AEEC

Together "We Set the Standard."

To	Aviation Industry	**Date**	May 18, 2020
From	P. J. Prisaznuk AEEC Executive Secretary & Program Director pjp@sae-itc.org tel +1 443-254-0528	**Reference**	20-051/AXX-230 lth

Subject **AEEC Work Program for 2020-2021**
AEEC General Session
May 12 and May 14, 2020

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

APIM Number	AEEC Sub-Committee	APIM Description
20-001	KSAT	ARINC Project Paper 792A: Multi-Modem Ku/Ka Satcom System with Fiber Optic Interfaces
19-008A	WXR	ARINC Project Paper 748: Airborne Weather Radar with Advanced Antenna Technology
19-009A	Traffic Surv	Supplement 5 to ARINC Characteristic 718A – Mark 4 ATC Transponder (ATCRBS/MODE S) ARINC Project Paper 735C – Traffic Computer, ACAS-X and ADS-B Functionality
17-002B	DLK	Supplement 9 to ARINC Specification 631: VHF Digital Link (VDL) Mode 2 Implementation Provisions
09-009D	EFB Users	Electronic Flight Bag (EFB) Users Forum – 3-year Extension of Activity

The statement of work for each of these projects is attached to this document in the form of an APIM (ARINC Proposal to Initiate/Modify an ARINC Standard). As of the date of this letter, the AEEC has 15 AEEC Project Papers and 26 Supplements to existing ARINC Standards presently in work.

Summary The purpose of this letter is twofold:

1. Actions of the Airlines Electronic Engineering Committee (AEEC) are hereby announced.
2. ARINC Industry Activities invites its Members, Corporate Sponsors, and all interested parties to participate in ARINC Standards development activities.

For additional information on the AEEC work program, contact the AEEC Executive Secretary or visit the AEEC website: *www.aviation-ia.com/activities/aeec*.

cc AEEC Executive Committee, DLK, EFB Users, KSAT, SAI, WXR, XPDR

Attachment 1

Attachment 1

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project APIM 20-001

ARINC Project Paper 792A: Multi-Modem Ku/Ka Satcom System with Fiber Optic Interfaces

1.1 Name of Originator and/or Organization

Mark Sorensen, Delta Air Lines

2.0 Subcommittee Assignment and Project Support

Ku/Ka Satcom Subcommittee

2.1 Suggested AEEC Group and Chairman

Ku/Ka Satcom Subcommittee, Mark Sorensen and Chris Schaupmann

2.2 Support for the Activity (as verified)

Airlines: Delta Air Lines, FedEx, Lufthansa, TAP Portugal, United Airlines

Airframe Manufacturers: Boeing, Airbus, Mitsubishi

Suppliers: Viasat, Carlisle, Astronics, GEE, Collins Aerospace, Gogo, Panasonic Avionics, Honeywell, Gilat (TBC), Hughes (TBC), Smiths Interconnect, ThinKom, Satixfy (TBC), Safran (TBC)

Others: Inmarsat, Cotsworks, Gore, SCI Technology, Glenair, iDirect, Space X

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines: Delta Air Lines, United Airlines

Airframe Manufacturers: Boeing, Airbus, Mitsubishi

Suppliers: Viasat, Carlisle, Astronics, GEE, Collins Aerospace, Gogo, Panasonic Avionics, Honeywell

Others: Cotsworks, Gore, SCI Technology, iDirect, Space X

2.4 Recommended Coordination with other groups

Cabin Systems Subcommittee (CSS)

Fiber Optic Subcommittee

3.0 Project Scope

Define a new Ku/Ka satcom system interwiring standard using fiber optic cabling for both radio channel and Ethernet interconnections.

The standard will leverage ARINC 792 equipment architecture and form factors and will change connector inserts.

3.1 Description

Emerging Electronically Steerable Antenna (ESA) has the capability to support multiple simultaneous beams, each with unique, selectable waveforms. These features are critical to support Non-Geostationary (NGSO) Satellite Networks, including Low Earth Orbit (LEO) and Medium Earth Orbit (MEO). Existing coaxial interconnections require difficult measures for this mode of operation.

