UK AIRPROX BOARD

AIRPROX Insight
DIGEST
2019-20

Where are you flying today?

Who will you be listening to?

A listening squawk enables an air traffic controller to alert a pilot if their aircraft looks likely to infringe. Check which listening squawks and frequencies you will need before your next flight.

> Select the listening squawk, using ALT (Mode C) if you have it

> Tune in to the appropriate frequency without transmitting

> Listen out for your call sign or position

> Change to code 7000 when you leave the area or change frequency
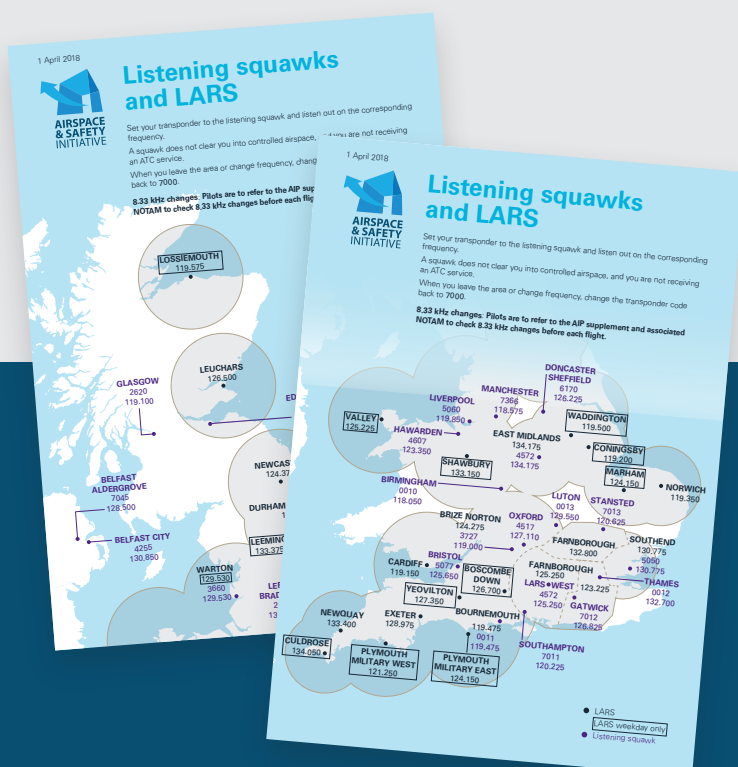
ℹ **8.33 kHz changes** – use the AIP Supplement to check for 8.33 kHz changes before each flight.

Download squawks from:
airspacesafety.com/listen

Welcome to the UK Airprox Board 2019-20 digest

I'm delighted to have the honour to have joined the Airprox Board in June as its new Director, having recently retired from the RAF after 24 years as a Hercules (C130) pilot, Commanding Officer and lastly as the Director of the RAF Division at the Defence Academy of the UK.

Firstly, I'd like to convey my heartfelt thanks to retiring Director Steve Forward who dedicated six-and-a-half years to this role. Steve worked tirelessly throughout his time as Director and it's down to his expertise, diligence and vision that I have taken over such a well balanced and experienced team – he has left me some big shoes to fill.

Our only aim at the UK Airprox Board is to enhance air safety in any way we can and the incidents you'll find in this magazine haven't been selected to embarrass or point fingers at anyone, so if you do recognise yourself (or someone else) involved then please do take the lessons away in the spirit in which they are intended.

From my first few months as Director it has become evident that there's a healthy culture of safety reporting in aviation and it's very important to me that we continue to encourage this attitude, because responsibly and selflessly sharing our mistakes and experiences is one of the best ways to learn without actually having to go through that experience ourselves.

That is really the point of my monthly Airprox Insight Newsletters and this digest of 2019-20's Insights. By publishing these incidents I want to spark your interest, get you talking and get you thinking; perhaps by asking yourself 'What would I have done in similar situations?', 'What can I learn?', 'how do I protect myself from coming uncomfortably close (or closer) to another aircraft?'.

Within this compilation are eight newsletters from the past 12 months and the themes I've chosen represent some common areas we see in Airprox reporting – courtesy, consideration and caution at all times (especially in the visual circuit); making your intentions clear on the radio and ensuring accurate position reports; giving TCAS-equipped aircraft a wide berth; giving way to aircraft on your right even when you're conducting an instrument approach; give minor airfields a wide berth if possible so that you don't inadvertently fly into their circuit (and when you are in a small airfield's circuit keep an eye out for those that might be flying past); conflicts between pilots joining long-final and others in the circuit; understanding electronic navigation equipment and making sure you're aware of their limitations (and huge advantages) and don't let distractions draw you away from a properly prioritised lookout, even if you're dealing with some form of emergency.

The following newsletters are in no particular order of importance, and I don't profess to offer any silver-bullet solutions, but I hope at least that you'll find them thought-provoking and they will act as a starter-for-ten for those café and bar conversations.

If you'd like to read more about me, our roles and responsibilities and the UK Airprox Board, go to **https://www.airproxboard.org.uk/Learn-more/About-us/**

Safe flying!

Rachael Caston, BEng MA
Director, UK Airprox Board

'I want to spark your interest, get you talking and get you thinking'

Tale of the unexpected…

You never quite know what's going to happen during a flight — or what twist there might be at the end of it

A PA-28 pilot was turning from base to final at Southend when his radio acted up. Although he'd been told he was number one to an EC155 on an ILS approach, after failing to hear any of the controller's subsequent calls and fearing that he wasn't cleared to land, he decided to orbit on final and turn up the approach path while resolving the radio issue.

Meanwhile, the EC155 on the ILS approach was already quite tight on the PA-28 and, aware that the pilot wasn't responding to radio calls, suddenly saw it turn towards them on final.

Although they came reasonably close, the EC155 crew had seen the PA-28 early on and were ready to take action if necessary, so it was felt there was no risk of collision. That said, this Category C incident (**Airprox 2018310**) raises a number of issues worth highlighting. For the PA-28 pilot, Southend's

local radio-failure procedures were that in his circumstances he should have followed his last clearance and landed as soon as possible while watching for visual signals from the tower. He had previously been given Traffic Information about the EC155 but probably became task-focused on his radio problem and might not have remembered it.

Aviate, Navigate, Communicate remains a well-recognised mantra for prioritising activities and avoiding distractions.

Even if he wasn't fully aware of the radio-fail procedures in the circuit, rather than turn back up final towards the instrument approach, the pilot would probably have been better advised to have simply gone around early onto the deadside at circuit height, or simply continued through the final approach track, departed the circuit, and then conducted a full radio-failure join. For the EC155 crew, aware that the other pilot

was having problems, it might have been better to have made an early decision to go-around and take the pressure off everyone rather than carry on to see how things unfolded, only to be surprised when the PA-28 turned towards them.

The messages from this incident are: know your airfield's procedures and what to do when unexpected things such as radio failures happen; expect the unexpected and always have a Plan B; and give those experiencing difficulties a wide berth, not just out of consideration but also to avoid you being put in a difficult situation if they do something you don't anticipate.

Full details can be found by following the link left or at airproxboard.org.uk in the 'Airprox Reports and Analysis' section within the appropriate year and then in the 'Individual Airprox reports' tab.

Diagram based on radar data and pilot reports

CPA 1138:19
100ft V/0.1nm H

EC155

1400ft alt
1500ft alt

PA-28
1400ft alt

Poor procedures or procedures not being followed and poor tactical planning and execution by pilots (ten cases) were this month's predominant theme.

Instances ranged from the selection of transit heights that needlessly exposed aircraft to extra risk in the GA flight band of 1000-2000ft; flying non-standard procedures or poor compliance with procedures, and the lack of a 'Plan B' when things went wrong or changed.

Other headline topics at the Board's April meeting included inaction by either controllers or pilots in seven events; late- or non-sightings featured in six; sub-optimal ATS selection was a factor in five and insufficient or late Traffic Information from controllers was noted in four cases.

Overall, 26 Airprox were discussed: seven were drone/sUAS incidents, while 19 were aircraft-to-aircraft. Six of the latter were assessed as risk-bearing (three were Category A, where providence played a major part, and three were Category B, where safety was much reduced through serendipity, misjudgement, inaction, or late sighting).

