

Making GA safer

Airspace4All's **Steve Hutt** is confident the results of a trial using ATS ADS-B traffic displays will help cut the risk of collisions

The Civil Aviation Authority (CAA) aims to publish policy changes by the summer that could authorise general aviation (GA) airfield air traffic service (ATS) and air/ground communication service (AGCS) units to use automatic dependent surveillance broadcast (ADS-B) traffic displays, according to Airspace4All.

The move has been prompted by the results of Airspace4All's GA Airfield ATS ADS-B Traffic Display Trial, an independent study conducted by the group last year. It assessed potential changes to regulations governing the use of surveillance systems by GA airfield ATS units, in an attempt to reduce the probability of airspace infringements and collisions.

Expensive, radar-based surveillance



The airspace at or near GA airfields is the area of highest collision risk – 85% of powered GA aircraft collisions were found to be with another powered GA aircraft, and 57% of these occurred at or near airfields



systems have long been available to air traffic control officers (ATCOs) at larger airports, but they are beyond the means of smaller UK GA airfields. However, with the availability of electronic conspicuity (EC) solutions for GA aircraft, such as ADS-B, computer-based traffic displays can present highly accurate real-time EC surveillance information.

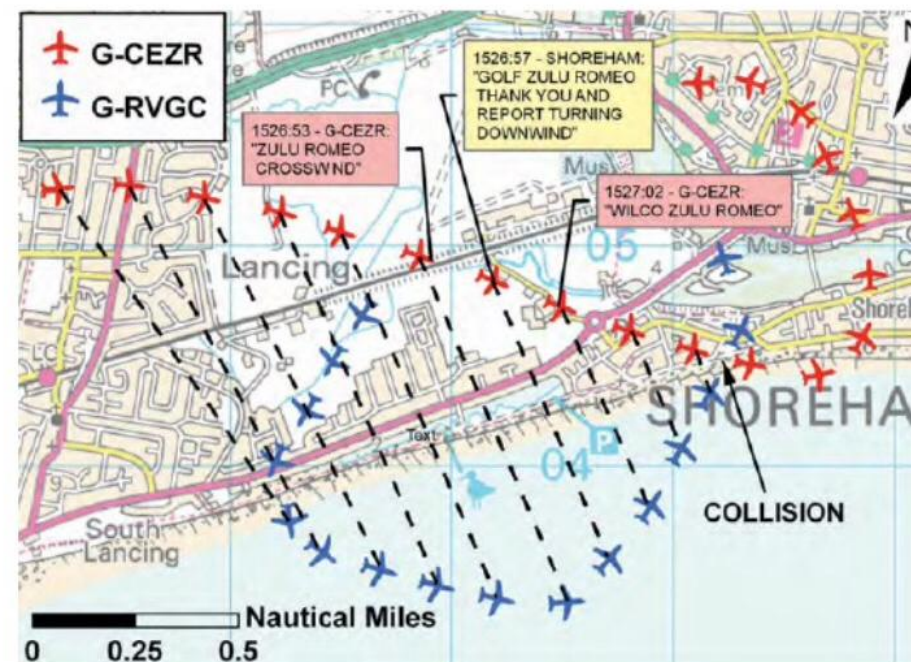
Analysis of UK mid-air collisions has found the airspace at or near GA airfields is the area of highest collision risk – 85% of powered GA aircraft collisions were found to be with another powered GA aircraft, and 57% of these occurred at or near airfields. The accident highlighted on the page opposite is just one example.

Past studies have identified limitations to the 'see and avoid' principle by which pilots flying visual flight rules (VFR) avoid other aircraft and found that alerted see-and-avoid is eight times more effective than unalerted. Many of the factors that hinder a pilot seeing other aircraft also affect the ability of ATS staff to spot traffic in/joining/leaving their airfield's visual circuit. This has a negative bearing on the safety of flights at or near the airfield. Better traffic information from ATS could be the alert that enables a pilot to avoid a collision.

Why have a trial?

In 2011, the Shoreham ATCO had no surveillance system to help him, and still didn't in February. Nor do UK CAA regulations currently permit non-radar ATS units and AGCS units to use ADS-B surveillance systems.

That is why, in July 2017, with the backing of the UK CAA Electronic Conspicuity Working Group, Airspace4All (then called FASVIG) proposed a trial of low-cost ADS-B traffic display technology by GA airfield



A chart from the AAIB report on the collision between G-CEZR and G-RVGC on July 4, 2011.

SHOREHAM AIRPORT CRASH, WEST SUSSEX, UK, JULY 4, 2011

About 10 seconds after the last exchange above, Zulu Romeo (ZR), a Diamond DA40 with two flying instructors onboard, joining the Shoreham circuit, hit a Van's RV-6 already in the circuit on downwind for runway 20. Zulu Romeo lost its propeller, but managed to safely glide to land on runway 24. The RV-6 lost its tail, rendering it uncontrollable, and it crashed seconds later in a local park, killing the pilot. No avoiding action was taken by either aircraft – the pilots did not see each other. The Shoreham air traffic control officer (ATCO) never saw ZR joining the circuit either. It was mid-afternoon on a sunny summer's day. The UK Air Accident Investigation Branch report quoted witnesses saying visibility was at least 30nm.

ATS units. It was endorsed by the CAA in a public statement on August 16, 2017.

