



AIRPROX *Insight*

DIGEST

2021-22

UK AIRPROX BOARD

AIRPROX *Insight*

DIRECTOR UKAB'S MONTHLY UPDATE



Our evolving 'skyscape'

With light aircraft encounters increasing, it's time to consider the possibility of a drone encounter in Threat & Error management when flight-planning

With the steady and welcome return towards 2019 levels of flying, July was the second consecutive month with the number of occurrences above the five-year average. In cumulative terms we're rapidly approaching the five-year average which I expect will be surpassed in late August.

The Board considered 17 Airprox in July including six SIALK events (one of which was reported by the drone operator). Of the 11 aircraft-to-aircraft Airprox, five were risk-bearing - two were category A and three category B. Five were classified as category C and one as category E.

This month we've evaluated another drone reported Airprox, so I thought it useful to share some insights into these occurrences and offer some thoughts on what could be the changing landscape of aviation.

2021 Airprox - Monthly Distribution

2021 Airprox - Cumulative Distribution

UK AIRPROX BOARD

AIRPROX *Insight*

DIRECTOR UKAB'S MONTHLY UPDATE

September 2021



Circuits still taking a bashing

So how can we mitigate the risks for all?

Five circuit-based events were covered in the Board's September meeting and these occur regularly, tending to revolve around the same thing - difficulty integrating with other traffic which normally results from reduced situational awareness.

One, Airprox (2021/0485), happened at White Waltham back in April. The joining traffic was a RV-6 and they describe being very aware of two aircraft on the climb-out which could become a factor on the crosswind portion of their join.

To mitigate this they decided to fly higher than the published circuit height. Even though they describe diligently looking out to clear the downwind leg, they were not consciously looking out below them. They consequently thought that the downwind leg was clear of traffic, they certainly did not see anything on downwind, and they had calculated that the two previous aircraft on climb-out would be behind them in the pattern.

As they turned downwind, however, they saw an aircraft slightly below on their left. There was no time to do anything and it was probably only the fact that they had been flying at the wrong height which kept them apart. This is ironic, as the fact that they were flying at the wrong height was the thing that stopped them from seeing this traffic in the first place.

Both pilots got a shock from this Airprox and indeed had a conversation with each other on the ground. The depth of detail submitted by the RV-6 pilot who was conducting this join, was welcome - the pilot had clearly reflected very carefully on what had happened and offered their thoughts in their report, highlighting what they think they could have done better and how they had learned from it. They are to be commended for doing this



Diagram based on radar and GPS data

UK AIRPROX BOARD

AIRPROX *Insight*

DIRECTOR UKAB'S MONTHLY UPDATE

June 2021



How can we improve lookout?

Down to the eyes and a good scan any longer

Of weather and to the air traffic predicted surge for the month of June 2021. Excited about the fact that we've exceeded 5000 events since we started Airprox, it's time we start to think about the risk of these events and how we can reduce them and

2021 Airprox - Monthly Distribution

2021 Airprox - Cumulative Distribution



Welcome

UK Airprox Board 2021-22 digest

How Airprox 'Barriers' work together

As the General Aviation season approaches its seasonal nadir, it's worth reflecting on the observations of the UK Airprox Board over the last year or so. In 'Airprox world' it's the case that any major analysis has to be done retrospectively as it takes time not only to evaluate Airprox, but also to ensure that enough data is available to allow me to draw meaningful observations.

You might remember in my last compendium that we looked broadly at safety barriers and electronic conspicuity. In this edition I want to summarise my annual report from 2020 (available in full here) and give you an idea about how safety barriers knit together, which contributory factors are appearing again and again, and offer some thoughts about how you can improve the performance of your barriers so that you can minimise your chances of having a close encounter and do your bit to enhance air safety for all.

Behind the numbers

Headline figures are one thing, but it's crucial to understand what's really been happening in the sky - and why

In broad terms then, the following graphic gives you an idea of Airprox by numbers. Please bear in mind that the Covid Pandemic significantly affected the numbers of Airprox as there were several months when no one in the General Aviation sports and recreational community was flying. When pilots of this sector were able to fly i.e out of lockdowns, the numbers per month were representative of previous years.

163

Airprox overall represents, on average, about three incidents per week - just over one every two days

118

Manned aircraft-to-aircraft Airprox represents, on average, a manned aircraft-to-aircraft incident every three days

58

Risk-bearing Airprox overall means that, on average, there was either a risk of collision in UK airspace or safety was much reduced below norms just over once per week

40

Risk-bearing aircraft-to-aircraft Airprox means that, on average, there was either a risk of collision in UK airspace or safety was much reduced below norms between two manned aircraft slightly more often than 3 times

All Aircraft to Aircraft Airprox 2011 - 2020

RISK	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	10yr AVERAGE
A	23	18	22	25	27	17	13	20	18	8	19
B	36	27	43	64	52	41	49	50	50	32	44
C	88	96	72	85	75	79	75	80	106	51	81
D	1	1	9	6	5	8	5	2	6	2	5
E	11	13	26	33	18	25	20	29	23	25	22
Risk Bearing	59	45	65	89	79	58	62	70	68	40	64
% Risk Bearing	37%	29%	38%	42%	45%	34%	38%	39%	33%	34%	37%
Total	159	155	172	213	177	170	162	181	203	118	171

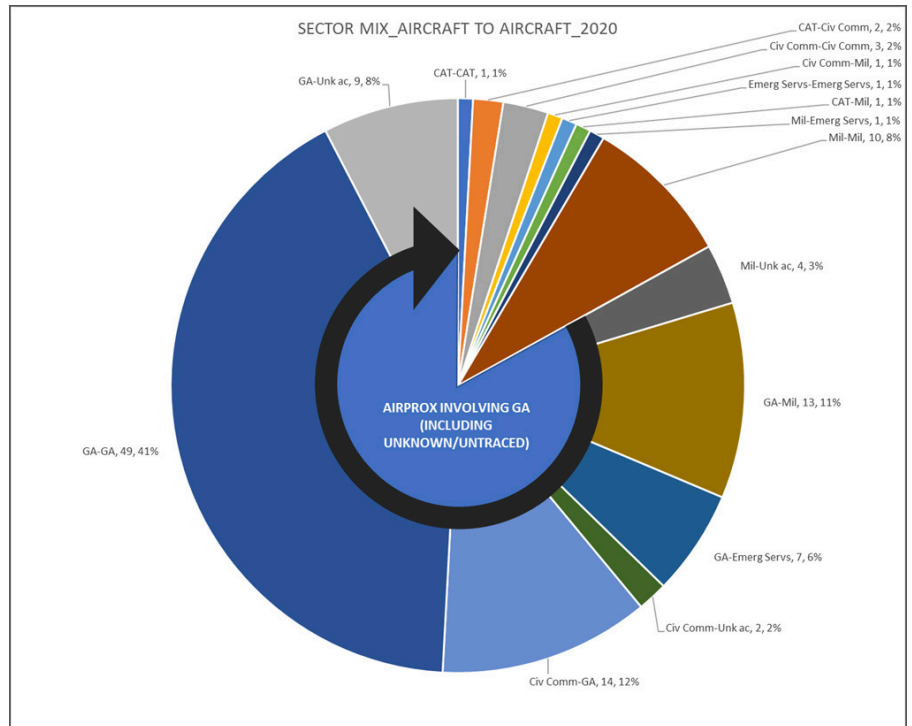
This table shows only the aircraft-to-aircraft figures for the last ten years and is useful because it gives you an idea of how many events we normally evaluate and what level of risks of collision were assigned to them.

