

# 8 THINGS EVERY AIRCRAFT OWNER NEEDS TO KNOW ABOUT THE 2020 ADS-B MANDATE



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## INTRO:

Aircraft owners across the United States are rapidly approaching the deadline for the installation of Automatic Dependent Surveillance-Broadcast equipment (ADS-B), which occurs on January 1, 2020.

In this short eBook brought to you by the Equip ADS-B Marketplace, we examine eight important things that every aircraft owner needs to know about the ADS-B upgrade process.

We examine what the equipment is, how it functions, and the benefits it provides, along with providing information on potential costs and challenges that owners may face along the way – such as locating an avionics repair station that has the appropriate TSO-approved solution for their needs.

The Equip ADS-B Marketplace not only makes the process of researching equipment and prospecting for potential avionics shops significantly easier on aircraft owners (than attempting to navigate the process themselves) but also ensures they won't pay any more out of pocket than is strictly necessary, due to Equip ADS-B Marketplace's innovative public bidding system and low-price guarantee. There are, quite literally, no drawbacks nor costs for using the marketplace for owners.

So let's get started, and take a look at the eight most important things every aircraft owner needs to know about the 2020 ADS-B Mandate!





## 1. WHAT IS ADS-B EQUIPMENT, AND WHAT DOES IT DO?

ADS-B is an acronym which stands for Automatic Dependent Surveillance-Broadcast.

In a nutshell, it is a sophisticated piece of electronic equipment which encodes aircraft performance and precise satellite-derived positioning data and periodically transmits it, enabling real-time tracking of your aircraft. It works Automatically, is Dependent on your aircraft's avionics system, sends Surveillance information for target identification and separation, which is Broadcasted out to receivers once per second. It will augment primary surveillance radar and one day completely displace the need for secondary surveillance systems.

ADS-B consists of two separate and distinct services, ADS-B Out, and ADS-B In. ADS-B Out service is the one mandated for installation on aircraft operating in U.S. airspace by January 1, 2020. ADS-B Out broadcasts flight data and aircraft capabilities information used for air traffic surveillance and separation. ADS-B In service gives pilots real-time ADS-B traffic information on compatible links and flight information over the Universal Access Transceiver Link. ADS-B In increases pilot's situational awareness, enhances safety, and will eventually support delegated self-separation procedures.



## 2. WHY IS THE FAA MANDATING THIS?

ADS-B is to radar surveillance what high-definition color monitors are to black and white television sets; the capabilities of the former far surpass the technology of the latter. The FAA is mandating ADS-B because it far exceeds ground-based surveillance and will enhance safety and efficiency, and directly benefits pilots and controllers. It is foundational to the Next Generation Air Transportation System. Soon, aircraft and vehicles will be precisely tracked using satellite signals instead of ground-based radar.

This is how it works: An aircraft with an ADS-B system can accurately pinpoint its position in real time using GPS and broadcast this data to Air Traffic Control. Near-by aircraft with the capability to receive ADS-B transmissions enable pilots, for the first time, to see what the controller sees. This increases everyone's situational awareness and enhances safety. ADS-B allows controllers to separate aircraft more efficiently, thus increasing airspace capacity and throughput.

ADS-B is also instrumental in making surface operations safer and more efficient. Aircraft with ADS-B In displays show the precise location of other aircraft and surface vehicles – even at night or during heavy rainfall – thereby reducing the risk of runway incursions. ADS-B applications will give pilots indications and alerts of any potential conflicts.

The FAA is also mandating ADS-B because it expands surveillance services into areas where little or no radar coverage currently exists, like the Gulf of Mexico, parts of Alaska, and Canada. ADS-B will enhance safety, improve Air Traffic Control efficiency, and increase airspace capacity in the nation's skies.

### 3. HOW DOES IT WORK (TECHNICALLY SPEAKING)?

If you want to become familiar with some of the technical aspects of an ADS-B system, you will want to read this section.

