

ARINC Project Initiation/Modification (APIM)

- 1.0 Name of Proposed Project** **APIM 18-002**
LTE and Ligado Protection, and Enhanced VoIP, to be defined by the following:
- Supplement 8 to ARINC Characteristic 781
 - Supplement 15 to ARINC Characteristic 741 Part 1
 - Supplement 6 to ARINC Characteristic 761
- 1.1 Name of Originator and/or Organization**
Alan Schuster-Bruce, Inmarsat
- 2.0 Subcommittee Assignment and Project Support**
- 2.1 Suggested AEEC Group and Chairman**
AGCS Subcommittee
Robert Holcomb, American Airlines
- 2.2 Support for the activity (as verified)**
Airlines: American, KLM, TAP
Airframe Manufacturers: Airbus, Boeing, Bombardier
Suppliers: Cobham Satcom, Rockwell Collins, Honeywell, Thales
Others: Inmarsat
- 2.3 Commitment for Drafting and Meeting Participation (as verified)**
Airlines: American
Airframe Manufacturers: Airbus, Boeing, Bombardier
Suppliers: Cobham Satcom, Rockwell Collins, Honeywell, Thales
Others: Inmarsat
- 2.4 Recommended Coordination with other groups**
SAI Subcommittee
- 3.0 Project Scope**
- 3.1 Description / Background**
Resilience for new spectrum environment - The ITU in 2015 allocated the band up to 1518 MHz for mobile communications (e.g., LTE). Mobile/cellular operators are expected to deploy base stations in the next few years and, if near airports, these will cause interference to Inmarsat terminals (which receive in the band 1518-1559 MHz) causing them to be overloaded and hence inoperative. In the US this band will not be used as it is allocated for aeronautical telemetry. However, Ligado has a pending application with the FCC to deploy mobile communications in the band 1526-1536 MHz within the USA. Consequently, it is necessary to develop new equipment (specifically new Diplexer Low Noise Amplifiers - DLNAs) and aircraft provisions (if needed) suitable for retrofit and forward fit which have sufficient resiliency to such mobile communication transmissions. The DLNA to support Inmarsat SwiftBroadband needs to be

switchable as the Ligado signal is in the Inmarsat band.

Note that ARINC 781 compact satcom systems currently under development have Ligado and LTE resilience incorporated.

Enhanced VOIP - ARINC Characteristic 781-7 presently includes a security overlay (VPN) based on IPSEC and PKI to support ACARS services. Due to security concerns raised by Airbus, it is proposed to extend this to the SwiftBroadband Safety VOIP service in Supplement 8. The new service will be called enhanced VOIP.

Scope of activity

It is proposed to:

1. Include in ARINC Characteristic 781, potentially four (4) DLNA specifications with functions shown in the table below. The DLNAs may be used for forward fit and retrofit for ARINC 741, ARINC 761 and ARINC 781 satcom systems. For the Type 4 DLNA specification, wiring changes and a control functions (within the satcom system) are expected to be needed, as the DLNA has switchable filters that require switching in flight. The choice of DLNA for a specific aircraft will depend on the type of Inmarsat service used, whether retrofit or forward fit, compatibility with existing form factor and wiring, installed cost, time to market, and where the aircraft will operate. To date, a single cost-effective solution for all cases has not been found, although the AGCS Subcommittee will try to identify such a solution.

Type	LTE Resilient	Ligado Resilient	Supports Classic Aero	Supports Swift Broadband	Drop in replacement to existing DLNA
1	X		x		x
2	X		x	x	x
3	X	x	x		x
4	X	x	x	x	

Notes:

A reference to ARINC 781 from ARINC 741 and from ARINC 761 will be made.

The AGCS subcommittee will propose names for these DLNAs to replace the working names in the table.

2. Include in ARINC 781 the addition of VOIP to the existing VPN.
3. Some other maintenance changes will be made to ARINC 781 including:
 - Alignment to ARINC 771 including security objectives, dual satcom, Ethernet, and CMU interface
 - Other minor issues as they arise

3.2 Planned usage of the envisioned specification

Note: New airplane programs must be confirmed by manufacturer prior to completing this section.

Use the following symbol to check yes or no below. ☒

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

Airbus: All production aircraft
 Boeing: All production aircraft
 Other: Bombardier production aircraft

Modification/retrofit requirement yes ☒ no ☐

Specify: Any aircraft that require LTE/Ligado resilience

Needed for airframe manufacturer or airline project yes ☐ no ☐

Specify: (aircraft & date)

Mandate/regulatory requirement yes ☐ no ☒

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

When is the ARINC Standard required?

March 2019

What is driving this date?

New DLNA - deployment of LTE in band adjacent to Inmarsat and possible deployment of Ligado

Enhanced VOIP - Development of Airbus Lightweight Cockpit Satcom programme

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

If NO please specify solution: The AGCS Subcommittee believes one year is sufficient time

Are Patent(s) involved? yes ☐ no ☒

If YES please describe, identify patent holder: _____

3.3 Issues to be worked

New DLNA - RF filtering, control of filter including potential wiring changes, what happens if Ligado's license is not approved, compatibility with existing SDUs without software changes, identifying a single solution, defining the names for the DLNAs.

Enhanced VOIP - none known

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: Service: Inmarsat only

SDU: Cobham Satcom, L3T, Honeywell, Rockwell Collins, Thales

4.2 Specific Project Benefits

4.2.1 Benefits for Airlines

Provide a state of the art security overlay for VOIP/SBB.

Provide continued operation of Inmarsat services at airports when LTE is deployed, and if Ligado is deployed.

4.2.2 Benefits for Airframe Manufacturers

Provide what airlines need/want.

4.2.3 Benefits for Avionics Equipment Suppliers

More/continued sales, and provides more functionality from the satcom system.

5.0 Documents to be Produced and Date of Expected Result

ARINC 781 - Supplement 8

ARINC 741 Part 1 - Supplement 15

ARINC 761 - Supplement 6

5.1 Meetings and Expected Document Completion

Product/Activity	Mtgs	Mtg-Days (Total)	Expected Start Date	Expected Completion Date
Supplement 8 to ARINC Characteristic 781	3	9*	April 2018	March 2019
Supplement 15 to ARINC Characteristic 741 Part 1			April 2018	March 2019
Supplement 6 to ARINC Characteristic 761			April 2018	March 2019

* It is expected that this activity will be carried out during 3 AGCS Subcommittee meetings shown above. Web conferencing, 1 or 2 per month where appropriate.

6.0 Comments

None

6.1 Expiration Date for this APIM

Sept 2019

Submit completed form to the AEEC Executive Secretary.