The Airspace4All GA Airfield ATS ADS-B Traffic Display Trial aimed to gather evidence that would enable the CAA to assess the technology's capability, consider a policy change authorising the use of ADS-B real-time traffic displays by GAATS units and, in particular, highlight the potential to:

- Reduce the probability of mid-air collisions
- Provide increased situational awareness, resulting in fewer airspace infringements
- Monitor compliance with local traffic regulations.

It was also hoped the trial would encourage further technology developments to support ATS provision at UK GA airfields. Without a policy permitting such systems, there can be no market to encourage innovation and development.

A trial safety case and safety plan were drawn up and gained CAA approval. The trial went live at City Airport (Manchester

Barton Aerodrome) on March 1, 2019, joined soon after by North Weald Airfield in Essex and Goodwood Aerodrome in West Sussex.

The airfields were equipped with real-time flight tracking equipment based on direct receipt of air-to-ground ADS-B broadcasts that provided a situational awareness tool for ATS. It was not used to provide any form of air traffic control service. ADS-B is the UK CAA's publicly stated preferred EC solution.

To complement those aircraft already equipped with ADS-B Out (via portable or fixed airframe installations), a number of GA aircraft based at the trial airfields were equipped with loaned CAPI391-compliant portable ADS-B Out devices. Airborne usage and air-to-air ADS-B In capabilities of the CAPI391 devices were outside the scope of the trial except where they had a bearing on the ATS provision. CAPI391 is a UK CAA publication that defines an authorised standard for low-power portable 1,090MHz ADS-B transceivers.

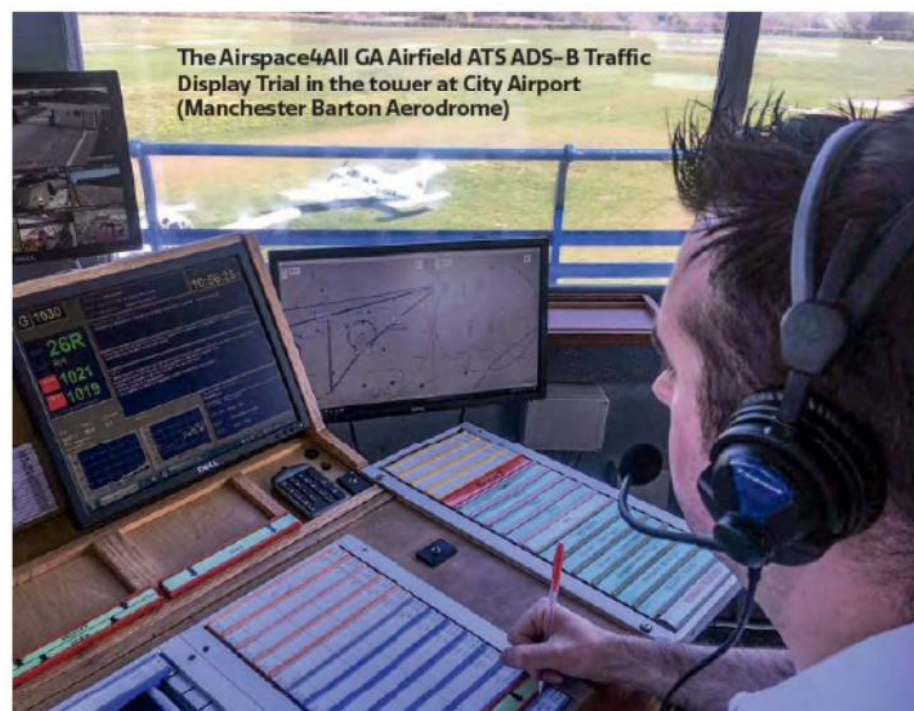
The ATS ADS-B traffic display was reported to be reliable, very accurate and, crucially, did not constitute a distraction

hazard – it was safe to use. Although only showing ADS-B equipped traffic, it represented a valuable enhancement to existing ATS tools and procedures, improving situational awareness and service, and providing a positive safety benefit to aircraft. It also had a positive effect on the wellbeing and confidence of ATS and AGCS staffs. However, achieving the benefits required airfield management and staff to be committed to the installation, training and supervision, and open to change. Its use made GA pilots more aware of the advantages of carrying ADS-B and there has already been an uptake in fitting and deploying the equipment.

The trial concluded that GA safety would be improved by authorising GA airfield ATS and AGCS units to use ADS-B traffic displays. This would require amendments to staff licensing regulations, ATS/AGCS and radio procedures and surveillance systems. Bringing ADS-B traffic display installation and operation within reach of UK GA airfields would need light and proportionate regulation, plus simple and inexpensive start-up procedures.

The UK CAA has now advised that, based on the trial and report of the findings and recommendations, it is developing policy changes that it hopes to publish in the first half of 2020. **ATM**

Further details of the trial are available on the Airspace4All website: airspace4all.org



About...

... THE AUTHOR

Steve Hutt is Airspace4All's electronic conspicuity lead, and managed its GA Airfield ATS ADS-B Traffic Display Trial. He is a private pilot and an ex-director of the UK Light Aircraft Association.

... AIRSPACE4ALL

Airspace4All is a not-for-profit group that works with other aviation stakeholders to explore innovative solutions to create a sustainable and equitable UK air traffic environment.