

# ADS-B and Electronic Flight Bag

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# Why ADS-B, Why not radar?

- Accuracy
- Update rate
- Air-to-ground and air-to-air



## Why delegated separation vs. a spacing task?

Minimizes the latency in adjusting to be closer to the actual separation standard

- Doesn't require controller intervention time
- Same quality of surveillance data available in the cockpit as on the ground (or even better)



# ADS-B In Trail Procedures Overview

Why is United interested in In-Trail Procedures?

- ITP Business Case
- ITP installation

Flight Crew Training Methodology

- Computer Based Training
- In aircraft “live” training

What makes ITP different from other ATC procedures and clearances?

Training summary and follow-on “ADS-B In” applications

## Why is United doing ITP?

FAA wants to accelerate technologies associated with the NextGen Air Traffic Management environment

FAA funded the avionics development and equipage of 12 UA B747-400 aircraft,

- Over \$20M in taxpayer investments
- Over \$5M in UA in-kind expenses

UA to demonstrate the business case for ITP



## What does ITP do for an airline?

- Safety and efficiency: A tool for pilots to avoid being trapped at a turbulent or inefficient altitude
- Greatly enhanced situational awareness compared to a “TCAS only” traffic display
  - Improved situational awareness of proximate traffic – enhances inter-flight communications on ride reports, wind reports, weather hazards
  - Improved safety during weather deviations
- No change in pilot/controller responsibilities
  - ATC clearance based on reported distance between aircraft, and distance/closure limits of the procedure

## ITP Business Case

- Lower fuel burn due to reduced contingency fuel carried
  - Still need contingency fuel for reasons including:
    - Destination/alternate weather
    - Turbulence or convection that causes an inefficient vertical or horizontal routing profile
  - May not need as much contingency fuel due to the lower probability of being stuck at an inefficient altitude

## What makes ITP different?

- ITP is a relatively “straightforward” procedure, however it does include the requirement for flight crews to re-validate that they still meet the ITP initiation criteria after receiving the ATC clearance
  - If the initiation criteria are not met, the flight crew must not initiate the ITP maneuver, and must decline the ATC clearance

## ADS-B ITP Benefits

- Increased ability to reach optimal aircraft performance altitude
- Reduced fuel consumption: ITP savings estimated at \$200K+ per aircraft per year
- Optimized contingency fuel on all equipped flights, allowing more high value cargo to be carried on MTOGW flights
- Improved situational awareness for strategic decision making and safety

# Electronic Flight Bag Class 1 Type A Application



# iPad Operational Approvals

- Completed all requirements in 8900.1 CHG 47 including checklists
- Operational Authorization Requirements
- EMI Testing
- Developed & executed test plans for each aircraft type
- Coordinated with FAA
- Rapid Decompression
- FAA has accepted Jeppesen commissioned rapid decompression testing on the iPad 2
- Dangerous Goods (Lithium Polymer Battery)
- Approval granted by FAA Dangerous Goods Office
- Flight Crewmember Approved Training

# Future Plans

- Goals
- Remove as much paper as possible from the cockpit
- Remove AFM, FOM, & WOM from flight bags
- Use devices to accomplish CBT training
- WX download and storing via WSI App
- EFB Class 2 EFB (iPad) Type B is Current Primary Focus
- Mount, Power, and 429 Bus Connections
- Airport Moving Map and Weather via WSI App
- Device will stay on the aircraft and have 3G/4G Connectivity
- EFB Class 3 dependent upon in-trail procedures business case

**Questions?**

A STAR ALLIANCE MEMBER 