ESA and Modem interfaces are moving towards a digital baseband interface instead of Intermediate Frequency. This technology allows the flexibility in positioning the modem, specifically to be inside the Outside Antenna Equipment. Furthermore, these measures are ideally suited for software defined modems.

Fiber optic bundles are lighter, can scale to support multiple beams, and can be easily adapted to installations that use both very short and very long bundle runs. Alternate application of IF over Fiber or RF over Fiber to support analog waveforms.

3.2 Planned usage of the ARINC Standard

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

Boeing plans on using this specification on future aircraft.

Mitsubishi plans on using this specification as an option on future aircraft

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 ☐

Adding ARINC 600 (shell size 1 fiber insert)

When is the ARINC standard required? May 2022

What is driving this date? ESA and NGSO networks are coming into service by 2022.

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

- Modman Connector
- Pressure Bulkhead Interface
- Transmit and Receive Link Budget
- Reference Frequency
- Number of channels to support
- Simplex/Duplex Ethernet fiber interface
- Baseband (I/Q) signal characteristics
- Analog IF or RF over Fiber
- Maintainability
- Software Selectable waveform

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 ☐

4.2 Specific Project Benefits

Simple, scalable, lighter installation.

Support for NGSO networks.

Support for multiple, simultaneous beams.

Support for Software Selectable Waveforms

Avoids coaxial cable challenges

More freedom for locating equipment

Reduced EMI, Lightning and Bonding challenges

4.2.1 Benefits for Airlines

Weight saving

Improved access to NGSO satellite networks

4.2.2 Benefits for Airframe Manufacturers

Simple, scalable, lighter installation.

Support for NGSO networks.

Support for multiple, simultaneous beams.

Support for Software Selectable Waveforms

Avoids coaxial cable challenges

More freedom for locating equipment

Reduced EMI, Lightning and Bonding challenges

4.2.3 Benefits for Avionics Equipment Suppliers

Digital baseband modem/antenna interface

Reduced EMI, Lightning and Bonding challenges

Support for multiple, simultaneous beams.

Support for Software Selectable Waveforms

Support for NGSO networks.

5.0 Documents to be Produced and Date of Expected Result

New ARINC Project Paper 792A, May 2022

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 PP 792A	6	18*	May 2020	April 2022
Web Conferences	monthly			

*concurrent with other KSAT projects

6.0 Comments

ARINC 792 specifies the use of coaxial interwiring. A new characteristic will differentiate the fiber/digital interwiring from the legacy coaxial interwiring. Any given installation will operate with either fiber or coaxial interwiring, but not both.

6.1 Expiration Date for the APIM

September 2022

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 19-008A

New ARINC Project Paper 748: Airborne Weather Radar with Advanced Antenna Technology

1.1 Name of Originator and/or Organization

Boeing / Jessie Turner

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

Systems Architecture and Interfaces (SAI) Subcommittee

SAI Chairmen: Reinhard Andreae and Rich Stillwell

Weather Radar Working Group Chairman: Mohammed Ahmed, Boeing

2.2 Support for the activity

Airlines: American, Delta, FedEx, Lufthansa, TAP Portugal, United, UPS

Airframe Manufacturers: Airbus, Boeing

Suppliers: Collins, Garmin, Honeywell, Gables

Others:

2.3 Commitment for Drafting and Meeting Participation

Airlines: FedEx

Airframe Manufacturers: Airbus, Boeing

Suppliers: Collins, Gables, Garmin, Honeywell

Others:

2.4 Recommended Coordination with other groups

None

3.0 Project Scope

3.1 Description

This project calls for a new Weather Radar ARINC Project Paper 748 to support new, ARINC 664 network-based, aircraft designs.

ARINC Characteristic 708A “Airborne Weather Radar with Forward Looking Windshear Detection Capability” was last updated with Supplement 3 in 1999. The ARINC 708A-3 architecture has the WXR antenna and antenna drive under the nose radome, and interconnected, via a waveguide, to a Receiver/ Transmitter (that contains the RF front-end and processing) installed in a tray inside the pressure vessel.