After a busy start to the year, March was relatively quiet for aircraft-to-aircraft Airprox notifications, but April saw a return to historic norms and so overall numbers of aircraft-to-aircraft incidents for 2019 are still tracking the expected five-year average (43 actual vs 43 expected).
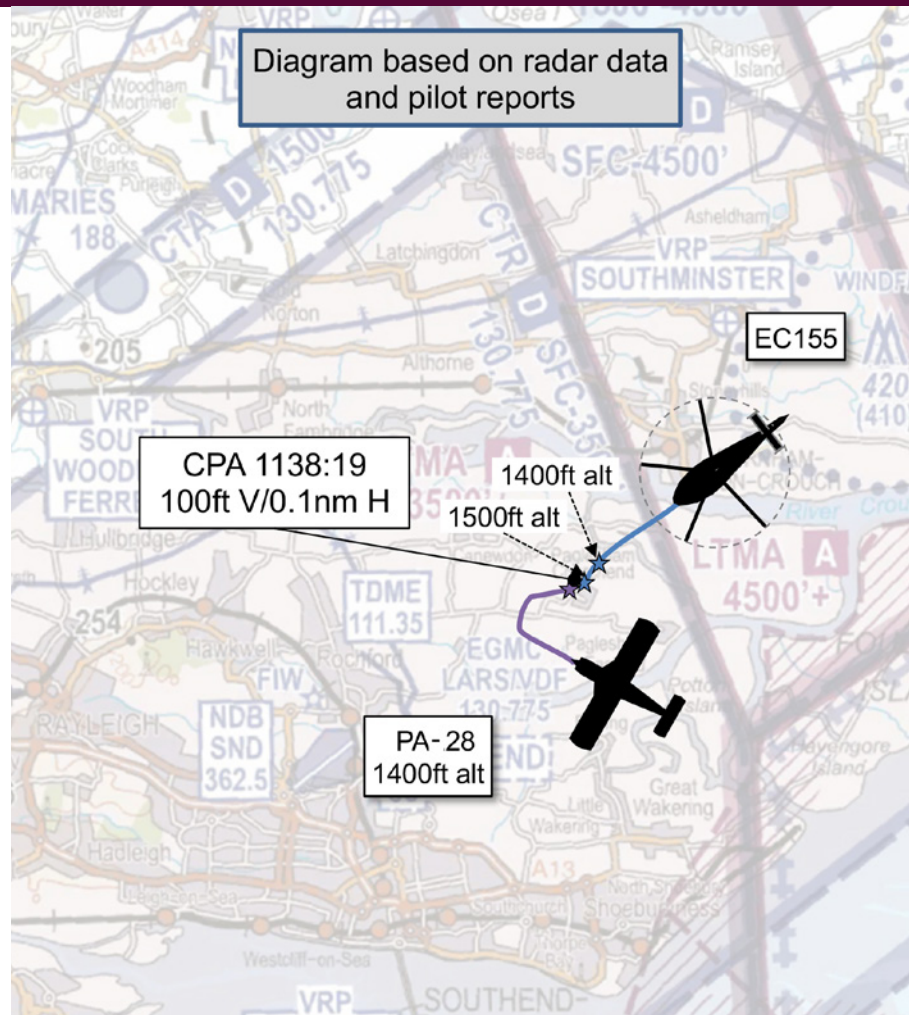
On the other hand, 'drone' incidents remain well above expectations (28 actual vs 15 expected).

As well as the incident in the Airprox of the Month, aircraft-to-aircraft clashes in the visual circuit seemed to be a common scenario — there were eight events where aircraft came into conflict either in the circuit, joining it or flying though.

The key lessons from these are the need to follow procedures, be clear to others about one's intentions and, above all, maintain a robust lookout at all times even when conducting visual circuits in case others might lose (or have flawed) situational awareness or ineffective lookout.

Other quick-wins would be for pilots to avoid the 1000-2000ft transit height block whenever possible, and to seek a Traffic Service if conducting simple transits.

It seems to be a feature of some helicopter operations in particular (air-taxi, emergency helicopters, etc) that pilots choose to transit at about 1000ft by default when off-task. This means they risk passing unknowingly through, or near, the circuit patterns of small strips where aircraft might be getting airborne and climbing, or encountering GA aircraft either routing to or from airfields themselves or conducting training activities such as PFLs.

The Board made two recommendations.

2018312
The CAA develop guidance for aerodrome operators regarding complexity of operations versus the level of ATS provision.
2018319
The CAA investigate options for the cost-effective and straightforward means to afford additional protection of traffic operating in the immediate vicinity of busy minor airfields.

The first recommendation resulted from an incident at Leicester where a Cabri G2 and an SR22 came into conflict while conducting circuits to different runways. Although concurrent multi-type, multi-runway circuits are perfectly acceptable when everyone knows what's going on, it seemed that it would be advantageous for the CAA to provide some guidance as to how to conduct such operations safely and with what level of ATS provision.

The second recommendation resulted from an incident at Beverley where a Tornado flew through the circuit pattern and into conflict with a Cessna 172 that was turning final.

Although it's clear that the Rules of the Air require other aircraft to avoid the pattern of traffic formed at any airfield, this relies on other pilots knowing where that pattern of traffic might be, and coming to their own conclusions as to how much to avoid it by. Hence the reason for ATZs at busy airfields to protect those in the circuit pattern.

While recognising that the deregulation of airfields in recent years has somewhat incentivised some operators to remove ATZs and/or let their licences lapse, it seemed to the Board that an unintended consequence was that we have lost a level of protection at some busy airfields, and it might benefit from CAA reviewing options for cost-effective and simple ways of applying for such protection. ■

Who's where?

The better the information you give over the radio, the more help you might get

A Cessna 152 was routing via Dunkeld at 2800ft when the pilot spotted a PA-28 flying directly towards him about 40 metres horizontally and 30ft below. It was about 90° to his track and passed directly underneath, there was no time for avoidance and the 152 pilot felt a collision would have been inevitable had it been a little higher.

The pilot notified Scottish Information of the **Airprox (2019018)** having asked if they were aware of an aircraft in the area. Scottish Information then asked the PA-28 pilot what his position was, to which the reply was "Dunkeld". After being contacted by UKAB during the incident investigation it became clear that the PA-28 pilot hadn't seen the C152 at all.

This was a Category A incident (where the aircraft missed each other largely due to providence) and both were in contact with Scottish Information under a Basic Service. The FISO knew they were in the same area but, based on the information they had, thought that the aircraft were more separated in time.

Ultimately, with both pilots under only a Basic Service, the FISO was not responsible for providing traffic information per se, but the Board felt there had been opportunities for better information flow both from the pilots to the FISO regarding their estimates for turning points, and from the FISO to the pilots regarding the presence of the other aircraft in the area.

The role of Scottish Information (and London Information) is often misunderstood, with some pilots under the impression that the FISO has a radar showing a 'God's-eye view' of the UK and will provide corresponding avoidance information (although I stress that the pilots in this case were not operating under that misconception).

Although the FISO may have a situational awareness display (that might or might not show some of the tracks depending on altitude), they don't use radar-based surveillance and are essentially simply sat at a desk maintaining a track-log based on pilot reports.

The FISO uses Flight Progress Strips (FPS) to record details of each flight, a printed VFR chart (and an electronic version is available), a weather radar and a Flight Information Display (FID) for situational awareness. Their role is primarily to assist pilots in navigating a safe flight by providing weather, airspace and airfield information on request, not to give Traffic Information. If the FISO becomes aware of 'unusual activity' in an area (defined as three or more plots observed in close proximity in the same geographic area) then

they might provide generic information about the other aircraft in the area using the terminology "I am aware that there is increased activity in the vicinity of [location]".

In this latter respect, the better the information you give (accurate route and turning-point estimates for example) the more the FISO can help and the more chance that other pilots might also hear what you are doing and perhaps modify their own plans accordingly. Even so, ultimately, it is still for the pilots to see-and-avoid each other rather than rely on the FISO to provide avoiding-action information.

Full details of the incidents can be found at the links within this note or at airproxboard. org.uk in the 'Airprox Reports and Analysis' section within the appropriate year and then in the 'Individual Airprox reports' tab.

UKAB MONTHLY ROUND-UP

There were 32 Airprox reviewed at the Board's May meeting, of which 12 were SUAS incidents. Of the 20 manned aircraft-to-aircraft incidents, seven were assessed as risk-bearing (three were Category A and four Category B). The month of May produced increased rates of Airprox notifications, with overall numbers now indicating above the five-year average for both aircraft-to-aircraft and SUAS incidents.

The predominant theme revolved around inadequate communication or assimilation of information between controllers and pilots. Of the 13 associated incidents, four involved insufficient Traffic Information from ATC or controllers not sufficiently resolving a conflict; in another four the pilots didn't assimilate information that was available (mostly from R/T calls that other pilots had made); there were three examples of poor communication of intentions, and two incidents where pilots could have selected a more appropriate air traffic service.

In ten incidents late- or non-sightings were a factor, and there were seven incidents of inaction where pilots either did not act on the receipt of threat information when they could have, or simply failed to integrate with other aircraft they had been told were in the visual circuit.

