AEEC

Together "We Set the Standard."

To	Aviation Industry	**Date**	May 23, 2022
From	ARINC Industry Activities	**Reference**	22-030/AXX-241 lth

Subject **AEEC Work Program 2022-2023**
AEEC General Session
May 10-12, 2022

Summary The AEEC Executive Committee approved six project proposals during the AEEC General Session:

APIM Number	AEEC Sub-Committee	APIM Description
22-001	SAI	Develop **ARINC Project Paper 660C***: CNS/ATM Avionics Architectures Supporting NextGen/SESAR Concepts*
22-002	NIS	Develop **ARINC Project Paper Report 811A:** *Commercial Aircraft Information Security Concepts of Operation and Process Framework*
22-003	NIS	Develop **ARINC Project Paper 822B:** *On-Ground Aircraft Wireless Communication*
22-004	SDL	Develop **ARINC Project Paper 851:** (intended to describe standards for software reception for eEnabled aircraft)
17-007B	GAIN	Develop **Supplement 1 to ARINC Specification 812A, Part 2:** Standard Data Interfaces for Galley Inserts (GAIN) Galley Interfaces
11-005D	NDB	Develop **Supplement 24 to ARINC Specification 424:** *Navigation Database*

The scope and schedule for each project is attached to this document in the form of an APIM (ARINC Proposal to Initiate/Modify an ARINC Standard).

Action The purpose of this letter is twofold:

1. The actions of the Airlines Electronic Engineering Committee (AEEC) are hereby announced.
2. ARINC Industry Activities invites all interested parties to participate in the development of ARINC Standards.

For additional information on AEEC's Work Program visit the AEEC website: *www.aviation-ia.com/activities/aeec*.

cc AEEC Executive Committee, CSS, EFB, GAIN, IPS, KSAT, NDB, NIS, SAI, SDL

Attachment 1

Attachment 1

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project APIM 22-001

ARINC Project Paper 660C: *CNS/ATM Avionics Architectures Supporting NextGen/SESAR Concepts* (working title)

1.1 Name of Originator and/or Organization

Jessie Turner, The Boeing Company

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

Systems Architecture and Interfaces (SAI) Subcommittee

Chairmen: Rich Stillwell, United

2.2 Support for the activity (as verified)

Airlines: FedEx

Airframe Manufacturers: Airbus, Boeing, Embraer

Suppliers: Collins Aerospace, GE Aviation, Honeywell, L3-Harris - ACSS, Thales

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines:

Airframe Manufacturers: Airbus, Boeing, Embraer

Suppliers: Collins, L3-Harris - ACSS, Thales

Others:

2.4 Recommended Coordination with other groups

ICAO ICNSS/TF, FAA NextGen, SESAR/SJU, etc.

3.0 Project Scope (why and when standard is needed)

3.1 Description

ARINC Report 660B: *CNS/ATM Avionics Architectures Supporting NextGen / SESAR Concepts* was published in January 2014. Since this time, there have been a number of significant industry developments in the areas of Communication, Navigation, and Surveillance (CNS) and Air Traffic Management (ATM). ARINC Report 660B should be updated to capture the benefits of new technologies and to identify impacts to avionics architectures that would apply to new and retrofit airplanes. Potential topics include Internet Protocol Suite (IPS), NextGen Airborne Collision Avoidance System (ACAS-$X_{A/O}$), Automatic Dependent Surveillance – Broadcast (ADS-B), L-band Digital Aeronautical Communication System (LDACS), and a number of others.

The product from this effort will be ARINC Report 660C.

3.2 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 ☒ no ☐

Airbus: Future airplane developments

Boeing: Future airplane developments

Other:

Modification/retrofit requirement yes ☒ no ☐

Specify: Modernized/updated systems

Needed for airframe manufacturer or airline project yes ☐ no ☒

Specify:

Mandate/regulatory requirement yes ☐ no ☒

Program and date:

Is the activity defining/changing an infrastructure standard? yes ☐ no ☒

Specify (e.g., ARINC 429)

When is the ARINC standard required? May 2024

What is driving this date? Logical progression of report preparation

Are 18 months (min) available for standardization work? yes ☒ no ☐

If NO please specify solution: _____

Are Patent(s) involved? yes ☐ no ☒

If YES please describe, identify patent holder: _____

3.3 Issues to be worked

Updates to the ARINC 660B document sections, including, but not limited to:

§1 Introduction - Identify updates to FAA NextGen, European SESAR, and ICAO ASBU plans, and other sub-sections as needed

Discuss role that CNS/ATM systems, both air and ground, play in operational efficiency and long-term sustainability of aviation.

§2 INTRODUCTION TO NEXTGEN/SESAR CONCEPTS – Provide updates to Satellite Navigation infrastructure deployment & standards development plans, Datalink Communication deployment plans, ADS-B In applications, SWIM, and others. Add new technologies, including IPS, LDACS, ACAS-$X_{A/O}$, Space-based ADS-B, and others.

