ARINC
INDUSTRY ACTIVITIES℠
An SAE ITC Program

2014 ANNUAL REPORT

AEEC • AMC • FSEMC

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MESSAGE FROM INDUSTRY ACTIVITIES
Review of 2014

On December 23, 2013, ARINC Industry Activities was sold to SAE Industry Technologies Consortia. In the first few weeks, we set a priority to continue operating on a business as usual basis with no external disruptions for our industry while undergoing the internal and logistical transition to new ownership. At first, we felt that we were off to a slow start, but in retrospect it went as well as one can expect. In the end, I believe we accomplished our objectives as an organization very well and hopefully you all do too.

For anyone who has ever been through a transition in ownership, you know what that entails. For those that do not, it sort of goes like this:

- Day one: We now work for a new owner. What does this mean?
- Day two: Let's figure this out in a hurry and get going!
- Day three and so on: Make it happen as quickly and effectively as possible!

In the first three months, we searched for and secured a new office location while transitioning ARINC IA's internal support services to SAE International. This entailed planning for and implementing the migration of essential ARINC IA processes, applications, and infrastructure to ensure that day-to-day operations continued uninterrupted for our customers. It also included adapting to new processes, applications, and infrastructure within SAE, which is ongoing today. Finally, we moved into our new offices the last week of May 2014 and completed the critical portions of the transition by the end of June 2014.

All in all, we are now in a good and stable environment with our new ownership and we both look forward to improving our processes and efficiencies as we learn from each other.

2014 Highlights:

- Conducted the 65th annual AEEC General Session and AMC Conference, held April 14-17, 2014, in Toronto, Canada. This conference was attended by 39 airlines, 5 airframe manufacturers, 149 avionics suppliers, and others. Overall, the total registered attendance was 668 people representing 193 companies from 25 countries.
- Conducted the 20th annual FSEMC Conference, held September 15-18, 2014, in Tulsa, Oklahoma. This conference was attended by 40 simulator user organizations, 57 products and services suppliers, 3 airframe manufacturers, 8 simulator manufacturers, and 4 regulatory authorities. The total registered attendance was 352 attendees from 29 countries.

- Held four largely attended information sharing meetings that raise awareness of operational, technological, and regulatory issues.
    - The Data Link Users Forum met February 4-5, 2014, in Safety Harbor, Florida and September 23-24, 2014, in Brussels, Belgium.
    - The Electronic Flight Bag Users Forum met May 13-15, 2014, in Memphis, Tennessee and November 12-13, 2014, in Rome, Italy.
- Held numerous subcommittee, working group, task group, and WebEx teleconferences throughout the year.
- Adopted 8 new ARINC Standards and 12 supplements to existing ARINC Standards, and authorized 24 new projects.
- Vetted 385 questions related to resolving avionics maintenance and flight simulation issues.

Going forward, ARINC Industry Activities, as an SAE ITC Program, will continue to organize the AEEC, AMC, and FSEMC activities as we have in the past. As always, your financial support through membership and sponsorship of the AEEC, AMC, and FSEMC activities and your technical contributions throughout the year are crucial to ensure this important work continues to benefit all segments of our industry. Many organizations benefit from the work of the AEEC, AMC, and FSEMC. However, those organizations that participate reap many more benefits through enhanced conversations and sharing of information among engineering professionals. It can be argued that in the absence of a company's participation your competitors will determine your future. Don't let that happen to your organization. Join today!

Michael D. Rockwell
Executive Director

ARINC Industry Activities, an
SAE ITC Program

AEEC | AMC WELCOME AND KEYNOTE

Pictured from left to right are AEEC Chairman Brian Gleason, Southwest Airlines; AEEC Chairman-Elect Jürgen Lauterbach, Lufthansa; Keynote Speaker Claude Chidiac, Esterline CMC Electronics; AMC Chairman Marijan Jozic, KLM Royal Dutch Airlines; and AMC Vice Chairman Anand Moorthy, American Airlines.

The 2014 AEEC | AMC, organized by ARINC Industry Activities and hosted by Esterline CMC Electronics was held April 14-17, 2014, in Toronto, Canada.

AEEC Chairman Brian Gleason, Southwest, officially opened the AEEC | AMC Conference and welcomed participants to Toronto. Brian emphasized the importance of collaboration in solving complex technical problems in aviation. He noted that collaboration is the key to developing the ARINC Standards.

The keynote address included a presentation from Claude Chidac, Esterline CMC Electronics. Claude Chidiac, in his remarks, emphasized the rich history of Esterline CMC Electronics and their long-standing commitment to the airline community. The Canadian Marconi Company (CMC) opened their doors in 1903 as a radio communications group. After developing a Doppler radar in the mid-1950s, CMC began to shift its endeavors from radio communications to avionics. CMC has been a part of Esterline's Avionics and Controls business unit since 2007.

CMC believes that as an avionics manufacturer, they have unique insight into what they see as the future of the avionics industry. Spearheading this future are three major drivers of growth:

1. There is a very large undelivered backlog of commercial aircraft, both narrow body and wide body.

2. NextGen/SESAR will bring fundamental transformation to Air Traffic Management and drive the requirement to update aircraft over the coming years.

3. New aircraft programs and manufacturers, both military and civilian, are emerging from countries like China, India, and Russia.

These drivers offer both immediate and long term growth for the industry. Regardless, even when recent trends in the avionics industry, like the integrated cockpit, have reversed, the general trend has consistently led towards growth.

During this conference, a number of technical issues of immediate interest to the airline community were discussed. Symposiums on ADS-B Equipage, Aircraft Connectivity: the Airlines' Point of View, FMS, NextGen/SESAR Airspace, Reliability Communication, 3D Printing, and 4D Navigation captivated the interest of meeting participants.

FSEMC WELCOME AND KEYNOTE

Stefan Nowak
Vice Chairman, 2013 - 2014

John Van Maren, Vice President Simulation
FlightSafety International

The 2014 FSEMC, organized by ARINC Industry Activities and hosted by FlightSafety International, was held September 15-18, 2014, in Tulsa Oklahoma.

