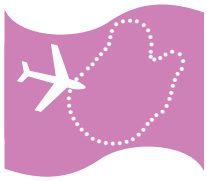


AIRSPACE INFRINGEMENTS - PILOTS' PROBLEMS

The problem of airspace infringement seldom affects airlines. Airlines usually follow designated air routes within controlled airspace. The intended routing is known in advance and if, for example, it must be changed due to temporary restricted airspace, a re-route is issued, often before the aircraft leaves the ground. The airline is usually under the control of an air traffic unit from the moment it begins to taxi until it comes to a halt at its destination, so any deviation from the cleared flight plan is quickly detected and equally quickly corrected. The opportunity for airspace infringement is small and the training and professionalism of airline pilots makes it a rare event indeed.

General aviation (GA), on the other hand, operates largely outside controlled airspace. For the amateur pilot, air routes, control areas and the like may be something of a mystery, and the correct procedures for entering or crossing it may not be properly understood. Even the experienced flying instructor or air-taxi pilot may not be fully conversant with the requirements. It is not surprising, therefore, that the majority of airspace infringement incidents involve general aviation. An appreciation of the pilots' perspective will help us to understand their problems and the reasons why this takes place. This understanding may help us to take appropriate defensive action in good time and prevent airspace infringement incidents having dangerous consequences.

Pilots' Problems

Unlike commercial airline pilots, private pilot training is often very basic and standards are not subject to the same frequent rigorous checks. There is a strong tendency for flying instructors to concentrate on the skills the student pilot needs to handle the aircraft safely and pass the required examinations at the end of the course. Other matters are not dealt with at any great depth and may even be ignored. For newly qualified GA pilots, the learning curve is steep; limited flying hours may mean that a long time passes before a real understanding of the airspace environment is acquired together with the necessary skill and experience to navigate it safely and efficiently.

On many GA flights there is only one pilot, so there is no-one with whom to share the workload or to discuss problems. Even when two pilots are present, the second pilot may be no more experienced than the first. Light aircraft are often not very well equipped, with no auto-pilot or at best a very basic instrument. Navigation may be fairly primitive and where GPS is fitted, lack of familiarity with the equipment may result in considerable distraction when re-programming is necessary. Correct transponder setting may also present difficulties.

Added to this, many small aerodromes do not have extensive flight-planning facilities where the pilot may easily brief himself on NOTAMs and the latest changes to airspace structure and procedures. If experienced staff are present, the pilot may not know the right questions to ask to equip himself for a flight into controlled airspace. It is therefore clear that the possibilities for airspace infringement are considerable. Let us consider a hypothetical case.

The Inexperienced Pilot

John is a PPL with less than 200 hours total; it is several weeks since his last flight and several months since he last crossed controlled airspace. This is not his own aircraft, but one he has hired from the local flying club. There is no altitude capture on his autopilot and navigation will be by reference to VOR/DME supplemented by visual observation. Weather conditions for the route are VMC but with some cloud below, making map-reading difficult. He will have a tail-wind as he approaches the airway. He is the only pilot on board but his non-flying girlfriend is with him as passenger. While he is preparing his flight, his excited passenger is full of questions, distracting him from the task in hand. To John, the controller is an unknown quantity - not quite an adversary but not a friend. Flight in controlled airspace, however brief, is an adventure, so he takes time to consider where he intends to enter controlled airspace, what he will say and what he will do.

John calls up for crossing clearance about 6 minutes before reaching the airway but the frequency is very busy and the controller tells him to stand by. Instead of turning away, he continues on heading expecting to receive crossing clearance soon. The cloud below, coupled with his inexperience at map-reading make navigation difficult and because he has not annotated his chart with VOR radials and DME ranges he is uncertain of his position. Eventually he turns to avoid the airway, but with the tail-wind, he comes so close to an infringement that the controller has to give avoiding action to airways traffic.

When the controller calls John back, he is not where he intended to be and his carefully prepared information is out of date. He can't remember his aircraft registration, then remembers it is on a plate on his instrument panel. He doesn't know where he is relative to his intended entry point. The controller

issues a squawk but John has forgotten how to set his transponder and some time passes before he is identified.

Eventually, the patient controller clears him to cross, but on a radar heading and at a different level from what he had planned. When he begins to descend, his passenger asks if they are about to land and while he is trying to explain what is happening, he overshoots his level and has to be alerted to the fact by the controller. Next, John tries to fix his position and work out a new route to his destination, but once again he loses situational awareness and drifts off heading, to the annoyance of the busy controller.

You may be thinking that you would have realised that John was likely to cause trouble and would not have given him crossing clearance in the first place. But controllers are a tolerant breed and do not like to say "No"; so probably, you would have done what our controller did and put him on a heading and at a level where he was safe, and then kept a close eye on him.

Other Considerations

Of course, if the pilot has not yet passed his full request, it will be impossible for you to decide if he/she is inexperienced and likely to cause problems. Moreover, if you do not know the aircraft altitude or the pilot's intentions, defensive action may affect many aircraft. Therefore, if you have had to tell the pilot to standby, you should call him/her back as soon as possible, either with a clearance or a refusal. The pilot's response may enable you to judge his/her ability and so decide whether it is necessary to take additional precautions.

... No, crossing controlled airspace is not complicated. The difficult part is doing the flying at the same time ...

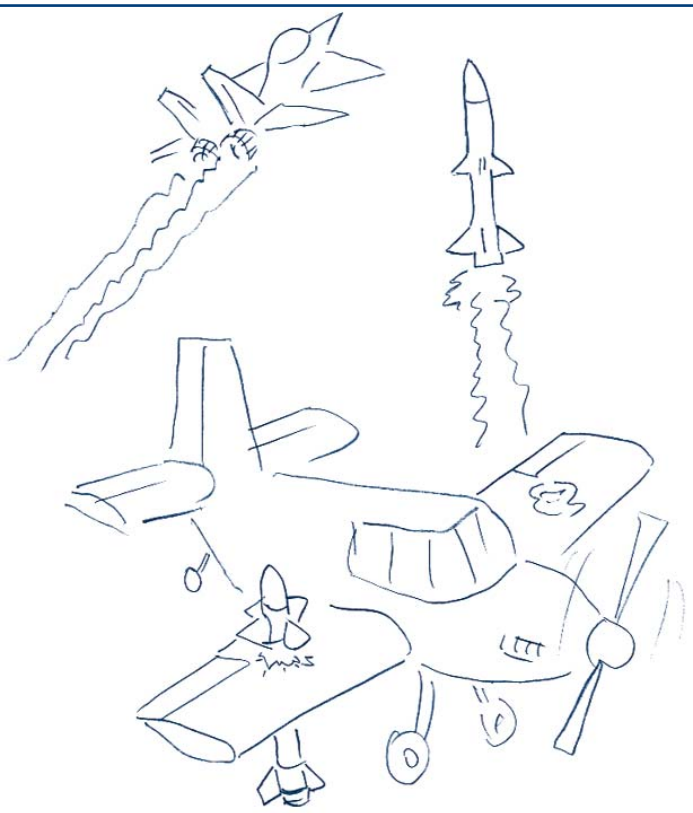
If it is necessary to instruct the pilot to change altitude, bear in mind that many GA aircraft have limited performance and a climb may take a considerable time. During the climb or descent the pilot will be performing other tasks, such as navigation, and without altitude capture, altitude alert, or similar warning devices may unintentionally overshoot the assigned altitude.

An inexperienced pilot may have considerable difficulty dealing with a routing different from what he/she had planned; in less than ideal meteorological conditions a designated visual reference point may be misidentified, especially if the pilot is uncertain of his/her precise position to start with. If circumstances permit, a radar heading may be the best solution because it reduces the number of tasks the pilot has to perform, removing from the inexperienced pilot the necessity to navigate.

Action to be taken by controllers in the event of airspace infringement varies according to the type of airspace. In Classes A or D airspace, traffic information service and, if necessary, avoiding action should be passed. In Class E airspace, traffic information should be passed and, at the pilot's request, avoiding action. You will be familiar with the required action in your sector; the pilot may not.

When vectoring aircraft during the initial and intermediate approach phases, it is wise to ensure that the flight trajectory will not pass through Classes E or G airspace, where unknown traffic may occur without warning, causing a potential conflict with the vectored traffic.

Pilots engaged in aerial work such as parachute dropping while operating within controlled airspace require special consideration. Bear in mind that national authorities usually permit such work to be carried out by pilots having only a private pilot's licence. Therefore, there is the possibility that the pilot may be relatively inexperienced. Sometimes, the Sector Controller permits the pilot to work another frequency (e.g. the Aerodrome Flight Information Service) while on task. This practice is risky unless special procedures are developed and adhered to, and has resulted in deviation from the notified altitude or route due to unforeseen circumstances, such as weather, without being able to inform the Sector Controller, leading to loss of separation and AIRPROX.



Darling, don't get upset, I thought that "D Area" stood for "Destination Area" ...

LESSONS LEARNED

From the many lessons learned from this and other incidents concerning all members of the aviation community, the following relate particularly to Air Traffic Controllers:

- Familiarise yourself with the GA pilot's working environment, his problems and his workload.
- Bear in mind that many GA aircraft are poorly equipped and their pilots may be very inexperienced, and recognise the dangers that could result.
- Note that a "Standby" instruction issued to an aircraft requesting crossing or joining clearance should be followed as soon as possible by a call issuing clearance or refusal.
- Monitor the track of the aircraft when a "Standby" instruction is issued, to ensure that airspace infringement does not take place.
- Pay particular attention to the actions of apparently inexperienced pilots, to ensure that any unexpected deviation from clearance is noted promptly.
- Consider issuing a radar heading at a level clear of other traffic and monitor the aircraft's flight path closely if you suspect that a pilot may be overloaded, or may have difficulty complying with instructions.
- Note that when vectoring aircraft during the initial and intermediate approach phases, it is wise to ensure that the flight trajectory will not pass through Classes E or G airspace, where unknown traffic may appear without warning, causing a potential conflict with the vectored traffic.
- Bear in mind that pilots engaged in aerial work within controlled airspace may have to deviate from their cleared flight parameters and communication may be difficult if they are working a different frequency.