Airprox in or near the visual circuit seemed common again this month; there were 11 events where aircraft came into conflict with others either in the circuit, joining the circuit or flying though the circuit. Most were simple misunderstandings or failures to assimilate information, but three were examples of pilots flying too close to the pattern of traffic at minor airfields without an ATZ (it seems that some pilots are still not careful enough in the planning or execution of their flight),

Diagram based on pilot reports
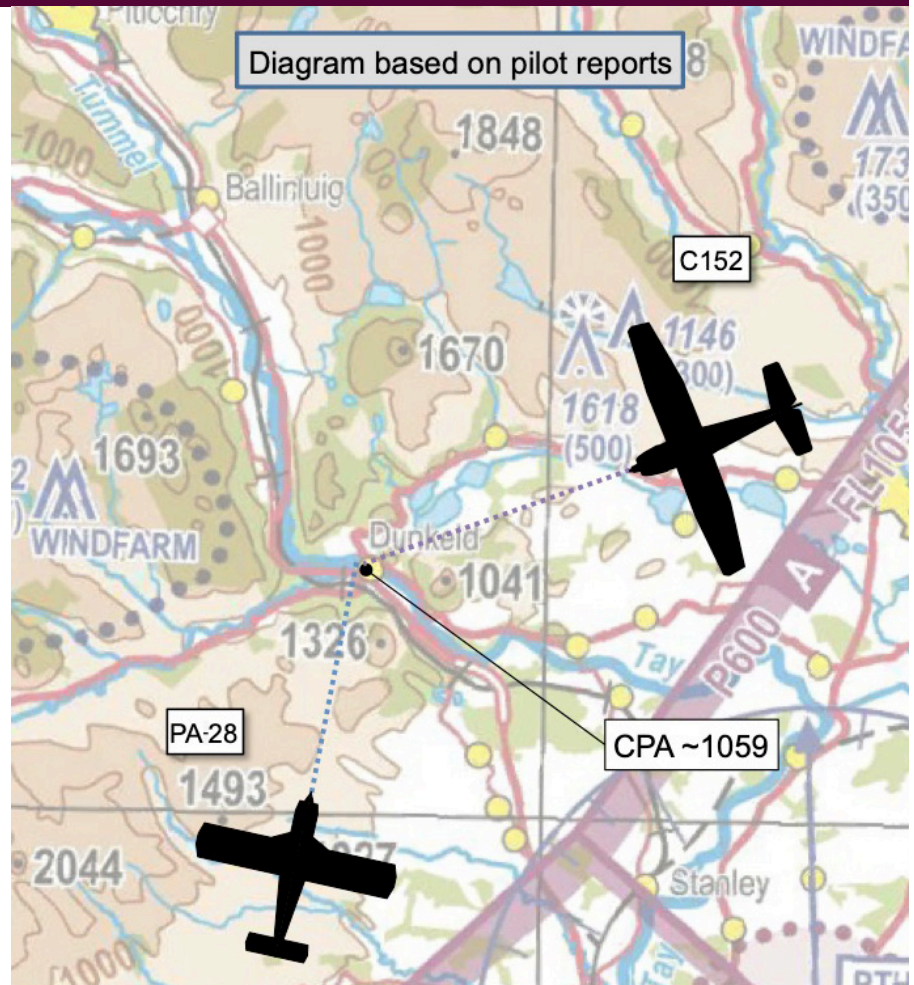
and two were examples of seeming 'air rage' where those who thought they had the right of way flew towards the other aircraft joining the circuit apparently to prove their point.

Although the 'who's ahead of whom?' debate is often a finely judged matter, the lesson is that sometimes the 'grey areas' of conflict resolution might not be as obvious to the other pilot as you might think, so self-preservation, courtesy and consideration for others dictates that allowances are made.

Even if you do think you have 'right of way', it is not appropriate to make the point by deliberately flying towards the other aircraft – widen or extend your own track as appropriate, and then talk about it afterwards in the clubroom once you've landed.

The Board made two recommendations.

2019002
Wellesbourne Mountford update their AIP entry to reflect the BRUNO approach.

2019004 & 2019008
The CAA and MAA provide advice and guidance on the interpretation and use of electronic conspicuity equipment.

The first resulted from the Board's discussions about an incident between two

Cessna 152s at Wellesbourne Mountford. One was on base-leg after joining overhead and the other was long-finals after joining straight-in from a locally developed and unofficial 'BRUNO instrument approach procedure'. The recommendation sought to clarify this procedure so that all pilots would be aware of it, codify associated radio calls, and offer guidance about how to integrate.

The second recommendation resulted from a couple of incidents where pilots received TAS/TCAS indications about the other aircraft but either did not act, or acted inappropriately, on this information.

It seemed to the Board that there is a lack of guidance about TAS/TCAS use and how best to interpret and react accordingly. Rather than interpreting what's being shown in the heat of the moment, some generic thoughts on various scenarios would be useful, as would guidance on the pros and cons of such systems (such as the inaccuracy of azimuth indications due to aerial installations for example) and what pilots can expect to receive in terms of alert algorithms etc. ■

Approaching trouble

Good communication and taking early action is a benefit to everyone

A Falcon 2000 pilot receiving a Traffic Service from Bournemouth was positioning for an ILS approach to the airport, but while descending through 4000ft on the extended centreline at about 11nm a Mooney M20 was crossing the centreline from his right (**Airprox 2019036**).

The controller gave the Falcon pilot Traffic Information in good time, although arguably incomplete regarding the converging geometry. The Falcon pilot was aware of the Mooney and was required to give way to it. However, the pilot continued on track until a TCAS resolution advisory caused him to descend for avoidance.

The Mooney pilot was listening out with Solent Radar (with their Listening Squawk selected) when it would have been better to have selected Bournemouth and their Listening Squawk; had he done so then, when the Bournemouth controller made a blind call to him, he might have been able to either reassure all that he had the Falcon in sight, or agree to avoid it by routing behind.

The Falcon pilot was given Traffic Information at 5nm and 1nm and had heard the Traffic Information being passed in-the-blind to the Mooney pilot, all of which the Board thought was sufficient information for him to take action. Some members wondered whether there had been an assumption that the Falcon, operating under IFR and self-positioning for the ILS, had 'right of way' in some way when they did not – the collision avoidance rules of the air apply irrespective of flight rules, weather conditions or procedures being flown.

As it was, the Falcon pilot only saw the Mooney at a late stage (during the TCAS resolution advisory), but the Mooney pilot had seen the Falcon well before and was content that he had sufficient vertical separation.

This case also highlights the need to think of others flying aircraft that might be TCAS-equipped; although you might have sufficient vertical separation for VFR purposes, if a commercial pilot receives

a TCAS resolution advisory from your closing SSR they are mandated to react and manoeuvre. Out of courtesy if nothing else, try to ensure a wide berth, or at least point your vector well behind such aircraft to prevent unnecessary reactions.

Full details of the incidents can be found at the links within this note or at airproxboard. org.uk in the 'Airprox Reports and Analysis' section within the appropriate year and then in the 'Individual Airprox reports' tab.

UKAB MONTHLY ROUND-UP

Some 31 Airprox, were reviewed during the Board's meeting — Of the 19 manned aircraft-to-aircraft incidents, seven were assessed as risk-bearing with two Category A (where separation was reduced to the bare minimum and only stopped short of an actual collision because providence played a major part in events), and five were Category B (where safety margins were much reduced below the norm through either chance, misjudgement or inaction; or where emergency avoiding action was only taken at the last minute).

Overall, in June this year's increased reporting rates continue, with overall numbers remaining above the five-year average for both aircraft-to-aircraft and SUAS incidents (of which there were 12).

The predominant theme was late-/non-sighting (11 cases) which, in the absence of other available barriers, highlights once again the fragility of see-and-avoid as a safety barrier and the need therefore for robust lookout at all times as the back-stop for collision avoidance in Class G airspace.

Inaction by pilots featured in six Airprox, within which there were two instances of pilots not integrating properly with other aircraft which they had been informed were present in the visual circuit.

Inaction and failure to integrate are becoming too regular in visual circuit Airprox, with pilots pressing on when self-preservation at least should cause them to give way or go around even if the other aircraft should technically give way to them. The Board has warned many times before about the perils of assuming that the other pilot has situational awareness or has seen your aircraft; if for whatever reason they haven't become aware then they clearly won't avoid.

Other themes this month included four cases where pilots could have selected better ATS options both to gain situational awareness from ATC and also provide ATC

