ARINC Project Initiation/Modification (APIM)

1.0 Name of Proposed Project APIM 18-004

Supplement 5 to **ARINC Report 665**: *Loadable Software Standards*

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

ARINC Software Distribution and Loading (SDL) Subcommittee

Chairmen:

- Rod Gates, American Airlines
- Ted Patmore, Delta Air Lines

2.2 Support for the activity (as verified)

Airlines: Delta Air Lines, American Airlines

Airframe Manufacturers: Boeing

Suppliers: Honeywell, Rockwell Collins, TechSAT

Others:

2.3 Commitment for Drafting and Meeting Participation (as verified)

Airlines: Delta Air Lines

Airframe Manufacturers: Boeing

Suppliers: Honeywell, Rockwell Collins, TechSAT

Others:

2.4 Recommended Coordination with other groups

TBD

3.0 Project Scope (why and when standard is needed)

Supplement 4 to ARINC Report 665 was published in July 2016. The standard was updated to include existing data that was contained in Technical Application Bulletins (TAB), errata, industry input, and coordination to align with other ARINC Standards and external documents.

There have been several other documents developed or modified within AEEC Standards that affect the content of ARINC Report 665.

3.1 Description

ARINC Report 665: *Loadable Software Standards*

This document defines the aircraft industry's standards for Loadable Software Parts (LSP) and Media Set Parts (MSP). It describes the common principles and rules to be applied to any part of a data load system to ensure compatibility and interoperability.

Included are standard processes for part numbering, content, labeling, and formatting of an LSP, and a Media Set containing LSPs.

ARINC Report 665 publication history:

Initial Publication – Published: December 22, 1999

- ARINC Report 615A, *Software Data Loader Using Ethernet Interfaces*, was developed in two parts:
  - Part 1 – Physical Standards and Protocols
  - Part 2 – Loadable Software Standards.

Supplement 1 - Published: January 12, 2001.

- The former Part 1 of ARINC Report 615A is published as Supplement 1 of ARINC Report 615A, *Software Data Loader Using Ethernet Interfaces*.
- The former Part 2 is published as Supplement 1 of ARINC Report 665, *Loadable Software Standards*.

Supplement 2 - Published: August 30, 2002

- Addition of spare 16 bit field for alignment of pointers.
- Moved List of Batch File Content and Organization to Section 3.0
- Addition of .LUB file name extension

Supplement 3 - Published: August 12, 2005

- Several changes regarding check value (CRC)
- New sections added.

Supplement 4 - Published: July 14, 2016

- Part number conventions
- Nomenclature considerations
- Security and integrity checking
- Manufacturer's Code Request processes

Supplement 5 – This proposed APIM

- Proposed work described in Section 3.3 of this APIM.

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: (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

Intent of work covered by this APIM

The SDL Subcommittee will not modify the software part format version (8002/3 in code) in ARINC 665. The resulting supplement will remain technically accurate, relevant, and backwards compatible with previous supplements and their functionality.

The work to be accomplished includes:

Solve Logical MSPs and LSP issues: ARINC 665 should be consistent with Logical MSP definitions found in ARINC Specification 641.

ARINC Specification 641: *Logical Software Part Packaging for Transport* was developed by the SDL working group and published July 31, 2015. It provides a method for packaging aircraft software parts for distribution using contemporary media or by electronic distribution. ARINC 665 Appendix F needs modification to be consistent with ARINC 641.

Reference ARINC Specification 838 from ARINC Report 665.

ARINC Specification 838: *Loadable Software Part Definition Format* should be referenced from ARINC Report 665 as a consistent way forward to produced XML defined software parts. This is a good time to reconcile any part formats that may have slight content inconsistencies between standards.

Synchronize ARINC Report 665 with ARINC Project Paper 645: *Common Terms and Functions for Software Distribution and Loading*

ARINC 645 purpose is to contain information that is common across aircraft software management related documents. Included items are:

- Which ARINC data loading standard to use in specific situations
- The use of and how integrity checks should be applied
- Common terminology in airborne software management
- Compile and present all applicable CRC material
- Guidance for Manufacturer’s Code requests and usage

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: Allows for interoperable software parts

Product offered by more than one supplier yes ☒ no ☐

Identify: All software producing organizations

4.2 Specific project benefits (Describe overall project benefits.)

4.2.1 Benefits for Airlines

Having a standard format for software part greatly reduces the need for airlines to own and maintain multiple ground equipment types for managing software across multiple fleets and equipment types. Equipment diversity and cost is reduced by accepting one standard format.

4.2.2 Benefits for Airframe Manufacturers

The airframe manufacturers have one standard format to specify for all software part distributions. Software parts will be in standard format used by all equipment suppliers.

4.2.3 Benefits for Avionics Equipment Suppliers

Component manufacturers Equipment design is simplified by accepting one standard format. They are able to provide to provide products that are consistent with one industry standard.

5.0 Documents to be Produced and Date of Expected Result

Supplement 5 to ARINC Report 665 will be produced.

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 Report 665, *Loadable Software Standards*	*5*	*5*	*Jun 2018*	*Oct 2019*

* Reflects in-person meetings

6.0 Comments

The SDL Subcommittee has two other on-going projects. This APIM, if approved, will be worked in conjunction at each F2F meeting. Web conferences will also be utilized for each project.

6.1 Expiration Date for the APIM

April 2020

Completed forms should be submitted to the AEEC Executive Secretary.