FSEMC Vice Chairman Stefan Nowak officially opened the meeting and reported that Brandon Mazzacavallo, FSEMC Chairman, was unable to attend due to an injury. Stefan then noted that this was FSEMC's 20th year, and that the flight simulation industry is growing rapidly. Air travel is expanding in Asia, Africa, and South America, constantly adding aircraft and routes. As a result, we are busier than ever, and that is a good thing. The industry is also changing: software intensive aircraft, regulatory changes, aging equipment, and obsolescence are all things we face daily now. These changes are what the FSEMC and this conference comes to bear. Stefan went on to introduce the Keynote Speaker John Van Maren, Vice President of Simulation at FlightSafety International.

John Van Maren, FlightSafety International, provided a brief history of flight simulation in Tulsa, and celebrated the current advancement of the simulation industry. The aviation industry, with flight simulation riding on its coattails, is forecasting unprecedented growth. Aircraft fleets are expected to double over the next 20 years with 30,000 to 35,000 new aircraft delivered. Over 500,000 new pilots over the next 20 years will need to be trained to offset pilot retirements and keep up with the fleet growth. This equates to a need of 1000 new full flight simulators and countless lower level devices.

John discussed the emergence of Commercial Off The Shelf (COTS) components from traditional custom-designed hardware. The primary benefit of using COTS solutions is that it allows the industry to take advantage of leading edge technologies without incurring the time and cost of developing proprietary solutions. Visual capabilities are quickly increasing by taking advantage of COTS computers, graphics cards, and projectors. However, the use of COTS solutions also creates new challenges. It is the nature of Commercial Off The Shelf components to change as technology evolves. What is available today may not be available 10 years from now. It is vital that there is a planned, cost effective sustainment plan for every COTS component if simulators are to be supported for 30 years or more.

John continued the discussion of the importance of a sustainment plan asking participants: how can the industry protect simulators from becoming a commodity? With procurement decisions becoming primarily based on lowest acquisition cost, the industry needs to find a way to ensure value items, such as innovation, service, and long-term support fit into the purchase decision. The challenge of ensuring new simulation devices can be supported for the next 30 years is something that operators continuously face. Simulators manufactures need to continue to work to address the delicate balance between cost and support, while simultaneously protecting their intellectual property.

John urged participants to keep these challenges in mind during the FSEMC Conference, and remember the FSEMC is the only vehicle at this time that can truly address and effect industry change.

During the conference, the FSEMC held symposiums on:

- Ready, Set, Upset!
- Keeping B787 Devices Current with the Airplane – The Boeing TDM Perspective
- Automated Testing Tool for Motion Bases: An Approach to Automated System Evaluation
- Update or Die: How to Keep Your Grandfather Rights Alive
- Smooth Moves: Using Objective Motion Cueing Tests to Verify and Enhance Motion Cueing
- Impact of Upcoming Regulation on Our Industy
- ARINC Specification 661: Cockpit Display Systems

BRINGING THE INDUSTRY TOGETHER

Focusing on Technical Issues

Most of our daily professional lives are focused on the technical issues. However, we do not lose sight of community, family, or integrating a bit of fun.

Taking Care of Community, Family, and Having a Bit of Fun

Our annual events select a local charity and fun filled activities for accompanying family of the attendees. The AEEC | AMC attendees showed the spirit of community awareness and generosity by raising $678 for the SickKids Hospital for Children. The Esterline CMC Electronics charity event added $522, bringing the total amount contributed to the SickKids Hospital for Children to $1,200. Thanks to all who contributed to this worthy cause.

AEEC, AMC, & FSEMC
Aviation Industry Activities

AEEC, AMC, & FSEMC: Aviation Industry Activities Organized by ARINC

The AEEC, AMC, and FSEMC create value for the airlines, aircraft and flight simulator manufacturers, avionics suppliers, training providers, and other stakeholders by cooperatively establishing common technical standards and developing shared technical solutions that no one organization could develop independently. The AEEC, AMC, and FSEMC conduct internationally recognized aviation engineering and maintenance conferences that are attended by more than 2,700 aviation industry professionals representing more than 70 airlines and 225 industry suppliers from nearly 40 countries around the world.

Working cooperatively through the AEEC, engineering professionals in the avionics and cabin electronics segments of the industry develop technical standards that contribute to achieving a safe, global, seamless, and interoperable aviation system.

The AMC has proven the benefits of using a cooperative approach to resolve avionics maintenance issues and the FSEMC has done likewise for flight simulator engineering and maintenance issues.

Airlines Electronic Engineering Committee (AEEC)

The AEEC was formed in 1949 to provide leadership to the aviation community, namely the airlines, airframe manufacturers, and avionics suppliers that drive aircraft and avionics development. AEEC develops ARINC Standards for new aircraft development programs, major retrofit programs, for incorporating current/evolving information technology, and to meet regulatory requirements. This includes systems and services for NextGen, SESAR, and CARATS airspace improvement initiatives. AEEC conducts technical evaluations and develops standards applicable to all segments of the aviation community. Today, nearly all commercial and regional aircraft around the world rely on avionics equipment based on the consensus-based standards developed and approved by the AEEC. ARINC Standards are used as the basis for design, development, investment, acquisition, life-cycle support, and other business decisions.

Avionics Maintenance Conference (AMC)

The AMC was formed in 1949 to create value by reducing the cost of ownership for airborne electronics by promoting reliability and improving maintenance and support techniques. AMC achieves its goal through the exchange of maintenance and associated technical information at its premier event—the annual Avionics Maintenance Conference. Each year, more than 750 avionics maintenance professionals from airlines and their suppliers across the globe assemble to identify solutions to tough avionics maintenance problems in a question-and-answer format supplemented by technical symposia; this leads to the aviation industry saving tens of millions of dollars annually. As a result of discussions at the annual AMC meeting or in response to emerging industry concerns, AMC establishes task groups to develop maintenance-related ARINC Standards that present best practices or address a specific issue.

Flight Simulator Engineering & Maintenance Conference (FSEMC)

The FSEMC was formed in 1996 and brings the proven approach of the AMC to the flight simulation community. FSEMC creates value through a number of activities, including the annual Flight Simulator Engineering and Maintenance Conference. Attended by more than 350 flight simulator experts from around the world, the annual conference uses a question-and-answer format and technical symposia to exchange engineering, maintenance, and associated technical information and identify technical solutions that allow simulator users to operate more cost effectively. FSEMC also conducts a series of task groups that develop technical standards related to simulation and training. As a result, simulator users reduce life-cycle costs for flight simulators and training devices by promoting reliability and improving maintenance and support techniques.

