

ARINC IA Project Initiation/Modification (APIM)

1. Name of Proposed Project

APIM #: 07-010B

AEEC Project Paper 830: Aircraft/Ground Information Exchange

Software specification only

yes no

2. Suggested Subcommittee Assignment (who acts)

2.1 Identify AEEC group

AGIE/MAGIC Subcommittee

2.2. Support for the activity

Organizations: **Airbus**, AirCell, ARINC, Boeing, FedEx, Rockwell Collins, VT Miltope, **Teledyne**

2.3. Commitment for resources (directly from participant)

Organizations: **Airbus**, AirCell, ARINC, Boeing, FedEx, VT Miltope, **Teledyne**

2.4. Recommended Coordination with other groups

The following activities are relevant to this topic:

- Aircraft Network and File Server (ANFS) - ARINC 821
- Aircraft/Ground IP Communication – ARINC 822
- Network Infrastructure and Security (NIS) - ARINC 664 and ARINC 811
- Electronic Flight Bag (EFB) – ARINC 828
- Software Data Loading (SDL) – ARINC 615 and ARINC 665
- **Aircraft Data Interface Function – ARINC 834**
- **EFB Application Control Interface – ARINC 840**
- **Media Independent Aircraft Messaging (MIAM)– ARINC 841**
- Other Application Layer activities

3. Project Scope

3.1 Description

The Aircraft/Ground Information Exchange (AGIE) is a set of protocols and interfaces for application-to-application process information exchange between aircraft applications and the airline ground infrastructure, using wired, wireless and optical technologies. Communication services are managed transparently by the IP Comm Manager (e.g., Manager of Air/Ground Interface Connections MAGIC). The aviation industry has spent significant effort defining onboard architectures and communication protocols to support the delivery of large amounts of aircraft information using Internet Protocols (IP). For example, aircraft and applications have been developed to rely on wireless communication of these data uploads/downloads for efficient operation. AGIE would allow for use of a common-use infrastructure such that every airline, airframe or third-party content provider does not need to maintain local servers for individual aircraft applications (such as EFB chart viewers, document viewers, electronic logbooks, flight data download systems, IFE content, etc.). The specification should define a

standard interface and functionality for ground applications to enable use of the “store and forward” process.

While the AEEC efforts to standardize Gatelink (ARINC 822) and onboard network functionality (ARINC 821) are essential to promote interoperability across vendor products, there is one piece of the wireless data delivery that has not been addressed. Most aircraft applications built or in development assume that the large bandwidth available over Gatelink is also available through the wide area network (WAN) all the way to the ground application. These applications are not taking into account the cost that an airline would incur to provide such large bandwidth communication circuits to airports to support this data delivery.

To alleviate the need for large, costly dedicated communication circuitry, a common protocols and interfaces should be defined to support **ground-based** subsystems based that allow for a “store and forward” process of large data transfers. This application-level protocol will require an aircraft software component such that on-board applications can be directed to upload and download data to local subsystems at the airport rather than trying to reach host applications across the WAN.

Authentication, authorization, integrity and security provisions specific for AGIE will be included. Provisions should be made as follows:

The open standard for AGIE should be extensible and transparent to the addition of new communication links between the aircraft and the ground.

The AGIE protocol should allow transmission of partial uploads/downloads, in case the aircraft turn time is insufficient to complete all data waiting for delivery or the communication link is otherwise interrupted.

The AGIE should be available for use by multiple aircraft and ground-based applications, allowing airlines to define priorities of data for transfer.

The AGIE should be independent of the communication paths available. It is expected that the IP Communication Management function (e.g., MAGIC) will provide policy-based transparency to the AGIE service.

The messaging should be able to terminate in multiple aircraft domains.

