

ARINC Project Initiation/Modification (APIM)

1. Name of Proposed Project

APIM #: 10-010

ISS with ADS-B OUT & ADS-B IN Capability

Software specification only

yes no

1.1 Name or Originator & Organization

Jessie Turner, Boeing

2. Suggested Subcommittee Assignment (who acts)

2.1 Identify AEEC group

ARINC 768, ISS WG

2.2. Support for the activity (to be confirmed)

Airlines: Lufthansa (DLH), Air France, UPS, FedEx, United, American

Airframers: Airbus, Boeing

Suppliers: Honeywell, Rockwell Collins

Others:

2.3. Commitment for resources (directly from participant) (to be confirmed)

Airlines: Lufthansa (DLH), Air France, UPS, FedEx

Airframers: Airbus, Boeing

Suppliers: Honeywell, Rockwell Collins

Others:

2.4. Recommended Coordination with other groups

The following working groups are relevant to this topic:

- RTCA SC-186
- EUROCAE WG51

3. Project Scope

3.1 Description

This project will start from the ARINC 768-1 ISS characteristic, to create an ARINC 768-2 which will introduce the ADS-B OUT (per DO-260B) and ADS-B IN capability in the ISS characteristic. The ARINC 768-2 characteristic will address form, fit and function. Note that this effort is equivalent to:

- 1) The ADS-B OUT (per RTCA DO-260B) effort currently taking place in ARINC 718A-3 (Transponder), and
- 2) The ADS-B IN effort that was recently completed in going from ARINC 735A (TCAS) to ARINC 735B (Traffic Computer).

The project will address:

- 1) The ADS-B OUT functional requirements defined in RTCA DO-260B (1090MHz ADS-B/TIS-B MOPS)
- 2) The ADS-B IN applications to come in the near future, and will prepare provisions for longer term ADS-B IN applications. Near-term ADS-B IN applications, consistent with applications defined by the Requirements Focus Group (RFG) and RTCA/EUROCAE committees (e.g. In-Trail Procedures, Interval Management, Visual Acquisition, Surface Monitoring, etc), will be part of the functions that will be introduced by ARINC 768-2. Provisions will be defined for longer term ADS-B IN applications (e.g. Independent Closely Spaced Parallel Approaches (ICSPA).

The project will introduce new Input/Output signals compared to ARINC 768-1, to support ADS-B functions (ADS-B OUT, Near-term ADS-B IN applications, and provisions for longer term ADS-B IN applications).

ARINC 768-2 will still support the basic ATC transponder, TCAS, TAWS, and WXR functions, with the same safety and availability characteristics, and will add new functions:

Additional inputs to support DO-260B ADS-B OUT

ADS-B IN (1090 MHz)

TIS-B IN (1090 MHz)

Traffic data fusion between TCAS (Mode S, Mode A/C), ADS-B and TIS-B data

Output of traffic data to the Display System(s) following DTIF format

Output of data to MCDU/Displays, to allow the crew to access details concerning all traffic data

Input from MCDU (or other selection means) for the flight crew to highlight traffic of interest

Feedback from the Display system, to know which traffic is displayed.

Provisions for future ADS-B IN functions.

ARINC 768-2 will address:

- 1) Production aircraft with Common Data Network/AFDX architecture
- 2) Production and retrofit aircraft based on an ARINC 429 federated architecture

3.2. Planned usage of the envisioned specification

New aircraft developments currently use this specification, but other aircraft models implementing ADS-B IN applications may also use ARINC 768 utilizing ARINC 429 inputs/outputs.

Airbus: A380/A350

Boeing: B-787

yes no

Mandate/regulatory requirement

Please specify program and date: FAA & EASA mandates for ADS-B OUT per DO-260B. Publishing of FAA mandate expected April 2010.

yes no

Modification/retrofit requirement

Please specify: Airbus A380

Boeing B-787

yes no

Airframer and/or airline projects to use this specification

Intended for Airbus and Boeing retrofit and forward fit.

yes no

Is the infrastructure standard for the aircraft defined?

Yes. ARINC 768 ISS is installed on A380 and B787.

yes no

When is the ARINC standard required? March 2011

Date is driven by FAA & EASA ADS-B OUT mandates, as well as incorporation of ADS-B IN applications into production models.

Are 18 months (min) available for standardization work?

If 'No' please specify solution: Changes required to ARINC 768 are already being identified in ARINC 718A-3 (Transponder) for ADS-B OUT and have already been identified in ARINC 735B (Traffic Computer) for ADS-B IN. Therefore, this activity is expected to take less than 18 months.

yes no

Patent(s) involved?

If 'Yes' please describe: (to be investigated)

yes no

3.3. Issues to be worked

The main issues to work are:

- Agree on the system interfaces
- Identification of the new ADS-N IN applications to be addressed.

These issues should be mitigated based on prior work on ARINC 718A-3 (Transponder) and ARINC 735B (Traffic Computer).

4. Benefits envisioned

4.1. Basic benefits

Projects benefiting from this effort would be all in-production aircraft and major retrofit programs.

Operational enhancements (reduction in DOC?) yes no

Form, Fit, Function, (FFF) standard (HW and/or SW):

a. ARINC 600 form (only HW) yes no

b. Interchangeable fit (plug, mount, SW loading interface, etc) yes no

c. Interchangeable function yes no

If not fully interchangeable, please explain:

Interface and protocol standard (for aircraft defined in 3 scope) yes no

Please specify:

Product offerable from more than one supplier (competitive environment) yes no

Please identify: Honeywell and Rockwell Collins are definite candidates.

ACSS is a possible candidate.

4.2 Specific project benefits

ARINC 768-2 will enable the development of ISS with ADS-B OUT & ADS-B IN capabilities by different suppliers, while maintaining today's situation where the ISS equipment are interchangeable, and where the airlines can choose their supplier.

4.3 Project Benefit for Airlines

This standard will provide several benefits to Airlines:

- ADS-B IN applications will improve flight safety by improved situational awareness of surrounding traffic (airborne and surface)
- ADS-B IN applications will improve flight efficiency by allowing approach, landing, or cruise maneuvers which are not possible today, without sufficient knowledge of the traffic
- Allow the airlines to choose between different suppliers