However, the table does not tell the whole story because it doesn't break down the sectors that we are talking about in any detail.

These fall into several categories: Commercial Air Transport (CAT) aircraft, normally large passenger carriers; Civil Commercial aircraft (Civ Comm), normally business jets, air taxis, specialised operations such as pipeline inspection or survey aircraft; Military aircraft (Mil); General Aviation aircraft (GA), which includes PPL instructional aircraft and all categories of sports and recreational aircraft and Unknown or Untraced aircraft (Unk ac) which are generally aircraft which from their descriptions are actually GA, but where we have not been able to trace the pilots.

This pie chart (right) shows the aircraft-to-aircraft distributions and it's very obvious that the majority of Airprox reported to my team and evaluated by my board have at least one participant from the GA sports and recreational category.

More importantly, 49% of Airprox involve only the GA sports and recreational community (including unknown/untraced aircraft which fit this description). This means that if you are a GA pilot and you have an Airprox, then the other pilot is very likely to be just like you. So if you can make some small changes to the way you think, prepare and do business and the pilot who is 'just like you' can do the same then we can begin to increase awareness and increase air safety all around



DID YOU KNOW?

In 2020 – 90% of all risk-bearing aircraft-to-aircraft events involved a GA sports and recreational light aircraft

(This number includes Unknown/Untraced aircraft where the description fitted this category)

Being aware of who is out there is really useful, but being aware of where they are likely to be is also useful and sticking to the theme of 'the other pilot is most likely just like me' you can probably guess where in terms of altitude and airspace that hypothetical other pilot is likely to be:

In 2020 – 80% of all aircraft-to-aircraft events took place at or below 3000ft and 92% of all aircraft-to-aircraft events took place in Class G airspace

In 2020 – All Category A Aircraft-to-aircraft Airprox involved GA sports and recreational light aircraft and in 2021 all (except 2021003) involved exclusively GA sports and recreational light aircraft.



AIRPROX NO	YEAR	ALT BLOCK	RISK CATEGORY	SECTOR MIX
2020045	2020	1001-1500	A	GA-GA
2020082	2020	2001-3000	A	GA-GA
2020109	2020	3001-FL79	A	Civ Comm-GA
2020127	2020	1001-1500	A	GA-GA
2020141	2020	1001-1500	A	GA-GA
2020146	2020	501-1000	A	GA-Emerg Servs
2020159	2020	1501-2000	A	GA-GA
2020160	2020	1501-2000	A	GA-GA
2021003	2021	1501-2000	A	Mil-Mil
2021029	2021	2001-3000	A	GA-GA
2021032	2021	0-500	A	GA-GA
2021045	2021	501-1000	A	GA-GA
2021051	2021	3001-FL79	A	GA-GA
2021054	2021	3001-FL79	A	GA-GA
2021059	2021	1001-1500	A	GA-GA
2021061	2021	1001-1500	A	GA-GA
2021062	2021	3001-FL79	A	GA-GA
2021067	2021	501-1000	A	GA-GA

So, that's a look at the numbers and the distributions, but that doesn't really help us to understand what we can do about it because it doesn't help us identify the weakest observed areas, or help us to work out where we are best focusing our attention within those areas.

The best way of doing this is to break down an Airprox into its constituent parts through 'safety barriers' and look at how they interact. Then we can look at the underlying contributory factors because these are the specific things that strengthen or weaken a barrier and they are therefore the specific things you should incorporate into your planning and preparation and have in the back of your mind when flying.

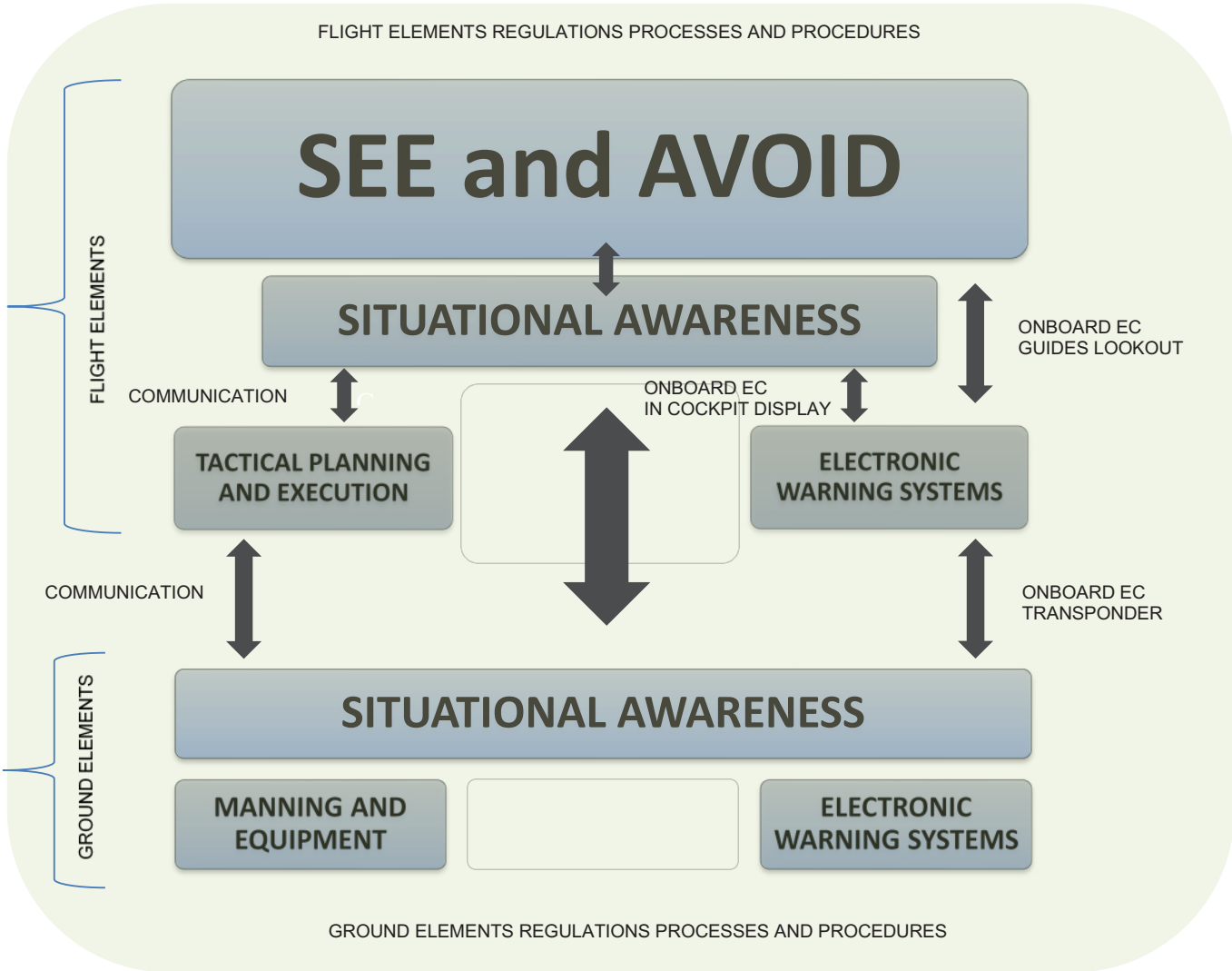
'Yes, but what does it all actually mean for us?'