3.2 AGIES Defined service Interfaces

AGIE is expected to be a client/server system operating similarly to the conventional email system. AGIE clients represent the end-systems from which data originate and who consume data. Servers are responsible for managing the transport of information. As such AGIE will contain the following fundamental interfaces as illustrated in Figure 1:

- **Communication link between an onboard and a ground based AGIE server (A1)**
- **Interface between client and server onboard an aircraft (A2)**
- **Inteface between client and server on ground (A3)**

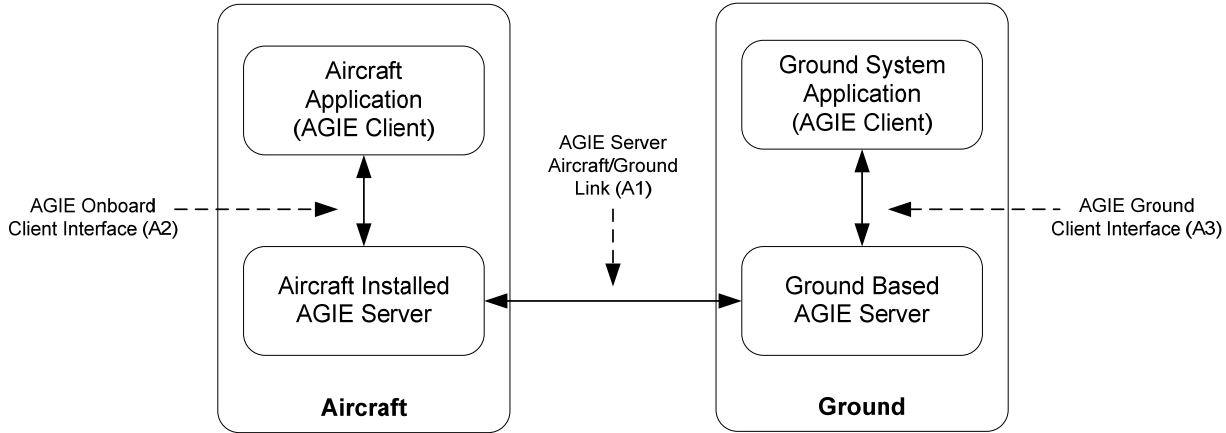


Figure 1: Fundamental Interfaces between AGIE components

3.3. Planned usage of the envisioned specification

New aircraft developments planned to use this specification yes no

Airbus: A350XWB

Boeing:

Other:

New avionics equipment for major retrofit programs (schedule TBD) yes no

Mandate/regulatory requirement yes no

Please specify program and date: N/A

Modification/retrofit requirement yes no

Please specify: tbd

Airframer and/or airline projects to use this specification yes no

Is the infrastructure standard for the aircraft defined? yes no

When is the ARINC standard required?

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

If 'No' please specify solution:

Patent(s) involved? yes

If 'Yes' please describe:

(This specification will not prescribe a wireless link that may have been already patented)

3.4. Issues to be worked

The main issues are:

4.3 Project Benefit for Airlines

This standard will provide several benefits to Airlines:

- Commonality between the delivery and tracking mechanism for data delivery to and from aircraft applications
- Ability to prioritize data transfer for different aircraft applications

4.4 Project Benefit for Airframe Manufacturers

Airframe manufacturers can define a single data delivery interface on the aircraft for all onboard applications to use.

Flexibility to add new functions to the aircraft that require large data uploads/downloads while not jeopardizing “high priority” data transfers

4.5 Project Benefit for Avionics Equipment Suppliers

Allows for an open market place for manufacturers to supply interoperable equipment

5. Documents to be Produced and Date of Expected Result

ARINC Project Paper 830: Aircraft/Ground Information Exchange for IP Communication.

6. Meetings/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
Prepare standards for AGIE	6	18 (6*3)	Dec 2008	Mar 2010
Revised schedule (set Sept 29, 2010)	3	9 (3*3)	Oct 2010	Sept 2011

Note: Part of AGIE/MAGIC Subcommittee activity

7. Comments

Any other information deemed useful to the committee for managing this work.

For IA staff use only:

Date Received: Rev A Sept 18, 2008
 Potential impact: New Acft
 Resolution: Authorized

IA: PJP

Date of Resolution: First: April 15, 2008
 Rev A:
 RevB: