

# AIRPROX



THE PUBLICATION OF THE UK'S AIRPROX BOARD

2017

Remember, its only...  
**FIVE SECONDS TO IMPACT!**  
EYES OUT / LOOK OUT / LISTEN OUT

- LOOKOUT
- LISTEN ON THE RADIO
- ELECTRONIC CONSPICUITY
- PROFESSIONAL KNOWLEDGE
- PRIORITISING TASKS
- DEFENSIVE FLYING

INSIDE

**EVERY SECOND COUNTS...**  
The final few will surprise you

**GO ON, SHOW YOURSELF...**  
Can you be seen out there?

**IT'S GOOD TO TALK...**  
Why using the radio counts



## WELCOME...

to the annual Airprox Magazine 2017

### EYES, EARS, FORESIGHT, INSIGHT, ADVERTISE AND PRIORITISE...

Every year there's an increase in Airprox as the better weather of spring and summer arrives. It's probably no coincidence; those who aren't hardy winter flyers get back into the cockpit, perhaps a little rusty after a bit of a lay-off and, as a result, there's a great temptation to focus on getting hands and minds recalibrated rather than looking out.

On average we see something like one mid-air per 60 Airprox, so attention to themes from previous Airprox is worthwhile. I've chosen six that merit particular attention, and these are expanded in posters, articles and a short animation. Look out for them at flying clubs, and you can also see them at [airproxboard.org.uk](http://airproxboard.org.uk) in the 'Dir UKAB's Topical Issues and Themes' section alongside other useful stuff.

So help yourself to avoid becoming a statistic by taking a couple of minutes to remind yourself of the risks and causes of Airprox before flight, and keep your eyes outside as much as possible. Remember:

- **Eyes** – lookout and develop a robust scan technique.
- **Ears** – communicate by talking/listening on the radio to make your intentions clear and maintain situational awareness of others.
- **Foresight** – fly defensively, with vigilance, courtesy and consideration for others (aka airmanship).
- **Insight** – review your understanding of ATC services, rules of the air, circuit patterns and procedures.
- **Advertise** – make your presence known through conspicuity measures (electronic and visual).
- **Prioritise** – time-share cockpit tasks and avoid distractions compromising your lookout.

#### PUBLICATION CONTENT.

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#### Publisher CAA

UK Airprox Board  
RAF Northolt,  
West End Road  
Ruislip, Middlesex, HA4 6NG  
Tel: 020 8842 6051  
E: [contact@airproxboard.org.uk](mailto:contact@airproxboard.org.uk)



# When EVERY second COUNTS

## How long do you reckon it takes from seeing another aircraft to hitting it – 30 seconds to a minute, maybe? You'd be wrong

If you've been unlucky enough to have a very close encounter you'll know you have nowhere near as long as even 30 seconds to take action; a bit like a slow motion train crash everything seems to take a long time until the last few moments when it all happens in split seconds.

Apart from those instinctive 'jeez' moments when push or pull comes down to a split-second of survival instinct, research shows that in normal circumstances the average pilot and aircraft needs anything from nine to 12.5 seconds (about how long it's taken you to read to here...) from spotting another aircraft to processing the closure geometry and avoiding a potential collision.

So take two PA-28s meeting head-on at around 90kt each (pictured top right); there's around ten seconds from the most eagle-eye'd being able to spot the other aircraft and impact. The crucial thing here is that in the first five seconds little seems to happen with not much change in the size or motion of the oncoming PA-28, it's only in the last five seconds that it suddenly blooms in size; the mind then takes a

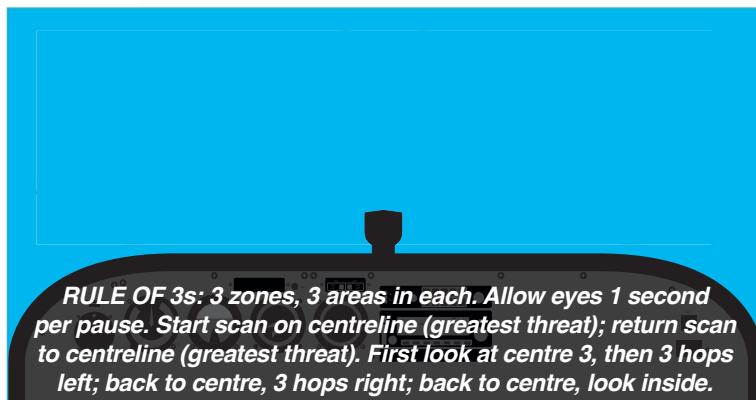
couple of seconds to recognise it as a threat, leaving just three seconds or so to take action.

Naturally, the odds of spotting a potential collision reduce in relation to time spent looking out, and the best rule of thumb is 80:20 – 80 percent of the time looking out and just 20 percent inside the cockpit in small chunks.

A recent collision between two PA-28s shows just how looking down into the cockpit can lead to trouble.