'In 2020 – 90% of all risk-bearing aircraft-to-aircraft events involved a GA sports and recreational light aircraft'

SAFETY BARRIERS AND CONTRIBUTORY FACTORS

This picture (below) shows a conceptual model of how the barriers interact. It is, of course a simplified representation, but the aim is to demonstrate that they are all interlinked to some degree or another. The most important ones are joined on the diagram with two-way arrows showing, ideally, that information is gained, communicated and updated continuously throughout the flight.



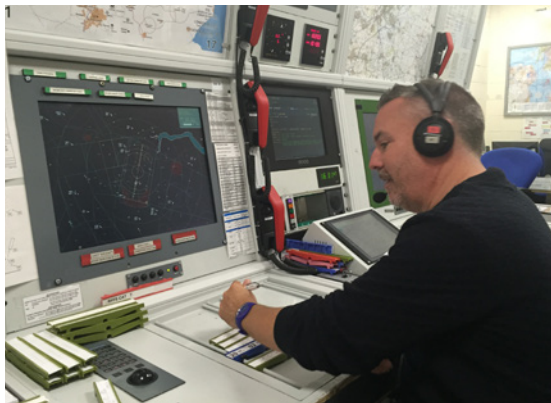
I suspect by now you're asking "Yes, but what does this all actually mean for us?", so here goes:

For both Ground and Flight Elements, the performance of the **Regulations, Processes and Procedures** barriers surrounds everything and it should capture the availability and the application of generic and specific standardised operating and regulatory principles for flying activity, aerodrome operation and ATM provision. A mistake or misinterpretation in this area will almost certainly be contributory to the performance of (mainly) the Situational Awareness barrier (Ground Elements) and (mainly) the Tactical Planning and Execution barrier (Flight Elements)

The **Ground Elements Manning and Equipment** and the **Ground Elements Electronic Warning Systems** barriers are the other two pillars that support the Ground Elements Situational Awareness barrier – If both of these barriers are strong, then the Ground Elements have the best chance of gaining solid situational awareness.

You can think of the **Ground Elements Situational Awareness** barrier as the interface between any communicating ground agent and the airborne traffic. It's strengthened (among other things) by robust and accurate two-way communication and positive identification through electronic conspicuity (for example, transponding traffic).

In 59% of risk-bearing Airprox either ATC was not used in a way that would provide Traffic Information or was not present at all





GROUND ELEMENTS SITUATIONAL AWARENESS

This table shows the top 5 contributory factors which were determined to have weakened this barrier (data collected 2019 – 2021)

GROUND ELEMENTS SITUATIONAL AWARENESS – ALL AIRPROX
ANS Flight Information Provision (Not required to monitor the aircraft under the agreed service)
Situational Awareness and Sensory Events (The controller had only generic, late or no Situational Awareness)
ANS Traffic Information Provision (TI not provided, inaccurate, inadequate, or late)
Conflict Detection - Not Detected
Distraction - Job Related (Controller engaged in other tasks)

DID YOU KNOW?

In 59% of risk bearing Airprox either ATC was not used in a way that would provide Traffic Information (a Basic Service, for example) or was not present at all.

When the Ground Elements Situational Awareness barrier is Fully Effective – the Airprox is classified as either Category E (normal safety parameters pertained) or a Category C (no risk of collision, although safety may have been compromised) 88% of the time.

FLIGHT ELEMENTS SITUATIONAL AWARENESS

FLIGHT ELEMENTS SITUATIONAL AWARENESS – ALL AIRPROX
Situational Awareness and Sensory Events (pilot had no, late or only generic, Situational Awareness)
Understanding/Comprehension (pilot did not assimilate conflict information)
Distraction - Job Related (pilot engaged in other tasks)
Monitoring of Other Aircraft (pilot did not sufficiently integrate with the other aircraft)
Lack of Action (pilot flew into conflict despite Situational Awareness)

SECTOR	FOCUS AREAS (SITUATIONAL AWARENESS)
All Sectors	Proactive use of a surveillance-based ATS
	Assimilation of conflict information
	Minimising in-cockpit and Ground Elements Distraction from Electronic conspicuity equipment

As you can probably determine from the conceptual model, the interaction of the Ground and Flight Elements Situational Awareness barrier is critical – so here are some facts about their interactions:

Situational Awareness Ground and Air Interactions – some facts

- On the 137 occasions where the pilot was either operating without an air traffic service, or was utilising one where the controller was not required to monitor, the pilot had full situational awareness on only eight occasions.
- When the Ground Elements Situational Awareness barrier was assessed as ineffective the Flight Elements Situational Awareness barrier was also assessed as ineffective, or partially ineffective 85% of the time.
- When the Flight Elements Situational Awareness barrier was assessed as fully effective the controller also had either full or partial situational awareness 71% of the time and the outcome was either a Category E or at worst a C – but in either case there was no risk of collision.

So, here are some easy things you can do to strengthen your situational awareness barrier:

DID YOU KNOW?