Continued Commitment

The benefits of the cooperation in avionics engineering, maintenance, and flight simulation are clear. It is also true that the aviation industry is continually changing. Relationships among airlines, airframe manufacturers, and avionics suppliers are also evolving. Therefore, AEEC, AMC, and FSEMC are changing to meet the challenges of 21st century aviation.

Continued commitment and support from the entire aviation community is critical to ensuring that the cooperation fostered and value created by AEEC, AMC, and FSEMC endures and thrives. These activities are global membership organizations with leadership and work planning driven by the worldwide participants and those companies that benefit from the value created.

To learn more, please visit www.aviation-ia.com.

MEMBER ORGANIZATIONS AND CORPORATE SPONSORS
Benefits

AEEC, AMC, and FSEMC are global technical activities comprised of airlines and other organizations eligible to be Member Organizations with additional support provided by Corporate Sponsors. The ability of AEEC, AMC, and FSEMC to create value depends on the commitment from organizations like yours.

Your commitment of support, by becoming a Corporate Sponsor or Member Organization, helps ensure the continued development of ARINC Standards and collaborative solutions that improve cost effectiveness, increase productivity, and reduce life-cycle costs for airlines and their partners in the avionics, cabin system, and flight simulation and training segments of the aviation industry.

Benefits of becoming a Corporate Sponsor include:

- Ability to download ARINC Standards from the web site at no additional charge.
- Discount of 50% for hard copy ARINC Standards.
- Ability to download other Industry Activities published information (i.e., meeting and conference reports, draft documents, technical application bulletins, etc.) at no additional charge.
- Eligibility to host a hospitality suite at our AEEC | AMC Conference.
- Eligibility to exhibit at the FSEMC.
- Attend the AEEC, AMC, FSEMC, and/or EFB Users Forum at no additional charge.
- Recognition at AEEC, AMC, and FSEMC meetings and on our web site.

Benefits of becoming a Member Organization include:

- All of the benefits mentioned above.
- Eligibility to vote for companies to serve on the Steering Group or Steering Committee.
- Eligibility to serve on the leadership committees.

Becoming a Corporate Sponsor or Member Organization also provides:

- Satisfaction of knowing that your organization is contributing to the value created by AEEC, AMC, and FSEMC.
- Greater networking opportunities with other companies and potential customers.

Please let us know how we can best assist your efforts. We look forward to working with your organization to strengthen the value created by AEEC•AMC•FSEMC in the future.

For more information, please contact us at ia.sponsorship@sae-itc.org.

SUPPORTING ORGANIZATIONS

Member Organizations (As of December 31, 2014)

Airline	AEEC	AMC	FSEMC
Advanced Simulation Corp		X	X
Aerolineas Argentina	X		X
Air Canada (Flight Ops Training)		X	X
Air France – KLM	X	X	X
Air Wisconsin	X		X
Airbus France SAS			X
Airbus SAS	X	X	
Alaska Airlines	X	X	X
All Nippon Airways	X	X	X
American Airlines	X	X	X
American Eagle	X		X
Asian Aviation Training Centre, Ltd.		X	X
Austrian Airlines	X	X	
Azul Linhas Aereas	X	X	
Bangkok Airways Public Company Limited	X		X
Boeing Company, The	X	X	X
British Airways	X		X
CAE			X
Cargolux Airlines International S.A.			X
Cathay Pacific Airways, Ltd.		X	X
Chautauqua Airways, Inc.	X	X	X
Czech Airlines	X		
Czech Airlines Training Centre		X	X
Delta Air Lines	X	X	X
El Al Israel Airlines			
Ethiopian Airlines		X	X
FedEx	X		X
Finnish Transport Safety Agency (Trafi)			X
FlightSafety International		X	X
Hawaiian Airlines	X	X	X
Iberia Airlines			

Airline	AEEC	AMC	FSEMC
Indra Sistemas, S.A.			X
Institute of Air Transport, Ltd. (Sofia Flight Training)		X	X
Japan Airlines	X		X
L3 Communications			X
Landrx Simulation, Inc.		X	X
Lufthansa	X		X
MOOG			X
Muller Simulation Consultancy			X
Rockwell Collins Simulation and Training			X
Sim Industries		X	X
Southwest Airlines	X	X	X
Swiss International Airlines	X	X	X
TAP Air Portugal	X		X
TRU Simulation + Training		X	X
Turkish Airlines		X	
United Airlines	X		X
United States Air Force	X	X	
UPS	X	X	X
US Airways	X	X	X
Virgin Atlantic	X		X
UPS	X	X	X
US Airways	X	X	X
Virgin Atlantic	X	X	X

CORPORATE SPONSORS
(As of December 31, 2014)

- Adacel
- Adventium Labs
- Aero Instruments and Avionics
- Aeroflex
- AeroNavData
- Airline Services, Ltd.
- ALTYS Technologies
- Amdar Programme
- Amphenol Air LB
- Astronautics Corporation of America
- Astronics
- Aurora Optics
- AV-DEC
- Avia Radio A/S
- Aviation Data Communication Corporation
- Aviation Spectrum Resources (ASRI)
- AVIC Avionics Company, Ltd.
- Avicom Japan Co., Ltd.
- Avilution, LLC.
- Avionica, Inc.
- Avionics Support Group
- Avitech GmbH
- Bad Elf
- BAE Systems
- Barfield
- Beijing Weibang Yuenhang Wireless Technologies Co., Ltd.
- Carillon Information Security, Inc.
- Carlisle Interconnect Technologies
- CETCA Avionics Co., Ltd.
- China Aero Polytechnology Establishment
- Cinch Connectors
- CIRA Scpa
- Civil Aviation Bureau of Japan (JCAB)
- CMC Electronics, Inc.
- Cobham Antenna Systems
- Cobham SATCOM
- Comply 365
- DDC-I Inc.
- Ecole de Technologie Superieure (ETS)
- Ecole Polytechnique de Montreal
- Embraer
- EMTEQ
- Esterline Control and Communication Systems
- Esterline Technologies India Private Limited
- Eurocontrol
- European Aviation Safety Agency (EASA)
- Federal Aviation Administration - AVN
- FLYHT Aerospace Solutions
- Gables Engineering, Inc.
- Garmin International
- GE Aviation Systems
- GE Intelligent Platforms
- Glenair, Inc.
- Global Invacom, Ltd.
- Gogo LLC
- Harris Corporation
- HEICO
- Honeywell, Inc.
- ICG - International Communications Group
- iJet Onboard
- Inmarsat (Aeronautical Business)
- Innovative Solutions and Support

