



The ADS-B Multi-Link Alternative

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Introduction

- The technical assessments of the individual candidate ADS-B links indicate that no single ADS-B can satisfy all future requirements
- Different factors are the motivators for ADS-B equipage
 - users seeking improved efficiency to give economic benefits
 - users seeking improved safety
- A multi-link solution has the potential to support a package of services attractive to each segment of the aviation community but with added complexity and potentially additional cost burden for some or all users
- The FAA, with the support of MITRE/CAASD, has investigated the functionality of a range of possible ADS-B multi-link configurations

Multi-link Overview

- Various combinations of UAT, 1090 MHz Extended Squitter and VDL Mode 4 capabilities were considered
- Accommodation onboard the aircraft and/or by the ADS-B ground stations were considered
- The ideal situation is where every ADS-B aircraft can be seen by every other ADS-B aircraft and by every ADS-B ground station
 - each multi-link alternative should provide this capability for those users willing to equip with the compatible reception configuration

Multi-link Configurations

- One set of alternatives rely on a ground cross-link gateway to accommodate different ADS-B airborne technologies within common airspace
 - limits multi-link accommodation to coverage of ground stations
- Another set of alternatives rely on some or all aircraft being equipped with a multi-link capability
 - most robust technical alternative but presents a cost burden to some or all airborne systems/installations
- Another means of accommodating a multi-link solution for the NAS would be via airspace segregation
 - most aircraft would only need to carry a single link

The Multi-link Goal

- Our goal, as the aviation community, should be to identify the multi-link alternative(ies) that would provide:
 - the greatest flexibility for users to select their preferred link
 - that minimizes any cost burden to the user from allowing multiple ADS-B links within the NAS
 - that satisfies the operational requirements for the ADS-B services that are of interest to each class of user
 - that maximizes the voluntary user equipage with ADS-B