ADS-B equipment is certified to Technical Standard Orders (TSO). The FAA requires ADS-B Out systems to include a 1090 MHz Extended Squitter Mode S Transponder (1090ES) or a Universal Access Transceiver (UAT) paired with a TSO-C145(c or d) GPS position source. To operate in U.S. airspace above FL180 or outside of the U.S., you'll need a TSO-C166b 1090ES transponder. For operations in U.S. airspace below FL180, either the 1090ES or a TSO-C154c UAT system will be sufficient.

With a functioning ADS-B Out system, you'll receive numerous ADS-B services every time you fly.

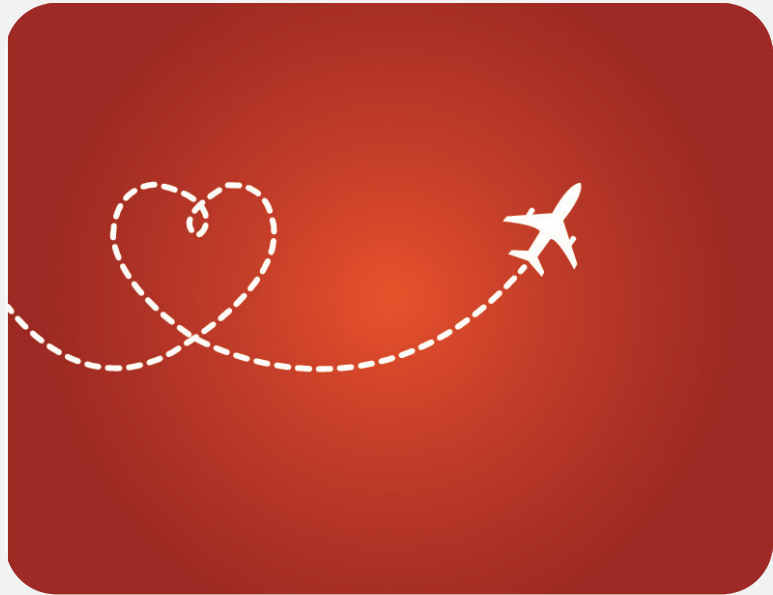
These include:

1. Separation Services: ADS-B information is used by Air Traffic Control and surrounding aircraft to identify traffic by flight ID, position, heading, velocity, and other relevant data in real-time.
2. Increased Situational Awareness: Automatic Dependent Surveillance-Rebroadcast (ADS-R) and Traffic Information Service-Broadcast (TIS-B) enables aircraft with ADS-B In systems and a traffic display capable of receiving ADS-B signals to see other aircraft, in real-time.
  - a. ADS-R allows you to see ADS-B aircraft that are on the opposite frequency (1090 or 978).
  - b. TIS-B enables you to see non-ADS-B aircraft within a 15nm radius transmitting Mode A/C.
  - c. UAT-equipped aircraft can receive Flight Information Service-Broadcasts (FIS-B) to pinpoint hazardous weather and terrain, and receive critical flight information.

Now you can ensure your avionics shop will install the correct TSO'd ADS-B system.

## 4. HOW MUCH WILL IT COST ME?

This is a hard question to pin down because of the dramatic variance when it comes to individual aircraft, as well as the choice of the ADS-B equipment itself. Generally speaking, the more sophisticated, larger, or rarer the aircraft, the more expensive the solution will be; large, customized jet aircraft or highly personalized, limited-run aircraft can require specially engineered ADS-B solutions, while smaller, mass-produced single-propeller enthusiast craft can get away with a less costly installation.



Another factor to consider is whether you want ADS-B In with ADS-B Out. ADS-B In equipment costs more, on average, than the simpler ADS-B Out equipment, but without having access to the inbound ADS data streams on both links, it will dramatically curtail most of the actual pilot benefit.