The two aircraft were flying on a converging track, and while one pilot looked down to set QFE on his altimeter in preparation for landing, the other looked down at his map – moments later they collided. They were lucky, one aircraft's propeller blade struck the other's left wheel while the other's left tyre struck the upper surface of the first aircraft's wing. Both were able to land safely.

*The AIB concluded: 'It is likely that the poor into-sun visibility, the constant angle between the tracks of the aircraft, and the fact that the attention of both pilots was inside their respective cockpits before the collision, contributed to the*



**RULE OF 3s: 3 zones, 3 areas in each. Allow eyes 1 second per pause. Start scan on centreline (greatest threat); return scan to centreline (greatest threat). First look at centre 3, then 3 hops left; back to centre, 3 hops right; back to centre, look inside.**



*breakdown of the see-and-avoid.*

So looking for other aircraft is vital, especially before going head-down in the cockpit, but just 'looking' isn't enough, and here's why.

Even in a featureless sky eyes tend to focus somewhere, but if there's nothing specific to focus on they rather lazily revert to a relaxed intermediate distance which means you don't necessarily see anything that's going on out there. You'll probably know much of this already, but it's worth re-examining how the eye works to understand why this happens.

Essentially, the lens focuses light to form an image on the retina which is made up of more than 100 million light sensitive cells that convert the light (image) to electrical impulses which are then sent to the brain. So to develop an effective 'lookout' it's important to understand the distribution and function of the retina's two types of cells, rods and cones.

What you see might seem like one big picture, but detailed interrogation of the world is only provided by rods in the central, focal, part of the visual system, an area no larger than a thumbnail held at arm's length. Not only is this area small, but an image falling on it has to be stable and the pilot's attention directed towards it for active interpretation – still getting the big picture?

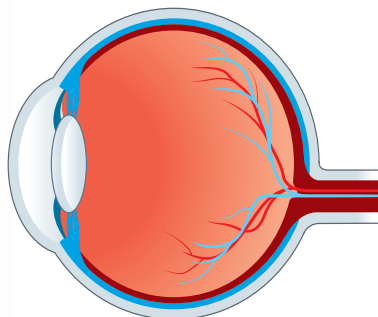
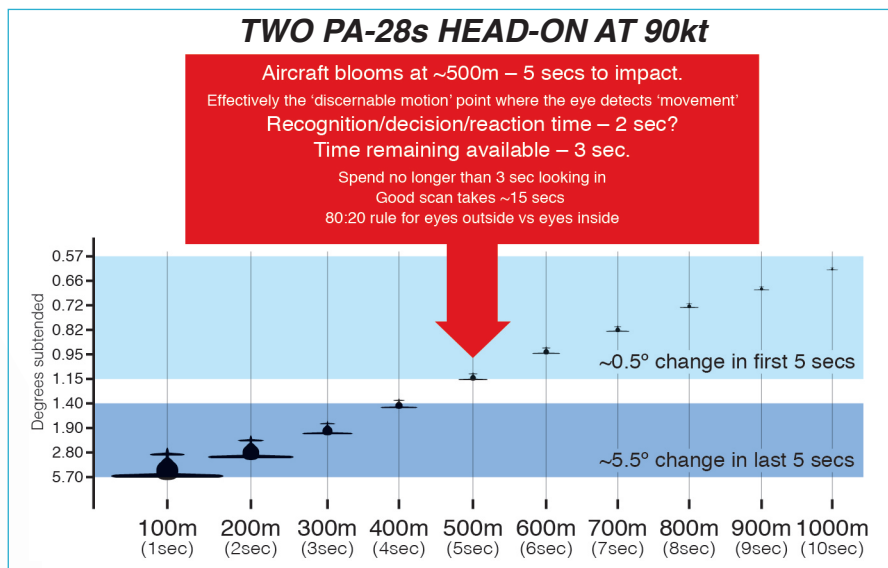
Meanwhile, the cones in the periphery of the retina are responsible for the ambient visual system that relies on an object's motion in the outside world to attract the focal system's attention, so movement is a very important attention-getter.

With no visual cues to attract the eye's attention, there's a tendency for it to focus at a point in space one to two metres away, making you effectively short-sighted so you're not necessarily going to see something at a distance; a periodic glance at objects such as the wingtips will stop this 'empty field myopia'.

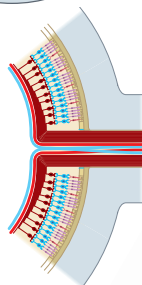
Quite apart from the physiological limitations, the eyes are vulnerable to other visual distractions; lighting, foreign objects, illness, fatigue, emotion, the effect of alcohol, certain medications and age all play their part. Then there are additional challenges such as atmospheric conditions, glare, deterioration of transparencies, aircraft design and cabin temperature, which all take their toll on your eyes and what you can see.

Most pilots know that when looking out you should shift glances and try to refocus at intervals, but doing it randomly doesn't really work; to spot a potential conflict needs an effective scan in front – and a check on who might be coming at you from the side...

