

Airservices Australia and Space Based ADS-B



GET FITTED IN TIME

ADS-B

Flying IFR? We're urging all IFR aircraft to allow enough time to be fitted with ADS-B ahead of CASA's 2 February 2017 fitment mandate.



| Where do you fit? | On or after | Requirement |
|-----------------------------------------------|---------------------------------|-------------------------------------------------|
| All flights at/above FL290 | Implemented on 12 December 2013 | Must be ADS-B capable |
| Addition to Australian register | Implemented on 6 February 2014 | Must be ADS-B capable GNSS avionics required |
| Replacement transponder | Implemented on 6 February 2014 | Must be ADS-B transponder |
| Operating 500NM from Perth | 4 February 2016 | Must be ADS-B capable |
| IFR aircraft (aerial work/private operations) | 4 February 2016 | GNSS avionics required |
| Operate to BNE, SYD, PER or MEL | 4 February 2016 | Mode S transponder required |
| All IFR aircraft | 2 February 2017 | Must be ADS-B capable |

More information on ADS-B mandates is available at
www.airservicesaustralia.com/projects/ads-b/other-mandates-2014-2017



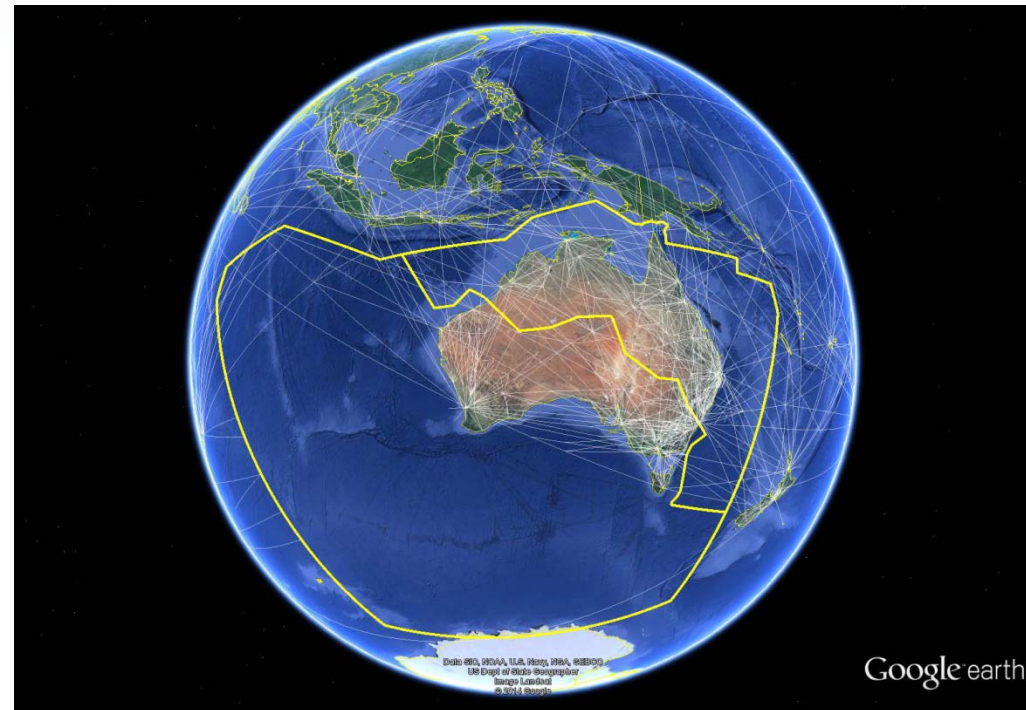
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Australian FIR environment



- Two large FIRs with enormous Oceanic areas
- Ground based ADS-B infrastructure available over landmass
 - ➔ **A decade of operational experience**
- ADS-B mandates in place and 99% of flights equipped above FL285
- Desire to reduce separation standards in Oceanic airspace
 - ➔ **A Good candidate for space based ADS-B**
- Long routes with low traffic density
 - ➔ Any business case for space based ADS-B is not as strong as North Atlantic

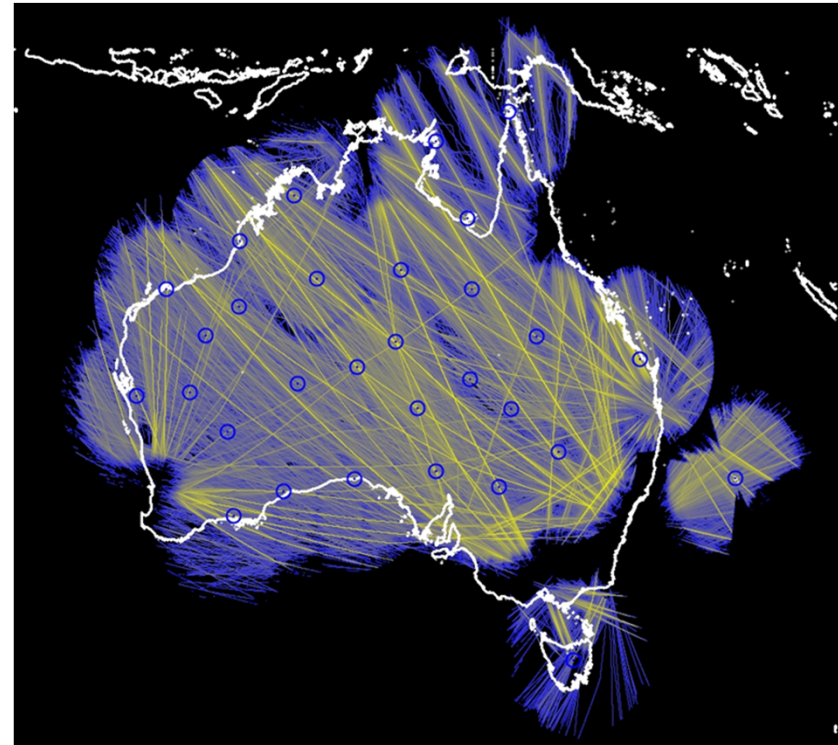


**All IFR ADS-B mandate
Feb 2017**

Benefits of Space based ADS-B (Depends on the environment)



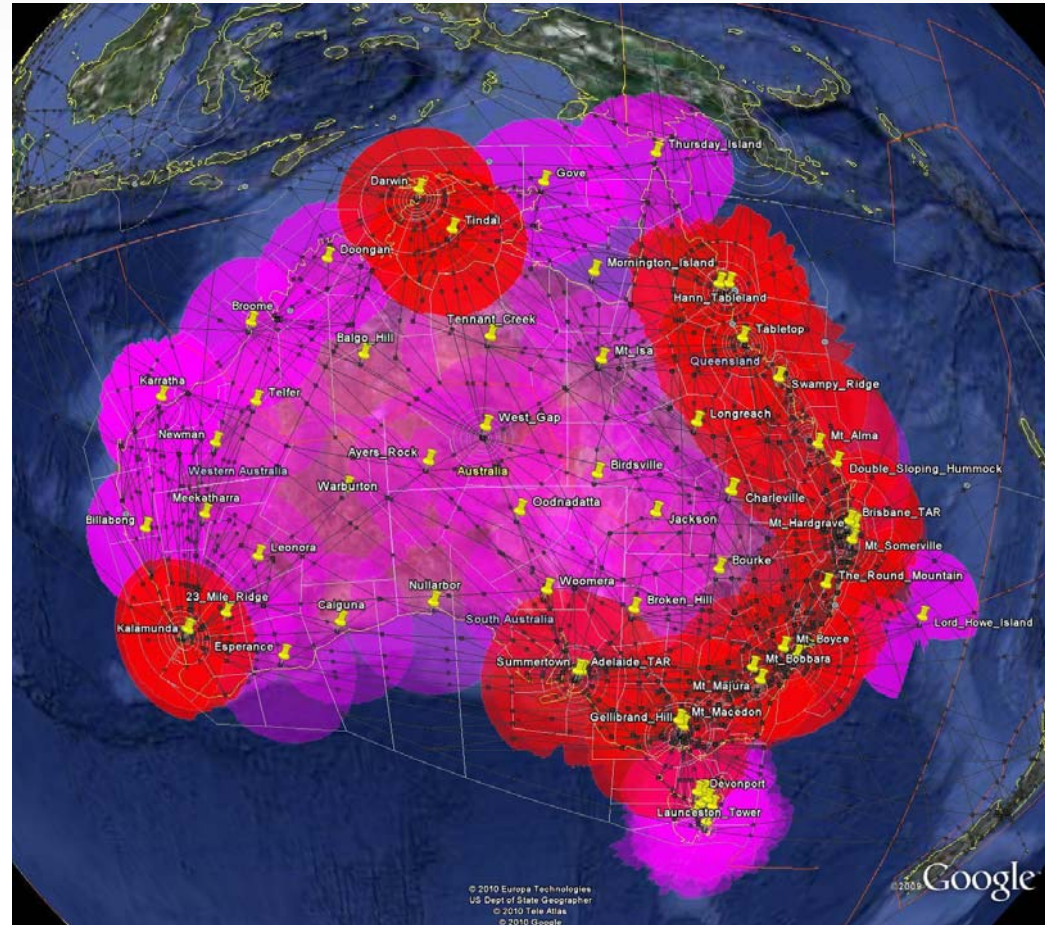
- Airservices Australia recognises the potential benefits
 - Reduced oceanic separation allowing
 - **Optimal flight levels/ flexibility**
 - **Greater traffic capacity (if tracks were fully loaded)**
 - **Support UPRs**
 - Backup / redundancy
 - **For large aircraft**
 - FIR Boundary situational awareness & safety
- Business case depends on price of service



