientists disagree as to the exact cause, and it's likely that no single theory fully explains the phenomenon. The most extensive study was conducted by Boeing researchers after a series of airline 'black hole' accidents in the 1960s. Using a flight simulator, Boeing instructor pilots (with more than 10,000 hours each) conducted entirely visual approaches to runways in black hole conditions. Without the aid of altimeter or glide slope information, most pilots flew excessively low approaches and crashed into terrain short of the runway.

While man-made obstacles near an airport such as buildings or towers are normally lit in the dark, natural ones such as hills or trees obviously aren't, so, unless there is exceptional illumination such as a full moon on new snow, they'll be largely invisible. This factor greatly increases the potential of flying into the ground and numerous such accidents have occurred, so follow the APAI or PAPI (if available) indications or keep your focus on the runway edge lights to provide an aspect on the runway.

Another significant night visual approach risk stems from the way we interpret visual cues. Consider the runway light illustrations: *Which indicates the aircraft is on the correct flight path for the approach?**



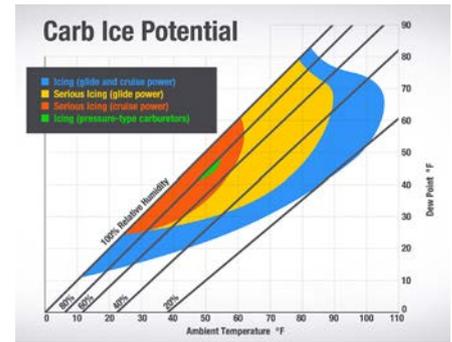
With the increase in the number of pilots complaining of laser lights being pointed at aircraft, be extra vigilant if you hear such reports.

TRAINING

As mentioned in the main article, if you haven't flown at night for some time seek some refresher training – it's also an opportunity to identify what regulations have changed since you last flew at night. For instance, are you aware of SERA and the requirement for a flightplan for any VFR night flight? It can be abridged and filed by radio, but it's now a requirement.

Finally, enjoy night flying it can be a stunning experience.

Justin Willcocks – CAA, GA Unit



the carburettor body might also maintain the venturi temperature above freezing.

So, what to do about it? Some engines do, of course, have electric heaters which increase the temperature of the carburettor; and a similar effect may be obtained in a liquid-cooled engine by directing the flow of coolant. On other air-cooled engines, selecting the alternative air source by-passes the normal intake filter and supplies air heated in an exhaust heat-exchanger to melt any ice. Fuel-injected engines generally have an alternate air intake located via a valve downstream from the normal air intake. Alternate air is warmed by engine heat, and doesn't normally pass through a heat-exchanger.

So select hot air as a matter of routine at regular intervals to prevent ice build-up; if there's a drop in rpm or manifold pressure, or rough engine running and when carb icing conditions are suspected.

Apply carburettor heat at regular intervals for long enough (at the very least 15 seconds, but considerably more in certain aircraft) to pre-empt the loss of engine power or restore power to the original level.

If icing has caused a loss of power and the hot air disperses it, re-selecting cold air should produce an increase in rpm or manifold pressure; absence of carb icing should produce no increase in rpm or manifold pressure beyond that noted prior to the use of hot air.

Remember, selecting hot air when ice is present might at first make the situation appear worse as the engine runs roughly while the ice melts and passes through the engine. If this happens do resist the temptation to return to cold air so that the hot air has time to clear the ice — that might be in the region of 15 seconds, which can feel like a very long time.

Judging by the large number of successful flights in the UK, we have demonstrated that we can cope, but it is worth being careful to avoid proving that wise old aviation head's adage about carb ice...

THE HOT FACTS OF CARB ICE

It's been around for years, but still remains an issue

A wise old aviation head once said: "As long as aircraft have carburettors, there'll be carb icing." — He's right, as any avid reader of the AAIB's incident report summaries will know.

So why does it still happen? If you recall the graph about carb icing risks, you'll know that it isn't supposed to form quite as quickly on a cold day compared with a summer one, which is true theoretically because cold air holds less moisture than warm air, but in reality it's best to assume that carb ice is always a potential threat in UK flying whatever the season.