In the last 10 years, suppliers have designed and fielded newer WXR system installations that are not compliant with ARINC 708A (or any other standard). In these WXR installations, the RF front end is installed within a Receiver/Transmitter Module (RTM) under the nose radome and is interconnected with a standalone ARINC 600 rack-mounted WXR processor in the EE bay. Also, no separate waveguide installation is required for these newer WXR installations. [Note: This type of newer WXR architecture (with an RTM under the nose radome) is documented in the ARINC 768 Integrated Surveillance System (ISS) characteristic, but ARINC 768 has an ISS Processor Unit in lieu of a standalone WXR Processor in the EE bay].

Although these newer WXR installations provide cost and Size, Weight, and Power (SWaP) benefits over-and-above the ARINC 708A WXR installations, these newer, standalone WXR installations do not follow an industry standard and are not interchangeable between suppliers. Consequently, if one supplier's WXR system needs to be swapped-out to install another supplier's WXR system, extensive aircraft changes are required to be made (e.g. the WXR Processor's ship-side connector, RTM ship-side connector, and wiring between the WXR Processor and RTM need to be changed). This has a significant impact if an airframer or airline wants to switch between WXR equipment suppliers.

For future network-based aircraft, the WXR system installation needs to be standardized so that these extensive aircraft changes are not required. The working group should consider an interface definition for accommodating the receipt and transmission of raw weather data. **The Working Group's goal is to develop a WXR system that installs an Electronically Scanned Antenna (ESA) under the aircraft's nose radome.**

3.2 Planned usage of the envisioned specification

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

Specify: Next new Boeing air transport aircraft

Next new Airbus air transport aircraft

Modification/retrofit requirement — yes ☐ no ☒

Specify:

Needed for airframe manufacturer or airline project — yes ☒ no ☐

Specify: Next new Boeing air transport aircraft

Mandate/regulatory requirement — yes ☐ no ☒

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

Specify:

When is the ARINC Standard required? May 2021

What is driving this date? Target design date

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

Are Patent(s) involved? — yes ☐ no ☒

If YES please describe, identify patent holder:

3.3 Issues to be worked

It is expected that the following specific items will be addressed as part of the WXR standard development (and others as they arise):

1) Standardize a WXR **Electronically Scanned Antenna (ESA) installation under the nose radome. The goal is that the ESA would support RF transmit/receive, processing, and input/output functions, thus, negating the need for a separate WXR processor in the EE bay. Whether this goal can be met will be determined during standards development.**

2) **The ESA installation would standardize the following:**
   a. **Installation mounting**
   b. **Maximum volume**
   c. **Connector(s) and pinouts to support power input and ARINC 664 network-based connections (e.g., fiber, and others if required)**
   d. **Antenna pattern field of view**
   e. **Operational frequencies**

~~1)~~**3) Expected system reliability for the new installation needs to be determined and should be improved over current WXR installations (single and dual installations).**

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: Not applicable	
Is this a software interface and protocol standard?	yes ☐ no ☒
Specify:	
Product offered by more than one supplier	yes ☒ no ☐
Identify: Collins Aerospace, Garmin, Honeywell	

4.2 Specific project benefits (Describe overall project benefits.)

4.2.1 Benefits for Airlines

- Supplier system interchangeability

4.2.2 Benefits for Airframe Manufacturers

- Common installation(s)/solution(s), less variability
- Supplier system interchangeability

4.2.3 Benefits for Avionics Equipment Suppliers

- Provide equipment that can be installed on multiple aircraft platforms, across multiple aircraft OEMs.

5.0 Documents to be Produced and Date of Expected Result

ARINC Project Paper 748: Airborne Weather Radar System with Advanced Antenna Technology, May 2021.

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 748 Weather Radar	**TBD**	12	October 2019	March 2021

6.0 Comments

Regularly scheduled web conferences are planned.

