ARINC Project Initiation/Modification (APIM)

# Name of Proposed ProjectAPIM 21-006

Fiber Optics Active Device Interchangeability Guidance

## Name of Originator and/or Organization

Tom Jaeger, American Airlines
Robert Nye, The Boeing Company

# Subcommittee Assignment and Project Support

## Suggested AEEC Group and Chairman

AEEC Fiber Optics Subcommittee (FOS)

## Support for the activity (as verified)

Airlines: American Airlines

Airframe Manufacturers: Airbus, Boeing

Suppliers: Cotsworks, Glenair, Smiths Interconnect, Radiall

Others:

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

Airlines: American Airlines

Airframe Manufacturers: Airbus, Boeing

Suppliers: Cotsworks, Glenair, Smiths Interconnect, Radiall

Others:

## Recommended Coordination with other groups

SAE AS-3 (Photonic) John Mazurowski

# Project Scope (why and when standard is needed)

## Description

As new aircraft are produced, and older aircraft retrofitted, the use of Fiber Optics (FO) has increased in avionics systems, as well as cabin IFES. While the ARINC FO Standards (ARINC 801-807, 845, 846) have provided guidance on interconnectability for connectors, cables, etc., the standardization of the optoelectronics (transceivers) is also deserving of closer attention.

In order to maintain interoperability of fiber optic data transmission between different vendors and OEMs agreement needs to be reached on frequency usage and transmission standards. If these characteristics are not standardized the Operators will have to source multiple LRUs for their fleets due to network incompatibilities for units which could otherwise be identical.

## Planned usage of the envisioned specification

Note: New airplane programs must be confirmed by manufacturer prior to completing this section.

New aircraft developments planned to use this specification yes [x]  no [ ]

 Airbus: Modernized systems with FO

 Boeing: Modernized systems with FO

 Other: Modernized systems with FO

Modification/retrofit requirement yes [x]  no [ ]

 Specify: Modernized/updated systems with FO

Needed for airframe manufacturer or airline project yes [ ]  no [x]

 Specify: (aircraft & date)

Mandate/regulatory requirement yes [ ]  no [x]

 Program and date: (program & date)

Is the activity defining/changing an infrastructure standard? yes [ ]  no [x]

 Specify (e.g., ARINC 429)

When is the ARINC standard required? 2023

What is driving this date? Logical progression of standard preparation

Are 18 months (min) available for standardization work? yes [x]  no [ ]

 If NO please specify solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Are Patent(s) involved? yes [ ]  no [x]

 If YES please describe, identify patent holder: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Issues to be worked

1. Identify state of optoelectronics in avionics/airborne systems
2. Identify gaps in existing ARINC Standards for proposed guidance
3. Drafting of consensus-based material for inclusion in ARINC Standards
4. Determine if a new ARINC Standard is required (not likely)
5. Circulate and review draft supplement material
	1. **Supplement 5 to ARINC Report 803:** *Fiber Optic Design Guidelines*
	2. **Supplement 3 to ARINC Report 804:** *Fiber Optic Active Device Specification*

## Security Scope

Is Cyber Security Impacted (if YES, check box(es) below) yes [ ]  no [x]

 Aircraft Control Domain yes [ ]  no [ ]

 Airline Information Services Domain yes [ ]  no [ ]

 PAX Information and Entertainment Systems yes [ ]  no [ ]

 Other: yes [ ]  no [ ]

(Discuss the level of cyber security guidance needed, the specific topics to be covered, and whether these topics are covered elsewhere by reference, e.g., ICAO Documents, RTCA/EUROCAE Standards, existing ARINC Standards, or if they need to be defined by a new or revised ARINC Standard.)

# Benefits

## Basic benefits

Operational enhancements yes [x]  no [ ]

For equipment standards:

* + - * 1. Is this a hardware characteristic? yes [x]  no [ ]
				2. Is this a software characteristic? yes [ ]  no [x]
				3. Interchangeable interface definition? yes [x]  no [ ]
				4. Interchangeable function definition? yes [x]  no [ ]

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

Is this a software interface and protocol standard? yes [ ]  no [x]

 Specify: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Product offered by more than one supplier yes [x]  no [ ]

 Identify: (company name)

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

### Benefits for Airlines

Improve interchangeability between airframe and avionics suppliers

Reduce communication errors caused by optoelectronics

### Benefits for Airframe Manufacturers

Same as Section 4.2.1

### Benefits for Avionics Equipment Suppliers

Same as Section 4.2.1

# Documents to be Produced and Date of Expected Result

Supplement 5 to ARINC Report 803

Supplement 3 to ARINC Report 804

## 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** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supp 5 to ARINC 803 | 15 | 15 | 11/2021 | 05/2023 |
| Supp 3 to ARINC 804 | 15 | 15 | 11/2021 | 05/2023 |
|  |  |  |  |  |
|  |  |  |  |  |

The number of meetings/days noted are ARINC online meetings.

# Comments

The FOS is preparing fiber optic standards to support Cabin and Ku/Ka Satcom APIMs:

 18-001A – Cabin Systems (CSS) work on 5th Gen Seat Networks

 20-001 – Ku/Ka Band Satellite (KSAT) work on ARINC 792A

## Expiration Date for the APIM

October 2023

Completed forms should be submitted to Paul Prisaznuk (pjp@sae-itc.org)

AEEC Executive Secretary & Program Director