ADS-B Session IV
April 5, 2019

ADS-B at KTRK – Development

This session will focus on the process, as we currently understand it, which will allow the airport to deploy an ADS-B system if the Board so chooses.

The System

ADS-B "*Out"* for most aircraft will be required by law, in the U.S. on January 1, 2020. In Europe, it will be required for aircraft greater than 12,566 LBS and faster than 250 knots on June 7, 2020. *"Out",* means the aircraft has the ability to relay flight data (position, speed, altitude etc.) and discrete data regarding the registration and other type and model specific information. The FAA has deployed 750+- ADS-B ground stations across the nation to receive, digest, process, and relay this info back to air traffic controllers. This ADS-B systems works in concert with a multitude of other surveillance technologies such as radar, ground tracking such as Airport Surface Detection Equipment, (ASDE-X) and even multi-lateration to paint a full spectrum picture for air traffic controllers. The big system is called ERAM, En Route Automation Modernization (ERAM).

Our MLAT System

The reason we cannot use our current MLAT system is that it was not designed to a standard currently allowed by the FAA, it doesn't integrate into ERAM, it is not installed redundantly, it does not connect in any way back to the FAA main stream data delivery points etc.

Harris Corporation

ADS-B is a Technology developed with use of Global Positioning Satellites. Harris Corporation, which started in 1895 as a lithographic company, is the prime contractor to the FAA that provides the system (https://en.wikipedia.org/wiki/Harris_Corporation). Harris is one of the largest Federal Contractors and purveyors of telecommunications, defense, and weapons systems technology to the US Government. Their sales revenue exceeds $8 billion annually. Harris won the contract from the FAA to provide **data services. This is very important!** Harris deployed all the ADS-B stations, ground infrastructure, etc., the entire system, on their own dime. The FAA only pays for data once it is delivered into the ERAM system that allows air traffic controllers to safely control aircraft. The FAA does not own or maintain the ADS-B system, and really by definition does not even really own the Next Gen System touted throughout the media – the entire system is owned and maintained by Harris. It is a service delivery contract. Harris also has the ability to resell data from the system to other customers that are authorized to use this data. Big data customers include other Air Navigational Service Providers (ANSP), like Euro-Control and Nav-Canada.

How Do We Get ADS-B At Truckee California?

To get an ADS-B system installed in Truckee we need to work on two parallel paths with two partners, the FAA and Harris, the vendor. **No private entity, domestic airport, person, or company has been allowed to construct an FAA certified ADS-B site and integrate the data into the FAA ERAM system. It has never been done before.** Along comes Truckee Tahoe Airport District who wants to get something done. I spent 18 months working within the bowels of the FAA to find the responsible individual(s) who have authority

over these types of decisions. A lot of time has been spent on the phone and in D.C. with Harris and the FAA trying to understand how we get this project off the ground and assure its success. It turns out the equation for success relied on every single person and organization in the decision making chain:

- Harris Staff And Leadership
- FAA's Air Traffic Management Organizations
- FAA Surveillance And Broadcasting
- FAA Technical Operations
- National Air Traffic Controllers Association
- ADS-B Deployment Office
- FAA Division Of Airports
- FAA Next Generation System Office
- Northern California TRACON
- Oakland Center
- FAA Contracting and Legal

If you want, to understand how all these fit together you can buy me breakfast, lunch and dinner over the course of a few weekends and I can describe it for you. We have almost gotten there!

Here Is Where We Are At With the Contracts

In fall of 2018, the FAA finally granted permission to the Truckee Tahoe Airport District to submit a Service Volume Design Document (SVDD) to both the FAA and Harris. This is a technical engineering report that summarizes the exact nature of the coverage we are requesting, what points need ADS-B coverage, at what altitudes for each procedure and en-route activity for KTRK and the surrounding airports. (The FAA made a requirement that we not only show benefit for KTRK but also for other surrounding airports, KTVL, KRNO, etc.) as well as the entire regional airspace system. That document is complete. Harris is reviewing it. For the privilege of investigating this potential ADS-B solution, the FAA required a legal agreement that TTAD cover the associated cost of every step required to approve this SVDD document. This is called a Reimbursable Agreement, (RA). This agreement is a contract between TTAD and the FAA, this document has been completed and TTAD paid the FAA approximately $42,000 for anticipated cost associated with the first phase of the ADS-B project, which includes review and approval, within the FAA, of the SVDD.

How Does The SVDD Determine The Form And Cost Of The Final ADS-B System?

Harris is using the SVDD as a schematic design tool. The engineers use this document to design a system that can see an aircraft at every point in space and every altitude near the points and paths outlined within the SVDD. Imagine flashlights in a small dark room with a couch. If every point in the room required illumination, without any shadow, there would be a certain geometry and number of flashlights required to provide this. Another way to understand this concept is a lawn sprinkler head that is round covering a square lawn. Multiple sprinklers would be required to cover the lawn and each would overlap to some degree to provide seamless coverage. Once the engineers understand approximately, how to achieve the specified coverage a rough estimate of system cost can be developed.

Where We Are Today

The Harris engineers are finding the right number of stations, the correct placement, aspect, and height to provide coverage specified within the contractual agreement between the FAA and TTAD outlined in the SVDD document. Once Harris is assured they understand these requirements for station placements, they will provide the TTAD with several items:

1. A contract for design and engineering of the system that meets the specification of the SVDD and the FAA. This design and engineering cost will be $50-$75K. This has not been completed.
2. A rough estimate of the total, non-recurring build cost to develop the system. This includes the actual construction of the ADS-B sites.
3. A rough estimate of total recurring cost. This includes the cost of data and telecommunications, power, integration with the FAA, and display technology so the TTAD and our control tower can use the ADS-B system.

What is an ADS-B Site?

An ADS-B site is a location where antennae(s) 8' tall by about 8" wide may be hung up on a tower with cables running down to a building. Within the building is a server rack, telecommunication equipment, redundant power generators, batteries, and security equipment. This site may be constructed by Harris or leased. It may be on airport property or on the top of Squaw Valley, Northstar, or Mt. Rose. It is required to have power, communications, backup equipment, and security apparatus like fences, alarms etc. We have been working with Squaw and Northstar for some time trying to understand our ability to enter into a ground lease for deployment. These discussions look promising. Once we receive the final word from Harris on potential sites, discussions will be more definitive and useful.

Summary

Based on this groundbreaking concept of a private ADS-B system partnership, considerable discovery is required prior to any decision making. The Board of Directors prioritized investigation of a potential ADS-B system deployment as a top priority for staff in 2018 and the GM integrated it in the District project goals. In April Staff will provide a full update for the Community, Staff and Board on the current progress of the ADS-B investigative initiative. A full decision for program initiation and funding is tentatively scheduled for the June Board meeting. This is contingent upon Harris Corporation delivery the final rough estimation of cost along with the draft design and engineering agreement for full system deployment. As always, feel free to call, email or visit me for clarification of anything in this memo or the entire ADS-B program. Our goal is to provide the Community, Staff and Board all information related to this subject for a fully informed dialogue.

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