As many will know, the first signs with a fixed-pitch propeller can be a slight drop in rpm and performance (airspeed and/or altitude). The loss can be sneakily smooth and gradual, and the usual reaction is often to open the throttle slightly to compensate. While this might restore power it's only hiding the loss as ice builds in the venturi, until there's rough running, vibration and loss of performance until the engine stops.

With a constant-speed propeller, and in a helicopter, the loss of power tends to be large before an rpm reduction occurs. Icing here can be even more insidious, but there

will probably be a drop in manifold pressure and a reduction in performance.

While the primary detection of carb icing in many fixed-pitch aircraft is the rpm gauge together with the ASI and altimeter, for constant-speed propellers the primary detection instrument is the manifold pressure gauge. In steady level flight an exhaust gas temperature gauge, if fitted, might show a decrease in temperature before any significant decrease in engine and aircraft performance.

The general threat of carburettor icing theory is based on the physics of fuel vaporising and mixing with air in the venturi-based carburettor before entering the engine cylinders. The lower pressure in the venturi plus the natural cooling from a liquid vaporising (latent heat of energy transfer) contributes to a significant temperature drop often to freezing values. If there's one thing even the clear air in our UK atmosphere is rarely short of in significant quantities, it's water vapour ready to solidify as ice should carburettor temperatures drop below zero. Water-cooled engine bodies do, however, tend to cool less quickly when power is reduced, lessening the icing severity. Coolant directed around



Slippery when wet

✈ BEECH 58 BARON
📍 HAYDOCK PARK AIRFIELD
NEWTON-LE-WILLOWS
📅 8 SEPTEMBER 2018

Before leaving Thrupton aerodrome, the pilot spoke to the Clerk of the Course at Haydock Park Racecourse (Newton-Le-Willows Airfield) to understand the condition of the runway. The Clerk stated that the Head Groundsman had walked the course several times that morning and, in his opinion, the ground was wet but “firm enough for aircraft to land”.

A Piper Saratoga and a Eurocopter AS355 Écureuil 2 Helicopter had both landed that day with no incident and were parked, as instructed, at the far western end of the airfield. When the Baron pilot arrived at Haydock he overflew the airfield to confirm visually the wind conditions from the windsock. He noted that it was raining but felt confident there was sufficient runway, providing the touchdown was at the threshold.

Aware that the runway length was just enough in the wet conditions, he felt that the touchdown needed to be firm at the threshold. The touchdown went as planned but the wet conditions affected braking over the last third of the runway.

Recognising that there was insufficient

runway remaining to come to a stop and that he had passed the point of a successful go-around he decided to stop by deliberately ground-looping.

The manoeuvre went as intended, except that the initial move was too wide and, while steering to the left, the aft fuselage and left flap hit the right wing of the parked Saratoga damaging it extensively. The Beech continued with the manoeuvre and came to rest as intended with damage limited to the aft fuselage skin panel and several fuselage frames. No-one was hurt.

Both the parked aircraft and helicopter were clear of the runway and would not have impeded a normal landing, but the pilot later commented that, in his opinion, “it is inadvisable to park aircraft in an area where overshooting the runway is a possibility. Any obstructions in this area should be minimised to reduce the possibility of damage and injury to personnel”.

The manoeuvre would have been successful had contact not been made with the parked aircraft.

The CAA has published document CAP 793: ‘Safe Operating Practices at Unlicensed Aerodromes’ which includes recommended safety factors to be applied when pilots are calculating landing distances on wet grass runways.



Fatigue failure

✈ CZAW SPORTCRUISER
📍 Nr CLACTON-ON-SEA, ESSEX
📅 18 AUGUST 2018

The Sportcruiser took off from Clacton and the pilot reported leaving the circuit to the west, changing frequency to Southend Radar. While making his initial call to Southend Radar there was a “loud clank” from the engine which lost power.

The pilot continued to fly while the instructor took over the radio and advised Southend they would be landing in a field.

The instructor monitored the pilot, reminding him of the wind and pointing out a field. However, it became apparent the pilot had selected a different field, the instructor pointed out that the field was rough and suggested another, but as the pilot was fully engaged with the landing he judged it would be safely made and decided not to interfere further.

