



Airspace Infringement Working Group

Report from Causal Factors Working Group 2019

The Causal Factors Working Group is a sub-group of the Civil Aviation Authority's Airspace Infringement Working Group (AIWG). It includes three people, all independent of the UK Civil Aviation Authority: two industry experts whose experience covers microlight flying and instruction, higher performance commercial and IFR flying and instruction alongside a third member with experience in SEP flying and PhD level work in causal factors.

The members of the Causal Factors Working Group are:

- T Nathan, PPL/IR Board member, ATPL holder and Instrument Rating Instructor
- G Weighell, Chief Executive BMAA
- M Evans, PhD Student at University College London and SEP Pilot

The Airspace & Safety Initiative is a joint CAA, NATS, AOA, GA and MoD initiative to tackle major safety risks in UK airspace: airspacesafety.com

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Introduction

An airspace infringement is the unauthorised entry of an aircraft into notified airspace. This includes controlled, prohibited or restricted airspace, active danger areas, aerodrome traffic zones, radio mandatory zones or transponder mandatory zones.

This sub-group of the AIWG meets annually to analyse and discuss the previous year's infringements and are subject to Non-Disclosure Agreements. The Group had access to 437 MORs said to contain pilot reports. They were also helped in their work that the vast majority of pilot reports were in a common format, that of the report that pilots are asked by the CAA and ANSP to make online.

Of these 437 occurrences, 28 could not be analysed because either there was no pilot report, or it was lacking in sufficient detail and no conclusions were drawn. Six reports were deemed by the team not to be infringements; they were either misfiled, misreported or, when reviewed by the CAA under CAP1404, previously closed as not being an airspace infringement.

The Group was left with 403 properly reported and confirmed infringements. The Group consider this to be a fair representation of the whole and so, this year for the first time, will not be adding caveats about statistical uncertainty. The Group thanked the CAA safety reporting group for all their work in making this possible.

It is often suggested that many pilots who are reported as infringing claim that they were outside controlled airspace and that the altitude readout on their transponder is at fault. However, only 23 (5.7%) of those studied made that claim and offered varying levels of evidence from stating "it was probably an incorrect Mode C" to an engineer's report, with most at the "probably" end of the scale. Where the CAA accepts that the transponder was faulty, following an engineer's report, it is not treated as an infringement.

Only after the analysis was complete was the question raised of the match between the Group's assessment of causal factors and the conclusions drawn by the Airspace Infringement Coordination Group. It would be useful to know the correlation, and include that analysis in future years.

The Group discusses some contributions to infringements that may fall under the heading 'human factors'. The role of such factors in accidents and infringements is well established but needs to be properly understood if we are to reduce the number of incidents.

These include the role of alarm fatigue as contributing to the failure by some pilots to respond to moving map alerts of impending airspace, whereby low-hour pilots and pilots operating with an increased workload may become close to capacity. As a result, they become fixated on the task in hand and simply do not register the alarm.

Distraction is also a significant factor leading to pilot error. Many pilots understand distraction to mean something like worsening weather, dropping a pen in the cockpit or a passenger asking a question. But distraction can, and does, go much further. Distraction, which leads to a break in the flow of activities, does not only involve immediate attentional failures. It can start hours or even days before the flight, but effectively adds to workload and leads to stress. Indeed, anything that disturbs the normal functioning of the individual, including time pressures and tiredness, can be considered to be a distraction.

Statistics

The Group was asked by the AIWG to address some very specific questions, the following are some statistics by way of an introduction:

Licence held

Students	28	(6.9%)
PPL/LAPL/NPPL	305	(75.7%)
CPL/ATPL	70	(17.4%)
Instructors	56	(13.9%)

The majority of professional licence holders were engaged in instruction or examination. Only 18 (4.4% of the total) were professional pilots not engaged in training and most of these were engaged in non-commercial operations.

Concerns about instructional flights are discussed later, but instructors on instructional flights remain a large cohort of infringers.

Type of flight

Recreational/other	295	(73.2%)
Commercial	13	(3.2%)
Instructional	57	(14.1%)
Student Solo	28	(6.9%)
Unknown	10	(2.5%)

Appropriate Moving Map

The Group had some difficulty determining what should be considered as a Moving Map appropriate for avoiding airspace infringement. The conclusion was made that purely IFR units, such as the GNS 430, although capable of giving some pictorial representation and alerts, fall below the threshold of usability required. Therefore, the Group generally recorded tablets and phones running apps such as SkyDemon and RunwayHD, and portable units such as the Garmin Aera range, as meeting the criteria to be included.

We were surprised by the number of pilots who reported that apps such as SkyDemon and RunwayHD do not provide airspace alerting functionality (to the extent that we contacted the manufacturers of RunwayHD to reassure ourselves that it really does). In many cases the question *"Was the aircraft equipped with a GPS or airspace warning device that issues an audible or visual alert when proximate to controlled airspace?"* was answered "no" when the pilot had also reported that they had SkyDemon or RunwayHD. The analysis classified those that reported that the functionality was not available together with those who had switched off alerting accidentally.

The Group was gratified that 289 (71.7%) had an appropriate moving map but were rather puzzled as why they still infringed. Very often this detail was not reported but we were able to establish the following statistics. In these cases, percentages are based on only the number of aircraft with a moving map available (289)

Alerts

Not available on the unit	72	(24.9%)
Deliberately switched off	25	(8.7%)
Accidentally off/not aware they exist	105	(36.3%)
No information	87	(30.1%)

In 16 (5.5%) of cases, the moving map was out of sight, typically in a pocket either of the pilot or the aircraft. In 28 (9.7%) cases the moving map was present but not used. These were for a variety of reasons from "I don't need it in my local area" to it being too big for the aircraft or stowed for aerobatics.

In 11 (3.8%) cases the alert was not understood by the pilot.

One anecdote we wanted to test was that moving maps are not used by instructors "to give a good example" to students who "should learn to navigate properly". In fact, this was only mentioned in 3 (1%) cases.