Diagram based on radar data

CPA 1412:40
500ft V/0.3nm H

Falcon 2000

Mooney M20
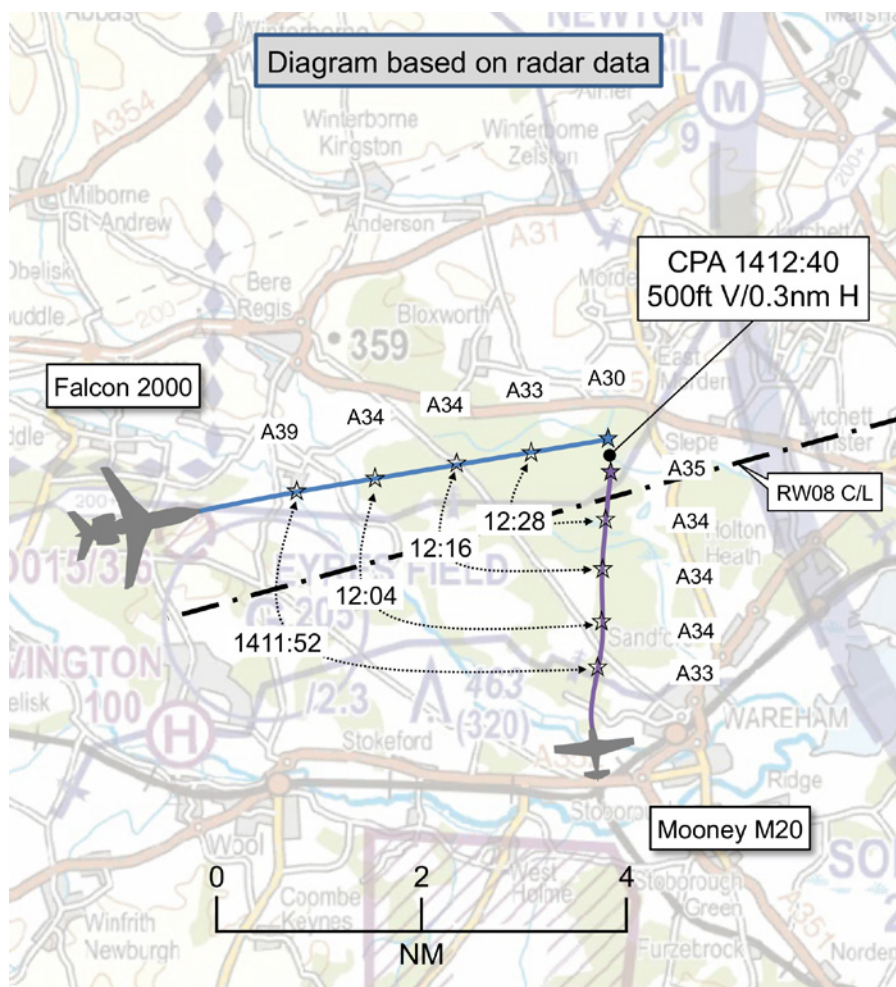
with valuable information about their own intentions. There were also four instances of sub-optimal controller performance, (some more clear-cut than others, and some simply down to an interpretation of 'controllership').

Even when controllers have satisfied their legal requirements, more could perhaps be done sometimes to assist pilots with their collision avoidance responsibilities. This is always a difficult discussion during Board meetings because of the desire not to blur the provision of services; however, aviation safety is rarely black-and-white in its circumstances and so sometimes a timely intervention over-and-above that which is formally required can assist the pilots in the grey areas.

The remaining incidents were a mixed-bag of poor communication of intentions, sighting reports, no SSR or incompatible Traffic Alerting Systems (TAS), and mentoring oversights.

Picking up on one of these issues, we still see too many aircraft not displaying SSR in all modes (contrary to the requirements of SERA.13001). If SSR is fitted and functional it should be selected on with all modes (gliders

excepted of course if battery considerations are an issue). With many pilots taking advantage of increasingly affordable TAS equipment, those who do not select SSR are often denying themselves a safety barrier even if their own aircraft doesn't have a TAS fitted.

The Board made one recommendation during the June meeting. This related to a Partenavia P68 conducting a survey consisting of multiple reciprocal passes at 2100ft. Although the pilot did see the other aircraft, a Beech Bonanza (albeit later than desirable), the Board felt that the company involved ought to consider equipping its aircraft with a TAS given the frequency of its survey tasks and the concomitant risk of task-focus to the detriment of lookout.

2019028
The P68 operating company consider the incorporation of a TAS. ■

Circuit-breakers

You might know where people are at your airfield, but what about those just passing by (or over...)?

The pilot of a Scheibe SF-25 Falke motor-glider was late downwind in the visual circuit at Enstone (which is nominally flown at 800ft) when the instructor spotted a helicopter in their 11 o'clock and very close. The motor-glider pilots climbed immediately but felt that not a lot of avoiding action was possible due to the late sighting.

The A109 helicopter pilot was routing from a private site to the south-west and passing Enstone at 1500ft on the QNH; with Enstone at 550ft elevation, this put the A109 at almost the same height as the SF-25 and the pilot didn't see the motor-glider as he flew between it and the airfield.

The incident (**Airprox 2019096**) raised a couple of points of interest. Firstly, it's a reminder of the need to maintain a robust lookout at all times, even in the visual circuit where a pilot's attention might be diverted into flying the correct pattern, height and speeds. All of the former are important of course (and who hasn't been clipped around the ear by an instructor for not being accurate!) but it's vital to keep that lookout scan going in the circuit, even when you're within the protection of an ATZ (we get many cases of aircraft mistakenly flying through ATZs or getting confused and joining the wrong way in the circuit).

Which brings me to the second point. There is no ATZ at Enstone but, even so, the Rules of the Air (SERA.3225 to be specific) still require others flying past airfields to 'avoid the pattern of traffic formed by other aircraft in operation'. So, the A109 pilot was required to avoid the SF25 pilot's 'pattern of traffic' and would have been much better served by ensuring greater avoidance of the airfield either vertically or laterally.

As you'll see on the diagram, Enstone is marked with a blue circle with a 'T' that indicates it's a busy training airfield, but it's important to note that the blue circle has no significance in respect of geographical avoidance criteria, it's just a symbol designed to draw pilots' attention to the airfield, so don't think that by avoiding the circle you're avoiding the visual circuit traffic.

Finally, you'll also see that the Enstone frequency is printed on the chart, so if you are going to pass nearby to minor airfields then why not listen out and, even better, make a broadcast call of your intentions so that you enhance both your situational awareness and also that of those who might

be operating at the airfield. Full details of the incident can be found at the link within this note or at airproxboard.org.uk in the 'Airprox Reports and Analysis' section within the appropriate year and then in the 'Individual Airprox reports' tab.

At its July meeting the Airprox Board reviewed 32 Airprox, of which 14 were SUAS incidents.

Of the 18 manned aircraft-to-aircraft incidents, ten were assessed as risk-bearing with three being Category A (where separation was reduced to the bare minimum and only stopped short of an actual collision because providence played a major part in events), and seven were Category B (where safety margins were much reduced below the norm through either chance, misjudgement or inaction; or where emergency avoiding action was only taken at the last minute).
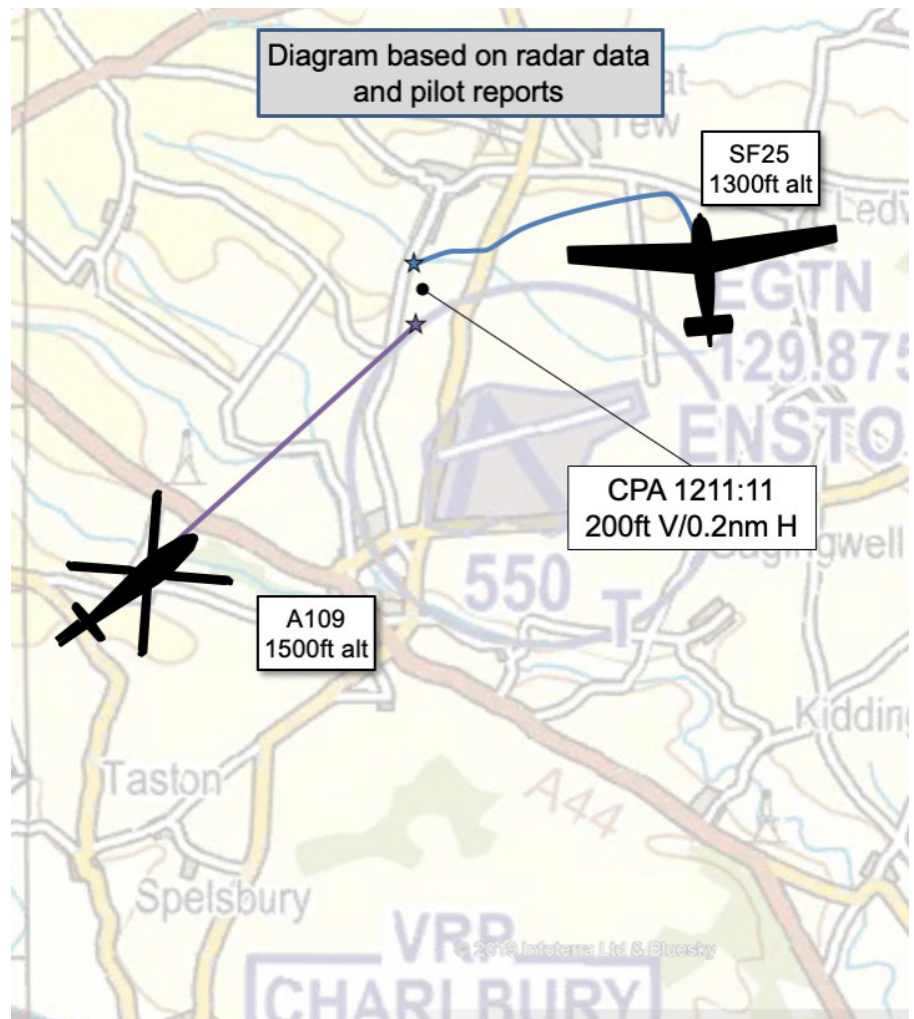
Overall, this year's increased reporting rates continued in July, with overall numbers remaining well above the five-year average for both aircraft-to-aircraft and SUAS incidents.

I was struck this month by the number of incidents where collision warning systems (CWS) were present in one or both aircraft but were unable to provide a warning due to either incompatibility of equipment (TAS vs Flarm) or aircraft not squawking (and therefore not detectable by the TAS).

There were eight such incidents, most of which would likely not have occurred if the pilots had received appropriate warnings from their equipment. This reflects the dilemma of current electronic conspicuity equipment; without a common interface, users are purchasing equipment that they think will best suit their needs fully aware that others may be operating different equipment that will not be detected.

The CAA's 'Share the Air' conference on June 27 again highlighted this problem, with a clear understanding that a universal data-sharing/transmission protocol was required such that all equipment can interface with each other and so avoid the current 'VHS vs Betamax' situation.

Notwithstanding the compatibility issue, this month's predominant theme was again late-/non-sighting (14 cases). Somewhat implicit in the Airprox definition and so unsurprisingly a regular feature in Airprox themes, it is nonetheless interesting that associated safety barrier analysis indicates

Diagram based on radar data and pilot reports

SF25 1300ft alt

CPA 1211:11 200ft V/0.2nm H

A109 1500ft alt

that see-and-avoid was only fully effective in 30% of the incidents so far this year, partially effective in 41% (the late-sightings) and completely ineffective in 21% (the non-sightings).

This is also backed up by our new Contributory Factor assessment process which shows that, for the 56 incidents assessed to date for 2019, non-sighting was a factor 23 times, and late-sighting was a factor 25 times. Overall, factors associated with see-and-avoid – or lack thereof – represent about one quarter of all contributory factors to date.

Other themes included poor planning or adaption of plans by pilots (seven cases), insufficient or lack of communication of intent (four instances), inaction (three incidents), and not integrating sufficiently with other aircraft in the visual circuit (two). All of these are regular features in Airprox assessment and, unlike see-and-avoid (which is often down to physiological issues), are often eminently correctable by a little forethought and courtesy for others.

The Board made one recommendation during the July meeting as highlighted below. This related to an incident where two aircraft in the visual circuit came into proximity on final. One aircraft had turned fairly long on final while the other had turned tight and was just rolling out.

It seems that neither had yet made their 'Final' call, and this is a problem we've seen before when pilots don't hear or assimilate others' downwind calls at airfields under an A/G service. The Board thought there might be value in looking again at whether a 'Base' call might be useful at such airfields. In the incident we looked at, this would quickly have alerted both pilots to the presence of the other aircraft.

2019071
The CAA review R/T procedures at non-ATS aerodromes. ■

The risks are rising

You might know where people are at your airfield, but what about those just passing by (or over...)?
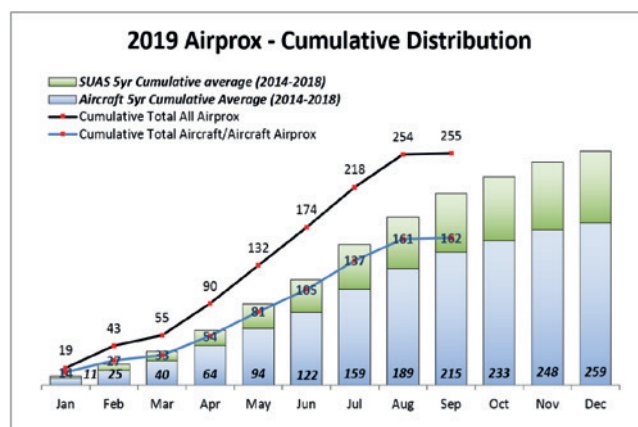
PHOTO: Brian Barr/Simon Finlay

The UK Airprox Board didn't meet during August because it was holiday season and, being a voluntary unpaid activity, Board members deserve a well-earned break as much as anybody else. So I thought I'd expand this month on one of the other July incidents as my Airprox of the month. But before that, though, it's worth noting that we're still seeing increased reporting rates compared to expectations as shown on the chart which covers the year up to early September.

The blue columns show the expected five-year average for manned aircraft-to-aircraft encounters and the blue line shows what we're actually seeing — there were 161 manned incidents actually reported up to the end of August compared with an expectation of 128. The black line indicates all Airprox (i.e. including those involving drones/SUAS), and the green bar shows the expected number of drone/SUAS incidents. Overall, you can see that we expected 189 incidents in total up to August but we actually had 254.

This shows either that we might actually be having more Airprox or simply be reporting more. I'd like to think the latter was the case but it's probably true that both explanations are playing a part, so it's also a warning signal that incidents might be increasing.

This is reinforced by some of the analysis I've done on the 2018 data (and soon to be released on our website as the Annual Blue Book report No. 34). This

2019 Airprox - Cumulative Distribution

- SUAS 5yr Cumulative average (2014-2018)
- Aircraft 5yr Cumulative Average (2014-2018)
- Cumulative Total All Airprox
- Cumulative Total Aircraft/Aircraft Airprox

analysis indicates that not only are Airprox incidents increasing but the percentage that are risk-bearing (Category A or B) is also rising. In other words, even if we put down the increased number of incidents to better reporting, all other things being equal, Airprox have become 'riskier' over the last ten years as shown on the second

Risk Bearing Airprox % 10-year trendline (no SUAS)

Diagram based on radar data and pilot reports

AA-5
1400ft alt

CPA 1259:18
500ft V/<0.1nm H

1258:30

58:42

NMC

58:54

59:06

C152

A09

NMC

A11
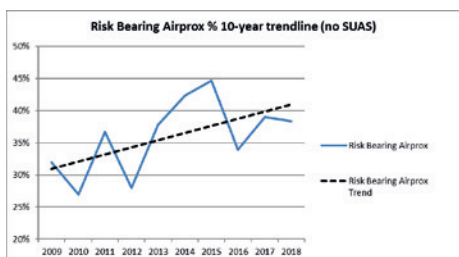
A13

NMC

0   1   2   3

NM

chart: in 2009, about 30% of incidents were risk-bearing; in 2018 it was about 40% and the trend is clearly rising.

This indicates to me that pilots are both increasingly less aware of other aircraft and are not seeing them until later, otherwise they wouldn't get so close.

There are no simple solutions to this: the old messages of prioritising lookout (especially with the proliferation of electronic navigation aids that vie for a pilot's attention); ensuring a robust scan at all times; talking to ATC; following procedures; and investing in electronic conspicuity and warning systems remain the key elements of mid-air collision avoidance.

But one other aspect seems to be increasingly relevant to me, and that's our willingness to tolerate the mistakes and seemingly sub-optimal actions of others. Too often I'm aware of pilots becoming intolerant of others who might impede them (either by mistake or misunderstanding) and who then deliberately 'press on' into a conflict situation to make their point out of a 'sense of entitlement'.

A little courtesy goes a long way, you simply don't know what's going on in the other cockpit and so, when faced with a situation where you think you're 'in the right', perhaps show a little magnanimity and let them go ahead – it's always better to discuss these things in the tea-bar afterwards than cause an incident and have cross words in the air.

Done in the right way, the other pilot will likely be grateful for your comments, might understand the 'error' of their ways, and you might also come to understand why they perhaps hadn't seen you or been aware of your presence. A bit like when I ride my motorcycle and drive defensively, I liken this to flying defensively: think ahead, expect the unexpected and be tolerant of other aviators' mistakes (no matter how crass you think they are).
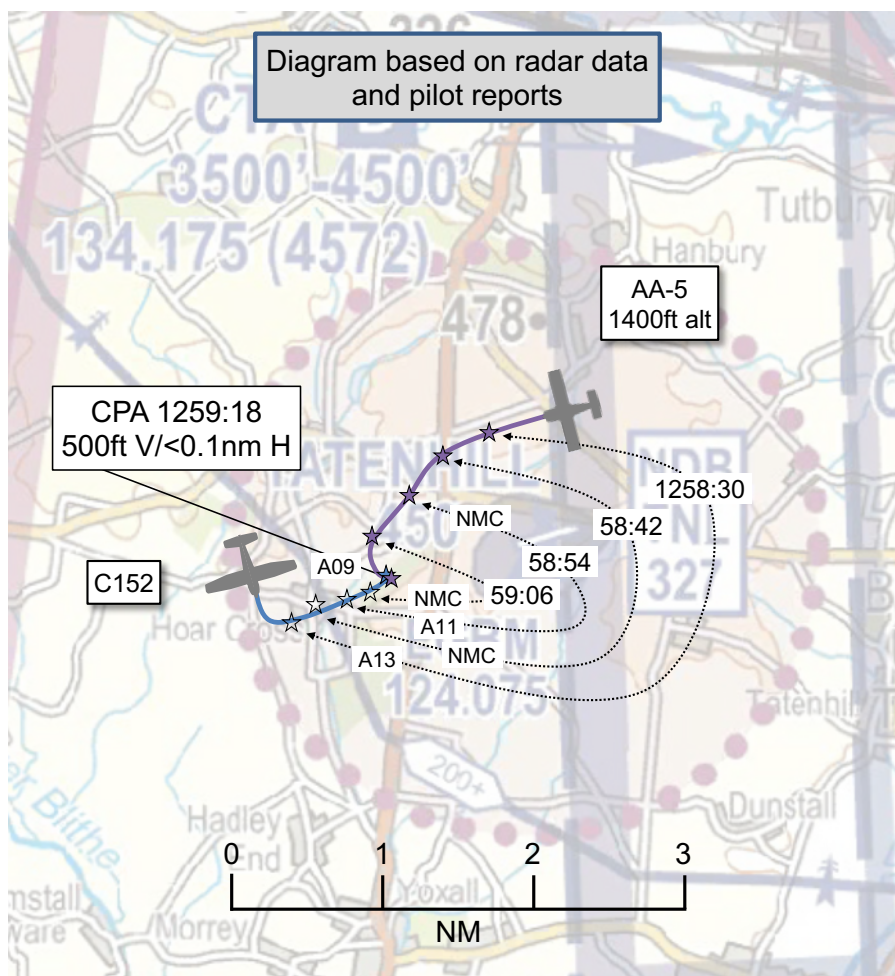
AIRPROX OF THE MONTH

As for my Airprox of the month (**Airprox 2019071** from the July meeting), this occurred when a Cessna 152 and a Grumman AA5 came into conflict in Tatenhill's visual circuit. The Cessna pilot was on a 'long' final (and yet to make his final call) as the AA5 pilot turned a tight base-leg and then tight-final inside the Cessna.