You'll probably be familiar with the problem



**The eye and its small optic disc packed with with (as shown here) purple rods and red cones**



of 'constant relative bearing' or 'stationary in the field of view', where colliding aircraft have a relative bearing constant to each other until impact. The subjective effect of this is that the collision threat remains in the same place (stationary) on the canopy unless you move your head to stimulate the ambient visual system. An unfortunate consequence of 'constant relative bearing' is that no other aircraft that the pilot has ever seen will have possessed the same characteristic as that of a colliding one... So moving your head, relative to the canopy or windscreen, is an important aid to lookout and, of course, it helps to take out the blind spots such as canopy furniture, pillars, high/low wings etc.

A quick bit more science shows that as a collision threat approaches, its size on the retina roughly doubles with each halving of the separation distance, so colliding aircraft stay relatively small until shortly before impact when it all happens rather quickly.

This presents a bit of a challenge even if you do perform a good 'lookout', but it underlines the importance of apportioning the correct amount of time for a systematic and repetitious scan pattern.

It's a curious thing about flying that many pilots believe they keep a good lookout when in reality it's less-than-effective; glancing out and scanning with smooth and continuous eye movements is incorrect because for the pilot to perceive another aircraft, time is needed for a stable image of it to fall on the centre of the retina and the pilot's attention directed towards it.

Lookout should be performed using a series of small eye and head movements with intervening rests, the latter being the only time when the outside world is really being interrogated. Carrying out regulated scans might sound a bit formulaic and, let's be honest, boring, but they do work.

That said; there's no one technique that suits all; although horizontal back-and-forth eye movements seem preferred by most. It's important to develop a comfortable and workable scan.

First, know where and how to concentrate 'lookout' on the most critical areas at any given time. In normal flight, most of the risk of a mid-air collision can generally be avoided by scanning an area at least 60° left and right of the intended flight path. This doesn't mean the rest of the area to be scanned should be forgotten. At least 10° above and below should also be searched.

One of the simplest and effective is the rule of threes as detailed in the graphic (left):

No one is immune to mid-air collision, but an understanding of the limitations of vision, collision geometry and visual scanning technique will help to avoid one. the cockpit.

Hopefully by now you get the big picture. ■



# It's good to talk



**Keeping a good lookout and listening-in tells you much about what's going on around you, but talking to ATC gets you the bigger picture**

It's a curious thing, some pilots will stand at the bar and bend your ear for hours about flying, but pop a headset on them and they come over all shy or, in some cases, simply prefer not to talk to whoever is out there.

Which is a shame, because think about these words: "Communicate unto the other person that which you would want him to communicate unto you if your positions were reversed."

It's a great quote and underscores why, in the words of a certain phone company, "it's good to talk". The thing is, you can only learn so much about other people near you, or heading your way, by keeping a good lookout and listening – talking gets you the bigger picture and also potentially gives them valuable situational awareness, too.

There are a stack of services that can help improve situational awareness if pilots use them, so let's start with LARS, the Lower Airspace Radar Services which is probably one of the most useful.

Established in the 1970s its aim was to improve the efficiency of ATC services for aircraft in the vicinity of airfields not protected by controlled airspace. Its primary objective is to aid the flow of traffic to and from these airfields by encouraging aircraft transiting the area to receive an Air Traffic Service (ATS).

The service is provided within approximately 30nm of each participating ATS Unit, and unless it's 24-hour will normally be available between 0700 & 1600 in the summer and 0800 & 1700 in the winter, Mondays to Fridays. Some units might serve evening, night or weekend flying, so it's worth giving them a call irrespective of the published hours. If no reply is received after three calls, you can assume it's not available.

So here's a quick refresher on how to use it: first, tell your departure airfield you wish to switch to the new frequency offering LARS. Having selected the frequency, call the unit and state your intentions.

Controllers like information in a common



'All you can realistically expect under a Basic Service is weather, airspace activity and conditions at airports. What you shouldn't expect is specific traffic information...'

format because it makes life easier for all, so give your call sign, aircraft type, where from and to, position, altitude, whether you're VFR/IFR/SVFR, your heading, and your request, ie, what sort of service you'd like; Basic, Traffic, Deconfliction or Procedural

Service (the latter two are now no longer available if you're flying VFR). It's worth bearing in mind that the provision of LARS is discretionary, especially if the controllers are engaged in other tasks and the level of cover will also depend on



the equipment available. The controller should make it clear what service is being offered, and if they can't provide a full service, whether there are restrictions involved.

Our advice is to ask for a Traffic Service wherever possible, but you might only get a Basic Service, especially if they're busy, and the clue really is in the name here. All you can realistically expect under a Basic Service is weather, airspace activity and conditions at airports. What you shouldn't expect with a Basic Service is specific traffic information, it's up to you to avoid other traffic by looking out for it.