6.1 Expiration Date for the APIM

October 2021

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

Attachment 3

Attachment 3

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project — APIM 19-009A

ATC Transponder and Traffic Computer Standardization
(ARINC 718A, ARINC 735C)

1.1 Name of Originator and/or Organization

Boeing / Jessie Turner

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

Systems Architecture and Interfaces (SAI) Subcommittee
SAI Chairmen: Reinhard Andreae and Rich Stillwell
Surveillance Working Group Chairman: Mohammed Ahmed, Boeing

2.2 Support for the activity

Airlines: American, Delta, FedEx, TAP Portugal, UPS
Airframe Manufacturers: Airbus, Boeing
Suppliers: ACSS, Collins, Garmin, Honeywell
Others:

2.3 Commitment for Drafting and Meeting Participation

Airlines:
Airframe Manufacturers: Airbus, Boeing
Suppliers: ACSS, Collins, Garmin, Honeywell
Others:

2.4 Recommended Coordination with other groups

None

3.0 Project Scope

3.1 Description

ATC Transponder/ADS-B Out Functions

This project proposes to update the following ARINC Characteristics based on changes being incorporated into RTCA DO-181F - ATCRBS/Mode S Minimum Operational Performance Standards (MOPS) and RTCA DO-260C - 1090 MHz ADS-B Out MOPS [both ECD Sept. 2020]:

- Prepare Supplement 5 to ARINC 718A: MARK 4 ATC TRANSPONDER (ATCRBS/MODE S)

TCAS/ACAS-X/ADS-B In Functions

This project also proposes to update the following ARINC Characteristics based on newly released RTCA DO-385 - Airborne Collision Avoidance System – X MOPS (dated Oct. 2, 2018)**, new ACAS-Xu MOPS [ECD Sept. 2020]** and changes being incorporated into RTCA DO-361A - Advanced Flight deck based Interval Management (FIM) MOPS **(dated March 26, 2020), RTCA DO-317C – ADS-B In Surveillance Applications MOPS [ECD June 2020],** and RTCA DO-260C - 1090 MHz ADS-B Out MOPS [ECD **Sept. 2020**]:

- Prepare **ARINC Project Paper 735C: Traffic Computer- ACAS-X and ADS-B Functionality**

3.2 Planned usage of the envisioned specification

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

Specify:

Modification/retrofit requirement — yes ☒ no ☐

Specify: ADS-B In & ACAS-X changes

Needed for airframe manufacturer or airline project — yes ☒ no ☐

Specify: Supports future ADS-B In/ACAS-X projects

Mandate/regulatory requirement — yes ☐ no ☒

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

Specify:

When is the ARINC Standard required? May 2021

What is driving this date? Target design date

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

Are Patent(s) involved? — yes ☐ no ☒

If YES please describe, identify patent holder:

3.3 Issues to be worked

ATC Transponder/ADS-B Out Functions
Update ARINC 718A to reflect changes necessary due to changes to the ATC/Mode S Transponder MOPS (RTCA DO-181F) and the 1090MHz ADS-B Out MOPS (RTCA DO-260C).

TCAS/ACAS-X/ADS-B In Functions
Prepare ARINC **Project Paper 735C** to reflect changes necessary due to the new ACAS-X_a/X_o MOPS (RTCA DO-385) and **ACAS-X_U MOPS (DO-3xx) and** changes being incorporated into the Advanced FIM MOPS (RTCA DO-361A) **and ADS-B In Applications MOPS (RTCA DO-317C)**.

Potential changes include (but are not limited to): descriptions of functions supported, input/output pin definitions, and ARINC 429 label/bit definitions.

4.0 Benefits

4.1 Basic benefits

Operational enhancements? ADS-B In — 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: Not applicable

Is this a software interface and protocol standard? — yes ☐ no ☒

Specify:

Product offered by more than one supplier — yes ☒ no ☐

Identify: ACSS, Collins Aerospace, Honeywell

4.2 Specific project benefits (Describe overall project benefits.)

4.2.1 Benefits for Airlines

- Supports future ADS-B In/Collision Avoidance capabilities
- Equipment supplier choices with common interfaces

4.2.2 Benefits for Airframe Manufacturers

- Supports future ADS-B In/Collision Avoidance capabilities
- Common installation(s)/solution(s), less variability

4.2.3 Benefits for Avionics Equipment Suppliers

- Supports future ADS-B In/Collision Avoidance capabilities
- Provide equipment that can be installed on multiple aircraft platforms,

across multiple aircraft OEMs.