§3 AVIONICS REFERENCE ARCHITECTURES – Add new sub-section for Avionics Architecture – 2020's

§4 IMPACTS ON AIRBORNE FUNCTIONAL ARCHITECTURES – Provide updates to potential impacts to systems to accommodate NextGen/SESAR functionality.

§5 RECOMMENDED AVIONICS ARCHITECTURES TO SUPPORT NEXTGEN/SESAR – Provide updates to the mandate summary and Retrofit Requirements for each of the Avionics Architectures. Add new sub-section for Avionics Architecture – 2020's.

§6 IMPACTS ON STANDARDS – Identify additional ARINC Standards that may require revisions to support NextGen/SESAR airspace initiatives.

3.4 Security Scope

Is Cyber Security Impacted (if YES, check box(es) below) yes ☒ no ☐

- 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.)

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 ☒

Specify: _____

Product offered by more than one supplier? N/A yes ☒ no ☐

Identify:

4.2 Specific project benefits (Describe overall project benefits.)

4.2.1 Benefits for Airlines

Supports airline planning and investment decisions.

4.2.2 Benefits for Airframe Manufacturers

Supports airframer planning and investment decisions for production, retrofit bulletins, and future airplane developments.

4.2.3 Benefits for Avionics Equipment Suppliers

Supports supplier planning and investment decisions for equipment upgrades and new equipment design development.

5.0 Documents to be Produced and Date of Expected Result

ARINC Project Paper 660C (May 2024)

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 660C	6	18	May 2022	May 2024

* Shows regularly scheduled SAI Subcommittee meetings between May 2022 and May 2024. Web conferences are also expected to be held as needed.

6.0 Comments

None

6.1 Expiration Date for the APIM

May 2024

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

Attachment 2

Attachment 2

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project APIM 22-002

ARINC Project Paper 811A: *Commercial Aircraft Information Security Concepts of Operation and Process Framework*

1.1 Name of Originator and /or Organization

Jeffrey Rae, United Airlines

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

Existing NIS Subcommittee

2.2 Support for the Activity (as verified)

Airlines: United Airlines, Delta Air Lines

Airframe Manufacturers: Airbus, Boeing

Suppliers: Panasonic, Universal Avionics, Collins Aerospace, Honeywell

Others:

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines: United Airlines, Delta Air Lines

Airframe Manufacturers: Airbus, Boeing

Suppliers: Panasonic, Universal Avionics, Collins Aerospace (TBC)

Others:

2.4 Recommended Coordination with other Groups

Cabin Systems Subcommittee (CSS), Software Data Loading (SDL)

3.0 Project Scope (why and when standard is needed)

3.1 Description

ARINC Report 811 was last published in 2005. Security technologies and concepts have changed significantly since that time. ARINC Report 811 should be reviewed and updated as needed to reflect the digital aircraft and modern approaches to security.

The intent is to remain within the original purpose and scope of ARINC Report 811 as referenced below:

1.1 Purpose of Document

The purpose of this document is to facilitate an understanding of aircraft information security and to develop aircraft information security operational concepts. This common understanding is important since a number of subcommittees and working groups within the aeronautical industry are considering aircraft information security.

This document also provides an aircraft information security process framework relating to airline operational needs that, when implemented by an airline and its suppliers, will enable the safe and secure dispatch of

the aircraft in a timely manner. This framework facilitates development of cost-effective aircraft information security and provides a common language for understanding security needs.

1.2 Scope

This document does not attempt to solve specific application, communication, or network security issues, but provides a concept of airline operations and process framework to AEEC subcommittees and working groups for the development of other ARINC Standards and aircraft equipment.

This document includes a common set of terms and concepts, bridging between airline organizations and the terrestrial network security industry.

3.2 Planned usage of the ARINC Standard

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 ☐ no ☒

Airbus: (aircraft & date)

Boeing (aircraft & date)

Other: (manufacturer, aircraft & date)

Modification/retrofit requirement yes ☐ no ☒

Specify: (aircraft & date)

Needed for airframe manufacturer or airline project yes ☐ no ☒

Specify: (aircraft & date)

Mandate/regulatory requirement yes ☐ no ☒

Program and date: (program & date)

Is the activity defining/changing an infrastructure standard? yes ☐ no ☒

Specify (e.g., ARINC 429)

When is the ARINC standard required? _____

What is driving this date? _____

Are 18 months (min) available for standardization work? yes ☒ no ☐

If NO please specify solution: _____

Are Patent(s) involved? yes ☐ no ☒

If YES please describe, identify patent holder: _____

3.3 Issues to be Worked

The intent is to review the document to update with current technology and appropriate terms including:

- Security Roles
- Information Security Processes
- Security Objectives
- Security Controls
- Cybersecurity Risks and Threats

Throughout the review, other documents may be identified (related documents). Any documents identified would be shared with the Subcommittee/Working Group associated with the document and discussed to determine updates needed.

