

## **ARINC Project Initiation/Modification (APIM)**

- 1.0 Name of Proposed Project** **APIM 18-001A**  
New ARINC Project Paper 8xx: 5<sup>th</sup> Generation Cabin Network (5GCN)
- 1.1 Name of Originator and/or Organization**  
Cabin Systems Subcommittee (CSS)  
Rolf Goedecke, Airbus
- 2.0 Subcommittee Assignment and Project Support**
- 2.1 Suggested AEEC Group and Chairman**  
Cabin System Subcommittee (CSS)  
Dale Freeman, Delta Air Lines
- 2.2 Support for the activity (as verified)**  
Airlines: Delta Air Lines  
Airframe Manufacturers: Airbus  
Others: Collins, Panasonic, Thales, ZII, Amphenol, Molex, Souriau, Radiall, TEC, Miltope
- 2.3 Commitment for Drafting and Meeting Participation (as verified)**  
Airlines: Delta Air Lines  
Airframe Manufacturers: Airbus  
Others: Collins, Panasonic, Thales, ZII, Amphenol, Molex, Souriau, Radiall, TEC, Miltope
- 2.4 Recommended Coordination with other groups**  
Network Infrastructure and Security (NIS), Fiber Optic Subcommittee (FOS)
- 3.0 Project Scope (why and when standard is needed)**
- 3.1 Context**  
The scope of this project is to develop the next generation (5<sup>th</sup>) Cabin Distribution Network as an enhancement of the 4GCN standard. The standardization will combine multiple networks to a distribution network with single backbone. Advantages of the new fiber components (ARINC 846) as well as the next generation cabin network bus (ARINC 854) with a special focus on the topology with consideration of future bandwidth needs, redundancy, reliability and reconfigurability. The standard includes connectors, pin allocation, data bus and the protocol of the interfaces to allow interchangeability. An effort will be made to create a plug-and-play standard for in-seat and cabin peripherals.
- 3.2 Description**  
A standardized system answering a set of agreed customer functions and needs with a standardized network topology scalable to aircraft size and customer options with standardized interfaces and provisions in the aircraft to reduce the customization effort to a minimum.

### 3.3 Planned usage of the envisioned specification

- New aircraft developments planned to use this specification      yes  no   
    Airbus:            all new  
    Boeing:
- Modification/retrofit requirement      yes  no   
    Specify: Airlines are retrofitting cabin systems into their existing fleets.
- Needed for airframe manufacturer or airline project      yes  no   
    Specify: driven by the need to provide common definitions for the airplane programs and retrofit programs
- Mandate/regulatory requirement      yes  no   
    Program and date: No mandate
- Is the activity defining/changing an infrastructure standard? yes  no   
    Specify:
- When is the ARINC Standard required? Per aircraft program  
What is driving this date? Aircraft Development Schedules
- Are 18 months (min) available for standardization work?      yes  no   
    If NO, please specify solution: Not applicable
- Are Patent(s) involved?      yes  no   
    If YES please describe

### 3.4 Issues to be worked

- Functions
  - Provide high bandwidth to all passenger seats and connected cabin equipment
  - Network security considerations
- Architecture
  - Definition of single cabin backbone and system topology to minimize customization effort and to allow scalability
- Interface
  - Definition of standardized mechanical and electrical interfaces to the aircraft
  - Connectors and cabling and electrical interfaces for cabin devices

### 4.0 Benefits

#### 4.1 Basic benefits

- Operational enhancements      yes  no   
For equipment standards:
- (a) Is this a hardware characteristic?      yes  no   
(b) Is this a software characteristic?      yes  no   
(c) Interchangeable interface definition?      yes  no

(d) Interchangeable function definition? yes  no

If not fully interchangeable, please explain: \_\_\_\_\_

Is this a software interface and protocol standard? yes  no

Product offered by more than one supplier yes  no

Identify:

#### 4.2 **Specific project benefits (Describe overall project benefits.)**

The standardization of the 5GCN will increase the bandwidth needed for future and will take advantage of new high-speed network components.