5.0 Documents to be Produced and Date of Expected Result

- Supplement 5 to ARINC 718A: MARK 4 ATC TRANSPONDER (ATCRBS/MODE S), May 2021
- ARINC **Project Paper 735C**: TRAFFIC COMPUTER - **ACAS-X** AND ADS-B FUNCTIONALITY, May 2021

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 5 to ARINC 718A XPDR	**Bi-weekly web conferences**	**TBD**	Oct 2019	Mar 2021
ARINC **Project Paper 735C ACAS-X and** ADS-B				

6.0 Comments

6.1 Expiration Date for the APIM

October 2021

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

Attachment 4

Attachment 4

ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project APIM 17-002B

Supplement 9 to ARINC Specification 631: *VHF Digital Link (VDL) Mode 2 Implementation Provisions*

Supplement 9 will add the definition of Connectionless VDL Mode 2

1.1 Name of Originator & Organization

Mike Matyas, Boeing

2.0 Subcommittee Assignment and Project Support

2.1 Suggested AEEC Group and Chairman

Datalink (DLK) Systems Subcommittee

Chairman: Bob Slaughter, American Airlines

2.2 Support for the activity (to be confirmed)

Airlines: American Airlines, Delta, Lufthansa, Southwest, TAP Portugal, UPS, United

Airframe Manufacturers: Airbus, Boeing

Suppliers: Honeywell, Collins Aerospace, Universal Avionics, Spectralux, Thales, Garmin (TBC)

Others: Collins Aerospace IMS, SITAOnAir, L3Harris Technologies, FAA

2.3 Commitment for Drafting and Meeting Participation

Airlines: American Airlines, UPS

Airframe Manufacturers: Airbus, Boeing

Suppliers: Honeywell, Collins Aerospace

Others: Collins Aerospace IMS, SITAOnAir, L3Harris Technologies

2.4 Recommended Coordination with other groups

DLK Users Forum, RTCA SC-214 VDLSG, EUROCAE WG-92, ICAO DCIWG, AEEC/RTCA/EUROCAE IPS Groups

3.0 Project Scope

This project will create Supplement 9 to ARINC Specification 631.

3.1 Description

Initial VDL Mode 2 CPDLC operation in Europe (Data Link Services) and USA (Data Comm En Route Services) has highlighted air-ground interoperability issues and the need for enhanced Frequency Management.

Supplement 8 to ARINC Specification 631 includes ELSA Consortium recommendations, and Handoff guidance that are expected to improve VDL Mode 2 performance by

encouraging robustness in the avionics' ground station selection algorithm.

Supplement 9 will include implementation provisions for connectionless VDL Mode 2 capability. It will add provisions for VDL subnetworks to support ATN/IPS. Security considerations required by the ICAO SARPS will be included.

These changes are intended to further improve VDL Mode 2 operation and performance beyond the changes made with Supplement 7.

Experience with implemented ATN/OSI B1 CPDLC in Europe has shown that VDL Mode 2 air-ground interoperability guidance is desirable. This will provide greater assurance that the VDL Mode 2 system will work as intended and allow early detection of potential interoperability issues.

Connectionless VDL Mode 2 will allow airplanes and ground stations to exchange messages without having to establish an explicit connection, similar to how POA (VDL Mode 0/A) works. It will exercise the previously unused connectionless message exchange capability already described in relevant standards, namely the Unnumbered Information (UI) frame defined in ISO 4335/7809 and ICAO Doc 9776 (the "VDL Tech Manual"). Connectionless VDL Mode 2 will be fully compatible with existing VDL Mode 2. Both variants will work on the same frequency at the same time and a particular airplane could use **either variant**.

