

ADS-B Broadcast Services

Automatic Dependent Surveillance–Broadcast (ADS-B) is the satellite-based successor to radar.

ADS-B Out is mandated for operators flying in certain airspace by 2020, generally where transponders are required today. It uses GPS to determine an aircraft's location and broadcasts that information to a network of ground stations, and to nearby aircraft equipped to receive that information via ADS-B In.

ADS-B broadcast services take advantage of ADS-B In to provide traffic, weather and other flight information directly to the cockpit at no subscription cost.

Two systems have been approved by the FAA for ADS-B:

- A Universal Access Transceiver (UAT) operating on 978 MHz
- A Mode S transponder operating on 1090 MHz with Extended Squitter (1090ES) that can be paired with a 1090 MHz receiver



With these systems, three types of FAA broadcast services offer benefits to pilots of ADS-B In-equipped aircraft and are now available across the United States:

- Flight Information Service–Broadcast (FIS-B): This service, available via UAT, broadcasts graphical weather to the cockpit based on what ground-based weather radar is detecting. In addition, FIS-B broadcasts text-based advisories including Notice to Airmen messages and reports on everything from significant weather to thunderstorm activity.





ADS-B ground stations are in place and ADS-B Broadcast Services are available across the country.

UAT-equipped general aviation aircraft can receive this information at altitudes up to 24,000 feet.

- **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. It can be received on both UAT and 1090 MHz. A general aviation aircraft equipped with ADS-B In can also receive position data directly from other aircraft broadcasting on the same ADS-B Out frequency. In addition, TIS-B enables pilots to see aircraft equipped with transponders flying nearby even if those aircraft are not equipped with ADS-B Out.
- **Automatic Dependent Surveillance–Rebroadcast (ADS-R):** ADS-R takes position information received on the ground from UAT-equipped aircraft and rebroadcasts it on the 1090 MHz frequency. Likewise, ADS-R rebroadcasts 1090 MHz data to UAT users. In concert with TIS-B, ADS-R provides 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.

To comply with the 2020 mandate, aircraft operating in Class A airspace — from 18,000 feet mean sea level (MSL) to and including Flight Level 600 — must broadcast ADS-B Out position data using the Mode S 1090ES ADS-B link. Aircraft operating in designated airspace exclusively below 18,000 feet MSL can use either 1090ES or a UAT.

The availability of rule-compliant avionics from various manufacturers is increasing, and the agency has completed advisory circular guidance so the general aviation community can install required avionics.

A display device is required for traffic and weather information enabled by ADS-B In. This information will also be available for display on some mobile devices at a time when many general aviation pilots own and use tablets. Complete TIS-B and ADS-R reports are only broadcast to aircraft equipped with ADS-B Out.

The FAA is also exploring the possibility of setting standards for battery-powered ADS-B Out transmitters that can be used on gliders and general aviation aircraft certificated without an electrical system. Additionally, the FAA is working with the aviation community to set standards for how ADS-B In provides pilots with a low-cost traffic alerting capability.

Aircraft owners or avionics shops may install an uncertified GPS on an amateur-built aircraft with an experimental airworthiness certificate. Uncertified equipment, including uncertified GPS units, should not be installed on aircraft with standard airworthiness certificates. Uncertified GPS units do not meet the equipment requirements associated with the mandate and do not qualify for ATC services using ADS-B data. Data from aircraft with uncertified GPS units are not displayed on certified ADS-B In displays, and pilots of aircraft with certified ADS-B equipment will not be able to see aircraft equipped with uncertified GPS units.