The landing was into wind with full flap at an estimated touchdown speed of around 30kt (20kt groundspeed). The Sportcruiser decelerated rapidly and, as it slid to a halt, the nosewheel snapped off. Neither was injured.

A later engine examination found that the flywheel had detached due to fatigue failure of at least one of its mounting bolts.

Drifting off

✈ PIPER PA-28-181
CHEROKEE ARCHER II
📍 CARDIFF AIRPORT
📅 4 DECEMBER 2018

While landing at Cardiff Airport, the Archer drifted left off the paved surface onto the grass, damaging the nose landing gear. The weather was good with the wind variable at 3kt. The pilot taxied the aircraft back onto the runway, but when he attempted to vacate on the taxiway, he couldn't turn left. He shut down and the airport fire service manually handled it to the apron. The pilot reported that, as he closed the throttle and flared, the aircraft drifted left. He tried to correct the drift with rudder, but it had departed the runway before he managed to straighten it.



In too deep

✈ **CESSNA U206C SUPER SKYWAGON**
 📍 **STRATHALLAN AERODROME, AUCHTERARDER, TAYSIDE**
 📅 **24 NOVEMBER 2018**

The pilot, who had conducted about 1,000 landings at the airfield in this type, was transporting four skydivers for a jump. The grass runway was 620 metres long with a fence at either end and a road passing near the threshold.

Due to cloud the jump was cancelled, and the pilot returned with the skydivers onboard. The wind was calm and the pilot reported that, on reflection, his approach was too high and too fast.

He touched down just over halfway down the runway and hit hard, causing the aircraft to bounce. He initiated a go-around but the Cessna struck a wooden fence at the end of the runway, damaging the cowling, propeller and horizontal stabiliser. Despite

this he climbed away and landed on the second attempt. The pilot said he had got into the habit of consistently approaching high to that runway because there were often people walking along the road near the threshold. He considered he had probably been consistently landing a “bit too deep” each time on that runway.

On this occasion he was heavier than normal with four skydivers onboard, the wind was calm and he probably touched down further along than normal. He hadn't appreciated how far along the runway he had touched down until he saw the ground marks afterwards. He realised with hindsight that he should have



Cloud issues

✈ **BELL 206B3 JET RANGER III**
 📍 **NEAR ALDBOROUGH, NORTH YORKSHIRE**
 📅 **30 MAY 2018**

The pilot was flying from Husthwaite to Walton Wood Airfield. The weather was challenging with low cloud and reduced visibility. The helicopter was seen flying normally before climbing steeply into cloud. It then emerged, rotated through 540°, descended rapidly and hit the ground where it inverted and caught fire. The pilot was fatally injured. No evidence of pre-existing defects were found on the helicopter and it couldn't be determined why it had entered cloud, but it is probable that the pilot was distracted or became disorientated in the poor weather. After entering the cloud it's likely that the pilot became spatially disorientated and lost control. The accident highlights the importance of pre-flight risk assessments and the hazard of flying helicopters in poor weather without adequate recency and experience.

Carb heat conundrum

✈ **GRUMMAN AA-5 TRAVELLER**
 📍 **NOTTINGHAM CITY AIRPORT**
 📅 **30 JANUARY 2019**

Despite extensive use of carburettor heat prior to take-off in high relative humidity, the Grumman's engine made two popping sounds at 150ft and the rpm rapidly reduced to zero.

The instructor immediately took control, turned away from houses and carried out a forced landing into a field next to the airport. The landing gear sank into the soft ground on the roll and the aircraft sustained extensive damage. Neither occupant was injured. Despite the extensive use of carburettor heat, the instructor considered that icing might have caused the engine to stop, but he couldn't rule out other possible causes.



Low flying risks

✈ CESSNA 152
📍 NEAR CRUMLIN, COUNTY ANTRIM
📅 19 APRIL 2018

The pilot had hired the Cessna for a flight with a photographer specialising in aerial photography, but while flying at low level there was a critical reduction in speed and loss of control killing both on board.

The pilot had taken off from Newtownards at approximately 1047hr and flown to the north-west. A couple of minutes later, the pilot advised Belfast City ATC they would be operating a photographic flight near Nutts Corner (a disused airfield near Belfast International Airport).