Connectionless VDL Mode 2 is intended to further address the performance issues by providing greater efficiency and robustness. The greater efficiency of connectionless VDL Mode 2 will increase effective VDL Mode 2 capacity – the limits of which are a valid concern in both Europe and the US – and accordingly its sustainability. Additionally, connectionless VDL Mode 2 will leverage investments already made in VDL Mode 2 (as opposed to starting over with new technology) and be highly beneficial for existing ACARS and ATN/OSI network technology as well as for future ATN/IPS network technology. Boeing, Honeywell, SITA have already performed successful ground and flight trials of IPS over connectionless VDL Mode 2. **Supplement 9** will define connectionless VDL Mode 2 to carry ACARS messages (AOA packets), ATN/OSI messages (ISO 8208 packets), and ATN/IPS messages (IP packets).

Supplement 9 will define VDL Mode 2 operation to support ATN/IPS. This may include additional protocols (e.g., Orange Protocol) and security measures.

3.2 Planned usage of the envisioned specification

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

Airbus:	(aircraft & date)
Boeing:	To be determined

Other: (manufacturer, aircraft & date)

Modification/retrofit requirement: yes ☒ no ☐

Specify: **TBD - need Airbus and Boeing input**

Needed for airframe manufacturer or airline project: yes ☒ no ☐

Specify: **TBD - need Airbus and Boeing input**

Mandate/regulatory requirement: yes ☐ no ☒

Program and date: (program & date)

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

Specify ARINC 631 VDL Mode 2

When is the ARINC Standard required?

Supplement 8: May 2020 (adopted)

Supplement 9: September 2022 (proposed)

What is driving this date?

This date is driven by the need for the benefits that VDL Mode 2 air-ground interoperability guidance and connectionless VDL Mode 2 will bring.

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

Are Patent(s) involved? yes ☐ no ☒

If YES please describe, identify patent holder: _____

3.3 Issues to be worked

Define the best way to perform frequency management when using connectionless VDL Mode 2 and how connectionless VDL Mode 2 will carry **AOA,** ATN/OSI **and IPS** messages.

Compatibility with existing air to ground operations over VDL Mode 2.

Data security requirements for VDL subnetworks to support ATN/IPS will 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 ☐**

For Supplement 9: Based on initial analysis, VDL Mode 2 security is required and will be dependent on IPS industry recommendations (ICAO Working Group I – Security Subgroup/ AEEC IPS SC/EUROCAE WG-108 / RTCA SC-223).

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. Is this an interchangeable interface definition? yes ☐ no ☒

d. Is this an interchangeable function definition? yes ☐ no ☒

If not fully interchangeable, please explain:

Air/Ground Interoperability

Is this a software interface and protocol standard? yes ☒ no ☐

Specify: Air/Ground Interoperability

Is this product offered by more than one supplier? yes ☒ no ☐

Universal Avionics, Spectralux, Garmin, Airbus, Honeywell, Collins Aerospace, Collins Aerospace IMS, SITAOnAir

4.2 Specific Project Benefits

4.2.1 Benefits for Airlines

Benefits for airlines of connectionless VDL Mode 2 include more efficient and robust communication of AOC and ATS messages via VDL Mode 2. As demonstrated in Europe with implemented ATN/OSI B1 CPDLC, current connection-oriented VDL Mode 2 has proven to be less efficient and robust than desired.

For example, ELSA “peer loss of communication” (also known as “N2 events”) will be less likely to occur with connectionless VDL Mode 2 because of antenna diversity. In particular, an airplane will accept uplinks from any ground station of the selected service provider and all ground stations of the selected service provider will accept downlinks from an airplane.

4.2.2 Benefits for Airframe Manufacturers

Benefits for airframe manufacturers of VDL Mode 2 air-ground interoperability tests include greater assurance that VDL Mode 2 systems will perform as intended and early detection of potential interoperability issues. Benefits for airframe manufacturers of connectionless VDL Mode 2 include more efficient and robust communication via VDL Mode 2 that better satisfy the needs of their customers.

4.2.3 Benefits for Avionics Equipment Suppliers

Benefits for avionics equipment suppliers of VDL Mode 2 air-ground interoperability tests include greater assurance that VDL Mode 2 systems will perform as intended and early detection of potential interoperability issues. Benefits for avionics equipment suppliers of connectionless VDL Mode 2 include

more efficient and robust communication via VDL Mode 2 that better satisfy the needs of their customers.

