

ARINC Project Initiation/Modification (APIM)

- 1.0 Name of Proposed Project** **APIM 19-014**
Prepare Supplement 1 to ARINC Specification 641: Logical Software Part Packaging for Transport
- 1.1 Name of Originator and/or Organization**
Olivier BASTIEN, Airbus Civil Aircraft
- 2.0 Subcommittee Assignment and Project Support**
- 2.1 Suggested AEEC Group and Chairman**
AEEC Software Distribution and Loading (SDL) Subcommittee
Ted Patmore, Delta Air Lines
- 2.2 Support for the activity (as verified)**
Airlines: American, Delta, Lufthansa,
Airframe Manufacturers: Airbus, Boeing
Suppliers: Honeywell, TechSAT, Safran, Teledyne
Others: TBD
- 2.3 Commitment for Drafting and Meeting Participation (as verified)**
Airlines: TBD
Airframe Manufacturers: Airbus
Suppliers: TBD
Others: TBD
- 2.4 Recommended Coordination with other groups**
TBD
- 3.0 Project Scope (why and when standard is needed)**
Legacy ARINC 615 software standard has been specified taking in consideration the certification of Field Loadable Software (FLS) distributed via physical media devices, which are most of the time part of the certified aircraft definition and requiring being kept onboard as per regulation requirement.
FLS physical media distribution is now becoming obsolete, and e-distribution of digitalized FLS progressively becomes the standard.
However, removing regulation requirement for storing FLS medias onboard the aircraft is challenging. It requires, not only, to ensure that any alternate FLS e-delivery process of these existing certified FLS medias being performed in a digitally secured way, from its originator to their final destinations, but also not to affect certification of existing legacy FLS medias, whose format and content are most of the time linked to ARINC 615 media sets organization.
This method needs to be included within ARINC 641. It will be used for A320 and A330/A340 aircraft to allow the removal of software media that has been required to be carried on the aircraft and kept updated. This method is compatible with the

method used for the A350/A380 field loadable software delivery, and is already approved. Therefore, this approved process specific to these aircraft types should be included within ARINC 641 to cover all use cases.

3.1 Description

This additional method specific to Airbus aircraft needs to be added to ARINC Specification 641 so that it will contain an array of complete solutions for aircraft software packaging.

This standard would propose a method allowing:

- Simple conversion of existing certified ARINC 615 FLS media sets in a digitally secured FLS, for compatibility with existing ARINC 665 & ARINC 835 standard involved in the FLS e-distribution processes.
- Simple re-generation of ARINC 615 media sets from a digitally secured FLS, for backward compatibility with existing in-service floppy based loaders.

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 <input type="checkbox"/> no <input checked="" type="checkbox"/>
Airbus:	A320 & A330 families,
Boeing:	
Other:	
Modification/retrofit requirement	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
Specify:	A320 & A330 families
Needed for airframe manufacturer or airline project	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
Specify:	allows e-distribution of existing ARINC 615 multiple media sets, in a secured digital ways
Mandate/regulatory requirement	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Program and date:	
Is the activity defining/changing an infrastructure standard?	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Specify:	allows e-distribution of existing ARINC 615 multiple media sets, in a secured digital ways.
When is the ARINC Standard required?	Q1-2020
What is driving this date?	
APIM review by SAI, APIM Consideration, APIM Approval, Drafting Work, Circulation for Adoption consideration	
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

Legacy ARINC 615 software standard has been specified taking in consideration the certification of Field Loadable Software (FLS) distributed via physical media devices. Today, FLS physical media distribution becomes obsolete, and e-distribution of digitalized FLS progressively becomes the standard.

However, digitalization of existing FLS physical medias is not obvious, and becoming challenging due to:

- The need to ensure integrity of e-distributed software vs. genuine certified physical media set content.
- The need to secure replicability of the e-distributed software vs. individual certified physical media sets aircraft attached.
- The need to ensure compatibility with well-known ARINC 665 (FLS format) & ARINC 835 (FLS digital signature)

On top of that, ARINC 615 software drives additional challenges, especially when they are based on a media sets made of multiple media members, due to:

- The presence of a commonly file named having different content on each media member of the media sets (e.g. CONFIG.LDR)
- The need to keep traceability of multiple floppy organization after e-distribution for backward compatibility with existing floppy based loader.

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

Allows electronic reception and distribution of existing ARINC 615 multiple media set Field Loadable Software (FLS) in a secured digitally signed way, compatible with existing ARINC 665 & ARINC 835 standards.

Streamlines Airline process, by:

- Suppressing Media devices from certified aircraft definition.

- Suppressing floppy media management for FLS distribution between Airline engineering and line maintenance
- Introducing state of the art of FLS Data Security, allowing multiple FLS copy from centralized airline software storage.

It also provides Airlines opportunity to align legacy aircraft FLS management and distribution on brand new aircraft FLS e-distribution processes.

Avoid the use physical media such as floppies/CD. Enhances robustness and avoids obsolescence issues.

Ensures backward compatibility with legacy floppy based aircraft loaders, if needed, by allowing re-generation of floppy media sets from an e-distributed FLS parts.

4.2.2 Benefits for Airframe Manufacturers

Allows electronic distribution of existing ARINC 615 multiple media set Field Loadable Software (FLS) in a secured digitally signed way, compatible with existing ARINC 665 & ARINC 835 standards.

Streamlines Airframer processes by:

- Suppressing Media devices from aircraft definition.
- Suppressing logistic flow of numerous floppy media distribution between Suppliers and Airframer Final assembly line for each MSN.
- Introducing state of the art of FLS Data Security, allowing multiple FLS copy from centralized Airframer software storage

4.2.3 Benefits for Avionics Equipment Suppliers

Allows electronic distribution of existing ARINC 615 multiple media set Field Loadable Software (FLS) in a secured digitally signed way, compatible with existing ARINC 665 & ARINC 835 standards.

Streamlines Supplier processes by:

- Suppressing logistic flow of numerous floppy media distribution between Suppliers and Airframer, or Airlines.
- Introducing state of the art of FLS Data Security, allowing multiple FLS copy from centralized supplier software storage

Ensures integrity of e-distributed FLS with regards to original certified media content, allowing re-using certified software PNR identifier and MoC, instead of Media PNR identifier.

5.0 Documents to be Produced and Date of Expected Result

Standard describing how to convert multiple ARINC 615 Media members FLS, in digitalized ARINC 665 FLS.

Optionally, this standard could describe the method to re-generate ARINC 615 media sets from digitalized FLS PNR.

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
<i>Supplement 1 to ARINC 641</i>	3	3	<i>Jan 2020</i>	<i>May 2021</i>

* This project worked in conjunction with other SDL projects (i.e., 3 meetings per year total, etc.).

6.0 Comments

none

6.1 Expiration Date for the APIM

October 2021

Completed forms should be submitted to the AEEC Executive Secretary.