

ARINC Project Initiation/Modification (APIM)

- 1.0 Name of Proposed Project** **APIM 21-002**
ARINC Project Paper 8xx: Guidance for Wireless Use of COTS Crew Devices
- 1.1 Name of Originator and/or Organization**
Electronic Flight Bag (EFB) Subcommittee
- 2.0 Subcommittee Assignment and Project Support**
Electronic Flight Bag (EFB) Subcommittee
- 2.1 Suggested AEEC Group and Chairman**
Electronic Flight Bag (EFB) Subcommittee - Dave Jones, Astronautics
- 2.2 Support for the Activity (as verified)**
Airlines: Air France, American Airlines, Austrian Airlines, Delta Air Lines, FedEx, Lufthansa Airlines, Southwest Airlines, United, UPS
Airframe Manufacturers: Airbus
Suppliers: APiJet, Astronautics, Astronics Ballard Technology, Avionica, Collins, GE Aviation, Honeywell, Jeppesen, Lextech, Lufthansa Systems, Navblue, SatAuth, SITA, Teledyne
Others: [TBD]
- 2.3 Commitment for Drafting and Meeting Participation (as verified)**
Airlines: American Airlines, Delta Air Lines, FedEx, Lufthansa Airlines, Southwest Airlines, UPS
Airframe Manufacturers: Airbus
Suppliers: APiJet, Astronautics, Astronics Ballard Technology, Avionica, Collins GE Aviation, Honeywell, Jeppesen, Lextech, Lufthansa Systems, Navblue, SITA, Teledyne
Others: [TBD]
- 2.4 Recommended Coordination with other Groups**
The EFB Subcommittee will coordinate this activity with the AEEC's Network Infrastructure and Security (NIS) Subcommittee and other AEEC Subcommittees as required with co-located teleconferences.
The following are relevant to this topic:
- ARINC Specification 664 Part 5
 - ARINC Project Paper 679
 - ARINC Project Paper 687
 - ARINC Characteristic 759
 - ARINC Specification 834
 - ARINC Project Paper 834A
 - ATA Spec 42
 - IEEE 802.11

- IETF RFC 5216

3.0 **Project Scope (why and when standard is needed)**

The transition from traditional installed EFBs to portable tablet EFB devices has brought the challenge of securely and reliably connecting these tablets to an Aircraft Interface Device (AID) and/or local area networks.

No ARINC guidance currently exists regarding wirelessly connecting tablet EFBs. Therefore, installations are designed by suppliers without the benefit of agreed upon industry standards, interfaces, or security measures.

Existing tablet based EFB installations are using Wi-Fi connected via:

- Dedicated Wireless Access Points (WAP) specifically installed for this purpose,
- WAP that are part of an AID,
- Using IFE provided WAPs or,
- Bluetooth connection.

The need for an ARINC standard to guarantee secure connectivity is increasing as airlines seek to obtain aircraft data for use on increasingly sophisticated EFB applications that require weather, winds aloft, atmospheric conditions, aircraft weight and balance, flight plan information etc.

3.1 **Description**

The objective of this APIM is to obtain authorization to prepare guidance specifically relating to installation and operation of wireless crew devices (e.g., EFB) to address areas including and not limited to:

1. Wireless technology used, e.g. type of IEEE 802.11, Bluetooth, or other
2. Device authentication methods, e.g., Pre-Shared Key versus RADIUS authentication, SSID policies etc.
3. Certificate management for both AID as well as tablet devices
4. Operating as part of a larger aircraft network
5. Network protection aspects, especially protecting unintended access by passengers (domain protection)
6. Failure mode scenarios

This work is planned to leverage of the work being performed on ARINC PP 687 as appropriate, which in turn references ARINC 842. The goal is to apply guidance provided by PP 687 specifically to the use of wireless EFB installations. The work requested by this APIM may also affect the formulation of PP 687.

The material being established through this work is not only envisioned to apply to EFB and AID suppliers but is also intended to provide guidance in other areas such as cabin crew devices, maintenance devices, and IFE providers to establish secure networks for use by EFB.