As Tatenhill is an Air/Ground airfield, everyone must rely on hearing the calls of others for situational awareness, and then looking for, and seeing them, where they expect them to be. The corollary being that everyone must make the correct calls in the right place, fly the expected pattern or, if you're going to deviate, make sure you make a clear call announcing your intentions.

It also reinforces the need to have a good look up the approach path before you turn final, and if you are in any way a bit long on final (either from a wide circuit or a straight-in approach), then have a good look upwards at both base legs (just in case someone's joining without a radio) as you near the airfield.

In this case, the Grumman pilot had not heard the Cessna pilot's downwind call and therefore had not assimilated that the 152 was on 'long' final. Nor did the Cessna pilot see the AA5 as its pilot flew his tight circuit and approached steeply on base-leg to final. It seems that neither had yet made their 'Final' call, and this is a problem we've seen before when pilots don't hear or assimilate others' downwind calls at airfields under an Air/Ground service.

Because there have been a number of final/long-final conflicts at Air/Ground airfields in recent months, this led the Board to recommend that the CAA might review R/T procedures with a view to the use of a 'base-leg' call; had there been one from the Cessna or Grumman pilots then this would have alerted the other to their presence and increased the situational awareness of all.

Full details of the incident can be found at the link within this note or at airproxboard.org.uk in the 'Airprox Reports and Analysis' section within the appropriate year and then in the 'Individual Airprox reports' tab.

Hidden in plain sight

Is your electronic map really showing you the whole story?

Just as the slack was being taken up on a winch cable to launch an ASK 21 glider at Portmoak one of the launch-team saw a PA-28 about to overfly the airfield and shouted "Stop, stop, stop" — a few seconds later and the glider pilot would have been established in the climb and poorly placed to avoid the Piper (even if he had seen it at all).

Although the risk in this case (**Airprox 2019101**) was graded as Category C (where no risk of collision has existed or risk was averted), there are important lessons here about the in-flight use of electronic maps.

The Piper pilot had been rerouted as he transited north from Edinburgh towards Leuchars, and had originally planned to be nowhere near Portmoak. As many of us would do, he entered the new waypoint into SkyDemon and started to follow the magenta line.

Although he knew Portmoak was somewhere nearby (and also that Fife and Balado were active so he needed to keep a good lookout) the new magenta line neatly obscured Portmoak's gliding activity and site

symbols so it wasn't obvious that they were there (as the graphic shows).

Although the PA-28 pilot was looking out and had seen another glider in the area, he didn't see Portmoak, and so wasn't aware of the glider about to launch.
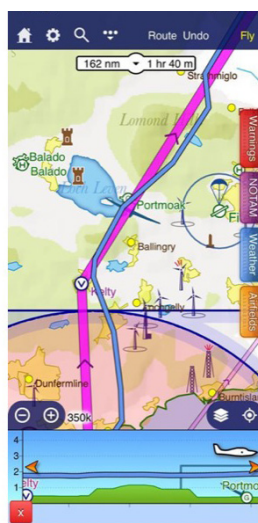
Hindsight is wonderful of course, and it's easy to say that the Piper pilot should have made sure his route didn't go over an active

glider site, but he wasn't helped by the SkyDemon display which shows gliding sites as a small symbol rather than the larger circle depicted on the VFR chart.

Also, it could well have been that the site was off the top of his display when he did his reroute so, without actively swiping and looking along the new track, all sorts of things could be missed. Finally, and although not pertinent in this case, it's possible to deselect sport aviation and glider site symbology on SkyDemon and so pilots might not even know the site was there.

The lessons are clear — always check your route when planning and re-planning (especially when in the air) and take note that electronic displays are not always as clear as VFR charts in making some sites obvious; beware of things being obscured by the magenta line, and note that glider winch-launch altitudes are not shown by default and have to be positively accessed by selecting on the glider site and accessing 'What's here?'.

Also, be wary of deselecting sports aviation and glider sites in the menus. Would you be as happy to fly around using a VFR

chart that didn't display all the relevant aeronautical information? Full details of the incident can be found at the link within this note or at airproxboard.org.uk in the 'Airprox Reports and Analysis' section within the appropriate year and then in the 'Individual Airprox reports' tab.

UKAB MONTHLY ROUND-UP

There were 35 airprox, of which 15 were SUAS incidents, reviewed at the Board's September meeting. Of the 20 manned aircraft-to-aircraft incidents, seven were risk-bearing with one being Category A (where separation was reduced to the bare minimum and only stopped short of an actual collision because providence played a major part in events), and six were Category B (where safety margins were much reduced below the norm through either chance, misjudgement or inaction, or where emergency avoiding action was only taken at the last minute).
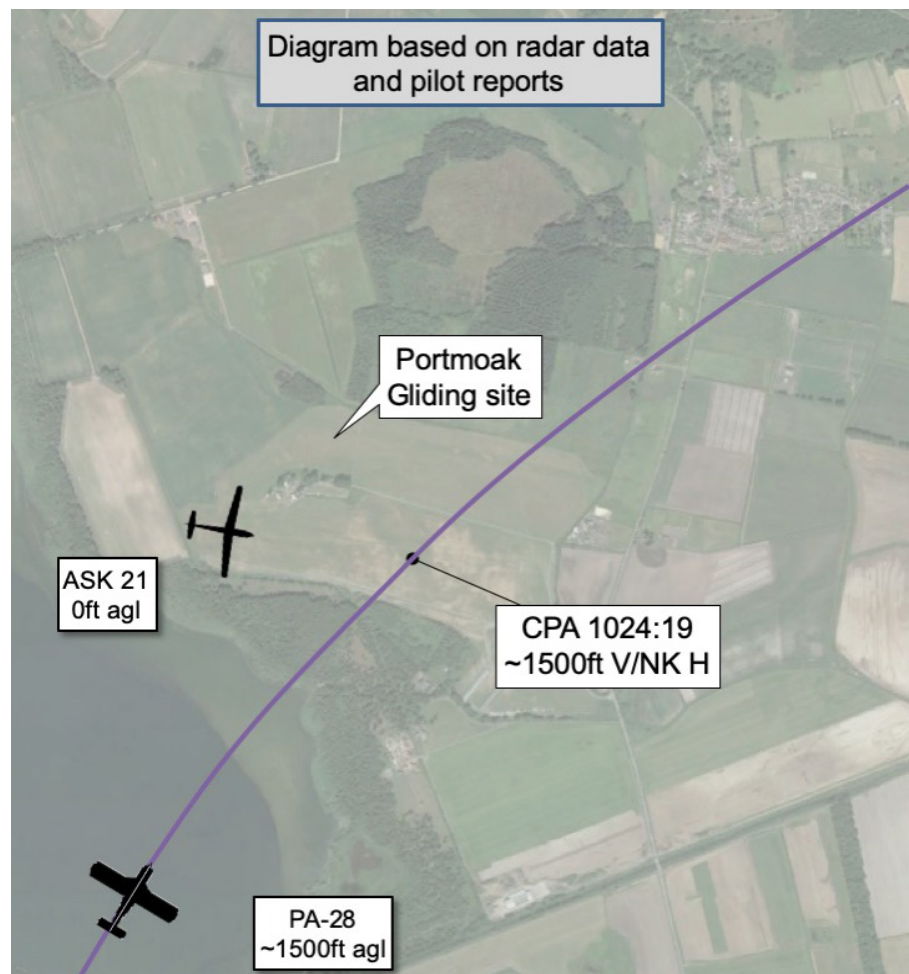
Overall, this year's increased reporting rates continue and it looks as if 2019 will be a record year for Airprox notifications. There are two ways of looking at this: either there are more Airprox (which would be the pessimistic view), or people are embracing the safety process and reporting incidents they might not have done before (which is good because we then have the visibility of lessons that we might not have known about before).

So please keep reporting – there's absolutely no stigma; it doesn't reflect on your prowess as a pilot, we don't do 'blame', we don't publish identities and our sole remit is to enhance air safety by trying to identify lessons and trends.

Speaking of which, I've just published the 2018 'Blue Book' annual Airprox summary and analysis at airproxboard.org.uk/Reports-and-analysis/Annual-Airprox-summary-reports/. Do have a read; it gives some thoughts from me and plenty of statistics for those who want to delve deeper. There's also a catalogue of all the 2018 incidents.

