

Automatic Dependent Surveillance-Broadcast (ADS-B)

DESCRIPTION

Automatic Dependent Surveillance-Broadcast (ADS-B) is FAA's satellite-based successor to ground-based air traffic control (ATC) radar. ADS-B makes use of GPS technology to determine and share precise aircraft location information with Air Traffic Organizations as well as other aircraft.

ADS-B OUT MANDATE: JANUARY 1, 2020

After January 1, 2020 no person may operate an aircraft:

In Class A airspace unless the aircraft has equipment installed that meets the requirements in TSO-C166b, Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Service-Broadcast (TIS-B) Equipment Operating on the Radio Frequency of 1090 Megahertz (MHz);

Below 18,000 feet MSL unless the aircraft has equipment installed that meets the requirements in TSO-C166b; or TSO-C154c, Universal Access Transceiver (UAT) Automatic Dependent Surveillance-Broadcast (ADS-B) Equipment Operating on Frequency of 978 MHz;

In the following airspace unless the aircraft has equipment installed that meets the requirements in TSO-C166b; or TSO-C154c:

1. Class B and Class C airspace areas;
2. Within 30 nautical miles of an airport listed in appendix D, section 1 to part 91 from the surface upward to 10,000 feet MSL; *
3. Above the ceiling and within the lateral boundaries of a Class B or Class C airspace area designated for an airport upward to 10,000 feet MSL;
4. Class E airspace within the 48 contiguous states and the District of Columbia at and above 10,000 feet MSL, excluding the airspace at and below 2,500 feet above the surface; * and
5. Class E airspace at and above 3,000 feet MSL over the Gulf of Mexico from the coastline of the United States out to 12 nautical miles.

* These requirements do not apply to any aircraft that were not originally certificated with an electrical system.

EQUIPMENT SPECIFICATIONS

ADS-B equipment must meet the following requirements:

- TSO-C166b: Extended Squitter Automatic Dependent Surveillance - Broadcast (ADS-B) and Traffic Information Service - Broadcast (TIS-B) Equipment Operating on the Radio Frequency of 1090 Megahertz (MHz); or
- TSO-C154c: Universal Access Transceiver (UAT) Automatic Dependent Surveillance-Broadcast (ADS-B) Equipment Operating on Frequency of 978 MHz;

In addition to the ADS-B Out transmitter, the system will need a WAAS GPS or other performance-compliant navigator.

AIRCRAFT ELECTRONICS
ASSOCIATION

DISCUSSION

In the U.S., ADS-B-equipped aircraft and vehicles exchange information on one of two frequencies: 1090 or 978 MHz.

ADS-B enables ATC to identify and track your aircraft. An ADS-B transceiver operating on either link does essentially everything a standard transponder does, plus a lot more. While a Mode C transponder provides ATC with your position (as detected by radar) and pressure altitude transmitted by your transponder and encoder, an ADS-B transceiver also emits other data about your flight, including your aircraft's type, velocity, and "geometric altitude," which is used to develop a more accurate indication of position.

The 1090 MHz link is already used by Mode A/C and S transponders and Traffic Collision and Avoidance System (TCAS) equipment. ADS-B extends the message elements of Mode S with additional information about the aircraft and its position. This is known as the "Extended Squitter" and is referred to as 1090ES.

In an international committee report published in 2001, 1090ES was identified as the ADS-B link to be supported by the international aviation community moving forward, with 1090ES being the preferred link for international operations and U.S.A. domestic operations above 18,000' MSL. The 978MHz/UAT link is a U.S. regional link mainly used for Flight Information System-Broadcast (FIS-B) services for use below 18,000' MSL.

Universal Access Transceiver (UAT) equipment operates on 978 MHz.

REFERENCES:

- § 91.225 Automatic Dependent Surveillance-Broadcast (ADS-B) Out equipment and use.
- § 91.227 Automatic Dependent Surveillance-Broadcast (ADS-B) Out equipment performance requirements.
- www.faa.gov/nextgen/implementation/programs/adsb/
- www.aea.net/ads-b/

IN A SNAPSHOT

► ADS-B OUT EQUIPMENT REQUIREMENTS:

WAAS GPS or other performance-compliant navigator – stand-alone (blind), integral to a single-box ADS-B system or a panel-mounted navigator.

ADS-B Out Transmitter, either a 978 MHz ADS-B stand-alone transmitter or UAT; or 1090ES Unit, stand-alone or an ADS-B Capable Mode S Transponder and an antenna.

► ADS-B IN OPTIONAL EQUIPMENT:

(in addition to Out hardware)

While not currently a regulatory requirement, should the operator choose to install ADS-B In, equipment requirements – in addition to ADS-B Out hardware – include one of two options: a 978 MHz ADS-B Receiver to receive the Out signals of other aircraft, as well as FIS-B and TIS-B data transmissions; or 1090ES also able to receive TIS-B. In addition, the aircraft will need a display screen of some type to show FIS-B and TIS-B images and text.

This information sheet is provided to the aviation industry as a public service of the Aircraft Electronics Association and your local AEA member repair station.