Requesting and actively engaging with an air traffic service where the controller monitors the flight is key to maintaining situational awareness in the air.

TACTICAL PLANNING AND EXECUTION

This barrier captures three areas of aviation activity: Planning and briefing (Threat & Error Management), appropriate and effective communication with ground agencies and the actual execution of the flight. This barrier is the easiest to strengthen and is the one which can release the *most capacity* to the individual pilot when airborne.

TACTICAL PLANING AND EXECUTION – ALL AIRPROX
Action Performed Incorrectly (incorrect or ineffective execution)
Communications by flight crew with ANS (pilot did not communicate with appropriate ATS provider)
Accuracy of Communication (ineffective communication of intentions)
Insufficient Decision/Plan (inadequate plan adaption)
Monitoring of Other Aircraft (did not avoid/conform with the pattern of traffic already formed)

The communication part of this barrier contributes directly to the pilots' and any controllers' situational awareness as well as to that of others on the same frequency.

The contributory factors above apply to all Airprox and as you can see, they concern execution, communication and planning. Execution is the part that relates directly back to an individual's recency and/or experience and it's a fact that most of the Airprox where there has been an issue with execution are ones that occur in and around the circuit. Specifically, integration into the circuit and being able to properly identify where everybody else is.

When looking at this barrier I thought it useful to look at airprox which involved gliders – I did this because I get a lot of reports in the vicinity of glider sites and I wondered if there were differences in the contributory factors – and indeed there are.

You can see from the table overleaf that it's aircraft navigation that features highly (as well as planning and communication). Paying attention to the locations of glider sites is essential and you should seriously consider giving them a wide berth.

GASCo's Take 2 is a good rule of thumb to employ. Also, be very wary of flying over the top of a glider site even if you are doing so well above the promulgated winch launch altitudes. Not only is it likely that you will find a glider there, but you could interpret the winch launch altitude incorrectly and fly through below it: an encounter with a cable would be very messy indeed...



TACTICAL PLANING AND EXECUTION – AIRPROX INVOLVING GLIDERS

Communications by flight crew with ANS (pilot did not communicate with appropriate ATS provider)

Aircraft Navigation (flew through promulgated and active airspace)

Flight Planning and Preparation

Accuracy of Communication (ineffective communication of intentions)

Communications by Flight Crew with ANS (appropriate ATS not requested by pilot)

DID YOU KNOW?

For Airprox involving gliders: Navigation – where the (normally) powered other aircraft involved flew too close to, or through promulgated and active glider sites and sometimes at or below advertised winch launch altitudes – is a key factor in these Airprox.

ELECTRONIC WARNING SYSTEMS

The **Electronic Warning Systems** barrier, if used appropriately, can directly influence the performance of three other barriers: Transponding aircraft influence the Ground Elements Situational Awareness barrier (if the Air Navigation Service (ANS) provider is appropriately equipped) and compatible on board electronic warning systems or electronic conspicuity equipment enhances both the Flight Elements Situational Awareness barrier and the critical See & Avoid barrier (through guiding the lookout).

However, a thorough understanding of the equipment fitted, its operation and compatibility with other types of equipment is critical as unfamiliarity can cause distraction and thereby drain capacity. Additionally, an over-reliance or unconsidered/unquestioned trust in its performance can lead to complacency and an assumption that it will (in and of itself) keep one safe.

ELECTRONIC WARNING SYSTEMS – ALL AIRPROX

ACAS/TCAS System Failure (incompatible CWS equipment)

ACAS/TCAS TA

ACAS/TCAS RA

ACAS/TCAS System Failure (CWS did not alert as expected)

Other warning system operation (warning from a system other than TCAS or TAS)

When looking at this table and in trying to work out what you can do to increase the performance of your Electronic Warning System barrier – think about the top one – incompatibility and the fourth one – did not alert as expected and focus on the following:

SECTOR	FOCUS AREAS (ELECTRONIC WARNING SYSTEMS)
All Sectors but especially the GA community	Understanding of the limitations of and the compatibility challenges of the different available electronic warning systems and other EC equipment.

SEE & AVOID

Finally, lets take a look at the **See & Avoid** barrier – In general terms – and for virtually all of the Airprox involving the GA sports and recreational communities, we are talking about Airprox which occur in the visual environment and in uncontrolled airspace. Safety is the individual's responsibility and the primary way of avoiding getting uncomfortably close to another aircraft is to spot it first and then to avoid as appropriate.

Additionally, Class G airspace is occupied by the most diverse range of air systems and encompasses the full range of pilot experience, competence and qualifications. It's important therefore that every tactic is employed to release capacity to lookout.

SEE & AVOID BARRIER – ALL AIRPROX

Monitoring of Other Aircraft (non-sighting or effectively a non-sighting by one or both pilots)

Monitoring of Other Aircraft (late-sighting by one or both pilots)

Perception of Visual Information (pilot was concerned by the proximity of the other aircraft)

Poor Visibility Encounter (one or both aircraft were obscured from the other)

Distraction – Job-Related (pilot looking elsewhere)

The performance of this barrier is intrinsically linked to the quality of your lookout. As I have mentioned before, lookout is an active process which takes practice and is tiring. For it to become an unconscious skill, one would normally need to be pilot with hundreds of hours per year in the See & Avoid environment. But, apart from practicing the skill itself, there are other things that you can think about which affect your ability to look out and can be addressed easily with just a little thought.

Try to give full consideration of the layout of your aeroplane and how that layout may affect visibility at different stages of flight. For example, if you were in, say, a Mustang, flying straight and level or descending, you would probably need to think about the effect of that big nose on what you can see ahead and below.

In a high-winged aeroplane such as a Cessna, where you are also offset from the centre, you might have more difficulty spotting things above you and to the side. Conversely, in a low-winged aircraft such as a PA-28, you might have more difficulty spotting something below you and to side.

The other thing you can do is to plan, or at least think about potential issues. How, for example, are you going to accomplish those tasks which necessarily bring your eyes into the cockpit — one solution is to break up tasks into small chunks, familiarise yourself with what you expect to see and hear from your in cockpit electronic conspicuity equipment, familiarise yourself with what you expect to hear from other warning indications that your aircraft may give you, practice how to change frequencies and insert transponder codes – you don't even need to be in air to do this – but every little helps as it means that you can devote more time to that critical activity of looking out.

SECTOR	Focus Areas (See and Avoid)
All Sectors	Obscuration
	Maintaining an active and efficient lookout
Primarily GA	Distraction

I hope you have found this precis interesting and I hope that you are able to take away a few things to think about over the winter in preparation for the return of the good weather next year. The following pages consist of some previously published summaries, collated here for ease of reference, which give you a flavour of some of the Airprox that the Board as evaluated throughout the year:



How can we improve lookout?