Reduced Oceanic Separation Candidates for Australia



- FANS 1/A CPDLC + ADS-C
 - can support 30/30 (for RNP4 aircraft)
 - Will “Global tracking” affect equipage / log on rate?
- Space based ADS-B supported by suitable direct pilot-controller communications
 - CPDLC ?
 - Satellite voice ?
 - target 15-15 separation
- ADS-B IN using ITP and CPDLC



Note : Space based will not support aircraft with a bottom only antenna - not suitable to support GA aircraft as a ground station alternative

Space based ADS-B uncertainties



- It is too early for Airservices Australia to commit to using space based ADS-B
 - Sounds promising & worth analysis
 - We are currently very busy with planning a new ATM system & managing the 2016/2017 ADS-B mandates

- We can wait for some uncertainties to resolve
 - What will the service cost be ?
 - When will it really be service ready?
 - Will actual achieved performance be acceptable ?
 - What update rate ?
 - Achieved performance?
 - Reliability of service?
 - What is the realistic pilot-controller coms?
 - How do you route sat voice to the correct controller?
 - Are all institutional issues resolved?

 - Will business case support Space based or FANS1A or ADS-B IN ?

Airservices Australia position for our environment



- **We are supportive of the analysis work**
 - Eg Airservices is supporting SASP modelling work for collision risk based separation minima using Space ADS-B in Atlantic

 - Eg Space based ADS-B is in our strategic plan

- **BUT the business case is unclear for Australia**
 - On our “skinny” routes
 - Which technology will best deliver reduced separation in our environment?
 - What is the exact cost?

- **No advantage for us to invest (yet)**
 - But we are watching carefully !

- **We can connect quickly later because we already have an ADS-B backbone (Asterix Cat21) and ATM system onto which we could easily add Space based ADS-B data.**



It is just ADS-B

Will we keep our Ground Stations



- **Yes**

- Support General aviation with bottom only antennas and low power
- Ground stations at VHF com sites
- Higher update
- Higher reliability
- Known/ proven – no risks

Will we use space based ADS-B



- **Probably – depending on cost**

- FIR boundary safety & seamlessness

- Maybe safety nets

- Maybe backup overlay

- **Separation & efficiency**

- Depends on comparative business case

Some things are common Space or Ground Based

- You need ATC system capability
- ADS-B mandates
- ADS-B fitment
- ADS-B separation approval by regulator

Key issues

- Total service cost
- The communications solution
- Can we wait & reduce risk?
 - Yes, in our case
- We encourage competition
 - to drive costs down
- We encourage those with a strong business case (depends on the environment)



Questions?