As the aircraft approached Nutts Corner, the pilot was instructed to hold as an aircraft was on approach to Belfast International. After several minutes at approximately 650ft agl the pilot reported visual with the other aircraft and was cleared to proceed.

The Cessna was then flown in clockwise, circular and oval shaped turns at bank angles up to 30° between approximately 350ft and 600ft above the ground at an estimated 60kt. The passenger, who had flown regularly with the pilot around 15 times a year for the last 14 years, was in the right seat, so clockwise turns would have provided a better view of properties below.

Radar showed that during the next 90 seconds the aircraft maintained about 900ft amsl (approximately 400ft above ground), while making turns to the right. The turn rate then increased to an estimated bank angle of about 45°, before reducing to about 20°. Radar data indicates that the aircraft continued with a gradual turn to the right. The final radar point recorded the aircraft about 260ft (+/-50ft) above ground.

Witnesses said the Cessna was apparently flying normally before suddenly 'nose-diving'. Two who were close to the accident site said they heard the engine "spluttering" as the aircraft passed low overhead, however no evidence was found of any engine problems.

As the aircraft was engaged in aerial photography the flight came under Specialised Operations which require a risk assessment, such as those associated with low level flying, but there was no evidence of the risk assessment having been carried out or for the checklist associated with the mitigations for that activity being in place.

The AAIB report noted that 'There is an increased level of risk associated with flying close to the stalling speed without sufficient height to recover from a stall, particularly when focused on a task such as taking aerial photographs'.



Grief for a Gazelle

✈ AEROSPATIALE SA341G GAZELLE
📍 PRIVATE LANDING FIELD, ENFIELD
📅 14 JULY 2018

After carrying out his daily inspection and pre-flight checks, the pilot lifted off into a 5 to 10ft hover to reposition the Gazelle from one part of his garden to another.

All checks were normal and he moved forward, initiating a right turn. During the turn he felt the engine lose power and tried to return to the take-off site but came down about 20 metres short. The ground was uneven with some large wooden pallets and other building materials. The pilot thought the Gazelle probably struck one of the pallets and then rolled onto its side with the rotor blades striking the ground. He escaped as a post-crash fire destroyed the aircraft.

Although it was a hot, calm day the Gazelle was 276kg below its maximum take-off weight so should have had sufficient performance for the manoeuvre. While the cause of the power loss could not be fully established due to the fire, it's possible that the airpath to the centrifugal compressor had accumulated deposits during operation which led to a lower compression rate and a higher temperature operation. This, combined with the hot outside air temperature, could have led to a T4 exceedance, turbine damage and a consequential loss of power, leading to the accident.

It's also possible that the T4 exceedance occurred during the post-impact fire and that some deposits were ingested while the engine continued to run on the ground with the helicopter on its side.

THE TROUBLE WITH WIRES

✈ CAMERON Z-350 HOT AIR BALLOON
📍 NEAR WICK, BATH
📅 15 SEPTEMBER 2018

The balloon was making an evening flight from Bath with 12 passengers when variable winds made the planned landing site unachievable so, after finding several landing areas were unsuitable, the pilot chose a couple of grass fields on a downhill slope.

He was aware of sunset approaching and a large 'no landing' area beyond the fields, both of which confirmed his decision to land. As there were horses

in the field beyond the landing site, the pilot made a low approach using the quiet burner to avoid disturbance. The approach was between two medium sized trees and the pilot was aware of electrical cables to the right and left, but the approach appeared clear.

Passing approximately three metres above ground he saw electrical wires and a pole some 30 metres ahead and, realising it wasn't possible to avoid them,

he pulled hard on the rapid deflation line. He briefed the passengers that a wire strike was imminent, that there may be a bang and to remain seated. When the basket was approximately one metre from the ground the envelope contacted the wires and there was a loud bang. The basket turned and came to rest against a horse jump close to the pole.

The commander assessed it was safe to exit and there were no injuries.



What brought an Auster down

✈️ AUSTER AOP.9 📍 SPANHOE AIRFIELD, NORTHAMPTONSHIRE 📅 18 JUNE, 2017

Shortly after take-off the Auster stalled, banked left into a steep descent and struck the ground. The pilot, who was making his second flight in the recently-restored ex-military aircraft, was fatally injured and the passenger was seriously hurt.