Those caveats aside, if you're looking for general ballpark figures on the total cost of an ADS-B solution for your aircraft, for single-engine piston aircraft you're likely looking at an expenditure of approximately \$1k to \$5k for the basic hardware and anywhere from \$1k-\$5k for the installation.

For single- and multi-engine turboprops and jets, the cost is considerably higher. It can range from the low \$20ks to over \$100k (including labor) depending on the avionics suite (federated or integrated), GPS position source, the number of transponders, TCAS II requirements, and other optional features.

## 5. WHEN DO I NEED ADS-B EQUIPMENT INSTALLED BY, AND WHAT HAPPENS IF I MISS THE DATE?

The FAA has mandated that all aircraft<sup>1</sup> flying in Class A, B, C, and E airspace will need to have an ADS-B Out system, at the minimum, installed by January 1, 2020 in order to operate legally in those airspaces. This mandate applies to all aircraft, whether its thrust is generated via propeller or jet engine – even most helicopters will be required to have ADS-B Out installed. Only craft using Class D airspace, the area below 2500' AGL in Class E airspace, and all Class G airspace are excluded from the mandate.

If you miss the deadline, your aircraft will be forced to stay within Class D, under 2500' AGL in Class E, or Class G airspaces, which will potentially limit both the utility and the enjoyment you derive from flying your aircraft.

If you absolutely must operate your aircraft after the mandate deadline has passed but before you have installed ADS-B equipment, you will be forced to request an ATC-Authorized Deviation to the ATC facility holding jurisdiction over the airspace you intend to use at least one full hour before the proposed operation.

You won't be able to cheat, either – the FAA has ADS-B compliance monitors stationed throughout the U.S. and all of its territories; intentional violation of Federal Aviation Regulations could result in a fine, suspension of your pilot's license, or both!

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<sup>1</sup> If your aircraft was not originally certified with an electrical system, or has not subsequently been certified with such a system (including balloons and gliders), you are not required to have ADS-B Out. See § 91.225 for further information.



## 6. PRICES ARE ONLY GOING UP — SAVE MONEY BY SCHEDULING SERVICE NOW

Aircraft owners looking to minimize their out-of-pocket costs related to the purchase and installation of ADS-B equipment would be well served to schedule their installation as soon as possible because prices on both the equipment and installation will only be going up over the coming months.

At the time of publication of this eBook, just over three years remain to comply with the mandate, yet 90 percent of GA have yet to install the equipment. This means that available installation slots will quickly start to dry up, and the price of the equipment and labor will rise, due to supply and demand, once aircraft owners start scrambling to make the deadline.

The federal government recently announced a \$500 funding incentive that may help if you have a fixed-wing, single-engine piston-driven aircraft; make sure you take advantage of it.

Another consideration is that at this point, you're going to be burdened with paying for the equipment one way or another. Even if you attempt to sell your aircraft immediately, prospective buyers are already aware of the upcoming mandate deadline and will likely demand that you adjust the prospective sale price of your aircraft accordingly, if the craft does not have ADS-B equipment installed and operational at the time of sale.