3.4 Security Scope

Is Cyber Security Impacted (if YES, check box(es) below) yes ☒ no ☐

- 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.)

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: _____

Product offered by more than one supplier yes ☐ no ☒

Identify: _____(company name)_____

4.2 Specific Project Benefits

Update ARINC Report 811 and facilitate a more relevant understanding of aircraft information security systems and concepts as encountered today. A common understanding of these updated concepts will benefit multiple stakeholders, subcommittees, and working groups within the aeronautical industry.

4.2.1 Benefits for Airlines

Per APIM 04-003 (ARINC 811):

The project will establish a clear and shared concept of operations for security mechanisms and procedures:

- identification of airlines assets and airframers policy
- definition of what to protect and why
- definition of how to protect.

which will allow to define a single cost-effective Aircraft Information Security system, consistent across the different airborne systems.

4.2.2 Benefits for Airframe Manufacturers

4.2.3 Benefits for Avionics Equipment Suppliers

5.0 Documents to be Produced and Date of Expected Result

ARINC Project Paper 811A – Expected May 2024

5.1 Meetings an 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 811A	7	7	05/2022	05/2024

Please note the number of in-person meetings and the number of meeting days to be supported by the ARINC IA Staff.

6.0 Comments

6.1 Expiration Date for the APIM

October 2024

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

Attachment 3

Attachment 3

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project APIM 22-003

ARINC Project Paper 822B: *Gatelink Wireless Security Updates*

1.1 Name of Originator and/or Organization

Jeffrey Rae – United Airlines

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

ARINC NIS Subcommittee, Jeffrey Rae – United Airlines

2.2 Support for the Activity (as Verified)

Airlines: United Airlines, American Airlines, Delta Air Lines, Lufthansa
Airframe Manufacturers: Airbus, Boeing
Suppliers: Panasonic, Collins Aerospace
Others:

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines: United Airlines, American Airlines, Delta Air Lines, Lufthansa
Airframe Manufacturers: Airbus, Boeing
Suppliers: Panasonic, Collins Aerospace
Others:

2.4 Recommended Coordination with Other Groups

TBD

3.0 Project Scope (Why and When Standard is Needed)

3.1 Description

Review and update ARINC SPECIFICATION 822A: On-Ground Aircraft Wireless Communication in order to maintain alignment with recent improvements to Wi-Fi standards (e.g., 802.11ax and new 6GHz band transmissions), encryption protocols (WPA3), cellular connectivity changes (5G), e-enabled aircraft file sizes, device technology (eSIM), and Wi-Fi certification considerations (Wi-Fi CERTIFIED 6™ & 6E), and varied implementations as described in ARINC Report 848.

Additionally, add recommendations for network configurations, on-ground aircraft wireless communication practices, telecommunications certifications, and device specifications.

The review and associated updates will remain within the ARINC Specification 822A Introduction and Scope as pasted below:

1.0 Introduction

This specification describes the functionality and interfaces of an Internet Protocol (IP)-based wireless communications system between an aircraft on the ground and a ground-based network using Wireless Local Area Network (WLAN) and/or cellular radios and protocols. The ground-based network will be primarily used to provide connectivity to an airline's back office or to its back-end maintenance systems although other uses are also possible when there is a need to transfer data to or from the aircraft's applications while it is taxiing or parked. "Gatelink" is the accepted industry term for this type of connection. This document is a major revision to ARINC Specification 822 released in 2008.

Additionally, this document addresses cyber security measures necessary to ensure that the Gatelink connection can only be accessed by authorized users or systems, and that transferred data cannot be intercepted or modified by unauthorized persons. Certain requirements are intended to raise the bar on security and, thereby, contribute to an overall reduced level of cyber risk in the aviation environment. These requirements may go beyond basic interoperability.

Key airline operational benefits of Gatelink include:

High bandwidth IP data connection that enables transfer of larger data sets during an aircraft's gate turn, while taxiing, and while at a maintenance facility.

Automatic establishment of a Gatelink connection when the aircraft lands or arrives at its parking position (no flight or ground crew intervention needed).

Timely download of flight segment-specific data sets, e.g., Flight Operations Quality Assurance (FOQA) data, engine performance data, and cabin logbook entries, that enable rapid response to aircraft problems and tuning of in-flight performance parameters for maximum flight efficiency.

Upload of time-sensitive In-Flight Entertainment (IFE) content, e.g., daily news and sports programs, that enhances the passenger experience

Wireless staging of Loadable Software Parts (LSPs), reducing time spent by maintenance personnel moving LSPs to the aircraft using legacy methods.

One area of significant interest by airlines is the use of cellular data modems to supplement or even replace existing WLAN-based radios. This can enable required ground data connectivity at airports that lack supporting Gatelink WLAN infrastructure or have infrastructure operated by non-contracted providers.