- Intelsat
- International Aeronavigation Systems
- Iridium
- ITT Corporation
- Japan Radio Air Navigation Systems Assoc.
- Jeppesen Sanderson
- Kitco Fiber Optics
- Kollsman
- Kymeta Corporation
- L2 Consulting Services, Inc.
- Lumexis Corporation
- MEN Mikro Elektronik
- Micro Nav, Ltd.
- Millennium International
- Molex
- National Geospatial-Intelligence Agency (NGA)
- NavHouse Corporation
- Navtech, Inc.
- NEC Corporation
- NTT Data Corporation
- Ontic Engineering & Manufacturing
- Panasonic
- Performance Software
- PGA Electronics
- Radiall USA, Inc.
- Row 44
- Safran Engineering Services/Labinal
- Souriau
- Spherea Test and Services
- Star Navigation Systems Group, Ltd.
- STS Aviation Group
- SYSGO AG
- T&A Systeme GmbH
- Talon Aerospace
- TE Connectivity
- TechSAT
- Teledyne Controls
- Teradyne, Inc.
- Thales CETC Avionics
- Thales SA
- Thomas Global Systems, LLC
- Thompson Aerospace
- Thrane & Thrane
- Ultramain Systems, Inc.
- Union Aviation Idustrialists
- United Technologies Corporation
- Universal Avionics Systems
- Universal Weather & Aviation, Inc.
- Validated Software Corporation
- Vector Informatik GmbH
- Verocel, Inc.
- ViaSat, Inc.
- Virginia Small Aircraft Transportation Systems
- Wavestream Corporation
- WG Holt, Inc.
- zee.aero
- Zodiac In-Flight Innovations
- Zodiac Seats France

OTHER AIRCRAFT OPERATORS
(As of December 31, 2014)

- Aer Lingus Ltd
- Airstar Corporation
- AK Steel Corporation
- American Financial Group
- Ameritas Life Ins. Corp dba Ameritas Financial Svc
- Amway Corporation
- Anheuser-Busch Companies
- Aquiliam Corporation
- AT&T Management Services
- Becton Dickinson and Company
- Bristow US LLC
- BW Aviation Management, LLC.
- BWIA West Indies Airways Ltd.
- Cableair, Inc.
- Citation Marketing Division
- Clos de Berry Management, Ltd.
- Comprehensive Investment Company
- ConAgra Foods, Inc.
- ConocoPhillips
- Cummings, Inc.
- Deere & Company
- Dunavant Enterprises
- Eaton Aerospace
- Egyptair
- Eli Lilly and Company
- Emerson Electric Company
- EWA Holdings LLC
- Exelis, Inc.
- FL Aviation Group
- Flight Proficiency Service, Inc.
- Florida West International Airways, Inc.
- G.G. Aircraft
- General Mills
- Greenaap Consultants, Ltd.
- Group Holdings, Inc.
- Hamilton Companies
- Harris Corporation
- Hess Corporation
- Iowa Land and Building
- Johnson & Johnson
- Kaiserair, Inc.
- Kansas City Life Insurance Company
- Kimberly-Clark Corp
- King Ranch, Inc.
- Kraft Foods Global Inc.
- LATAM Airlines Group S.A.
- Liberty Mutual Insurance Group/ Boston
- Lockheed Corp (Lockheed California Company)
- National Aviation Company of India Lt.
- New England Airlines, Inc.
- New York Hospital
- Newell Companies
- Nike
- Occidental Petroleum Corporation
- Owens-Illinois General Inc.
- PHI, Inc.
- Philippine Air Lines, Inc.
- Piedmont Airlines, Inc.
- R.T. Vanderbuilt Co, Inc.
- Rich Products Corporation
- Rutherford Oil Corporation
- SC Johnson & Son, Inc.
- Sony Aviation
- South African Airways (Pty.) Limited
- Thomas H Lee Company
- Timken Company
- Tracinda Corporation
- Tristam C. Colket, Jr
- United Services Automobile Association
- United States Steel Corporation
- Vallejo Investments, Inc.
- Vulcan Materials Company

ARINC STANDARDS
Introduction

ARINC Industry Activities publishes consensus-based, voluntary aviation technical standards that no one organization could develop independently. This is facilitated by the actions of three industry committees: AEEC, AMC, and FSEMC.

- The AEEC develops a broad range of avionics and infrastructure standards for new aircraft and for major derivative programs. These standards are used by all segments of the aviation community.
- The AMC develops maintenance-related technical standards.
- The FSEMC develops technical standards related to simulation and training.

ARINC Standards describe avionic systems, cabin systems, information systems, and associated interfaces used by more than 10,000 air transport and business aircraft worldwide. There are three classes of ARINC Standards:

- ARINC Characteristics: Define the traditional form, fit, function, and interfaces to avionics equipment and associated networks.
- ARINC Specifications: Define the avionics infrastructure including software operating systems interfaces, electrical interfaces, data buses, physical packaging of avionics equipment; communication, networking and data security standards.
- ARINC Reports: Provide guidelines or general information found by the aviation industry to be preferred practices, often related to avionics maintenance, product support, and flight simulator engineering and maintenance.