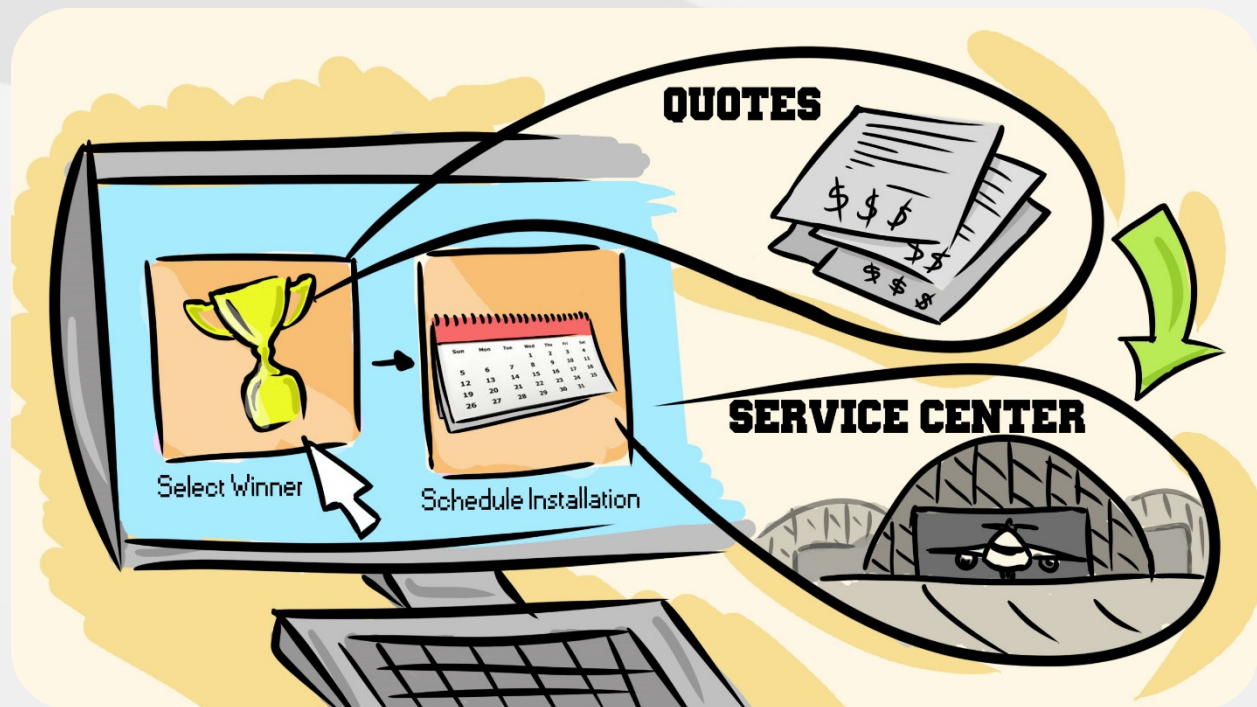
## 7. FINDING THE RIGHT SHOP CAN BE DIFFICULT

Finding an approved avionics shop that has the right ADS-B system for your aircraft, as well as the shop's availability to schedule you, can be a much more arduous and time-consuming process than you might imagine.

Firstly, not every shop is qualified to install every piece of equipment on every make and model of aircraft; individual shops need to engineer and federally certify every individual combination of equipment and aircraft they wish to work on, at a huge upfront cost to them.

Practically, this means that shops will tend to provide ADS-B quotes only for aircraft and equipment combinations they are familiar with and specialize in, meaning you might be looking for a shop for quite a while.

Another consideration is timing; as mentioned earlier in this eBook, the deadline for ADS-B equipment installation is rapidly approaching, while at the same time, very few aircraft owners have been proactive about things, meaning that there may not be any physical capacity left at the shops which do carry your approved solutions, if you wait too long to schedule things.



## 8. THE EQUIP ADS-B MARKETPLACE CAN HELP

The last, and potentially most important thing, an aircraft owner needs to know about the upcoming ADS-B mandate is that they can get help for all their needs at the Equip ADS-B Marketplace.

Instead of spending dozens of hours researching different equipment solutions on their own, they can simply peruse our vast informational library of resources to help them make the right selection when it comes to equipment.

They can then take advantage of the Marketplace's unique, low-price guaranteed public bidding system to actually source and schedule the installation of their equipment, potentially saving thousands of dollars over what they might have paid had they done the legwork themselves. Avionics shops in possession of the proper, certified solutions for their needs will locate and contact them directly, making prospecting shops a snap.

Best of all, every one of the features and information on the Marketplace are available free of charge to aircraft owners, who never need to pay a dime to use any of their services.

So if you're an aircraft owner still in need of your ADS-B equipment purchase and installation, head on over to [www.EquipADS-B.com](http://www.EquipADS-B.com), and register now to begin taking advantage of their incredibly valuable resources.