It's not just down to the eyes and a good scan any longer

Photo for illustrative purposes only: Brian Bari/SimonFinlay

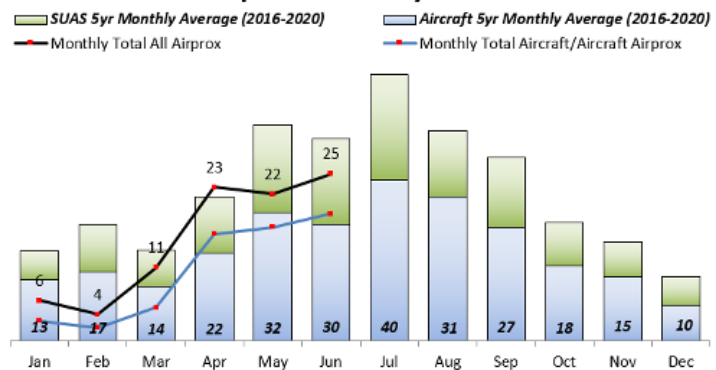
With the improved weather and pilots returning to the air, there has been the expected surge of reported incidents which has now taken us above the five-year average for aircraft-to-aircraft Airprox, although the numbers still are low compared with 2019.

At its June meeting the Board considered 15 Airprox, which included four UA/Other events (one of which was reported by the drone operator). Of the 11 aircraft-to-aircraft Airprox, four were classified as risk-bearing – two were category A and two category B. Of these risk bearing occurrences the weakest barriers lay with the Flight Elements of Situational Awareness, Electronic Warning systems and with the See and Avoid barriers.

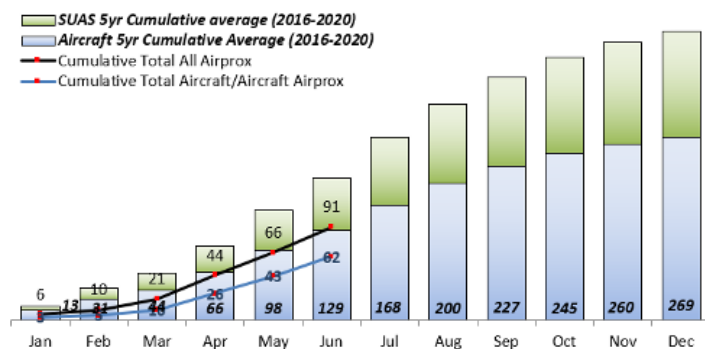
SEE AND AVOID AND DISTRACTION

While all of the barriers are interconnected, some are more important than others. The final barrier in all Class G airspace events has to be See and Avoid – after all, seeing and avoiding is the overriding principle governing flying in this type of airspace where responsibility is shared by both pilots

2021 Airprox - Monthly Distribution



2021 Airprox - Cumulative Distribution



not to so close to each other as to create a collision hazard¹.

But what can you do to make sure that your lookout is as effective as it can be? We've already spoken about the fallibility of the human eye – the default mode of the brain is to fill in the gaps by itself, creating an 'expected' picture but, if you keep active with your eyes, you allow your brain to overcome this default setting and you begin to 'see' reality.

Of course the principles of a methodical scan, clearing turns on descents and clearing airspace around you when manoeuvring remain core foundations of good airmanship and a good lookout, but what else can help? One of the most effective ways is for your lookout to be guided by indications on your electronic conspicuity equipment (if fitted).

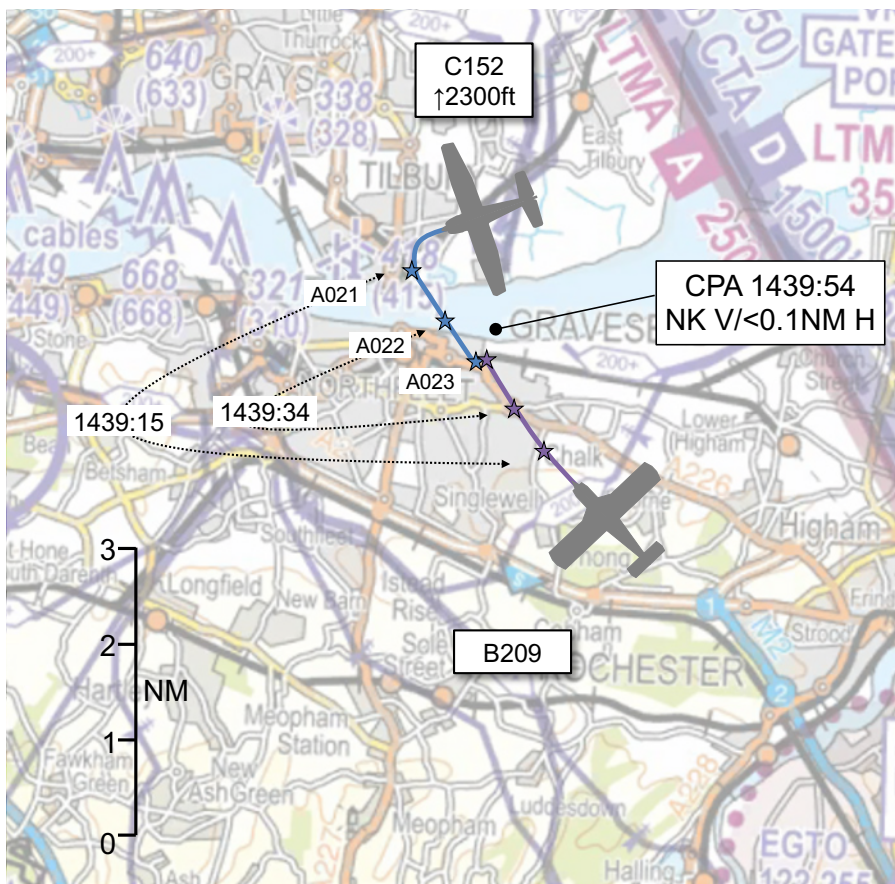
But electronic conspicuity shouldn't be treated as a panacea, one of the other ways is to actively engage a surveillance-based Air Traffic Service. The point of this is not to have an Air Traffic Controller drive you around the skies, but to gain awareness of the environment that you are in and give others the opportunity to do the same.

These two inputs into your brain allow you to build as accurate a mental model as possible. You know your position and your route from your planning, so you can use radio traffic information, ATC advice and your electronic conspicuity equipment to guide you where to look.