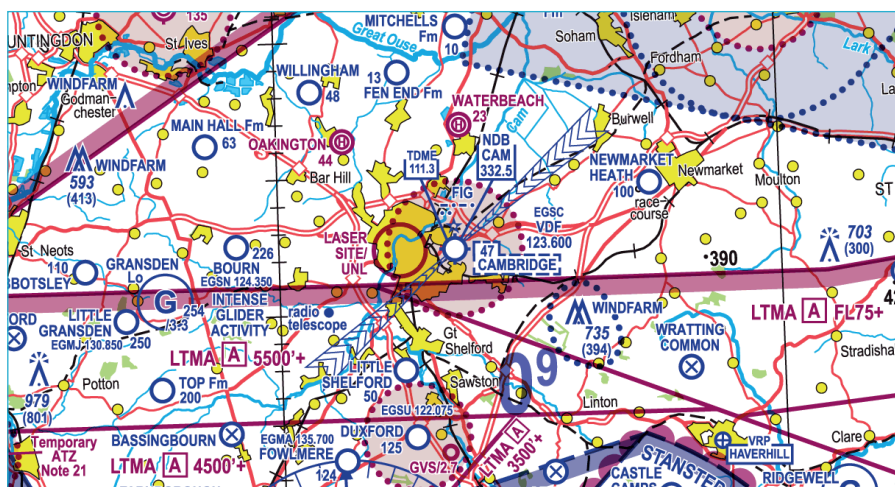
At best, you might be told if another pilot is estimating the same position at the same or a similar time. There is a 'but' though; if an ATS unit is providing you with a Basic Service and the controller sees a definite risk of collision then they should pass you specific traffic information because they have a legally defined 'Duty of Care' to you as their customer. However, there is no requirement for a controller to follow your flight under a Basic Service, so any traffic information will only be forthcoming if the controller happens to be looking at that part of the radar screen at the time and notices the potential conflict.

The reason we say that a Traffic Service is preferable is because, unlike a Basic Service, the controller will actively be tracking your flight and will provide radar derived traffic information to assist you in avoiding others, although responsibility for collision avoidance still remains with the pilot. The controller will pass information on traffic that will pass within 3nm and 3000ft, and should give that information before the traffic is within 5nm.

In theory, you'll be passed information that's pertinent to you in time for you to think about changing your course or height, but you won't get avoidance advice (and ATC might not even know the height of the other traffic if it's not squawking); if such action is needed it's your responsibility.

If you're not sure what ATC has (or hasn't) said, then simply ask them to repeat or clarify the message. And that's true for any communication with a controller. But remember, if they are calling traffic to you closing on a constant bearing, you have to do something about it yourself (although they may prompt you depending on how busy they are).

Even if you're not being helped by LARS, making radio calls can still avoid tricky situations, particularly if you're transiting



near an airfield. It's worth giving them a call because they can pass local information you might otherwise have missed, such as that parachute drop at the village fête that slipped by when you were checking the NOTAMS. It happens.

And how about the feathers on the chart showing an instrument approach at some airfields in Class G (pictured above)? Many pilots blithely fly across them without thinking someone might be on the way down concentrating on their instruments. If you want to cross them call the airfield and check; you can also find out if anyone is carving ovals in the sky in the associated hold – they could be as low as 2,500ft which is, of course, a popular en route height...

Calling airfields without full-blown radar, (such as Cranfield, Shoreham, Carlisle, Redhill and sometimes others such as Gloucester, Cambridge and Coventry) might not get you a full service, but they will be inclined to tell you about aircraft that they know about at the same level and perhaps warn you of other potential hazards such as local paragliders, microlights, balloons or "multiple gliders to the north", particularly in the busy spring and summer months.

Even if you don't want to talk to

someone, you might want to think about using a listening squawk where available. All you have to do is dial in the correct squawk code for the area with Mode C if you have it, and simply listen in. If there's something you need to know, such as a risk of encroaching airspace, the controller will let you know and possibly tell you about looming traffic, too.

Talking, and listening, to airfields early on becomes even more important near the destination because it can all get rather busy, so it helps to have a picture of who's doing what (and who might not necessarily be following the procedures you expect) early on. And think of this – it's not only other aircraft approaching the overhead that come into play, but also traffic climbing out that could be heading straight towards you.

The golden rule in any communication is 'if in doubt, ask', which probably applies more in a busy circuit than anywhere else; and if the picture doesn't match what you hear, tell the controller you're going to leave, rejoin and have another go.

Finally, don't try to tell others what they should do (they may not be able to do it!), just say what you'll be doing, and then do what you said you'd do! ■



# Now you see me

**It's all well and good keeping a good lookout yourself, but if you don't show up well in the air how can someone else see you?**

If lookout is about seeing, the flip side is being seen, which isn't always as easy as it should be, even in perfect visibility – and you might be surprised by the number of Airprox where one of the pilots said they never even saw the other aircraft. In fact, looking at the Airprox Board stats, 'Did not see traffic/late sighting' accounted for nearly half of the GA Airprox in 2015, and stats for 'see-and-avoid' not being an effective barrier to collisions look similar for 2016.