##### 4.2.1 **Benefits for Airlines**

The standardization of the 5GCN will ease customization and integration of such equipment in commercial aircrafts and allows fleet commonality between suppliers

##### 4.2.2 **Benefits for Airframe Manufacturers**

It will provide the required bandwidth for future needs and makes use of new highspeed network components in order to simplify the cabin networks. It allows to standardize the provisions on the aircraft and reduces the lead time for the airlines as there is interchangeability of units, using the same mechanical and wiring provisions as well as data bus protocols.

##### 4.2.3 **Benefits for Avionics Equipment Suppliers**

This standard supports the main goals to provide high bandwidth in conjunction with reliability and easy configurability by a simplified and harmonized topology and using the latest commercial standards to guarantee the quality of service. A single standard among different suppliers allows interchangeability and reduces development cost and therefore cost for the airlines.

#### 5.0 **Documents to be Produced and Date of Expected Result**

- **New ARINC Project Paper 8xx: 5GCN Seat Network**
- **Supplement 1 to ARINC Specification 846: Fiber Optic Ferrule, Mechanical Termini**
  - Develop new hybrid MT fiber and copper insert, using a new ARINC-defined rectangle MT fiber terminus.
- **Supplement 4 to ARINC Specification 664: Aircraft Data Network, Part 2, Ethernet Physical and Data Link Layer Specification**
  - Update Part 2 to include IEEE 802.3 bz Ethernet standard
- **Supplements to ARINC Specification 800, Part 2 (Connectors), Part 3 (Cables), and Part 4 (Standard Test Methodology)**
  - Updates for new revised connector and cable components and testing of the new links
- **Supplement 5 to ARINC Report 803: Fiber Optic Design Guidelines**
  - Updates for MT termini use cases
- **Supplement 6 to ARINC Report 805: Fiber Optic Test Procedures**
  - – Updates for MT termini use cases

- **Supplement 7 to ARINC Report 806: Fiber Optic Installation and Maintenance**
  - – Updates for MT termini use cases
- **Supplement 5 to ARINC Report 807: Fiber Optic Training Requirements**
  - – Updates for MT termini use cases
- **Supplement 1 to ARINC Specification 836A: Cabin Standard Enclosures**
  - – Updates for new MT fiber connectors use in the Mini-MRP

## 5.1 Meetings and Expected Document Completion

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

| Activity                              | Mtgs | Mtg-Days (Total)* | Expected Start Date | Expected Completion Date |
|---------------------------------------|------|-------------------|---------------------|--------------------------|
| ARINC Project Paper 8XX               | 12   | 36                | 6/23                | 6/25                     |
| Supplement 4 to ARINC 664, Part 2     |      |                   | 6/23                | 6/25                     |
| Supplements to ARINC 800, Parts 2,3,4 |      |                   | 6/23                | 6/25                     |
| Supplement 1 to ARINC 803             |      |                   | 6/23                | 6/25                     |
| Supplement 6 to ARINC 805             |      |                   | 6/23                | 6/25                     |
| Supplement 7 to ARINC 806             |      |                   | 6/23                | 6/25                     |
| Supplement 5 to ARINC 807             |      |                   | 6/23                | 6/25                     |
| Supplement 1 to ARINC 836A            |      |                   | 6/23                | 6/25                     |

\* Meeting days reflect CSS meetings responsible for multiple ARINC Standards. In addition to the in-person meetings identified above, web conferences will be called to support specific project goals.

\* Updates to ARINC 803, 805, 806, 807, and 846 may require inputs prepared by the Fiber Optic Subcommittee.

The APIM update in 2021 moved expected completion dates forward 48 months due to world economic pressures, as well as internal corporate priorities.

**6.0**      **Comments**

none

**6.1**      **Expiration Date for this APIM**

**October 2025**

*Completed forms should be submitted to Paul Prisaznuk ([pjp@sae-itc.org](mailto:pjp@sae-itc.org))  
AEEC Executive Secretary & Program Director*