This month's predominant theme was again late-/non-sighting (15 cases), reflecting the fact that most incidents were from this summer when GA flying rates increase and the probability of having an encounter also rises.

Perhaps more informative, though, was the second-most common theme which was sub-optimal selection of air traffic services (including not talking to nearby airfields) which featured in nine incidents. This reflects

Diagram based on radar data and pilot reports

Portmoak Gliding site

ASK 21 0ft agl

CPA 1024:19 ~1500ft V/NK H

PA-28 ~1500ft agl

on pilots not seeking a surveillance-based service when available, not seeking a service at all, or transiting near to busy airfields without either listening-out or making an information call to increase the situational awareness of others.

Although it isn't always practical to seek or obtain an air traffic service, Traffic Information from ATC is one of the prime sources of situational awareness that's not being employed to its fullest extent. Associated safety barrier analysis indicates that the 'ATC Situational Awareness and Action' barrier was not used (or was not required to be used due to the requested/available ATS) in 29% of incidents so far this year.

Inaction on receipt of situational awareness information or after a visual sighting featured in seven incidents, and sub-optimal planning or execution of the plan was evident in six events. Both of these reflect on the airmanship of those involved and more could have been done to prevent the situation unfolding had they acted more appropriately.

Sub-optimal Traffic Information or controller actions featured in five incidents,

and, disappointingly, there were another five where pilots either overflew glider sites below the winch-launch height, or flew close to busy airfields without thinking to call and announce their presence.

It was two of these glider site overflight incidents that led the Board to examine the use of SkyDemon by the pilots concerned, where it became apparent that SkyDemon's facility to deselect 'Sport Aviation' and Glider Sites from the display was less than desirable from a charting perspective given that pilots could then easily, and unwittingly, plan to fly through such sites without warning. The Board's recommendation reflected this issue as shown.

AIRPROX Recommendations 2019101 & 2019110
SkyDemon review the selection and depiction of sites used for aerial sporting and recreational activities.

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The TCAS trap

You might think you're far enough away, but appearing to be 'too close' to TCAS-equipped aircraft can cause avoidable problems

During a busy time at Dundee Airport a controller instructed three aircraft to orbit along the downwind leg — one at the start, another halfway and one at the end — while a Cessna Citation made an ILS approach.

The pilot orbiting at the end of the downwind leg was a solo student in a PA-28 who was probably working hard in the circuit. Those familiar with Dundee will know that the downwind leg goes over the southern end of the Tay railway bridge, which is the recognised cue to turn base-leg (as shown in the diagram).

Unfortunately, the student allowed himself to come too far north and hence too close to the approach path (perhaps influenced by the south bank that narrows towards the approach). Consequently, as they orbited the student ended up pointing towards the Cessna at relatively close-quarters, close enough to trigger its TCAS. As a result, the Cessna pilot received a TCAS Resolution Advisory (RA) which obliged him to go-around.

Although there was no risk of collision in this Category C incident (**2019132**), it's similar to several we've seen over the years where squawking aircraft have come close to TCAS-equipped aircraft, sometimes with more serious outcomes. It's important to recognise that these sorts of interactions are a result of equipment limitations rather than anyone breaking any rules per se.
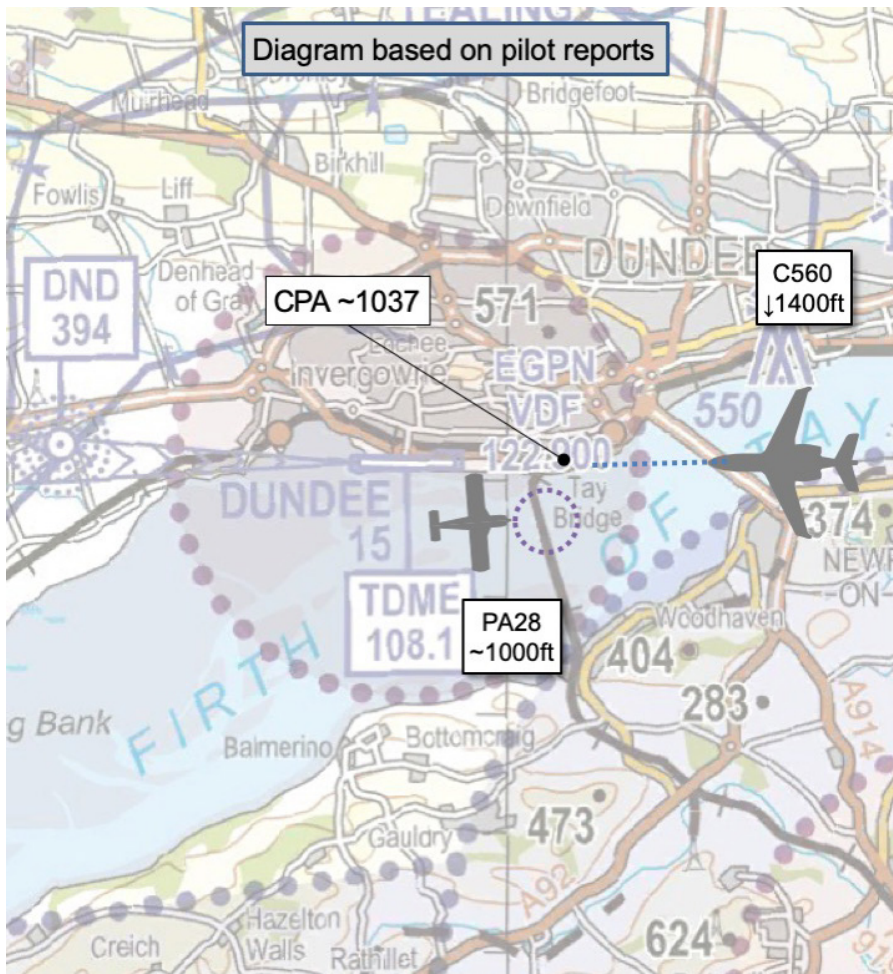
TCAS is designed for IFR conditions where aircraft are usually separated by ATC; its use in mixed IFR-VFR environments can be problematic because there is no standard separation in these circumstances and all that's required of the VFR pilot is that they avoid a collision by a sufficient margin which might easily be within the TCAS envelope.

It is, though, good airmanship to give IFR traffic a wide berth so that you don't cause problems such as this. This time it was just an inconvenience to the Cessna, but in busier airspace it could cause mayhem as large airliners manoeuvre because of TCAS RAs (which the pilots are mandated to follow) and then they and ATC have to
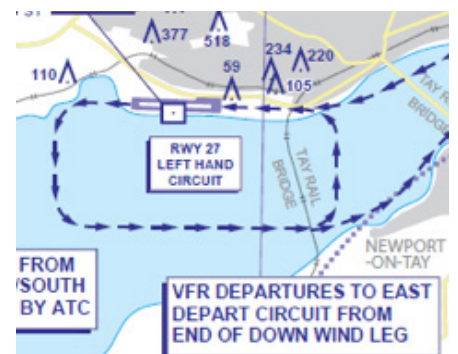
work hard to avoid other airliners as they are slotted back into the radar pattern.

But how much avoidance is enough? Well, TCAS is designed to take into account both the airliner's and your speed and trajectory and modify its alerts accordingly. So, there's no definitive answer but, as the graph (which is for representative speeds of 160kt for the airliner and 90kt for the intruder in the height band 1000ft to 2350ft) shows, a good rule of thumb is to try to avoid coming within 2nm head-on or 0.5-1nm laterally in the circuit area or environs.

Diagram based on pilot reports

Diagram based on pilot reports

CPA ~1037

C560
↓1400ft

PA28
~1000ft

TA and RA Ranges (nm): 1000-2350

— TA — RA -- Bearing

The graph shows a blue circle for the TCAS Traffic Advisory (TA) area which is a warning alert for the airliner pilot to prepare him to manoeuvre; the red circle is the TCAS RA area which is where they are mandated to act, usually by going around if in the circuit area.

Full details of the incident can be found at the link in this note or at airproxboard. org.uk in the 'Airprox Reports and Analysis' section within the appropriate year and then in the 'Individual Airprox reports' tab.

UKAB MONTHLY ROUND-UP

We're continuing to experience our busiest year for manned-aircraft-to-aircraft incidents in recent times and up to mid-October there have been 188 reported incidents, well above the expected five-year average of 156.

There are, however, encouraging signs over drone reporting and the overall reporting rates seem to have reduced compared to last year, so there is room for cautious optimism that the messages about drone use and the associated drone regulations are having an effect.

In previous years there was a definite peak in drone reports in the 1000ft-2000ft height band, but we're now seeing that peak at 2000ft-3000ft which perhaps indicates that the number of people who might have flown their drone up to 1000ft or so by mistake or lack of awareness has reduced. Subject to any last-minute surge, if current drone reporting rates continue

it looks as if there will be about 125 or so drone/object reports this year compared to 139 in 2018.