In consideration of new technologies and use cases and keeping functional specifications separate from form and fit, this document introduces the following terms:

Ground Wireless Local Area Network Function (GWLF) encompasses the full set of airborne Wi-Fi and/or cellular radio functions described in this specification for the aircraft part of the Gatelink network. These functions may be distributed across more than one Line Replaceable Unit (LRU) on the aircraft's network, or they may be contained in a single LRU (GWLU).

Ground Wireless LAN Unit (GWLU) refers to a specific design approach that incorporates the major GWLF functions into a single LRU. This is the more common approach for large transport aircraft; smaller aircraft may use a less-integrated approach.

Broad adherence to this specification will help ensure interoperability when a Gatelink-equipped aircraft lands at an airport offering terminal Wi-Fi connectivity or in an area with available contracted cellular data service. Use of commercial industry standard communications protocols helps meet this primary objective, as does close coordination on implementations between airlines, airports, Maintenance Repair Organizations (MROs), mobile telecom carriers, and other service providers. Although functionality will be specified to enable the onboard equipment to choose the correct provider and link type depending on its location, an aircraft should not require different system configurations to connect at different airports.

Please note that Gatelink provides a method for authorized clients (such as an aircraft) to access the Gatelink provider's network. Security protocols are specified, in order to authenticate the endpoints, provide access control, and protect the data between the client and the Gatelink access point. After this, there are no provisions for the security of the data.

Operators must assume that their connections, once established via the Gatelink service, are routed on the open Internet. Operators are responsible for the end-to-end protection of their application data between the client and the ultimate destination, even if routed across the Gatelink network.

1.1 Document Scope

This specification addresses the following types of IPv4-based connections between an aircraft on the ground and the airline's network infrastructure:

Connections based on IEEE 802.11 wireless LAN standards

Connections using cellular technologies: 3G, Universal Mobile Telecommunications System (UMTS), 4G, and Long Term Evolution (LTE)

This specification does not address the following technologies, nor does it preclude their future addition based on market demand:

Wired connections to the aircraft at the gate, e.g., powerline communications

AeroMACS, an aviation implementation of IEEE 802.16e (WiMAX) that uses protected spectrum to carry safety communications

5G cellular

IPv6

Elements necessary for interoperability in the radio and network layers are addressed while methods for application data transfer are out of scope. Measures to enhance cyber security are included and may go beyond basic interoperability.

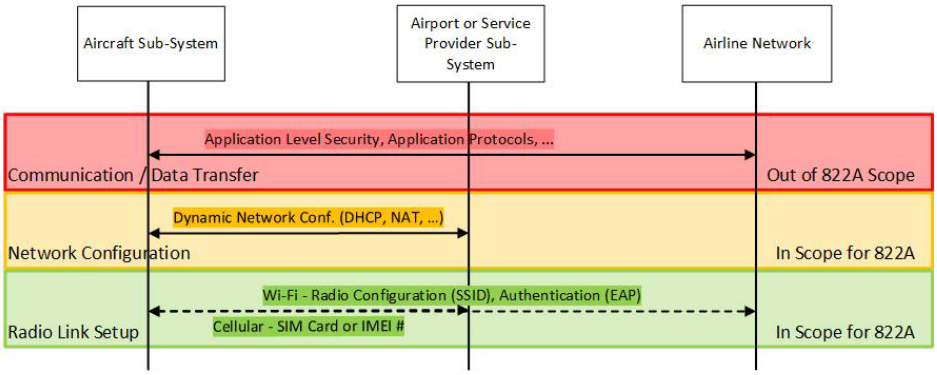

Figure 1 – ARINC 822A Scope

It is not the intent of this document to specify a system's implementation, define components, or imply an approach to such an implementation. Ultimately, it is up to suppliers, manufacturers, and end customers (i.e., airlines) to determine the requirements for, and acceptance of, products that comply with this specification. Manufacturers and suppliers are encouraged to exceed the features and functionality described by this specification to meet evolving market needs.

This document does not specify the form and fit of the airborne equipment, nor other physical and electrical characteristics. These are defined in ARINC Characteristics 763 and 763A.

3.2 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 ☒ no ☐

Airbus: (aircraft & date)

Boeing: 737, 777, 787, 2025

Other: (manufacturer, aircraft & date)

Modification/retrofit requirement yes ☐ no ☒

Specify: (aircraft & date)

Needed for airframe manufacturer or airline project yes ☒ no ☐

Specify: Boeing AID - 2023

Mandate/regulatory requirement yes ☐ no ☒

Program and date: (program & date)

Is the activity defining/changing an infrastructure standard? yes ☐ no ☒

Specify:

When is the ARINC Standard required?