ARINC STANDARDS
20 Standards Published in 2014

Standard	Subject	Document & Title
432-2	Simulation	ARINC Report 432-2: Training Requirements for Flight Training Equipment Support Personnel
439	Simulation	ARINC Report 439: Guidance for Simulated Air Traffic Control Environment in Flight Training Devices
485P1-3	Cabin	ARINC Specification 485-3: Cabin Equipment Interfaces, Part 1, Head End Equipment Protocol
485P2-4	Cabin	ARINC Specification 485-4: Cabin Equipment Interfaces, Part 2, Physical Layer - In-Seat Protocol
619-4	Datalink	ARINC Specification 619-4: ACARS Protocols for Avionic End Systems
620-8	Datalink	ARINC Specification 620-8: Data Link Ground System Standard and Interface Specification (DGSS/IS)
653P5	Software	ARINC Specification 653: Avionics Application Software Standard Interface, Part 5 - Core Software Required Capabilities
702A-4	CNS/ATM	ARINC Characteristic 702A-4: Advanced Flight Management Computer System
759	EFB	ARINC Characteristic 759: Aircraft Interface Device (AID)
791P1-2	Satcom	ARINC Characteristic 791-2: Mark I Aviation Ku-Band and Ka-Band Satellite Communication System, Part 1
791P2-1	Satcom	ARINC Characteristic 791-1: Mark I Aviation Ku-Band and Ka-Band Satellite Communication System, Part 2
800P2	Cabin	ARINC Specification 800P2: Cabin Connectors and Cables, Part 2, Specification of Connectors, Contacts, and Backshells
800P3	Cabin	ARINC Specification 800P3: Cabin Connectors and Cables, Part 3, Specification of Cables
809-3	Cabin	ARINC Specification 809-3: 3GCN - Seat Distribution System
810-4	Galley	ARINC Specification 810-4: Definition of Standard Interfaces for Galley Insert (GAIN) Equipment, Physical Interfaces

Standard	Subject	Document & Title
812AP1-1	Galley	ARINC Specification 812A-1: Standard Data Interfaces for Galley Insert (GAIN) Equipment, Part 1, CAN Communications
812AP2	Galley	ARINC Specification 812A: Standard Data Interface for Galley Insert (GAIN) Equipment, Part 2, CAN Communications, Verification and System Test Guidance
834-4	EFB	ARINC Specification 834-4: Aircraft Data Interface Function (ADIF)
830	Datalink	ARINC Specification 830: Aircraft/Ground Information Exchange using Internet Protocols (AGIE)
839	Datalink	ARINC Specification 839: Function Definition of Airborne Manager of Air-Ground Interface Communications (MAGIC)

Copies of these standards may be obtained at the ARINC Store: https://www.aviation-ia.com/cf/store. Members and Corporate Sponsors are eligible to access complimentary ARINC Standards

ARINC STANDARDS
20 Standards Published in 2014

A Summary of each ARINC Standard published in 2014 follows:

ARINC Report 432-2
Training Requirements for Flight Training Equipment Support Personnel
Adopted: September 15, 2014

This document is considered as a guide for flight training equipment operators and manufacturers to define the scope and content of Support Personnel training courses. This document defines the content of each module and the level to which it is taught. It can then be used as a common baseline for training requirements worldwide by flight training equipment operators and suppliers

ARINC Report 439
Guidance for Simulated Air Traffic Control Environments in Flight Simulation Training Devices
Adopted: February 4, 2014

This document provides guidance on provision of a Simulated Air Traffic Control Environment (SATCE) in Flight Simulation Training Devices (FSTDs) for the benefit of flight crew training. This guidance recommends a more mature set of requirements, and provides commentary on system scope, currently available technologies, integration, qualification, and maintenance. This work builds upon that originally undertaken by IATA Flight Simulator Working Group in 2002 (IATA, 2002), and further developed in ICAO Document 9625 Ed. 3 (ICAO 9625/3).

ARINC Specification 485P1-3
Cabin Equipment Interfaces, Part 1, Head End Equipment Protocol
Adopted: October 24, 2014

This document is based on computer standard bus RS-485. It defines the electrical characteristics, protocol, and data content for a data bus used within cabin systems. Part 1 describes communication requirements used with head end equipment. Supplement 3 defines messages for in-seat BITE reporting to support seat actuation electronics. It defines self-test fault messages to ease maintenance operations.

ARINC Specification 485P2-4
Cabin Equipment Interfaces, Part 2, Physical Layer - In-Seat Protocol
Adopted: October 24, 2014

This document is based on computer standard bus RS-485. It defines the electrical characteristics, protocol, and data content for a data bus used within cabin systems. Part 2 describes physical elements of the data bus and in-seat protocols. Supplement 4 defines messages for in-seat BITE reporting to support multiple seat suppliers and seat actuation electronics.

ARINC Specification 619-4

ACARS Protocols for Avionic End Systems
Adopted: April 15, 2014

This document defines ACARS protocols used between the onboard communications management unit and avionics user systems. Supplement 4 updates interface requirements in the form of a new General Format Identifier (GFI) for data exchange with the Cockpit Voice Recorder (CVR). This will enable investigators to decode CVR data independent of the CVR supplier. It also specifies an interface to the traffic computer to facilitate TCAS/ADS-B In-Trail Procedures.

ARINC Specification 620-8

Data Link Ground System Standard and Interface Specification (DGSS/IS)
Adopted: October 24, 2014

This document defines datalink ground system interfaces. Supplement 8 expands the ACARS ground standard message size to accommodate media independent messages yielding up to 5MB per message. It adds meteorological datalink formats consistent with World MET Organization (WMO) specifications.

ARINC Specification 653P5

Avionics Application Software Standard Interface, Part 5 - Core Software Recommended Capabilities
Adopted: October 24, 2014

This document defines an avionic computer operating system interface used for the development of avionics application software. Part 5 is an expansion of the ARINC 653 document set. It describes the expectations of the core software used within larger avionics systems.

ARINC Characteristic 702A-4

Advanced Flight Management Computer System
Adopted: October 24, 2014

This document defines flight management system functional standards in the framework of a traditional ARINC Standard. Supplement 4 adds winds temperature definitions as required to support 4D Trajectory operations. This enables the uplink of up to 10 temperatures for both climb and descent segments. In particular, wind temperatures added to the Predicted Wind Data (PWI) and Predicted Wind Modification (PWM) messages.

ARINC STANDARDS
20 Standards Published in 2014

ARINC Characteristic 759
Aircraft Interface Device (AID)
Adopted: April 15, 2014

This document defines a traditional form, fit and function specification for an Aircraft Interface Device (AID) used with Electronic Flight Bag (EFB) installations. The AID is intended to be used as a buffer to protect avionics equipment from unintended consequences of using commercial off-the-shelf equipment.

ARINC Characteristic 791P1-2
Mark I Aviation Ku-Band and Ka-Band Satellite Communication System, Part 1, Physical Installation and Aircraft Interfaces
Adopted: April 14, 2014

This document describes the characteristics of a Ku/Ka band satellite communication system intended for installation in all types of aircraft. It describes the desired operational capability of the equipment needed to provide a broadband network that can be used for data, video, and voice communications typically used for passenger communications and/or entertainment. Supplement 2 defines alternative system architectures and defines an Airplane Personality Module (APM).