A witness said the take-off initially seemed normal but soon after the aircraft rocked slightly, first right then left, then there was a short pause before it rolled left into a steep descent and struck the ground to the left of the runway.

During its Permit to Fly flight test the Auster didn't demonstrate any stall

warning, as is common to the type, and it also had a substantially higher stall speed and lower rate of climb compared with other AOP.9s and the Pilot's Notes figures. The pilot was likely to have decided to climb at an airspeed he thought would provide an adequate margin from the stall, but without prompt and appropriate actions recovery at a low height was unlikely.

Although the aircraft's engine was running, the investigation identified a number of anomalies that could have contributed to less-than-ideal engine and aircraft performance which, while they

wouldn't have accounted directly for the stall, might have distracted the pilot.

The investigation also identified several issues relating to the aircraft and engine maintenance documentation, the Permit to Fly application process, and guidance for pilots preparing for their first flight on a new type. The Light Aircraft Association has taken a number of safety actions to reinforce its existing processes and published guidance relating to the Permit to Fly application process, documentation of aircraft maintenance and pilots making their first flights on type.

STOL misfortune

The aircraft was on a test flight prior to being issued with a Permit to Fly. Shortly after take-off the engine failed. During the subsequent forced landing the aircraft landed firmly, sustaining severe damage. One of the two pilots suffered serious injuries.

It is believed that the engine failure was caused by fuel vaporisation as a result of high engine compartment temperatures. Having had an excessive EGT warning, followed by an engine failure at about 800ft, the pilots were left with little time to execute a forced landing in an area with limited options.

The testing pilot took control at about 200ft for the forced landing. Given he took control with little height available it's likely he did not stabilise the aircraft's airspeed, became slow and, with no height in which to lower the nose to correct the speed, the aircraft stalled and landed firmly.

✈️ JUST SUPERSTOL XL
📍 Nr BARTON AERODROME, MANCHESTER
📅 10 JUNE 2018



GOOD DECISION

✈️ PIPER PA-34-220T SENECA V
📍 OXFORD AIRPORT
📅 2 NOVEMBER 2018

The Seneca was about to enter the runway for take-off when the instructor became concerned about the feel of the left rudder pedal. He aborted the flight and taxied the aircraft back to the hangar. A subsequent engineering inspection found the left rudder cable had parted, with evidence that it had melted through due to chafing against the standby battery cable. Safety actions have been taken by the Civil Aviation Authority and the manufacturer has issued a mandatory Service Bulletin (No 1337).

FOR FURTHER INFORMATION ON INCIDENT REPORTS, VISIT AAIB.GOV.UK



JAMMED CONTROLS

DHC-1 Chipmunk 22
Nr White Waltham, Berkshire
8 September 2018

After completing the final manoeuvre of a display sequence, an aileron roll at 600ft, the Chipmunk continued to roll and pitch nose-down despite the pilot's control inputs. The pilot reduced power and declared a Mayday. Realising there was a restriction in the rudder controls the pilot moved all the flying controls vigorously which cleared the restriction and the pilot regained control at 50ft. An inspection immediately after landing showed that the controls appeared to operate normally and were undamaged, but a detailed inspection a few days later confirmed that while there were no control defects, a partially crushed pen was found in the fuselage and the probable cause of the control restriction. The pilot reported that, prior to the incident flight, a pen top had been recovered from the rear cockpit of the aircraft during the preflight loose article check but no other articles had been seen.

HUMP THUMP

Aero AT-3 R100
Sherburn-in-Elmet
North Yorkshire
17 February 2019

During the take-off roll on the grass runway, the aircraft went over a 'hump' at about 40kt and became airborne. The pilot reported that, as the aircraft was "below flying speed", he reduced the pitch attitude slightly, but the nose continued to drop and the

nosewheel detached on contact with the runway. Both occupants were uninjured.

FATIGUE FACTOR?

Boeing Stearman
Wickenby Airport, 22 July 2018

The pilot was conducting wing-walking flights and had completed nine without incident. On the tenth flight, while landing on a grass runway, the Stearman overran, crossing a hard runway before continuing onto the grass beyond, clipping a runway marker board at an estimated speed of 5 to 7kt. The weather was hot, with calm winds and thermal activity, requiring greater concentration by the pilot and fatigue may have been a factor.