Finally beware of distraction. It's so easy to be drawn into the cockpit when you should be looking out – so break up any 'in-cockpit' task into small pockets of activity. This achieves two things: if it's a complex task, you're more likely to complete it effectively because you're not rushing to get it done so that you can return to looking out, and secondly, it automatically helps your eye and your brain as you are continually changing your focal point from near to far.

Distraction comes in all shapes and sizes ranging from difficulty with passengers, to locating hats and sunglasses, to radio problems, to simply capacity overload when conducting a complex procedure or manoeuvre.

Here's a list of all the distraction-related, risk-bearing Airprox from 2019, 2020 and 2021 – dive in and take a look, but note that it's but one of the things that can contribute to an Airprox, not necessarily the only thing...



2019	2020	2021
2019071	2020008	2021028
2019109	2020035	2021029
2019162	2020064	
2019175	2020066	
2019199	2020069	
2019201	2020082	
2019206	2020103	
2019216	2020104	
2019295	2020133	
	2020152	

Finally, let's take a look at the latest Airprox involving an element of distraction – the full report can be found at the link in the table above, but a short summary follows here:

Airprox 2021029 was reported when a Cessna 152 and an Bolkow B 209 Monsoon flew into proximity near Gravesend. Both pilots were operating under VFR in VMC, the C152 pilot was in receipt of a Basic Service from Southend DIR while the B209 pilot wasn't in receipt of any service. For the

Ground Elements the **Situational Awareness of the Conflict and Action** barrier was assessed as ineffective because the controller was busy with inbound traffic and didn't see the conflict occur.

In the Flight Elements, three out of five of the barriers were ineffective — the **Situational Awareness** of the conflicting aircraft and Action barrier was assessed as **ineffective** because neither pilot had any situational awareness that the other was in the vicinity.

The **Electronic Warning System Operation and Compliance** barrier was assessed as **ineffective** because the TAS on the C152 did not detect the B209, and finally the **See and Avoid** barrier was deemed ineffective because neither pilot saw the other in time to take avoiding action.

There was an element of distraction in this Airprox when the B209 pilot was changing fuel tanks and the Board emphasised the importance of breaking up any activity which requires the pilot to look inside the aircraft and to punctuate it with a robust look-out.

Download the **new Airprox app**

GET IT ON Google Play | Download on the App Store



Photo for illustrative purposes only. Shutterstock / Ivan River

Our evolving 'skyscape'

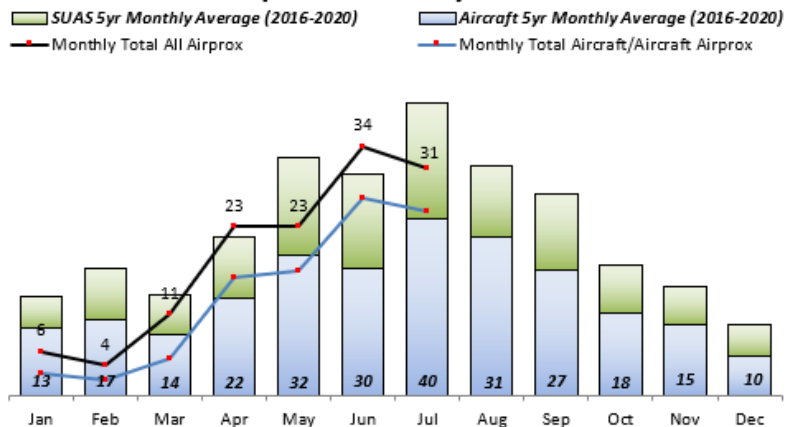
With light aircraft encounters increasing, it's time to consider the possibility of a drone encounter in Threat & Error management when flight-planning

With the steady and welcome return towards 2019 levels of flying, July was the second consecutive month with the number of occurrences above the five-year average. In cumulative terms we're rapidly approaching the five-year average which I expect will be surpassed as we enter August.

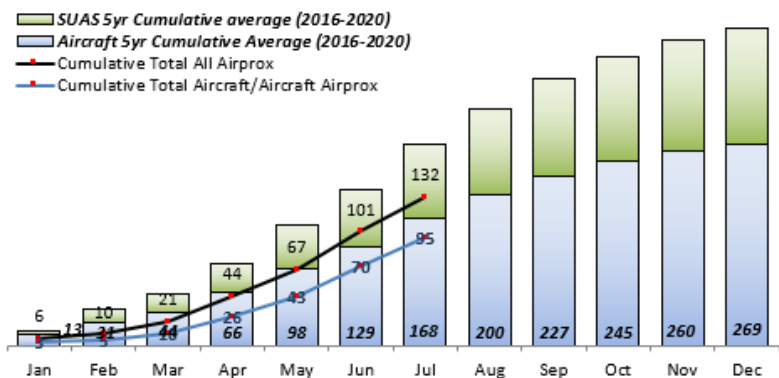
The Board considered 17 Airprox in July, including six UA/Other events (one of which was reported by the drone operator). Of the 11 aircraft-to-aircraft Airprox, five were risk-bearing – two were category A and three category B. Five were classified as category C and one as category E.

This month we evaluated another drone reported Airprox, so I thought it useful to share some insights into these occurrences and offer some thoughts on what could be the changing landscape of aviation.