ARINC Characteristic 791P2-1
Mark I Aviation Ku-Band and Ka-Band Satellite Communication System, Part 2, Electrical Interfaces and Functional Equipment Description
Adopted: April 14, 2014

This document describes the characteristics of a Ku/Ka band satellite communication system intended for installation in all types of aircraft. It describes the desired operational capability of the equipment needed to provide a broadband network that can be used for passenger entertainment and non-safety services. Supplement 1 updates antenna performance requirements and methods to achieve accurate satcom beam steering.

ARINC Specification 800P2
Cabin Connectors and Cables, Part 2, Specification of Connectors, Contacts, and Backshells
Adopted: April 14, 2014

This document defines connector characteristics and physical dimensions of connectors recommended for cabin systems used in commercial aircraft. Specifically, it provides a listing of connector, contacts and backshells. It provides test specifications for connectors, test groups and test requirements.

ARINC STANDARDS
20 Standards Published in 2014

ARINC Specification 800P3
Cabin Connectors and Cables, Part 3, Specification of Cables
Adopted: April 14, 2014

This document defines the characteristics of cable that are recommended for cabin systems used in commercial aircraft. Specifically, it provides a listing of cable categories, test specifications, test groups, and test requirements.

ARINC Specification 809-3
3GCN - Seat Distribution System
Adopted: April 14, 2014

This document defines early generation networking standards for cabin passenger seats. Supplement 3 provides standardized network addressing for the seat and seat peripherals. It provides guidelines for grounding associated seat electronics properly. It updates the definition of passenger seat power outlets and data outlets.

ARINC Specification 810-4
Definition of Standard Interfaces for Galley Insert (GAIN) Equipment, Physical Interfaces
Adopted: April 14, 2014

This document defines galley equipment physical attachments, envelopes, connections, and qualification guidelines for interchangeable galley equipment. Supplement 4 clarifies installation tolerances, improves water coupling, wheel guidance, and physical envelope definitions for standard trolleys and containers.

ARINC Specification 812AP1-1
Standard Data Interfaces for Galley Insert (GAIN) Equipment, Part 1, CAN Communications
Adopted: April 14, 2014

This document defines galley equipment computer interfaces using Controller Area Network (CAN) bus protocols. Supplement 1 provides changes to support the test requirements defined by ARINC 812A Part 2. These include XML definition of galley test messages and galley maintenance state messages.

ARINC Specification 812AP2
Standard Data Interface for Galley Insert (GAIN) Equipment, Part 2, CAN Communications, Verification and System Test Guidance
Adopted: April 14, 2014

This document defines galley equipment computer interfaces using Controller Area Network (CAN) bus protocols. Part 2 defines test methods to verify correct interface protocols for galley equipment connected to the CANbus. This includes guidelines for preparing galley test procedures, definition of standard pin programming for galley test, and definition of verification test procedures for the CANbus interface defined by ARINC 812A Part 1.

ARINC Specification 834-4

Aircraft Data Interface Function (ADIF)
Adopted: April 15, 2014

This document defines an avionics interface protocol between traditional avionics equipment and a standardized Aircraft Interface Device (AID) complying with ARINC 759. Supplement 4 defines a minimum set of capabilities necessary to be compliant with the Simple Text Avionics Protocol (STAP). It adds avionics write access to the Avionics Data Broadcast Protocol (ADBP).

ARINC Specification 830

Aircraft/Ground Information Exchange using Internet Protocols (AGIE)
Adopted: April 15, 2014

This document defines a data communication system for broadband message communications including satcom, gatelink and enroute communication services. ARINC 830 defines an IP-based message broker consisting of protocols and interfaces providing secure and prioritized data transfers between aircraft and airline ground infrastructures. Use cases include Airline Information Services (AIS) data, and Meteorological (MET) data, airline maintenance activities, software and data loading, and others.

ARINC Specification 839

Function Definition of Airborne Manager of Air-Ground Interface Communications (MAGIC)
Adopted: April 15, 2014

This document defines a network management and routing function utilizing IP-based communications links (e.g., cellular, satcom, ACARS, Gatelink) for data transmissions between the aircraft and various ground infrastructures. This functionality is analogous to that of the ACARS communications manager function. The services are defined for non-safety services, specifically for Airline Information Services (AIS) and Passenger Information and Entertainment Services (PIES).

ARINC IA PROJECT INITIATION/ MODIFICATION (APIMS)

24 Project Proposals Approved

New APIM	Project Name	Activity
14-001	Cabin Wireless for In-Flight Entertainment - ARINC Project Paper 820	CSS
14-003	Mark 4 Selective Calling (SELCAL) - ARINC Project Paper 714A	SAI
14-004	FMS Winds Temperature Data - ARINC 702A Supplement 4	FMS
14-005	Traffic Computer with Hybrid Surveillance - ARINC 735B Supplement 2	XPDR
14-007	Small Form Factor Ku/Ka Satcom - ARINC Project Paper 792	KSAT
14-008	Satcom Functional Interface Standard - ARINC Project Paper 848	KSAT
14-101	Design and Use of Built-In Test Equipment ARINC 604 Supplement 2	BITE
14-102	Aircraft Support Data Management – ARINC Project Paper 675	ASDM
14-103	Engineering Investigation for Aircraft Components – ARINC Project Paper 676	SIWG
14-202	Documentation Standards for Simulation – ARINC Project Paper 446	SDD
14-204	Simulated Air Traffic Control Environments – ARINC 439 Supplement 1	SATCE
13-003A	On-Ground Aircraft Wireless Communication -ARINC Project Paper 822A	NIS
13-004A	CANbus update – ARINC 825 Supplement 3	CAN
13-004B	CANbus update - ARINC 825 Supplement 4	CAN
13-014A	Cabin Connectors and Cables, ARINC 800, Multi Part Standard	CSS
13-005	Standardized IP Data Logging	NIS
12-004A	10 Gbps Ethernet Interface - ARINC 664 Part 2 Supplement 1	CSS
11-012B	Aircraft Data Interface Function - ARINC 834 Supplement 5	EFB
11-013A	Airport Surface Communication (AeroMACS) - ARINC Project Paper 7xx	SAI
10-003A	Cockpit Voice Recorder (CVR) - ARINC 757/A Supplements	DFDR
10-005D	Cabin System Interfaces - Supplements to ARINC 628	CSS
10-016B	Software Data Loading - ARINC Project Paper 844	SDL
09-009B	Electronic Flight Bag Users Forum (3 year extension)	EFB
08-011A	Cabin Equipment Miniature Enclosures - ARINC Project Paper 836A	CSS