_____

What is driving this date? ___Technology_____

Are 18 months (min) available for standardization work? yes ☒ no ☐

If NO, please specify solution: _____

Are Patent(s) involved? yes ☐ no ☒

If YES, please describe, identify patent holder: _____

3.3 Issues to be Worked

The main issues to be worked as part of this APIM are:

- Update Wi-Fi security standards defined within ARINC 822A ON-GROUND WIRELESS COMMUNICATION (GATELINK) report to reflect recent updates to Wi-Fi standards such as 802.11ax and WPA3.
- Align ARINC 822A technical recommendations with other published ARINC Reports (e.g., ARINC 687 SECURE ONBOARD WIFI PROFILE).
- Review and update cellular security, connectivity, and authentication recommendations including 5G.
- Overall review and update as needed
- Prescribe access point placement on the ground/by the gate, maximum LoS distance, etc. of airport Gatelink configurations.
- Update table B-1 to reflect the latest file transfer types and file sizes
  - Dependent on what industry thinks is relevant
- Update all sections to reflect latest technologies (WPA3, 802.11ax, 5G cellular).
- Recommend for or against eSIMs and add compliance requirements if for.
- Recommend for or against disabling the Gatelink SSID broadcasts.
- Update recommendations for access point controllers and how they impact and assist in handoffs including for authentication.
- Recommend Device design specifications including:
  - Latency
  - Throughput
  - Handoff algorithm logic from Wi-Fi to Wi-Fi and between Wi-Fi/cellular
  - Antenna design (freq. supported, a x b MIMO, passive vs. active)
  - Cosite interference
  - Rate adaptation algorithm
- Outline of how telecommunications certifications work, what countries you need to get them in, etc.

3.4 Security Scope

Is Cyber Security Impacted (if YES, check box(es) below) yes ☒ no ☐

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.)

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 ☐

Specify: _____

Product offered by more than one supplier yes ☒ no ☐

Identify: (company name)

4.2 Specific Project Benefits (Describe Overall Project Benefits.)

4.2.1 Benefits for Airlines

- Improved security and data protection for on-ground aircraft wireless connectivity.
- Improved data transfer throughput for on-ground wireless connections.
- Ensures aircraft component capabilities align with improved standards employed by newer Wi-Fi infrastructures for higher data throughput, encryption and compatibility.
- Increased awareness of additional technology options for on-ground aircraft wireless connectivity
- Increased understanding of current network conditions.

4.2.2 Benefits for Airframe Manufacturers

4.2.3

Compliance with ground Wi-Fi infrastructures deployed by airports or operators is more easily facilitated as infrastructures are built in accordance with additional recommendations.

4.2.4 Benefits for Avionics Equipment Suppliers

- Better market opportunities through enhanced interoperability through standardization between products
- Better guidance on emergent technologies which creates more efficient, effective, sustainable and safe product development

5.0 Documents to be Produced and Date of Expected Result

- Update of ARINC 822A by October 2023

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 822B	7	7	05/2022	10/2023

Please note the number of meetings, the number of meeting days, and the frequency of web conferences to be supported by the IA Staff.

6.0 Comments

6.1 Expiration Date for the APIM

May 2024

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

Attachment 4

Attachment 4

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project APIM 22-004

Aircraft Ground System Software Reception

(This APIM is a replacement for APIM 16-015A on eEnablement)

1.1 Name of Originator and/or Organization

Ted Patmore, Delta Air Lines

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

Software Distribution and Loading (SDL) Subcommittee

Co-Chairs:

Chris Kuske, Teledyne Controls

Ted Patmore, Delta Air Lines

2.2 Support for the Activity (as verified)

Airlines: American, Delta, FedEx, KLM, Lufthansa, United

Airframe Manufacturers: Airbus, Boeing

Suppliers: Teledyne, Collins, Safran, Aero Instruments, TechSAT, AIT, GE Aviation

Others:

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines: Delta, FedEx, KLM, Lufthansa, United

Airframe Manufacturers: Airbus, Boeing

Suppliers: Teledyne, Collins, Safran, Aero Instruments, TechSAT, AIT, GE Aviation, MBS electronics

Others:

2.4 Recommended Coordination with other groups

AEEC NIS Subcommittee

AEEC SAI Subcommittee

RTCA SC-216

EASA WG-72

3.0 Project Scope (why and when standard is needed)

3.1 Description

There is currently a proliferation of formats and protocols used to distribute aircraft software to airlines.

Airlines that operate aircraft from more than one airframer are faced with building and maintaining more than one ground system to receive software.

Standardization of software delivery process and method is greatly needed to avoid the growing proliferation of multiple reception scenarios, requiring the airlines to purchase, learn and maintain multiple tools and processes.

The left side of Figure 1 shows the external and internal functions concerned with airline software receiving. There can be many external sources of software each of which must be received by the airline receiving process. It is becoming increasingly important to have one common airline software receiving process. This will save much time and expense associated with using diverse software receiving systems and methods.