4.2.4 Benefits for ATSPs/DSPs/CSPs

Benefits for the ground service providers of VDL Mode 2 air-ground interoperability include greater assurance that VDL Mode 2 systems will perform as intended and early detection of potential interoperability issues.

Increased capability and reduction of RF congestion.

5.0 Documents to be Produced and Date of Expected Result

Supplement 8 to ARINC Specification 631, **May 2020 (adopted)**

Supplement 9 to ARINC Specification 631, September 2022 (proposed)

5.1 Meetings and Expected Document Completion

These meetings will be coordinated by the AEEC staff person assigned to this activity.

Activity	Mtgs	Mtg-Days (Total)	Expected Start Date	Expected Completion Date
Supplement 8 to ARINC 631	**TBD**	**24**	June 2017	**May 2020 Adopted**
Supplement 9 to ARINC 631	**TBD**	**17**	**May 2020**	**September 2022**

Proposals for inclusion in **Supplement 9** to ARINC 631 will be coordinated through web conference meetings. Final document review will take place as part of the regularly scheduled DLK Systems Subcommittee meetings.

6.0 Comments

Regular web conferences are planned.

6.1 Expiration Date for the APIM

May **2023**

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

Attachment 5

Attachment 5

ARINC Project Initiation/Modification (APIM)

1. Name of Proposed Project APIM 09-009D

AEEC Electronic Flight Bag Users Forum (EFB UF)

Note: This is an update to APIM 09-009 which initiated the EFB Users Forum.

2. Suggested Subcommittee Assignment (who acts)

2.1 Identify AEEC group

This APIM proposes the continuation of the **EFB Users Forum** activity for three years, i.e., through December **2023**. The activity is a joint activity with IATA EFB Task Force.

2.2. Support for the activity (all to be confirmed)

Airlines: Air France, Alaska, American, ANA, Austrian, Delta, FedEx, Hawaiian, Icelandair, JAL, Lufthansa, Swiss, TAP, Southwest, United, UPS and others.

Airframe Manufacturers: Airbus, Boeing, Bombardier, Embraer

Suppliers: APiJet, ASG, Astronautics, Astronics, Avio, Avionica, Bad Elf, CarlisleIT, CMC Electronics, Cobham, Collins Aerospace, Comply365, GE Aviation, Global Eagle Entertainment, GoGo, Honeywell, Inmarsat, Jeppesen, Lufthansa Systems, Microsoft, NavBlue, Pace, Pivot, Sabre, SITA, Teledyne, Thales, Ultramain, and others.

2.3. Commitment for resources (directly from participant) (all to be confirmed)

Chairmen: Philipp Haller (Austrian) and Will Ware (Southwest)

Airlines: Air France, Alaska, American, Austrian, Delta, FedEx, Hawaiian, Lufthansa, Southwest, United, UPS, and others.

Airframe Manufacturers: Airbus and Boeing

Suppliers: APiJet, ASG, Astronautics, Avio, Avionica, Bad Elf, CarlisleIT, CMC Electronics, Cobham, Collins Aerospace, GE Aviation, Gogo, Honeywell, Inmarsat, Jeppesen, Lufthansa Systems, Microsoft, Pace, Pivot, SITA, Teledyne, Thales, Ultramain, Viasat, and others.

2.4. Recommended Coordination with other groups

The following activities and standards are relevant to this topic:

- ADB (ARINC 814, 816)
- AOC (ARINC 633)
- ANFS (ARINC 763, 821, 822)
- EFB (ARINC **679,** 759, 828, 834, 840)
- NIS Subcommittee
- SAI Subcommittee

3. Project Scope

3.1 Description

This activity provides a unified forum for airlines, EFB system integrators, EFB hardware providers, EFB application providers, regulatory authorities, and other interested parties to present, discuss and find solutions to issues of interest to the EFB user community. This includes but is not limited to EFB topics as follows:

- Aircraft installation issues
- Application software
- Communication interfaces (e.g., media, provider, connectivity)
- Cyber security
- Data input devices, terminals, displays, interactive devices
- Electrical interfaces, including power
- Operational issues
- Regulatory issues

It should be noted that the EFB User Forum activity is not intended to create any new standard. Should such a desire arise during an EFB Users Forum meeting it would be forwarded to the AEEC Executive Committee.