Take this scenario, and if it's ever happened to you, you'll get this; you're flying into the sun when another aircraft suddenly appears ahead coming straight at you – before you can even blink, it's gone. At a closing speed of around 200kt there's virtually no time to do anything, you certainly don't have the nine or ten seconds you might get in other circumstances to spot it and take action (see the section on Lookout).

Head-ons from the sun might be reasonably rare, but other "I never saw them" near-misses aren't, it's a common

thread in Airprox however good the lookout and perfect the weather.

Of course you can do simple things to help yourself be seen such as switching on a beacon or strobe lights (and why not the nav and landing lights, it doesn't cost any more money) and turning on the transponder to Mode C/Alt, if fitted.

Many people switch it on as a matter of course, but if you don't, think about this; even if you're not talking to air traffic, if they can see you they know what's going on in and around their airspace which means they can offer advice (depending on the service) to others.

That means everyone gets better situational awareness because controllers know where people are and, crucially, where they're going to be so there are fewer surprises for all, plus other aircraft

with collision warning kit such as TCAS can see you.

Using the transponder brings us to the growing realm of electronic conspicuity. No matter how visible an aircraft is there are times when it's still not going to be seen with the naked eye, particularly where blind spots are involved.

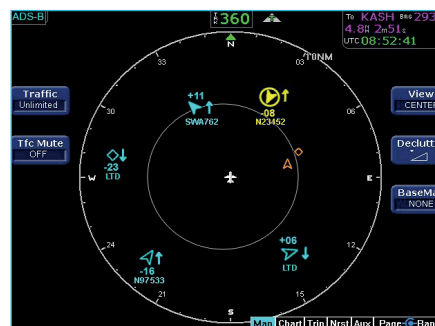
Electronic conspicuity might be a bit of a mouthful and perhaps a bit controversial in some quarters, but 'traffic warning devices' are an important and growing trend in GA. You can read more about the thinking behind their adoption in the CAA's CAP1391 at [caa.co.uk/cap1391](http://caa.co.uk/cap1391).

Talk to any pilot who has started to use one of the increasing number of 'traffic warning' (much easier to say...) systems and the odds are they'll say they wouldn't now fly without it.

'Being spotted is all about actually being seen, whether that's visual with lights or electronic via a transponder or traffic warning device'



### Don't forget both lights and transponder... how you can show up on a traffic warning screen



Although there isn't a common system yet and many are still developing (at a fast rate) they aren't expensive and do a good job of warning you who's out there and where. Here's a brief rundown of some current ones (there are other systems also available).

**FLARM** (Flight Alarm) and **Power FLARM** have been a great aid to glider pilots for more than a decade and fitment is recommended by the British Gliding Association. A cockpit transceiver linked to a small cockpit display (it can provide voice alerts with third-party software) warns of nearby FLARM-equipped traffic which poses a collision risk, but it has no conflict assessment capability.

Power FLARM adds the capability to receive and display 1090MHz ADS-B-out (Automatic Dependent Surveillance Broadcast) which transmits highly accurate positional information to ground controllers and also directly to other ADS-B equipped aircraft.

**PilotAware** is slightly similar to Power FLARM but on a different frequency. It also receives 1090MHz ADS-B. However, it has no conflict assessment capability and generally uses an external display, such as a tablet computer with navigational software; it can also provide audio warnings such

as "Traffic 2 o'clock, Above, 10 Kilometres". There is also a 'radar' function that shows the location of aircraft in your local area without the need to use a third party application, so it can for instance work on a mobile phone.

The **LPAT** Low Power ADS-B Transceiver has been in development since 2012 with the support of the CAA and AOPA after NATS carried out feasibility work on development of a reduced cost ADS-B transceiver for GA.

The idea was to provide the possibility of better detection of GA aircraft without a transponder near, and within, controlled airspace to reduce infringements.

Recognising that GA pilots are unlikely to use such equipment unless they receive a benefit, NATS has also included a cockpit display to show the position of other aircraft transmitting 1090MHz ADS-B to help visual acquisition and reduce the risk of conflict. Airborne trials have been taking place successfully over the last couple of years.

Other units are appearing called Traffic Situation Awareness with Alerts which also offer conflict detection. These not only work out who might be a threat to you, but rather like TCAS in larger aircraft they voice-announce the information so that you hear

something like "traffic, left 3 o'clock, 1/2 mile, 100ft above".

So far with most of these systems there's no avoiding action guidance, that's down to the pilot's judgement, but the whole point of them is to help pilots look for and see nearby aircraft quickly and easily.

Where does it all go from here? While traffic warning devices don't replace a good lookout, there's no doubt that electronic conspicuity is becoming a great aid in GA for everything from paragliders to fixed- and rotary-wing aircraft, the trick now is to get the different systems talking to each other.

