

## ARINC Project Initiation/Modification (APIM)

### 1. Name of Proposed Project

APIM 15-005

ARINC 702A-5: Advanced Flight Management Functional Definition

Software specification only

yes  no

### 1.1 Name of Originator & Organization

Mike Bakker, GE Aviation Systems LLC

### 2. Suggested Subcommittee Assignment and Project Support

#### 2.1 Suggested AEEC group

FMS Subcommittee

#### 2.2 Support for the Activity (as verified)

##### Airlines:

American Airlines

Delta Air Lines

FedEx

Lufthansa

Southwest

TAP Portugal

United Airlines

US Air Force

UPS

##### Airframers:

Airbus

##### Suppliers:

Esterline CMC Electronics

GE Aviation

Rockwell Collins

Thales

##### Others:

The MITRE Corp

SABRE

### 2.3 Commitment for Drafting and Meeting Participation (as verified)

Organizations: GE Aviation, MITRE

### 2.4 Recommended Coordination with other Industry Groups

The following AEEC Subcommittee activities are relevant to this topic:

- SAI Subcommittee (ARINC Report 660B)

The following RTCA/EUROCAE activities are relevant to this topic:

- RTCA SC-227/EUROCAE WG-85 (DO-236C - Change 1 / ED-75D)
- RTCA SC-214/EUROCAE WG-78 (DO-350 / ED-228)

## 3. Project Scope

### 3.1 Description

A number of key technologies have emerged and evolved in a manner different than that envisioned at the time ARINC 702A was written. Many of these evolutions are discussed in ARINC 660B and part of the larger CNS/ATM initiatives of NextGen and SESAR to increase the capacity and efficiency of the airspace. These evolutions include enhanced datalink, satellite-based approach procedures, airport moving map and guidance, and electronic flight bags. Other evolutions include graphical user interfaces (ARINC 661) and software partitioning (ARINC 653).

The project proposed will prepare Supplement 5 to ARINC 702A to take the aforementioned evolutions into account and thus align the standard with the current and future avionics architectures as detailed in ARINC 660B. The standard will also be updated to align with and point to applicable RTCA/EUROCAE standards in support of NextGEN and SESAR initiatives such as Performance-Based Navigation (PBN), Trajectory Based Operations (TBO), and enhanced datalink.

The resultant ARINC 702A-5 will be used for new airplane development programs as well as retrofit programs to better equip aircraft for operation in the NextGen and SESAR airspaces. It is recognized that some existing sections of ARINC 702A may not directly apply to some newer avionics architectures. It is hoped that a future project will address this issue and the other evolutions identified earlier (i.e. graphical user interfaces, software partitioning) as part of a future ARINC Project Paper 702B. In any case, it should be recognized that: (a) the proposed changes are applicable to both older and newer avionics architectures and (b) many older aircraft will operate in the NextGEN and SESAR airspaces and will benefit from an updated ARINC Standard.

### 3.2 Planned usage of the envisioned specification

New aircraft developments planned to use this specification

yes  no



Update Flight Management Function description to reflect industry guidance and lessons learned on design of FLS/IAN for use flying non-precision approaches. Update attachment 4 for this interface.

Update Flight Management Function description for FAS Data Block interface to the GNSS/MMR receiver in support of LPV approaches. Add/update attachment for this interface.

Update Flight Management Function description to reflect the role of the FMS in supporting and supplying the data necessary to support Airport Surface Guidance. Add/update attachment for this interface.

Update Flight Management Function datalink description(s) to reflect evolutions in the industry for SESAR and NextGEN. Align the EPP frame definition and ARINC 702A intent bus definition.

Other editorial changes as needed for clarification and/or alignment with RTCA DO-236C – Change 1 and RTCA DO-350.

Address MCDU, EFIS, and Cursor Control Device references to, at a minimum, recognize emergence of graphical user interfaces (ARINC 661) and the various other control/display devices.

Provide recommendation for Backup Navigation function and the corresponding interface. Backup Navigation has traditionally been implemented in the MCDU but may be hosted on other hardware devices.

Discuss and possibly extend the ACARS interface to support EFB applications, airline applications, and airframer applications.

## 4. Benefits envisioned

### 4.1 Basic benefits

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. Software specification only yes  no

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

d. Interchangeable function yes  no

If not fully interchangeable, please explain:

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

Please specify: FMC/Data Link Interface

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

Please identify:      Aircraft manufacturers, avionics manufacturers

## 4.2 Specific Project Benefits

This project will bring ARINC 702A into alignment with industry initiatives and activities that have transpired since the last major update. It provides a forum to advance and shape those initiatives from an airline and manufacturer perspective. In many ways, it is an extension of the concepts and requirements outlined in ARINC 660B. It will advance the NextGen and SESAR operational concepts which, in turn, provide a number of benefits to airlines, airframe manufacturers, and avionics suppliers.

### 4.2.1 Project Benefit for Airlines

Airlines will benefit from increased standardization and clarification of the Flight Management Computer functionality and its role in bringing about the future airspace. Airlines could also benefit from more clarity relative to the datalink interface and an enhanced ACARS interface.

### 4.2.2 Project Benefit for Airframe Manufacturers

Airframe Manufacturers will also benefit from increased standardization and clarification of the Flight Management Computer functionality and its role in bringing about the future airspace. Manufacturers could also benefit from more clarity relative to the datalink interface and may derive benefits from an enhanced ACARS interface.

### 4.2.2.3 Project Benefit for Avionics Equipment Suppliers

Avionics Suppliers will benefit from increased standardization and clarification of the Flight Management Computer functionality and its role in the evolving airspace. Suppliers will also benefit from more clarity relative to the datalink interface. A clear picture of both airline and airframe manufacturer needs and preferences relative to the evolving airspace will help guide research, investment, and implementation.

## 5. Documents to be Produced and Date of Expected Result

ARINC 702A-5: Advanced Flight Management Computer System Standard

## 6. Meetings/Expected Document Completion

The following table identifies the number of meetings and proposed meeting days needed to produce the documents described above.

This activity to be completed within the approved work program and meeting schedule for the FMS Subcommittee:

<b>Activity</b>	<b>Mtgs</b>	<b>Mtg-Days 2016</b>	<b>Mtg-Days 2017</b>
ARINC 702A-5	6 meetings (3 per year)	9	9

**In-person meetings will be augmented with monthly web conferences as needed.**

**6.1 Expiration Date for this APIM**

December 2017

**7. Comments**

Send this document to the AEEC Executive Secretary and please include any other information deemed useful for managing this work.