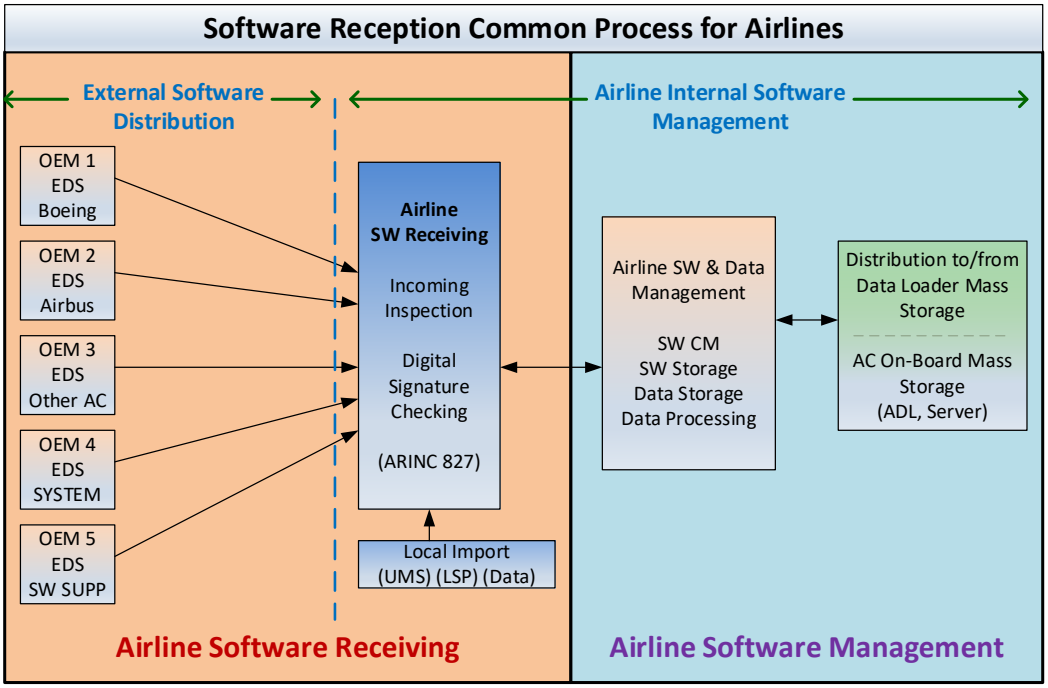

Figure 1 – Software Reception (Airline Perspective)

3.2 Planned usage of the ARINC Standard

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 ☐ no ☒

Airbus: (aircraft & date)

Boeing: (aircraft & date)

Other: (manufacturer, aircraft & date)

Modification/retrofit requirement yes ☐ no ☒

Specify: (aircraft & date)

Needed for airframe manufacturer or airline project yes ☐ no ☒

Specify: (aircraft & date)

Mandate/regulatory requirement yes ☐ no ☒

Program and date: (program & date)

Is the activity defining/changing an infrastructure standard? yes ☐ no ☒

Specify (e.g., ARINC 429)

When is the ARINC standard required? _____(month/year)_____

What is driving this date? _____(state reason)_____

Are 18 months (min) available for standardization work? yes ☐ no ☒

If NO please specify solution: _____

Are Patent(s) involved? yes ☐ no ☒

If YES please describe, identify patent holder: _____

3.3 Issues to be Worked

Need to assess all current software receiving requirements currently in use by operators to determine the best common software reception protocol solution. Determine methods for secure transfer and distribution of software must be included to comply with current security requirements. Determine if there are any enhancements required to **ARINC Report 827:** *Electronic Distribution of Software*.

3.4 Security Scope

Is Cyber Security Impacted (if yes, check box(es) below) yes ☒ no ☐

Aircraft Control Domain yes ☐ no ☒

Airline Information Services Domain yes ☐ no ☒

PAX Information and Entertainment Systems yes ☐ no ☒

Other - All Software Loaded Using Ground Infrastructure yes ☒ no ☐

This project will define a process for receiving software from multiple sources (i.e., airframers, component suppliers, software updates, etc.).

RTCA DO-355A was recently updated with airborne software protection guidance, but the airlines would like the AEEC to prepare a project paper that provides standardized processes to receive software in a safe, secure, and authenticated manner.

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 ☒

Specify: _____

Product offered by more than one supplier yes ☐ no ☒

Identify: (company name)

4.2 Specific Project Benefits

This standard will provide one common aircraft software distribution method that can be easily controlled and understood by multiple stakeholders.

4.2.1 Benefits for Airlines

The airlines will realize a savings in the cost, time and personnel required to maintain multiple reception methods from multiple vendors. The current confusion associated with maintaining multiple processes for software reception can be avoided.

4.2.2 Benefits for Airframe Manufacturers

Provide the airframe manufacturer with one method of sending software to recipients, avoiding the need to define multiple tools and processes for securely receiving software. There will be no need to provide multiple tools for operators to learn and use.

