



Aviation News

This article is featured in the December 2005 issue of Aviation News Magazine © HPC Publishing,

The article and its contents may not be reproduced without prior permission from the editor.

The December 2005 issue is on sale from all good newsagents.

The most exciting air band development since scanning radios were introduced is now within the grasp of any enthusiast with £500 to spare. Now you can monitor aircraft on a real time virtual radar display, almost like the ATC professionals! Indeed, the manufacturers of the SBS-1, Kinetic Aviation Products Ltd, hope to offer it to smaller airfields as a significant aid to operations. With some development to meet CAA requirements, this type of equipment may one day supersede, or at least back up, vastly more expensive current radar systems. The SBS-1 relies on aircraft Mode-S and/or ADS-B transponders to perform its magic. Equipped with a small antenna, it is simply connected to a PC loaded with the BaseStation software provided. On launch, it immediately begins to auto-detect suitably equipped aircraft in the vicinity, the process taking between 40 and 70 seconds. Range, as with a VHF antenna, will depend on location, results in a city, for example, leaving much to be desired.

The virtual radar screen takes up most of the left side of the picture, the rest being taken up with a window listing all the aircraft displayed. This contains details of aircraft status, i.e. climbing, descending or in level flight, call-sign, altitude, speed and several other parameters. This window can be resized or removed and the radar display expanded to fill the whole screen if you wish. It is also possible to confine the radar picture to any required area, such as the airspace around your local airport, while retaining a separate picture over a much wider area. In other words, two active radar screens side-by-side. As with professional radars, each aircraft has a data block, but these take up a lot of space with unnecessary information such as bearing from the ground station, exact height, e.g. 25,525ft. The manufacturers are responding to user feedback with software changes and I would suggest that they adopt the real world ATC data block presentation.

Now, what makes it work? Since March 31, 2005, CAA has introduced Mode-S airspace initially in the London TMA, Over the next few years it will spread to the Manchester and Scottish TMAs, together with some major airways and control area. Mode-S is a Secondary Surveillance Radar (SSR) technique currently on two levels: Elementary and Enhanced. Both provide greater integrity of data than the current system by practically eliminating false responses and garbling of data labels, particularly in busy airspace such as stacks. Additionally, the Enhanced level provides the capability to downlink extra data from the aircraft cockpit. Mode-S Elementary will become mandatory in all remaining areas of airspace by March 31,

2008. Currently the SBS-1 will 'see' only about 25% of traffic within range but this will obviously increase, as more aircraft are equipped with Mode S as the deadline approaches.

Background to ADS-B acronym for Automatic Dependent Surveillance – Broadcast, ADS-B equipped aircraft broadcast their precise position in space via a digital data link along with other data, including airspeed, altitude, and whether the aircraft is turning, climbing, or descending. ADS-B receivers that are integrated into the air traffic control system or installed aboard other aircraft provide users with an accurate depiction of real-time aviation traffic, both in the air and on the ground. The system relies on the satellite-based global positioning system to determine an aircraft's precise location in space. The system then converts the position into a digital code, which is combined with the height details. The digital code, containing all of this information, is updated several times a second and broadcast from the aircraft on a discrete frequency called a data link. Other aircraft and ground stations within about 150 miles receive the data link broadcasts and display the information in user-friendly format on a computer screen, Pilots in the cockpit see the traffic on a Cockpit Display of Traffic Information (CDTI). Controllers on the ground can see the ADS-B targets on their regular traffic display screen, along with other radar targets. ADS-B has been in use over the Pacific and other areas outside conventional radar range for several years.

Aviation professional are greatly concerned about the implications of virtual radar and would like a ban on the general sale of these devices. They fear that people will report incidents of supposed separation losses to the press or, in an unlikely worst case scenario, an evil doer could use a transceiver to direct aircraft on collision courses by means of bogus instructions. It will be interesting to see how this revolution in spotting resources develops. My colleagues' reaction is along the lines of 'That's great, I could work from home with a laptop!'