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today’s Debate: The Pros and Cons of ADS-B

Automatic Dependent Surveillance- Broadcast, ADS-B, is a satellite navigational system that helps to determine the position of an aircraft. This is a system that can report an aircrafts location to air traffic controllers on the ground and could replace a secondary radar. ADS-Bs can increase safety, efficiency, and accuracy of radar systems. The systems are supposed to benefit not only air traffic controllers on the ground, but pilots and the general public. The system, however, can be seen as dangerous to some people because it is not a secure system and has flaws. Some believe that the ADS-B would be a great benefit for air travel, however others argue that there are flaws with Automatic Dependent Surveillance- Broadcast systems could be more harmful than helpful. The pros of increasing safety could be outweighed by the fact that the systems could be easily hacked. The benefits of the Automatic Dependent Surveillance- Broadcast outweigh the negative aspects of the system.

Automatic Dependent Surveillance- Broadcast systems are more reliable than a radar system. This is important because radar systems are currently used to track airplanes. This can be seen as beneficial for many reasons. A system that can track airplane movement more reliably could prevent airlines from going missing or mid-air collisions from happening especially in hazardous conditions such as bad weather. ADS-Bs are do not have moving parts that wear out and have to be replaced, are low power, and have state of the art digital radio technology (ADS-B.com). Typical radars have many parts that get worn out and have to be replaced. The radars typically require high power and some do not have state of the art technology. For these reasons ADS-B systems are more reliable and dependable. Another problem with radars is that they do not work as well thru bad weather and sometimes cannot reach maximum distance when weather is bad. The ADS-B system is not affected by weather like radars. They can reach maximum range without being affected by the weather. ADS-B systems could be able to locate airplanes thru thunderstorms and snow storms. These factors make Automatic Dependent Surveillance- Broadcast systems to be more reliable and efficient than radar systems.

One problem with Automatic Dependent Surveillance- Broadcast systems is that they are not secure. An ADS-B system could be easily hacked by hackers or worse terrorists. Once hackers or terrorists have access to the system they could causes planes to crash into each other, cause planes to crash into the ground, or cause the airplane to lose complete contact with people on the ground. Radars can be hacked, but not as easily as ADS-B systems. Airplanes can also be spoofed onto the radar. The Federal Aviation Association has a system that filters out spoofs, but the spoofs would only be removed from the Automatic Dependent Surveillance- Broadcast ground systems and to airplanes that have the ADS-B systems in them. The aircraft would not be able to determine if the signal it was receiving was from the spoofed aircraft and or an actual airplane that is in the sky. The typical radar does not have this issue. When a spoofed aircraft is detected it is removed and the aircraft does not have a signal sent to them (ainonline.com). The fact that it does not send a signal makes the radar safer for this reason. There have been many concerns raised about the safety of ADS-B systems. The fact that the system is not secure is a major factor for concern about the Automatic Dependent Surveillance-Broadcast system.

ADS-B is better than other systems proposed to the Federal Aviation Association. Many airplanes already have the technology installed that is compatible with the Automatic Dependent Surveillance- Broadcast system and is cost effective. Mode-ES is the current standard in large commercial airplanes (Ads-b.com). A large number of aircrafts are already equipped with Mode-S transponders making the cost to “buy-in” lower for many companies (ads-b.com). The system is reliable for both precision and potential for a bidirectional exchange of data. This would provide significant safety advantages for airplanes enroute. ADS-B is less expensive than other technologies that could be implemented. There could be up to a twenty-six million dollar cap between the instillation of a ground surveillance system and an ADS-B system (ads-b.com). The exact amount of instillation varies between sites depending on the expenses to prepare the site for instillation, but the Automatic Dependent Surveillance- Broadcast system is significantly cheaper to install (ads-b.com). The exact amount of instillation varies between sites depending on the expenses to prepare the site for instillation, but the Automatic Dependent Surveillance- Broadcast system is significantly cheaper to install (ads-b.com). The exact amount of instillation varies between sites depending on the expenses to prepare the site for instillation, but the Automatic Dependent Surveillance- Broadcast system is significantly cheaper. The ADS-B is an effective inexpensive system to install. One of the many benefits of the Automatic Dependent Surveillance-Broadcast is that it is compatible with many aircrafts already and the ones that it is not it is inexpensive to install and use.

The ADS-B system does have its flaws. A major flaw is that the frequency is shared with Mode A, Mode C, and Mode S transponders as well as TCAS and other users (ads-b.com). The system would be on one of the busiest airspaces in the world. This could cause problems because it could take sometime for a signal to go from an airplane to an air traffic controller on the ground. The technology is not extremely profitable. The system is not required in every aircraft, only in aircrafts that have existing Mode-S transponders. This is causing manufactures to not make money off of the technology. Another flaw is that it it would cost about $25,000 to install into airplanes that do not have compatible software and it would take between fifteen and twenty man hours per airplane to install the software for one part of the Automatic Dependent Surveillance- Broadcast system (ads-b.com). This is a large about of man hours for one system to be installed not even considering the other system that could use up to 10 hours of man power and costs an additional six thousand dollars (ads-b.com). This is many man hours for two systems to be installed. The flaws of the Automatic Dependent Surveillance- Broadcast system are displayed in the frequency and the installment of the systems into aircrafts.

The Automatic Dependent Surveillance- Broadcast system provides advantages to the average pilot. The system provides safety advantages for the average pilot. The system has a “see and avoid” capability to accurately track aircrafts and record their positons within thirty feet. This has shown to be helpful in search and rescue operations (ads-b.com). ADS-B would help to arrive at the “free flight” concept that many pilots have been hoping is implemented. The “free flight” concept would allow pilots to fly without being controlled by somebody on the ground. The air traffic control method would allow planes to keep a safe distance while not having to speak to somebody on the ground. ADS-B would allow for this type of air traffic control to work and to be safe for people in the air and people on the ground. The range of ADS-B signal is between one hundred and seventy and two hundred nautical miles depending on if it is air-to-air or air-to-ground (ads-b.com). This is two hundred and thirty miles on the ground at the farthest distance. This is a good range for signal. This range of signal would allow an accurate and precise representation of what is going on in the air. The last advantage for the average pilot is that the system is more accurate than a regular radar. The system does not suffer from attenuation, reflection, or multi-pathing like a conventional radar does (ads-b.com). Automatic Dependent Surveillance- Broadcast is just as accurate at long distances, as it is as short and middle length distances. ADS-B is a more accurate system than a regular radar. The Automatic Dependent Surveillance-Broadcast provides multiple benefits for the average pilot.

ADS-B provide many pros and cons to them. They are more reliable and accurate than a regular radar, but they can be easily hacked into. The fact they can be easily hacked into proposes not only a risk to pilots, but the people on the ground and the passengers inside the aircrafts. The Automatic Dependent Surveillance- Broadcast could allow for a “free flight” system to be implemented in the United States. This is a dream for many pilots because it does not mandate contact with an actual person but allows planes to safely fly within a safe range of each other. The ADS-B is a system that ensures safety for pilots, passengers, and for people on the ground. The Automatic Dependent Surveillance- Broadcast is a cost efficient system that provides safety, accuracy, and reliability to air travel. There are flaws with the system that could causes problems, however the system is a good system. The benefits of implementing the Automatic Dependent Surveillance- Broadcast outweigh the negative factors the system features.

Work Cited

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