ARINC IA PROJECT INITIATION/ MODIFICATION (APIMS)

New Project Descriptions

APIM 14-001

Cabin Wireless LAN
ARINC Project Paper 820
Cabin Systems Subcommittee

APIM 14-001 calls for the development of ARINC Project Paper 820 to define cabin wireless LAN architecture, interwiring and connectors. The goal is to reduce acquisition cost of wireless media delivery systems for new and retrofit airplanes and provide a wireless backbone for media loading of seat-centric IFE. A mature draft is expected in 2016.

APIM 14-003

Selective Calling (SELCAL)
ARINC Project Paper 714A
SELCAL Working Group

APIM 14-003 calls for the development of ARINC Project Paper 714A defining a Mark 4 SELCAL system for HF and VHF communication. The equipment would expand from 16 audio tones to 32 audio tones. The benefit of this activity is to increases the number of unique SELCAL codes available to the user community from 10,920 codes to 215,760 codes. A mature draft is expected in 2015.

APIM 14-004

Winds Temperature Data use in Flight Management Systems
ARINC Characteristic 702A
FMS Working Group

APIM 14-004 calls for the development of Supplement 4 to ARINC Characteristic 702A. Winds temperature definitions will be added as required to support 4D Trajectory operations. This will enables the uplink of up to 10 temperatures for both climb and descent segments. In particular, wind temperatures added to the Predicted Wind Data (PWI) and Predicted Wind Modification (PWM) messages. A mature draft was adopted by AEEC in October 2014.

APIM 14-005

Hybrid Surveillance
ARINC Characteristic 735B
Traffic Surveillance Working Group

APIM 14-005 calls for the development of **Supplement 2 to ARINC Characteristic 735B:** *Traffic Computer (TCAS and ADS-B Functionality)* to reflect the latest version of TCAS hybrid Surveillance per RTCA DO-317A/B (MOPS for Aircraft Surveillance Applications (ASA) Systems and DO-300A (MOPS for TCAS II Hybrid Surveillance). Update existing ARINC 429 discrete Maintenance word or add a new Maintenance word to include the status of the Hybrid Surveillance input. A mature draft is expected in 2015.

ARINC IA PROJECT INITIATION/ MODIFICATION (APIMS)

New Project Descriptions

APIM 14-007

Small Form Factor Ku/Ka-band Satcom
ARINC Project Paper 792
KSAT Subcommittee

APIM 14-007 calls for the development of ARINC Project Paper 792 that will define a small form factor Ku-band and Ka-band satcom system in a modular manner. The KSAT Subcommittee will take advantage of technology improvements to reduce cost, weight, and complexity while enhancing satcom system performance. The benefit of this activity is smaller, light-weight satcom equipment. A mature draft is expected in 2017.

APIM 14-008

Satcom Functional Interface Standard
ARINC Project Paper 848
KSAT Subcommittee

APIM 14-008 calls for the development of ARINC Project Paper 848 that will define satcom interfaces to IP-based satcom systems. The activity will define common network protocols and interface definitions used among broadband satcom system. The expected benefit is lower system design cost for multiple airplanes, and lower airline acquisition costs. A mature draft is expected in 2015.

APIM 14-101

Design and Use of Built-In Test Equipment
ARINC Report 604
BITE Working Group

APIM 14-101 will update ARINC Report 604 to make the requirements coordinate with **ARINC Report 847:** *Guidance for Design, Maintainability, and Testability of Aircraft Components.*

APIM 14-102

Aircraft Support Data Management
ARINC Project Paper 675
ASDM Working Group

APIM 14-102 will develop standard airline-industry guidance to manage upload, verification, and activation of aircraft support data, that is, content, media, applications, and scripts that are not subject to the field-loadable software regulations and procedures. In general, this content does not affect the core function or operation of any on-board system, require supplier formal acceptance test or configuration control, reside within the onboard loadable software control system or IPC (Illustrated Parts Catalog), or require aircraft paperwork or technician touch labor to install. Aircraft support data is important to the operators because they directly affect the passenger experience. Often these items are transient, that is, they are loaded quickly to provide a targeted message and are often quickly removed and replaced with new data.

APIM 14-103

Engineering Investigation for Aircraft Components
ARINC Project Paper 676
SI Working Group

APIM 14-103 calls for the development of a new ARINC Report to provide guidance for the assignment, accomplishment, and reporting of Investigations for components which exceeds the regular workshop analysis and repair process. Regulatory Authorities and reliability issues has required the operator or its repair facility to provide additional attention to aircraft components, which have produced either a flight incident or do not reach its intended reliability issues. This might happen not only to one specific serial number but also on the complete series of components. A standardized process will define:

- Clarify Content and Scope of Investigation
- Provide a Comprehensive Report
- Avoid Delays and Cost
- Improve Reliability

ARINC IA PROJECT INITIATION/ MODIFICATION (APIMS)

New Project Descriptions

APIM 14-202

Documentation Standards for Simulation
ARINC Project Paper 446
SDD Working Group

APIM 14-202 defines a standard parameter set for documentation packages that are to be delivered with a new Flight Simulation Training Device (FSTD) purchase. The working group will define or provide guidance on the development and delivery of the following criteria.

- Data Requirements for lifetime support of FSTDs.
- Define scope and content of a support documentation package delivery.
- Structure and delivery format for documentation packages.
- Documentation package maintenance and updates.

APIM 14-204

Simulated Air Traffic Control Environments (SATCE)
ARINC Report 439
SATCE Working Group

APIM 14-204 intent is to produce a supplement to ARINC Report 439 (published April 2014) to maintain the document's currency with industry developments in this important area of flight simulation. SATCE can be considered a newly emergent sub-system for FSTDs. Over the next few years SATCE systems are expected to be developed, integrated, tested and approved using a variety of approaches and differing technologies. Industry guidance on scope, functionality, appropriate technologies, maintenance and certification will need to reflect best practice and lessons learned to be of most benefit.