4.2.3 Benefits for Avionics Equipment Suppliers

Provide equipment suppliers with one method of sending software to recipients, avoiding the need to define multiple tools and processes for securely receiving software. There will be no need to provide multiple tools for operators to learn and use.

5.0 Documents to be Produced and Date of Expected Result

Identify Project Papers expected to be completed per the table in the following section.

ARINC Project Paper 851: *Aircraft Ground System Software Reception*

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 851	3 mtgs	3 mtg days	04/2022	04/2023

Please note the number of in-person meetings and the number of meeting days to be supported by the ARINC IA Staff.

6.0 Comments

(none)

6.1 Expiration Date for the APIM

April 2024

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

Attachment 5

Attachment 5

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project APIM 17-007B

ARINC Specification 812A: *Standard Data Interfaces for Galley Insert (GAIN), Digital Interface Update for Health Management Messages, Functionality, and System Integration*

1.1 Name of Originator and/or Organization

Galley Insert (GAIN) Subcommittee

Airbus/Boeing, Co-Chairman

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Co-Chairmen

Galley Insert (GAIN) Subcommittee

Adam Cha, Boeing

Christian Auris, Airbus

2.2 Support for the activity (as verified)

Airlines: Lufthansa, United Airlines

Airframe Manufacturers: Airbus, Boeing

Suppliers (TBC): B/E Aerospace, Zodiac, Iacobucci HF Electronics, IPECO, Jamco

Others:

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines: TBD

Airframe Manufacturers: Airbus, Boeing

Suppliers (TBC): B/E Aerospace, Zodiac, Iacobucci HF Electronics, IPECO, Jamco

Others:

2.4 Recommended Coordination with other groups

CAN Working Group

3.0 Project Scope (why and when standard is needed)

3.1 Description

ARINC Specification 812A defines interfaces to functional catering components (i.e., beverage makers, ovens, refrigerators, trash compactors, etc.), specifically the Controller Area Network (CAN) data interfaces and data content to be considered between all galley equipment using a Galley Data Bus.

ARINC 812A includes two parts, Part 1 includes the definition of CAN data interfaces and protocols for digital galley equipment and Part 2 includes the definition of verification test procedures for ARINC 812A Part 1 bus protocol implementation.

Production implementation of the ARINC 812A protocols have led to the identification of changes and corrections that should be updated. This project will resume the important work of the GAIN Subcommittee. Specifically, the work will focus on the following:

- Development of Supplement 2 to ARINC Specification 812A Part 1: *Standard Data Interface for Galley Insert (GAIN) Equipment, CAN Communications*, which will:
  - Identify and incorporate changes necessitated by production implementation of digital Galley Equipment.
  - Update messages based on changes introduced by Supplement 3 to ARINC 825.
  - Consider the effect of the new CAN FD protocol on ARINC 812A-compliant components
  - Address data security and provide guidance as needed.
  - Update the XML and XSD support files as required.
- **Development of Supplement 3 to ARINC Specification 812A Part 1: *Standard Data Interface for Galley Insert (GAIN) Equipment, CAN Communications*. During the implementation of Supplement of Supplement 2 the following inconsistency were noted:**
  - **Life pulse message unclear: figures 4-1 and 4-2 on says that the first life pulse message makes an absent note present, but the explanation on below 6-43 on denotes otherwise.**
  - **Table 6-46 has 2 as a message signal value for GAIN fallback power mode, but table 6-47 specifies three instead. Need to clarify which one to use.**
- Development of Supplement 1 to **ARINC Specification 812A Part 2:** *Standard Data Interface for Galley Insert (GAIN) Equipment, CAN Communications, Verification, and System Test Guidance*, which will update the verification test procedures based on the changes identified in Supplement 2 to ARINC 812A Part 1. Development of Part 2 will commence upon acceptance of Supplement 2 to ARINC Specification 812A Part 1.

3.2 Planned usage of the envisioned specification

New aircraft developments planned to use this specification yes ☒ no ☐

Airbus: all new

Boeing: 777X

Modification/retrofit requirement yes ☐ no ☒

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, identify patent holder: Not applicable

3.3 Issues to be worked

- Incorporate enhanced health management messaging, functionality, and system integration
- Improve GAIN serial number capability, PBM (0, t) misinterpretation, and CAN-Bus recovery.
- Incorporate remote control messaging as optional feature.

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: B/E Aerospace, Zodiac, Zodiac Controls, IPECO, Iacobucci HF Electronics, Jamco

4.2 Specific project benefits (Describe overall project benefits.)

GAIN standards provide a common distribution system for Airbus and Boeing multi- and single-aisle aircraft. These standards focus on communications protocols and messaging that are beneficial to the airlines, airframe manufacturers, and suppliers.