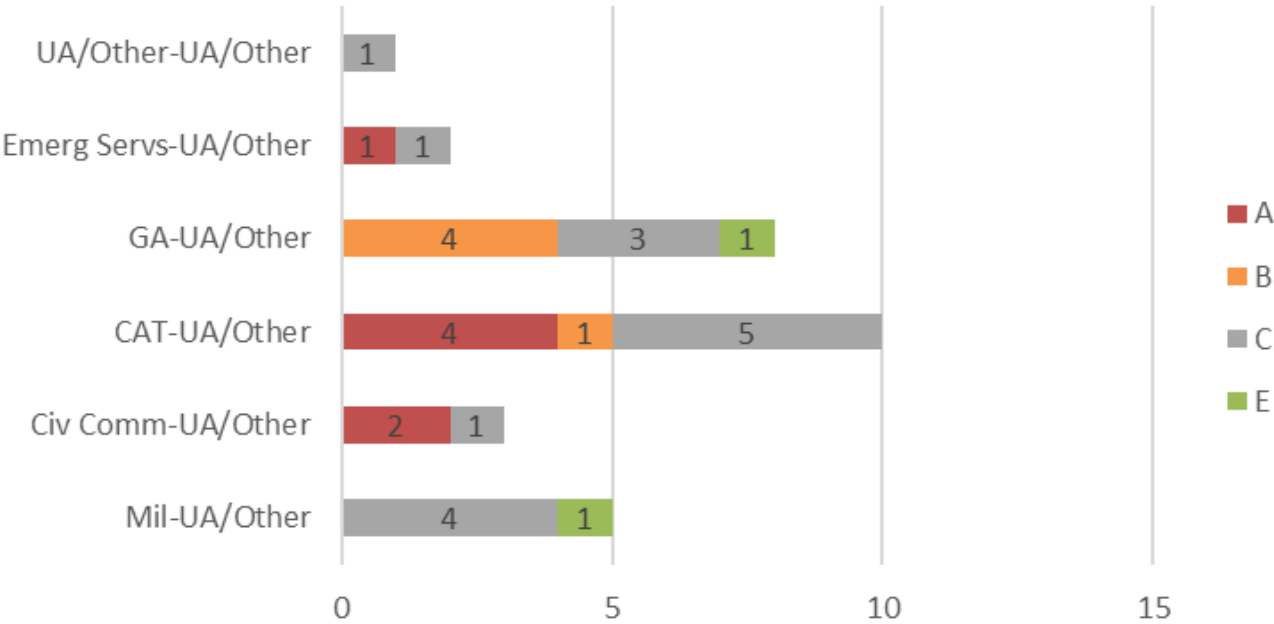
2021 Airprox - Monthly Distribution



2021 Airprox - Cumulative Distribution



SECTOR MIX_RISK



This chart shows the sector risk distribution for all evaluated Airprox involving UA/Other to date. As expected, most UA/Other encounters occur with commercial air transport (large carriers) who are predominantly in high workload phases of flight and fleeting in duration.

The majority of category A and B tend to be with unknown objects, rather than with drones and I am seeing an increase of drone reported Airprox, including the first Airprox involving two drones. This is encouraging as it points to an increased awareness of drone operators to their responsibilities with other air users.

Historically, commercial air transport provides the most UA/Other observations, however this year GA is yielding a comparable number which begs the question, is this pointing to a change in the environment? The emerging 'zone of conflict' rests in the 0-400ft band where GA traffic is allowed to operate unrestricted within the rules of the air, and UA operators have freedom of movement without any requirement to submit a Notam or gain permissions.

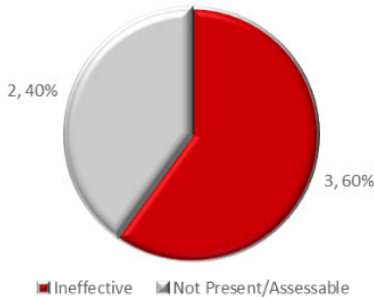
The only safety barrier which can function in these encounters is See and Avoid: radio communications and electronic conspicuity are rendered ineffective, although electronic conspicuity systems that may allow UA to detect and avoid other aircraft are under development and will likely emerge in the future.

All of this means there is less chance of conventional aircraft pilots to gain any situational awareness at all of the actual presence of a UA – the minimal feeds into the Situational Awareness barrier means that being almost entirely reliant on the See and Avoid barrier.

We all know how hard it can be to spot other aircraft let alone drones, so with the difficulties in spotting UA or model aircraft and we must now always consider the possibility of a UA encounter in our Threat & Error management when we plan our flight.

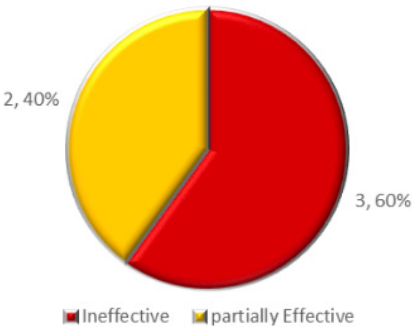
The two charts below show just how weak these two barriers are; in fact, they have not been evaluated as effective at all in all the drone instances we've examined – this is slightly concerning and is in contrast to the performance of these barriers when dealing with aircraft-to-aircraft Airprox, where although the performance could be better, it is not as bad as shown here!

FE - Electronic Warning Systems

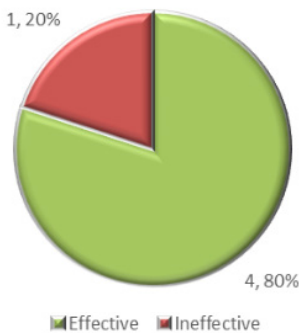


There is some mitigation though: a UA operator is likely to be able to hear your aircraft and therefore also likely to see you first and take appropriate avoiding action following the guidance on the CAA website. <https://www.caa.co.uk/Consumers/Unmanned-aircraft-and-drones/>

FE - Situational Awareness



FE - See and Avoid



Unmanned Aircraft (UA)

The Previously used term SUAS has been replaced by UA/Other, where UA is an Unmanned Aircraft: Any aircraft operating or designed to operate autonomously or to be piloted remotely without a pilot on board. Regulation (EU) 2018/1139 – Basic Regulation; and for Airprox purposes: Other is anything which cannot be definitively confirmed as a UA, but which has been reported in association with an Airprox.



Circuits still taking a bashing

So how can we mitigate the risks for all?

Photo for illustration purposes only: Brian Barr/Simon Finlay Photography

Five circuit-based events were covered in the Board's September meeting and these occur regularly, tending to revolve around the same thing – difficulty integrating with other traffic which normally results from reduced situational awareness.

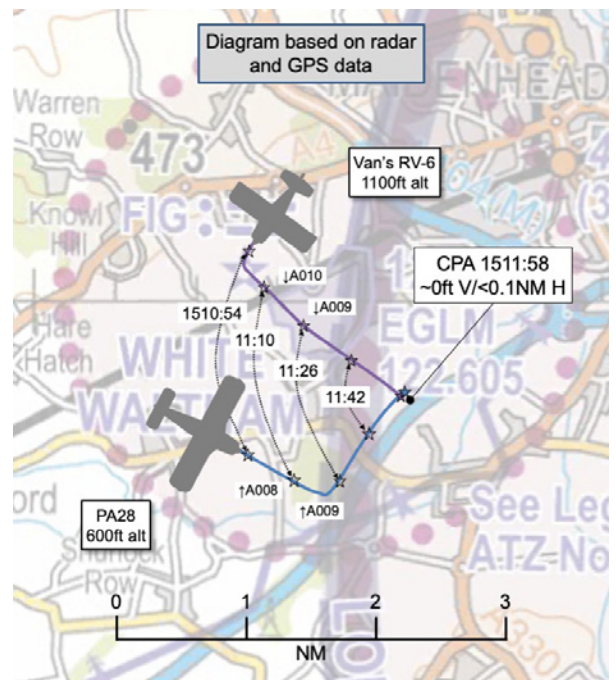
One, Airprox (2021045), happened at White Waltham back in April: The joining traffic was a RV-6 and they describe being very aware of two aircraft on the climb-out which could become a factor on the crosswind portion of their join.