TOO CLOSE ENCOUNTER

Cessna 152
North Weald Airfield, Essex
18 November 2018

After a flight from Elstree the pilot taxied close to an RV-9 which was parked with its tail towards the taxiway and he saw two people in front of it. The pilot didn't know whether the RV-9 was fully in the parking slot and did not realise how close the right wing of his Cessna was to its tail. He saw a man signal but misinterpreted this as an indication to go forward and, as he taxied closer to the RV, the man quickly changed his signal to indicate to stop. However, it was too late and the 152's wing hit the RV's rudder. The pilot commented that, in hindsight, he should have consciously taxied away from the centre of the taxiway to give a wide berth to the parked aircraft as there were only aircraft parked to one side.

'CHUTE SAVE

Cirrus SR22
Benington, Hertfordshire
9 June 2018

Approximately eight minutes into a flight from North Weald to Retford Gamston the engine failed catastrophically. At approximately 800ft above ground the pilot operated

the Cirrus's parachute recovery system (CAPS) in accordance with the manual and it descended into a field near the village of Benington. Neither the pilot nor passenger were injured. The failure was due to overheating of the connecting rod cap bolts due to insufficient cooling by the engine oil.



ROBBIE ROLLOVER

Robinson R22 Beta
East Lound, Doncaster
19 February 2019

As the helicopter lifted into the hover during a training flight the student applied full left pedal in reaction to a right roll. This caused a dynamic rollover and the instructor was unable to react quickly enough to prevent the rollover.

BRIEFING NOTE

Skyranger Swift 912S
Private strip, Aughrim, County Down
2 February 2019

The pilot was landing to the left of the runway centreline to avoid rutted ground to the right but the aircraft veered off the runway during the landing due to wet, sloping ground. Despite applying corrective control inputs, he couldn't prevent the Skyranger from colliding with a boundary wall and coming to rest in a ditch. The pilot felt that had he requested a full briefing from the owner of the airfield, he would have landed further to the right of the centreline to stay on the level ground.

POOLEYS

FLIGHT EQUIPMENT

— EST. 1957 —

Official Dealer for Bose & Garmin

POOLEYS is an Official Dealer for Bose Headsets & Accessories



ProFlight Headset

ProFlight Headset



POOLEYS is an Official Dealer for Garmin Mobile Products



D2 Delta S Aviator Watch

D2 Delta PX Aviator Watch

Aera 660 GPS



VIRB 360 Camera



Ultra 30 VIRB Camera



Pooleys Kneeboards and Flight Boards for:

- iPad 4
- iPad Mini 1-4
- iPhones 6-8/Plus & X
- Google Nexus
- Tablets
- Ram Mount with diamond and ball attachment
- Stick Aircraft
- Light Kneeboards for Night Flying
- Helicopters (HB-1, K1-3)
- Gliders (GB-3, GB-4)
- Microlights (MB-6)
- Small Cockpits (K3)

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



Aircraft Tie-Down Kits



Flying Gloves

You'll also find our products at over 95% of flying schools throughout the United Kingdom

www.pooleys.com

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



A20 AVIATION HEADSET

**There wasn't
an aviation
headset that met
our standards.**

So we built one.

The A20 offers the right combination of noise reduction, clear communication and comfort. With *Bluetooth*[®] for streaming audio and communication, auto-on*, auto-off, side-swappable mic and FAA TSO / EASA ETSO certification, the A20 is the choice of pilots the world over. Hear the A20 difference today.

**in select models*

Visit us at www.bose-aviation.eu or contact one of our authorised sales partners for a demonstration:

Mendelssohn Pilot Supplies
www.gps.co.uk

Pooleys Flight Equipment Ltd.
www.pooleys.com

HSL Headset Services Ltd.
www.headsetservices.com

Heli Air Ltd.
www.heli-air.com

Transair Pilot Shop
www.transair.co.uk

The AOPA Pilot Store - London
www.aopa.co.uk/thepilotstore

Connect with us @BoseAviation

© 2019 Bose Corporation

The *Bluetooth*[®] word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Bose Corporation is under license.

