

AEEC Project Initiation/Modification (APIM)

- 1.0 Name of Proposed Project** **APIM #: 10-008A**
Supplement 1 to ARINC Specification 826: *Software Data Loading Using CAN Interface*
(Data Loading over CAN Bus for Diminutive Targets; CAN Bus Data Loading via Gateway Architectures)
- 1.1 Name of Originator & Organization**
Software Data Loader Subcommittee
- 2.0 Subcommittee Assignment and Project Support**
- 2.1 Suggested AEEC Group and Chairman**
Software Data Loader Subcommittee
Chairmen: Ted Patmore, Delta Airlines
Rod Gates, American Airlines
- 2.2 Support for the activity (as verified)**
Airlines: American, Delta, Lufthansa
Airframe Manufacturers: Boeing
Suppliers:
Others:
- 2.3 Commitment for Drafting and Meeting Participation (as verified)**
Airlines: American, Delta, Lufthansa
Airframe Manufacturers: Boeing
Suppliers:
Others:
- 2.4 Recommended Coordination with other groups**
- AEEC Network Infrastructure and Security Subcommittee
 - Controller Area Network (CAN) Technical Working Group (ARINC 825)
 - AEEC Galley Insert (GAIN) Subcommittee
 - AEEC SAI Subcommittee
 - All other interested industry parties
- 3.0 Project Scope**
- 3.1 Description**
This project proposes to build upon this foundation to further define requirements and adapt ARINC 826 to other applications.
- Support “Diminutive” cabin avionics
 - Applications for data loading via gateways which connect high-speed data buses to CAN
- This project will be guided by the principles held to be important by the Software Data Loader Subcommittee:

Mandate/regulatory requirement yes no

Program and date: (program & date)

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

Specify ARINC Specification 826

When is the ARINC standard required?

October ~~2011~~2012

What is driving this date? The need for harmonization of CAN data bus loading and hardware usage of CAN communication onboard aircraft is the driver.

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

If NO please specify solution: _____

Are Patent(s) involved? yes

If YES please describe, identify patent holder: _____

3.3 Issues to be worked

The proposed Supplement to ARINC 826 will address the following issues and needs of the aviation industry with regards to CAN dataloading:

- ARINC 665 Constraints
- CAN Dataloading Subsets (shop and factory loading)
- CAN Gateways used for dataloading and/or data bus protocol interfaces
- Data load examples of small targets, gateways, high-speed data busses
- Interface examples with ARINC 825 CAN Protocol

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: Standardization of CAN bus technology is the key to using CAN in data loading and communications.

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

- Cost savings to airlines (single protocol/single tool approach vs. fragmented)
- Reinforcement of concept of ARINC 665 software part as the cornerstone of avionics data loading; expansion to new applications (diminutive)

targets)

- Harmonization with other ARINC CAN Standards, Working Groups and Subcommittees
- Harmonization within industry requirements

4.2.1 Benefits for Airlines

Data loading is one of the most expensive activities of aircraft maintenance. The industry has suffered greatly from non-integrated solutions. Since the late 1990's the ARINC Software Data Loading Subcommittee has worked to standardized data loading and to harmonize with data bus protocol and associated specifications. This launched a new generation of supporting specifications (ARINC 665, 666, 667 and 827) complementary with new definition and specification in avionics and data bus architectures. ARINC 826 continues this complementary approach. An extension to ARINC 826 continues this tradition and the cost saving benefits to airlines, airframe manufacturers and suppliers.

4.2.2 Benefits for Airframe Manufacturers

Software data loading is the fastest growing area of avionics; CAN is the fastest growing data bus protocol. Definition and creation of standardized processes, COTS tools saves the airlines cost over the old industry paradigm of a different protocol, protocol implementation and data loader for every avionics box.

Lower costs from suppliers able to utilized standardized processes and readily available tools are passed on to the airframe manufacturer and airlines.

4.2.3 Benefits for Avionics Equipment Suppliers

Data loading is typically an overlooked item. Standardized processes and tools reduce pressure during software development, test and integration. Lower costs are passed on to airframe programs and the end user – airline maintenance.

5.0

Documents to be Produced and Date of Expected Result

Supplement 1 to ARINC Specification 826 is expected from this activity.

In June 2011, the SDL Subcommittee felt that it would be beneficial to divide ARINC Specification 826 into 3 separate parts, to better present the basic ARINC 826 data loading theory and the existing 2 different methods of using ARINC 826 data loading methods.

The envisioned ARINC 826 standard is intended to include the following parts:

- **ARINC Specification 826, Part 0 – General Data Loading Theory and Methods, and application layer definitions**
- **Supplement 1 to ARINC Specification 826, Part 1 – CAN Data loading using peer to peer file transfer methods (the method found in the original published ARINC 826 Standard)**
- **ARINC Specification 826, Part 2 – CAN Data loading using the upload/download transfer methods found in the ARINC Specification 825 standard**

By using separate parts, this will simplify future modifications to the separate methods (producing a supplement to only one method). This will

also allow ARINC 826 data loading methods to be adapted to other aircraft data bus networks in the future. (This work would require a new APIM and support from the airlines).

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 826-1, Part 1	5 8	10-15 16-21	April 2010	October 2011 October 2012
ARINC 826, Part 0	4	10-15	October 2011	October 2012
ARINC 826, Part 2	4	10-15	October 2011	October 2012
	# of mtgs *	# of mtg days *		

The SDL Subcommittee currently has two projects in work: **ARINC Report 835: Security of Loadable Aircraft Software Parts**, and **ARINC Specification 838: Loadable Software Parts Using XML**. As such, the SDL already has commitments to meet an average of 3 times over the next 12 months. In reality, this APIM will only add 2 meetings, or 5-6 meeting days to the SDL work program.

* Indicate unsupported meetings and meeting days, i.e., technical working group or other ad hoc meetings that do not requiring AEEC staff support.

6.0 Comments

The SDL will coordinate with other AEEC Subcommittees and Working Groups for harmonization on CAN issues. All strawman papers and drafts will be widely distributed widely between these groups. Every attempt will be made to encourage participation by CAN subject matter experts, users, and airline maintenance and engineering.

6.1 Expiration Date for this APIM

March ~~2013~~ 2012

For AEEC Secretary use only	
Date Received: _____	AEEC staff: _____
Potential impact: _____	
(A. Safety B. Regulatory C. New aircraft/system D. Other)	
Resolution: _____	
<i>Authorized, Deferred, Withdrawn, More Detail Needed, Rejected</i>	
Assigned to SC/WG: _____	