The joint AEEC/IATA EFB Users Forum involves regulatory authorities in the Americas and Europe, as well other local regulatory bodies and ICAO. These regulators have attended past meetings and are seeking feedback and input from the EFB Users Forum regarding proposed changes and future regulation.

3.2. Planned usage of the envisioned specification

(Not Applicable)

3.3. Issues to be worked

The main issues are:

- Provide a forum where EFB system integrators and EFB hardware/software providers can present their product development plans with airline users
- Provide a venue for regulators to present and discuss pending regulatory changes and their impact on airline operators.
- Provide a forum for airlines to share current EFB experiences along with future expectations
- Enable the industry to identify common EFB services that need to be supported over the aircraft interfaces
- Identify any new avionics parameters which are useful for EFBs and the need for data structures to support the avionics interfaces
- Provide a forum for IT services providers to describe their efforts in this area. Ensure one or more methods are available to enable the EFBs to access wired and/or wireless air/ground links, onboard servers and to internet services in

general.

- Others (TBI)

4. Benefits envisioned

4.1. Basic benefits

Modeled after the Data Link Users Forum, the EFB Users Forum attracts users, regulators and suppliers in a neutral industry setting.

The activity identifies industry trends both operationally and technically. The overall goal is to exchange information and experience and to find standardized methods to resolve issues early and improve EFB services - for the benefit of all.

The rapidly evolving EFB market benefits from this platform and helps deal with key issues:

- Support Operational enhancements (reduction in DOC)
- Clarify in-service issues
- Support Interchangeability of EFB applications
- Identify potential improvements to existing interface and protocol standards as well as opportunities for new standards development
- Inform and discuss products offered from suppliers (competitive environment)
- Support hardware and software development as open market items

4.2 Specific project benefits

Extension of this activity is proposed in recognition of the ability for EFBs to meet a wide-variety of airline operational needs and to provide a neutral forum to discuss these needs. Airlines are moving quickly to install EFBs, many that are extensible to include all types of flight deck operations and data communications functions.

A properly executed effort will allow airlines and suppliers to be on the same page, reduce risk and provide the desired products to the marketplace.

4.3 Project Benefit for Airlines

- Enable airlines to influence EFB product evolution to suit their operational needs, leading to greater commonality across fleets.
- Provide a venue for airlines to have input in forming regulations that govern EFB usage.
- Common processes for EFB including software handling.
- Ensure flexibility when updating EFB, selecting and installing EFB products in a way that fits airline operations.
- Cost reduction in airline EFB programs.

4.4 Project Benefit for Airframe Manufacturers

Airframe manufacturers will benefit from being able to offer new aircraft models with EFBs and EFB provisions that meet the broadest needs of their customers.

Airframe manufacturers can continue to offer installed EFBs **as well as provisioning for portable electronic devices such as tablets.**

Airframe manufacturers can rely on EFB **hardware and software** suppliers and choose not to develop EFBs themselves.

4.5 Project Benefit for EFB Suppliers

Opens market opportunities for EFB suppliers to provide desired **hardware and software**

Will simplify supplier effort to equip different aircraft models

Easier to certify and to get operational approval due to commonality and familiarity

5. Documents to be Produced and Date of Expected Result

- Reports will be provided for each meeting.
- APIMs may be developed where the need arises.

5.1 Meetings/Expected Document Completion

The EFB Users Forum is expected to convene **at least** once per year in the May or June timeframe. Beyond this schedule, meetings may be organized on an as-needed basis as the EFB Leadership Team and the AEEC Executive Committee deems appropriate.

Meeting Days	20**20**	20**21**	20**22**	20**23**
EFB Users Forum	2 (+2)	2 (+2)	2 (+2)	2 (+2)

6.0 Comments

(None)

6.1 Expiration date for this APIM

December **2023**

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