4.2.1 Benefits for Airlines

- Equipment interoperability between suppliers
- Reduction in development cost, improved reliability, and therefore reduced cost for the airlines

4.2.2 Benefits for Airframe Manufacturers

- Equipment interoperable between suppliers
- Flexibility and reduced costs by working from the same set of guidelines

- Reduction of time and cost for new developments due to reuse of proven solutions

4.2.3 Benefits for Avionics Equipment Suppliers

- Eliminates the need to design custom provisions for each installation
- Reduction of time and cost for new developments due to reuse of proven solutions

5.0 Documents to be Produced and Date of Expected Result

- Supplement 3 to ARINC 812A Part 1
- Supplement 1 to ARINC 812A Part 2

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
Supplement 3 to ARINC 812A Part 1	1*	3	April 2022	August 2022
Supplement 1 to ARINC 812A Part 2	1*	3	March 2022	September 2022

* In addition to the in-person meetings identified above, monthly web conferences will be used to prepare material for review.

6.0 Comments

None.

6.1 Expiration Date for this APIM

May 2023

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

Attachment 6

Attachment 6

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project — APIM 11-005D

Navigation Data Base (NDB) / ARINC 424

This APIM proposes the development of Supplement 24 to ARINC Specification 424: *Navigation System Database*, defining both ASCII and XML data types.

ARINC Specification 424 is a dynamic document that requires continual update to coincide with every evolving global airspace.

1.1 Name of Originator and /or Organization

NDB Subcommittee

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

NDB Subcommittee

Choung Phung, FedEx

2.2 Support for the Activity (as verified)

Airlines: Delta, FedEx, Lufthansa, United,

Airframe Manufacturers: Airbus, Boeing

Suppliers: Jeppesen, LIDO, NavBlue, AeroNavData, Collins, Honeywell, Universal, GE Aviation, Garmin, NGA, MITRE

Others: TBD

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines: FedEx

Airframe Manufacturers:

Suppliers: Honeywell, Jeppesen, LIDO, NavBlue, AeroNavData, NGA

Others: TBD

2.4 Recommended Coordination with other Groups

SAI Subcommittee

3.0 Project Scope (why and when standard is needed)

3.1 Description

The project will identify, evaluate, and document the recommended standards for the preparation of airborne navigation system reference data for use in the air transport industry. This data is intended for merging with existing airborne navigation computer operational software to produce a navigation data base for use onboard the aircraft. This scope recommends Supplement 24 to ARINC Specification 424 to support new navigation procedures. This document will continue the development of the XML data in addition to the legacy ASCII format.

3.2 Planned usage of the ARINC Standard

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 ☒ no ☐

Airbus: (aircraft & date)

Boeing (aircraft & date)

Other: (manufacturer, aircraft & date)

Modification/retrofit requirement yes ☒ no ☐

Specify: (aircraft & date)

Needed for airframe manufacturer or airline project yes ☐ no ☒

Specify: (aircraft & date)

Mandate/regulatory requirement yes ☒ no ☐

Program and date: (program & date)

Is the activity defining/changing an infrastructure standard? yes ☐ no ☒

Specify (e.g., ARINC 429)

When is the ARINC standard required? _____(month/year)_____

What is driving this date? _____(state reason)_____

Are 18 months (min) available for standardization work? yes ☒ no ☐

If NO please specify solution: _____

Are Patent(s) involved? yes ☐ no ☒

If YES please describe, identify patent holder: _____

3.3 Issues to be Worked

(Describe the major issues to be addressed.)

3.4 Security Scope

Is Cyber Security Impacted (if YES, check box(es) below) yes ☒ no ☐

Aircraft Control Domain yes ☒ no ☐

Airline Information Services Domain yes ☐ no ☐

PAX Information and Entertainment Systems yes ☐ no ☐

Other: _____ yes ☒ no ☐

Include provisions to ensure XSD files are protected from mishandling.

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: _____

Product offered by more than one supplier yes ☒ no ☐

Identify: _____(company name)_____

4.2 Specific Project Benefits

There is universal support among airlines, manufacturers, and regulatory authorities for the preparation of regular updates to ARINC Specification 424. One of the key benefits of this project is the continued interoperability between new and older ATS procedures and Flight Management System (FMS) procedures. Significant additional benefits are expected from the reduced separation standards and the increased availability of user-preferred routing that will result from the development of **PBN** procedures. In addition to FMS, other avionics systems on the aircraft use ARINC 424 data.

4.2.1 Benefits for Airlines

See paragraph 4.2

4.2.2 Benefits for Airframe Manufacturers

See paragraph 4.2

4.2.3 Benefits for Avionics Equipment Suppliers

See paragraph 4.2

5.0 Documents to be Produced and Date of Expected Result

Supplement **24** to ARINC Specification 424.

5.1 Meetings an 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
Supplement 24 to ARINC 424	**6**	**18**	**May 2022**	**May 2025**

The NDB Subcommittee will meet every 9 to 12 months and hold online meetings as the need arises.

6.0 Comments

(none)

6.1 Expiration Date for the APIM

May 2025

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