But for now it can only be a secondary aid to a good lookout and sensible scan; think of it as an additional tool that can give earlier warnings to provide better awareness of traffic around and to help spot a threat – and being spotted is all about actually being seen, whether that's visual through the use of lights, or electronic via a transponder or a traffic transmitting and warning device.

But if you do nothing else, switch all lights on and do fly with your transponder selected to Mode C/Alt to give ATC and other aircraft a chance to detect you, increase their situational awareness and ultimately avoid you. ■



Communicate section about radio, so it's worth checking what ATC services might be available for the flight and making a note of their frequencies before you fly (much easier than trying to find them at the last minute) – and note them right through to the destination, which is where the risk factors start to ramp up. Forewarned is most definitely forearmed.

And what are those services that ATC can give? What do they mean? What do they do for you? Here's a reminder of some of the services available – you can read more in the Communicate section.

A Basic Service provides information including weather, changes of serviceability of facilities, conditions at aerodromes and general activity information within a unit's area of responsibility; a Traffic Service offers the same information plus radar-derived traffic information on relevant conflicting traffic; a Deconfliction Service (not for VFR flying) again offers the Basic Service information, plus the controllers will aim to assist you by passing traffic information and avoidance advice including headings and/or levels; at the top end a Procedural Service (not available for VFR flying) will provide deconfliction advice against other aircraft in receipt of a Procedural Service from the same controller. Perhaps time to dust off the latest version of [CAP 774](#) (UK FIS), or at least read the short leaflet [CAP1434](#) (Guide to UK FIS), and refresh your knowledge.

It's worth remembering, though, that avoiding other aircraft remains the pilot's responsibility with all these services – and that means a good lookout; you can read more about that in the Lookout section.

If you're not in receipt of a service you can still use a listening squawk; although a controller will generally only attempt to contact you if you are about to fly into controlled airspace, they might also warn you of a potential traffic conflict, though it's not a priority for them.

En route, things have altered a little since 2015 when the UK adopted, with some exemptions, the Standardised European Rules of the Air (SERA). While much hasn't changed while airborne, some parts of SERA do now make a difference.

For example, the UK's cruising level system which used to be based on 'quadrants' (changes of level each 90°) to provide separation has switched to the 'semi-circular' system (changes of level for each 180°) as applied throughout the rest of the world.

The rules haven't altered about what action to take if meeting another aircraft

# Think about it

**You could say Airprox prevention starts even before you have climbed into the aircraft. Confused? You soon won't be, and here's why**

**L**et's take a simple example: you're flying from a farm strip, done it hundreds of times before, no airspace nearby to worry about, the pleasure of not needing to use a radio, full throttle and off you go. Over the trees and... there's a low-flying helicopter carrying out a power cable check.

Okay, on the scale of probabilities it's at the unlikely end, but you get the point. It could happen, and a quick check of the NOTAMs would have flagged it up.

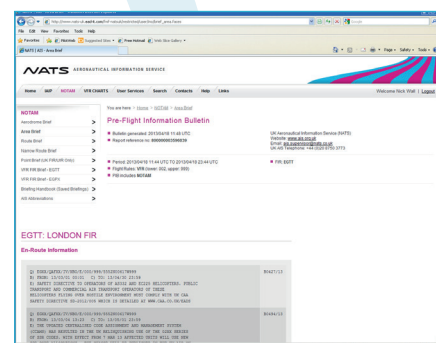
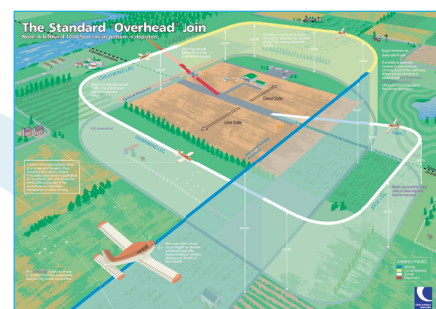
Or how about this: you're returning home when the weather deteriorates and forces you further off track than expected, and with

one eye on the showers running in quickly you inadvertently fly straight through a gliding site that wasn't in your route plan as gliders are using the cables.

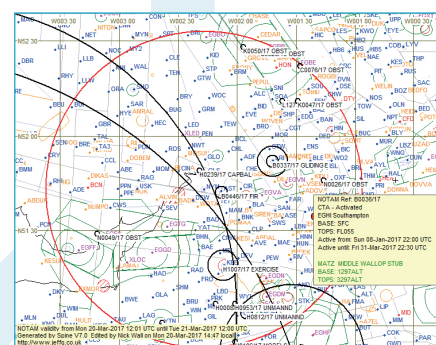
So yes, an Airprox can start before you get in the aircraft, but it doesn't take that long to cut the risk factors with a bit of planning. Take NOTAMs for example; checking them these days can be relatively quick and easy, and while pilots should check them before flight via the NATS AIS website at [nats-uk.ead-it.com](#) there's a lot of software that can help, with some of it displaying them graphically for easy assimilation.