At the Board's September meeting, 36 airprox were reviewed of which 16 were drone or objects. Of the 20 manned aircraft-to-aircraft incidents, five were risk-bearing in Category B (where safety margins were much reduced below the norm through either chance, misjudgement or inaction; or where emergency avoiding action was only taken at the last minute).

Aside from the usual crop of late-/non-sightings (13 cases), this month's manned aircraft-to-aircraft incidents saw a mixed-bag of contributory factors. Sub-optimal controlling or inadequate provision of Traffic Information featured in seven, and less-than-ideal pilot planning or execution/modification of the plan was evident in four.
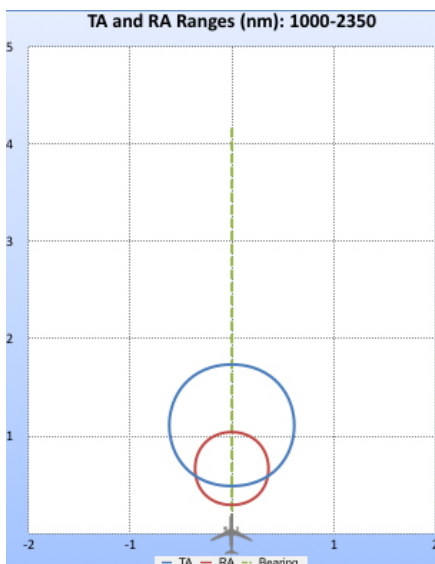
Three Airprox involved inaction by pilots who had received situational awareness, and another three where the pilots had either no situational awareness about the other aircraft or a flawed mental model about what was going on.

Other contributory factors included poor execution of procedures; incompatible collision warning systems or sub-optimal actions on receiving a warning; distraction from lookout; poor communication of intentions and not opting for the most apt air traffic service.

In three incidents the Board couldn't reach a conclusion as to what had occurred due to lack of information or conflicting accounts. One, at Westonzoyland, seemed to indicate that the two flying clubs at the airfield (one at Westonzoyland and one at Middlezoy) had a less than harmonious relationship that the Board felt was risking overall safety. As a result, although not directly a part of the Airprox at issue, the Board made the following recommendation.

AIRPROX Recommendations 2019151

Westonzoyland and Middlezoy airfield managers develop a letter of agreement regarding integration of their operations.

Action — not distraction

Being taken by surprise happens, but it's crucial not to lose a sense of who or what's happening around you

A Bulldog pilot on an air experience flight at Prestwick was performing right-hand circuits and had been instructed to hold at the end of the downwind leg to allow a Citation flying an RNAV approach to land.

He had intended to fly a left-hand orbit to comply, but just as he was establishing downwind his passenger suddenly felt unwell and needed a sick-bag urgently. While getting one out and attending to his passenger the pilot inadvertently entered a right-turn and, although he had previously been visual with the Citation, he became so distracted by the passenger that after about 180° he was horrified to see he had drifted very close to the runway centreline. In a frank and honest report (**Airprox 2019162**) the pilot said the cause was becoming distracted by the plight of his passenger to the extent that he lost situational awareness; while ensuring that the passenger was cared for and the aircraft was under control, he had mistakenly turned the wrong way in his orbit and had allowed a dangerous

loss of separation. Although it's easy to give armchair advice with the benefit of 20:20 hindsight, the old prioritisation axiom of 'Aviate, Navigate, Communicate' is as relevant as ever, even if you're very experienced.

The dangers of distraction are well known and this incident is a lesson that the No.1 priority always has to be an awareness of what the aircraft is doing, followed closely by an appreciation of where you are even when there's an emergency.

Those of us who have been unlucky enough to have a passenger pebble-dash the cockpit will attest to how unpleasant the experience is, but that's nothing compared to potentially crashing while trying to fish out a sick-bag during a critical phase of flight.

And it's not just pilots who need to be alert to the dangers of task fixation. In this case, the Citation was handed over late to the Tower controller from Approach, and this led to the Tower controller focusing more on what the Citation was doing to the detriment of monitoring the Bulldog. As a result, the controller lost situational awareness on the Bulldog and did not notice it deviating from its track towards the approach path and into conflict with the Citation. Had he done so he might have been able to issue a warning to the Bulldog pilot to correct his orbit/path.

Full details of the incident can be found at the link within this note or at airproxboard.org.uk in the 'Airprox Reports and Analysis' section within the appropriate year and then in the 'Individual Airprox reports' tab.

Diagram based on radar data

UKAB MONTHLY ROUND-UP

During its November meeting 29 incidents were reviewed by the Airprox Board, of which 12 were drone/object-related.

Of the 17 aircraft-to-aircraft incidents, five were assessed as Category B (where safety margins were much reduced below the norm through either chance, misjudgement or inaction; or where emergency avoiding action was only taken at the last minute).

There was, however, a welcome reduction in reported incidents in October and November, probably due to the reduced flying over those months as a result of the poor weather. Although this relieved some pressure on the UKAB team, 2019 has been our busiest year for manned-aircraft-to-aircraft incidents in
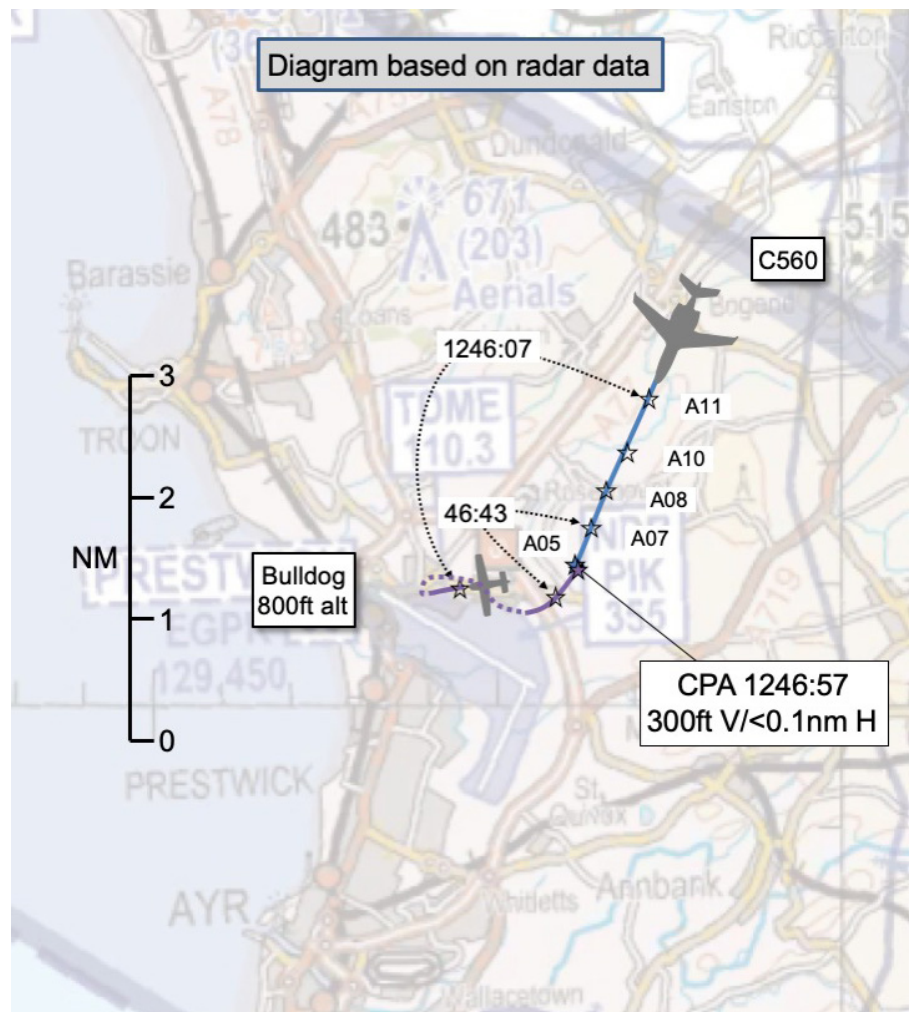
recent times and remains well above our expected five-year averages.

Another welcome outcome has been that drone/object reporting has also reduced in recent months compared to last year. Although the poor weather will have affected these as well, there was also a noticeable reduction in the summer months after the new drone regulations regarding Flight Restriction Zones (FRZ) came into force in March, and it might be that awareness has been raised as a result.

November's most frequent Airprox theme was inaction, flying into conflict or flying close enough to cause the other pilot concern (eight incidents). All of these Airprox occurred despite the pilot either having gained sufficient situational awareness or sighting the other aircraft in enough time to have done something to change their flight path. As such, most of these incidents were avoidable and largely reflect the risk perception and airmanship of those involved.

The next most prevalent theme was controllers making errors or not fully

following procedures (five Airprox); most were associated with inadequate or late traffic information which correspondingly reduced the situational awareness of the pilots concerned.

Poor planning or sub-optimal execution/ modification of the plan by pilots featured in four events, and there were four instances where late- or non-sighting of the other aircraft was the primary contributory factor. Pilots could have requested a better ATS (which would likely have provided them with situational awareness of the other aircraft) in three incidents; distraction from the task featured in two events; pilots not properly following processes and procedures caused two Airprox; and there was one incident where the key factor was not integrating into the circuit properly.