

# ADS-B Safety Benefits In and Out of Your Normal Base of Operations

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When flying in familiar territory, we're comfortable with the airspace, the weather patterns, and the traffic patterns. But what do we know when flying out of our normal operating area?

With thousands of pilots planning unfamiliar flights to EAA AirVenture, the Oshkosh airshow in late July, it's a good time to review the benefits of both Automatic Dependent Surveillance – Broadcast (ADS-B) Out and In. For everyday flying and especially for this kind of trip, ADS-B provides a significant boost in safety and situational awareness for general aviation (GA) pilots.

Nearly 11,000 aircraft — most of them GA airplanes — are now equipped for ADS-B Out and more than 120 of the FAA's 230 air traffic control facilities are using ADS-B, in conjunction with radar, to separate traffic. ADS-B Out transmits aircraft location data to air traffic controllers and other aircraft equipped to receive it.

The GPS-based surveillance provided by ADS-B Out enhances the ability to perform life-saving search and rescue missions. Controllers tracking aircraft with ADS-B Out have more accurate information about the last reported position of your aircraft. ADS-B Out avionics transmit data about once every second — compared to radar, which is about 3-15 seconds. This reduces that critical window of time involved in a search and rescue operation. And in rugged mountainous terrain — where even a minor accident could have dire consequences — having ADS-B coverage could assist in a search and rescue. The smaller footprint of ADS-B ground stations means they can be placed where a radar site would not be possible.

Although only ADS-B Out is mandated by January 1, 2020, for aircraft flying in most controlled airspace — aircraft without electrical systems are excluded — there are also significant advantages to ADS-B In. With ADS-B In and Flight Information Service–Broadcast (FIS-B), a pilot gets unprecedented levels of situational awareness, which translates into significant safety benefits.

FIS-B provides pilots with graphical weather displays in the cockpit as well as text-based advisories including NOTAMs and significant weather activity. This includes temporary flight restrictions or closed runways. These advisory services are provided free of charge to the user. Another key benefit of ADS-B In is that terrain maps can easily be added to cockpit displays, which is especially helpful in unfamiliar airspace or low-visibility situations.

Pilots of ADS-B In-equipped aircraft will see what controllers now see — the position of surrounding aircraft together with graphical weather displays. This creates an environment of shared situational awareness and crucial see-and-avoid capability.

There are three types of traffic broadcasts:

- **Traffic Information Service-Broadcast (TIS-B):** This air traffic advisory service provides the altitude, ground track, speed and distance of aircraft flying in radar contact with controllers and within a 15-nautical-mile (nm) radius, up to 3,500 feet above or below the receiving aircraft's position. TIS-B enables pilots to see aircraft equipped with transponders flying nearby even if those aircraft are not equipped with ADS-B Out.
- **Airborne Data Exchange:** Aircraft equipped with ADS-B In can also receive position data directly from other aircraft broadcasting on the same ADS-B Out frequency.
- **Automatic Dependent Surveillance—Rebroadcast (ADS-R):** This takes position information received on the ground from Universal Access Transceiver (UAT)-equipped aircraft and rebroadcasts it on the 1090 megahertz (MHz) frequency. Likewise, ADS-R rebroadcasts 1090 MHz data to UAT users. In concert with TIS-B, airborne data exchange and ADS-R provide all ADS-B In-equipped aircraft with a comprehensive airspace and airport surface traffic picture. ADS-R delivers traffic data within a 15-nm radius 5,000 feet above or below relative to the receiving aircraft's position.

The FAA has also established standards for a new ADS-B In capability that will allow pilots to keep track of aircraft flying in front of them during a visual approach. The pilot will be able to monitor the aircraft ahead by looking at a cockpit display of its position based on data received through an ADS-B broadcast.

The FAA has urged operators to equip soon for ADS-B Out to avoid a last-minute crunch, given a limited number of qualified repair stations. Whether you equip now or later, consider adding ADS-B In as well. It can make unfamiliar airspace a lot more comfortable.

For more information on how to equip for ADS-B, access [www.faa.gov/go/equipadbsb](http://www.faa.gov/go/equipadbsb).

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