What else can you do? We talked in the





**Check NOTAMs on the NATS website; you can also get them graphically, too**



depending on if the circuit is left/right – i.e. left-hand circuit, keep the airfield on your left as you join in the overhead. When you're already in the circuit, think about where others might conflict as they join, especially if they're 'radio fail' and neither you nor they know about each other.

The bottom-line is to get the information before you get airborne so that you're clear on circuit procedures and patterns.

The circuit is a busy time for any pilot and flexibility is the key – if someone departs from normal practice you need to be ready to deal with it; it might be annoying to see someone cross just ahead of you onto base leg when you're downwind, but simply letting it go and extending downwind (but not too much because you then become a non-standard hazard yourself!) or leaving the circuit altogether with an appropriate radio call and starting again is the right action; inflexibility could be a killer, whereas flexibility and fast adaptation, as in all flying, could save the day. ■

'Mind you, it's not worth clinging to your rights regardless and not taking action if your converging tracks don't alter...'

head-on; aside from emergency avoiding action where you have to break away in the most appropriate direction, in circumstances where you have time to take deliberate action both pilots should still turn to the right to avoid each other.

Overtaking hasn't changed either; pass on the right well clear of the person you're overtaking (in case that pilot decides to turn right unaware that you're there), and the old saying for crossing or converging traffic of 'on the right, in the right' still holds good; ie, the aircraft to the left should make a course alteration to avoid the traffic on the right.

But do you know when an aircraft is overtaking versus converging? If you're just 20° or more behind the other aircraft's 3-9 line then you're overtaking so, even if you're on the right and you're just behind the 3-9 line as you converge then you have the responsibility to give way.

Mind you, it's not worth clinging to your rights regardless and not taking action if your converging tracks don't alter; there's no point in saying to St Peter at the Pearly Gates, "but I was in the right", he'll probably just shake his head... We liken that to walking out in front of a Number 10 bus on a pedestrian crossing; cold comfort when in your hospital bed to know that the bus should have stopped. Inaction by pilots is a common cause of Airprox so do something early

because you can't rely on the other pilot having seen you – he may not have, and see-and-avoid only works if the 'see' bit is present.

So while things should be pretty straightforward en route with a good lookout and if receiving a traffic service, the same can't always be said for the end of the flight. Whether you're landing at home or away, every year there are a number of Airprox in the circuit.

Going back to where we came in, some of that comes down to pre-planning; a phone call or a few clicks on a webpage will tell you a lot about what you need to know about the destination if it's unfamiliar, and you can review its circuit patterns. It should warn you of any potential hazards, too, such as models being flown nearby.

While overhead joins are recommended (mandatory at some airfields) in practice people join the circuit at all sorts of different points, so think about potential conflicts and what's being said; you might know that a crosswind join is not the same as 'joining crosswind', but does the other pilot...

The well-known phenomenon that a pilot's brain-power reduces by half on stepping into the aircraft means that overhead joins can be tricky things to work out in the air, so have a think about it before getting airborne. A good tip is to keep the airfield to the left/right of you as you join



# It's a jungle out there...

**How close do you reckon you need to be to cause an Airprox, 100ft, 500ft, half-a-mile...surely not as much as a mile or two? Well, it really depends on your point of view – and the other pilot's**

**W**e all have different comfort zones for risk, and while some might think little of admiring another aircraft's interior cockpit trim from a few feet away, for others such as airline pilots for example it's a whole different matter.

Over the years there have been many Airprox reports where one pilot has described what he or she has believed to be an encounter that was much too close for comfort, while the other pilot hadn't thought anything of it at all.

Take this incident: After levelling off after climbing out, the crew received a TAS alert indicating traffic in the same position 500ft below. A few moments later the alert was repeated and the traffic appeared to be climbing. The pilot correctly took immediate avoiding action and assessed the risk of collision as 'high'.

The second pilot, who had seen the first aircraft and observed its movements, did not consider a change of course or climb was necessary and assessed the risk as 'none'.

The Airprox was put down to the first pilot having perceived the second aircraft appearing too close on his traffic alert system and being concerned by the proximity of the other aircraft.

So what one pilot perceives as 'normal' or acceptable might not be the case for another who could be startled by your sudden appearance. And that's particularly true for less experienced pilots. It's important that you don't assume everyone has the same comfort level as you, so give them a wider berth not just out of consideration but because you don't know what they'll do next anyway!

Traffic warning systems are invaluable, particularly in larger aircraft and have been the cause of a number of Airprox reports because, while there might have been little risk in reality, the system had perceived an aircraft as a 'threat' – and some of these cases have occurred simply due to thoughtlessness or lack of knowledge.

It's all to do with closure rates, and some pilots don't realise that TCAS can perceive a



'Has the other person who should give way seen you? Maybe they aren't looking your way or they're concentrating on the ground'

transponder-equipped aircraft as a 'threat' many miles ahead, or within around a thousand feet vertically if pointing towards it, and if the system sounds a 'resolution advisory' the crew has to take action.

