

TIS-B/ADS-R SERVICE STATUS

Presented to: RTCA SC-186 PLENARY

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Overview

- **Background**
- **Operational Concept**
- **Ground Concept**
- **MOPS Changes**
- **What's Next**
- **Summary**

Background

- **Purpose:** Determine ASAS MOPS Requirements for TIS-B/ADS-R Service Status
- **Why:** Ad Hoc Group formed to deal with non-concur FRAC comment
- **Start:** Started with no ASAS MOPS Req
- **Actions:**
 - Developed Operational Concept
 - Validated UAT Ground Concept
 - Developed 1090ES Ground Concept
 - Developed ASAS MOPS Requirements

Operational Concept

- **TIS-B & ADS-R Service Status combined in one message**
- **Pilot shown if traffic is complete or incomplete**
 - Message indicates loss of SS if TIS-B or ADS-R lost
- **Service Status integrated with system and ops status indications (on/off/test/etc)**

Operational Concept

CDTI Display	Meaning
ADS-B	<ul style="list-style-type: none"> ▪ ASSAP and CDTI are functioning <ul style="list-style-type: none"> • There are no dropped ADS-B Targets • Ownship is receiving TIS-B/ADS-R Service • Ownship Position information meets Table 2.2 requirements
ADS-B Or ADS-B Fail	<ul style="list-style-type: none"> ▪ ADS-B System is Failed (ASSAP/CDTI monitor indicates failure) ▪ Ownship position invalid or doesn't meet Table 2.2 requirements
ADS-B Incomplete Or Traffic Incomplete	<ul style="list-style-type: none"> ▪ TIS-B or ADS-R is unavailable or outside TIS-B/ADS-R Service* ▪ An ADS-B target within 15 nm has been dropped from the display
ADS-B TEST	ADS-B System is in Test Mode
ADS-B OFF	The ADS-B System has been turned off or the transponder has been turned to off or to standby in transponder based systems.

Ground Concept

- **TIS-B/ADS-R In-Service message (Airborne)**
 - 1090ES: Three 24-bit addresses can reside on each In-Service message.
 - UAT: 105 24-bit addresses can reside on each In-Service message.
 - Update Rate:
 - 1090ES: 30 sec (95%)
 - UAT: 20 sec (95%)
- **TIS-B/ADS-R Out-of-Service message (Airborne)**
 - 1090ES Only
 - Transmitted to ensure aircraft receipt within 30 sec at 95% probability.
 - Airborne Time-out at 45 sec ensures “Traffic Incomplete” if Out-of-Service missed
- **TIS-B/ADS-R Surface Service Volume Status message:**
 - Separate Service Status Message for 1090 & UAT
 - Encodes 3-Letter airport identifier for 4+airports and status
 - Necessary for ASSA/FAROA

MOPS Changes

- **2.2.5.3** **ASSAP Input Data Monitoring**
- **2.2.5.3.1** **ADS-B Report Interface (Tweaked)**
 - » ADS-B Monitor
- **2.2.5.3.2** **TCAS Interface (Tweaked)**
 - » Pass along TCAS Status
- **2.2.5.3.3** **Ownship State Data Interface (Tweaked)**
 - » Indicate Ownship data degradation or fault
- **2.2.5.3.4** **TIS-B/ADS-R Service Status Interface (Added)**
 - » TIS-B/ADS-R Service Status Processing & Timeout
 - » Proximate ADS-B Traffic not meeting Table 2.1 Requirements

MOPS Changes (Cont)

- **2.3.6.3 Display of System Status** [Replace Para/Subpara]
- **System Status shall be displayed in a manner consistent with the overall flight deck design philosophy. An example of a combined system status and operating status is included in Appendix H.**
- **2.3.6.31 ASSAP Self Test**
- **2.3.6.3.2 ASSAP Continuous Monitor**
- **2.3.6.3.3 CDTI Self Test**
- **2.3.6.3.4 CDTI Continuous Monitor**

MOPS Changes (Cont)

- **2.3.6.4 Display of Operating Status**
- **2.3.6.4.1 ADS-B Monitor**
- **2.3.6.4.2 TCAS Operating Status**
- **2.3.6.4.3 Ownship Status**
- **2.3.6.4.4 TIS-B/ADS-R and ADS-B Service Status**

General Issues

- **Boundary Awareness:**
- **TCAS Equipped Aircraft:**
- **RF Mitigation:**
- **Combined Operating Status, System Status, and Service Status**
- **Nuisance Status Changes near boundaries**
- **Operating in Non-Radar Airspace**
- **International Harmonization**

What's Next?

- **Accept Ground Concept**
- **Accept ASAS MOPS Requirements**
 - WG#4 Proceed with incorporating in MOPS
- **Tweak Ground Concept into Recommendations to FAA SBS for Critical & Essential Service Spec Changes**
- **Review Link MOPS for possible changes**

Summary

- **Ops & Ground Concept Complete**
- **ASAS MOPS Requirements Complete**
- **Next Steps**
 - Essential/Critical Svc Spec Change Recommendation
 - Link MOPS Review