Details are to be established through the ensuing work authorized through this APIM.

3.2 **Planned usage of the ARINC Standard**

The vast majority of EFBs today are portable tablet devices. Connectivity for these devices is overwhelmingly wireless. The use cases will typically require

additional data for specialized EFB applications. Planned usage will be industry-wide.

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

New aircraft developments planned to use this specification	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Airbus: (aircraft & date)	
Boeing (aircraft & date)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Other: (manufacturer, aircraft & date)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Modification/retrofit requirement	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Specify: (aircraft & date)	
Needed for airframe manufacturer or airline project	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Specify: (aircraft & date)	
Mandate/regulatory requirement	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Program and date: (program & date)	
Is the activity defining/changing an infrastructure standard?	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Specify (e.g., ARINC 429)	
When is the ARINC standard required?	<u>5/2023</u>
What is driving this date?	<u>Increasing use of wireless EFB connectivity</u>
Are 18 months (min) available for standardization work?	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
If NO please specify solution:	_____
Are Patent(s) involved?	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
If YES please describe, identify patent holder:	_____

3.3 Issues to be Worked

The main issues/aspects to be worked as authorized by this APIM include:

- Guidance on wireless technology used for EFBs and portable devices,
- Assure adequate security is provided, minimizing creation of attack vectors,
- Define an acceptable security certificate management process,
- Guidance for cost effective implementations for airlines.

3.4 Security Scope

Is Cyber Security Impacted (if YES, check box(es) below)	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
Aircraft Control Domain	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
Airline Information Services Domain	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
PAX Information and Entertainment Systems	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
Other: _____	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>

The goal of this proposal is to establish specific guidance for the use of wireless COTS crew devices within aircraft. It is anticipated that no higher than Authentication Assurance Level 2 will be required.

The security effort will be guided by:

ARINC Specification 664P5: *Aircraft Data Network Part 5 Network Domain Characteristics and Interconnection*

ARINC Project Paper 687: *Onboard Secure Wi-Fi Network Profile Standard*

ARINC Report 842: *Guidance for Use of Digital Certificates*

ATA Spec 42: *Aviation Industry Standards for Digital Information Security*

IETF RFC 5216: *Extensible Authentication Protocol (EAP)-Transport Layer Security (TLS)*

IEEE 802.11: *Wireless Local Area Networks (WLAN) Standards.*

4.0 Benefits

4.1 Basic Benefits

Operation 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

Specify: Wireless interface between portable electronic devices and aircraft data systems and/or AID.

Product offered by more than one supplier yes no

This proposed project will establish an open standard that can be implemented by any supplier.

4.2 Specific Project Benefits

This proposed project will establish an open standard that can be implemented by any supplier to provide secure wireless connectivity at competitive prices.

4.2.1 Benefits for Airlines:

- Standardize implementations by offering suggested architectures,
- Facilitate certification through use of agreed industry standards, reduce STC costs,
- Facilitate certificate management to IT, remove uncertainty still existing today,
- Manage airline expectations regarding implementation requirements.

4.2.2 Benefits for Airframe Manufacturers

- Reduce development effort and certification costs.

4.2.3 Benefits for Avionics Equipment Suppliers

- Better market opportunities through enhanced interoperability between installations.

5.0 Documents to be Produced and Date of Expected Result

New ARINC Project Paper 8xx by April 2023.

5.1 Meetings an Expected Document Completion

The following table identifies the meetings needed to produce the document described above.

Activity	Mtgs	Mtg-Days (Total)	Expected Start Date	Expected Completion Date
<i>ARINC PP 8xx</i>	<i>Monthly teleconferences</i>	<i>Semi-annual 3-day meetings online</i>	<i>June 2021</i>	<i>April 2023</i>

No in-person meetings are planned.

Monthly teleconferences will be held between semi-annual online meetings to maintain progress.

6.0 Comments

None

6.1 Expiration Date for the APIM

October 2023

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