But it's not just electronics that should prompt early action, any potential conflict needs to be dealt with decisively even if you're in the right (or think you are; it might be best to argue that one on the ground...).

Most of us use 'defensive driving' skills out on the road, whether we recognise it or not,

because of the myriad threats around us and the same should be true in the air. 'Defensive flying' isn't just for military pilots, it means maximising safety margins by never assuming that other pilots or ATC (or even Mother Nature) are looking out for you.

Has the other person who should give way to you actually seen you? Maybe they aren't looking your way or they're concentrating on the ground, their chart, their tablet, the instruments or their passenger(s).



Inaction is a real problem. If you don't like the look of something, defensive flying says take action sooner (now) rather than waiting to see how the situation develops and using up valuable time, which in the case of an Airprox can be as little as 30 seconds or much less. Just think how many times you've said "it all happened so quickly".

If 'vigilance' means keeping careful watch for possible danger or difficulties, then it goes hand-in-hand with 'consideration' to add up to 'foresight', because a bit of thought for others means you're less likely to end up in a difficult situation yourself.

Take some other airports such as parachuting or gliding; every year pilots blithely fly through these zones and sites seemingly unaware of the risks even though they're clearly marked on the charts.

For example, have a look at [youtube.com/watch?v=SHA0zvFfH9U](https://www.youtube.com/watch?v=SHA0zvFfH9U) if you want to see what an Airprox looks like from underneath a parachute; an Airprox is still an Airprox whether it's two aircraft or an aircraft and a person, so give them a wide berth.

And as far as gliding sites go defensive flying means steer clear. In addition to the risk of steel cables that can go up to 3000ft (winch launch altitudes are on the chart for a reason...), if you fly over, or even nearby, expect to find a honeypot of traffic, both gliders and towplanes which can be some miles away from the site, even on days when you might think flying won't be taking place. A fatal collision between a powered aircraft and a glider occurred close to a gliding site as recently as December 2016.

There are a lot of threats out there that can lead to an Airprox so it really does pay to be vigilant – and considerate to others. ■

## A question of priorities

**It's far too easy for pilot priorities to be disrupted by distractions – and it takes a conscious effort to keep things in order**

**H**ow often do you look inside the cockpit for a minute or so, perhaps trying to work out something on your tablet (okay, the chart for the less technologically inclined) or keeping an eye on the instruments (hmm, the cylinder head temperatures are creeping up, what's going on up front)?

Or you've had an enthusiastic passenger who loves chatting and takes your attention for a while, or perhaps one who's enjoying the flight rather less and you're hunting for the sickbag, or maybe you're an instructor who's having to work a little harder to get your student through a particular exercise?

What's missing in all of these scenarios is prioritisation. You might think that navigation, the sickbag or the instruction has top priority at the time, but all of these have actually led to Airprox because the pilot's priority task list was turned upside down and lookout went straight from the top to the bottom.

Lookout should always remain the top priority, dealing with distractions or other tasks quickly and properly needs be a close second, but always remember that other aircraft can quickly come into proximity at any stage so you need to concentrate on actively maintaining a robust scan, even in emergency situations.

Take passengers, for example; it's natural that they want to chat, but rather than letting them be a distraction and discussing the wonderful views of the world outside, much better to involve them in the flight and use them as another pair of eyes to look out – and they're likely to enjoy the flight more by feeling that they are playing a part in it.

But when it comes to prioritisation, what's most concerning is pilots spending too much time with their eyes inside the cockpit. The trouble is it's so easy to do nowadays, especially with some GA cockpits (and not just high-end ones) being fitted with enough tech to resemble



the flight deck of an A380. Who'd have thought not so many years ago that we'd be taking tablets and phones packed with flying software in the cockpit?

The problem is that while using them for navigation can be quick and easy (quicker than the chart and stopwatch!) they can be complex too, especially if you have to start scrolling through various pages to find what you want.

And even simple cockpit tasks such as resetting radio frequencies, checking airfield plates etc can easily take far more than the recommended maximum of three seconds eyes inside – and that's particularly true when the workload increases perhaps due to weather, airspace or around the circuit. It really does require a conscious effort to avoid lookout becoming overtaken by in-cockpit tasks and dropping down the priority order.

Perversely, becoming task-focused to the detriment of lookout also happens even when you're looking outside. Suppose you're checking for a landmark to make a turn, or the destination airfield (notoriously tricky to locate occasionally...), how much time do you think you spend observing the ground rather than looking out for traffic which might be heading there too? Good question, eh?

Diverting your priority to concentrate on the immediate task is a natural human trait, but the truth is you can't afford to upset the priority list, it exists for a reason and at the top of it is lookout (eyes outside 80 percent of the time and no more than three seconds looking inside in any one go) – whatever else is trying to distract you. ■