To mitigate this they decided to fly higher than the published circuit height. Even though they describe diligently looking out to clear the downwind leg, they were not consciously looking out below them. They consequently thought that the downwind leg was clear of traffic, they certainly did not see anything on downwind, and they had calculated that the two previous aircraft on climb-out would be behind them in the pattern.

As they turned downwind, however, they saw an aircraft slightly below on their left. There was no time to do anything and it

was probably only the fact that they had been flying at the wrong height which kept them apart. This is ironic, as the fact that they were flying at the wrong height was probably the thing that stopped them from seeing this traffic in the first place.

Both pilots got a shock from this Airprox and indeed had a conversation with each other on the ground. The depth of detail submitted in the report, especially by the RV-6 pilot who was conducting this join, was welcomed – the pilot had clearly reflected very carefully on what had happened and offered their thoughts in their report, highlighting what they think they could have done better and how they had learned from it. They are to be commended for doing this



as it shows humility, consideration and a true appreciation of the responsibilities we all have to each other when we go flying.

You can read the full report [here](#)

UKAB MONTHLY ROUND-UP

The Board considered 27 Airprox in September, including 12 UA/Other events (one of which was reported by the RPAS operator). Of the 15 aircraft-to-aircraft Airprox, ten were classified as risk-bearing – five were category A and five were category B. Three were category C, one as category D and one as category E. The chart shows a significant rise in reported Airprox in June where numbers were far in excess of the five-year average.

All but one of these risk bearing events took place between May 26 and June 5 representing an unprecedented spike in events; worryingly, five of them took place in the circuit and were generally the result of difficulty in integrating into the circuit and consequently coming into conflict with other traffic.

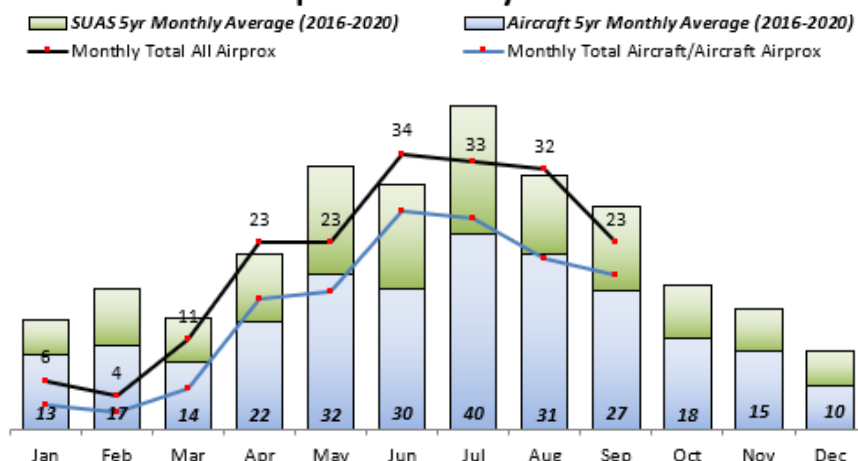
In more general terms, though, what can we do to help avoid situations arising in the circuit, especially when joining?

To join, or operate, safely, in the circuit it's imperative to understand where all the other traffic is. As flying in the circuit is always conducted in VMC under VFR, lookout is the primary means of deconfliction but, as we know, lookout can be unreliable — it's very easy to misjudge the dynamics of the situation when attempting to integrate with other traffic that might have a different performance, or indeed to integrate with pilots who might be flying an unusual shaped or sized circuit pattern. So what can we do to make it safer?

The first thing is to be *absolutely sure* you establish who is there already and exactly where they are. You can do this visually of course, and that is the advantage of conducting an overhead join: this procedure allows you to get into the overhead safely above the established circuit height whilst using your focused lookout to identify all the other aircraft in the circuit. Also you will normally have established contact with any ground elements (where present) prior to arriving in the circuit, either to gain permission to enter the ATZ, permission to join or, where permission is not required, to establish the airfield details and gain an appreciation of other traffic.

With this information you must be diligent in building your mental model so that you can work out how best, and where, to join. If you're unsure, ask for clarification. Secondly, make sure you have studied the relevant documentation so that you understand what is expected, but more importantly what is *not allowed!* Thirdly, be

2021 Airprox - Monthly Distribution



accurate and predictable, and if you intend to do something unusual (but permitted) ensure that you have clearly articulated and conveyed your intentions over the radio.

Finally, be aware of the different performance characteristics of the aircraft in the circuit – including your own.

Misjudging performance can be very dangerous and leave others with nowhere to go if you insert yourself too close behind or in front of another aircraft.

This table shows the weakest barriers and their associated Contributory Factors for Airprox which occurred in the circuit.

Barrier	CONTRIBUTORY FACTOR
Tactical planning and Execution	Did not conform with established pattern of Traffic
Situational Awareness	No, Late or generic Situational Awareness
	Did not assimilate traffic information
	Did not request further information
See and Avoid	Effective non-sighting

For further reading, this table has links to all published risk-bearing circuit events which occurred in 2020 and 2021.

Airprox No	Year	Alt Block	Risk Category	Sector Mix
2020014	2020	501-1000	B	GA-GA
2020018	2020	1001-1500	B	Mil-Mil
2020085	2020	501-1000	B	GA-GA
2020094	2020	1001-1500	B	GA-GA
2020127	2020	1001-1500	A	GA-GA
2020134	2020	1001-1500	B	GA-GA
2020136	2020	501-1000	B	GA-GA
2020141	2020	1001-1500	A	GA-GA
2020154	2020	1001-1500	B	Mil-Mil
2020156	2020	501-1000	B	GA-GA
2020161	2020	501-1000	B	GA-GA
2021038	2021	1001-1500	B	GA-GA
2021045	2021	501-1000	A	A-GA

Download the **new Airprox app**



THE SKYWAY CODE

“As an aerobatic display pilot I really value the accessibility and helpful reminders of the SkyWay Code; it is a one-stop shop for everything you need to consider before you brief and head out to your aircraft to go flying. I encourage all pilots to take the time to read through this free online document.”

Kirsty Murphy

Blades Aerobatic Display Pilot and former Red Arrow pilot

The SkyWay Code provides practical guidance for GA pilots, students and flight instructors on operational, safety and regulatory issues relevant to their flying.

Download your copy at: www.caa.co.uk/skywaycode