APIM 13-003A

On-Ground Aircraft Wireless Communication
ARINC Project Paper 822A
NIS Subcommittee

APIM 13-003A calls for the development of **ARINC Project Paper 822A:** *On-Ground Aircraft Wireless Communication.* This document is expected to update the technologies and methods defined by prior Gatelink standards. A mature draft is expected in 2015.

APIM 13-004A

CAN Bus
ARINC Specification 825
CAN Working Group

APIM 13-004A calls for the development of **Supplement 3 to ARINC Specification 825:** *General Standardization of CAN (Controller Area Network) Bus Protocol for Airborne Use*. The scope is to provide additional guidance pertinent to the CAN Flexible Data rate (CAN FD) standard, enabling CAN bandwidth to improve by a factor of eight. Other items include a new timing model, common latencies methodology, ARINC 429 interface to CAN, ARINC 664 conversions, and network bandwidth management policy. A mature draft is expected in 2015.

APIM 13-004B

CAN Bus
ARINC Specification 825
CAN Working Group

APIM 13-004B calls for the development of **Supplement 4 to ARINC Specification 825:** *General Standardization of CAN (Controller Area Network) Bus Protocol for Airborne Use.* The scope is to provide additional guidance pertinent to the CAN Flexible Data rate (CAN FD) standard, enabling CAN bandwidth to improve by a factor of eight. Other items include a new timing model, common latencies methodology, ARINC 429 interface to CAN, ARINC 664 conversions, and network bandwidth management policy. A mature draft is expected in 2017.

ARINC IA PROJECT INITIATION/ MODIFICATION (APIMS)

New Project Descriptions

APIM 13-005

Standardized IP Security Data Logging
ARINC Project Paper 8xx
Network Infrastructure and Security (NIS) Subcommittee

APIM 13-005 calls for the development of guidelines applicable to e-Enabled aircraft that can be used to acquire IP data security information for the purpose of aircraft IP network monitoring. This effort will include the following:

- Define standard set of data elements to be stored in a security log
- Define ground rules for collecting digital security data
- Event triggers for log entries
- Frequency of sampling and analysis
- At the highest level, overall monitoring, analyzing, and responding to various event guidance

Because Airbus and Boeing have developed security logs for their in-production aircraft; they have stated that they consider this APIM applicable to their future programs only.

APIM 13-014A

Cabin Connectors and Cabling
ARINC Specification 800
Cabin Systems Subcommittee

APIM 13-014A is extended in scope and time to define: **ARINC Specification 800:** *Cabin Connectors and Cables:*

- Part 1 – Description and Overview
- Part 2 – Specification of Connectors, Contacts, and Backshells
- Part 3 – Specification of Cables
- Part 4 - Test Plan for Ethernet Connectors and Cables

Mature drafts are expected in 2015.

APIM 12-004A

10Gbps Ethernet Interface
ARINC Specification 664, Part 2
Cabin Systems Subcommittee

APIM 12-004A calls for the development of **Supplement 3 to ARINC Specification 664:** *Aircraft Data Network, Part 2, Ethernet Physical and Data Link Layer Specification*. 10 Gbps Ethernet physical layer connectors and cabling will be defined with this activity. This will enable improvements to cabin networks and enable high-speed IFE content loading. A mature draft is expected in 2016.

APIM 11-012B

Aircraft Data Interface Function
ARINC Specification 834
Electronic Flight Bag (EFB) Subcommittee

APIM 11-012B calls for the development of **Supplement 5 to ARINC Specification 834:** *Aircraft Data Interface Function (ADIF).* This supplement will include improvements to the general purpose avionics access protocol required to support the ARINC 759 Aircraft Interface Device (AID). A mature draft is expected in 2015.

APIM 11-013A

Airport Surface Communications
ARINC Project Paper 7xx
SAI Subcommittee

APIM 11-013A calls for the development of ARINC Project Paper 7xx describing Aeronautical Mobile Airport Communications System (AeroMACS) for airport surface communication. This includes standards for an aircraft transceiver standard capable of operating at 5091 to 5150 MHz using IEEE 802.16 (WiMAX) protocols. AeroMACS is considered one of the future radio components bringing System Wide Information Management (SWIM) to the aircraft.

APIM 10-003A

Cockpit Voice Recorder (CVR)
ARINC Characteristics 757 and 757A
CVR Working Group

APIM 10-003A calls for an activity to update Flight Data Recording Standards. This will include new CVR equipment grounding requirements and changes to the ARINC 429 Sign Status Matrix (SSM) word definition. Supplement 6 to ARINC Characteristic 757 will be prepared as part of this activity. Supplement 1 to ARINC Characteristic 757A will also be prepared. Mature drafts are expected in 2015.

ARINC IA PROJECT INITIATION/ MODIFICATION (APIMS)

New Project Descriptions

APIM 10-005D

Cabin Equipment Interfaces
ARINC Specification 628
Cabin Systems Subcommittee

Cabin equipment interface standards are defined by ARINC Specification 628, published as a multi-part standard. This activity is an extension to cabin equipment interface standardization and it will expand four parts of ARINC 628, including:

- Supplement 3 to Part 0 - Overview
- Supplement 7 to Part 1 - Cabin wireless access point and low-current discrete definitions
- Supplement 8 to Part 2 - Protection of power outlets per FAA and EASA
- Supplement 4 to Part 9 - Update control panel interface and control panel sharing

Mature documents are expected in 2015.

APIM 10-016B

Clarifications to ARINC 615 Data loading Standards
ARINC Project Paper 844
Software Data Loader (SDL) Subcommittee

APIM 10-016B reflects the current schedule necessary to prepare guidance on software data loading. Avionics equipment is expected to invoke some portion of ARINC Report 615-3 and ARINC Report 615-4 data loading standards. A new standard, ARINC Project Paper 844, is expected to provide clear guidance on how hardware targets should utilize the ARINC 615 data loading methods. This is intended to reduce ambiguous interpretations of the various ARINC 615 data loading standards. Mature drafts are expected in 2015.

APIM 09-009B

EFB Activity Extension
Electronic Flight Bag (EFB) Users Forum

APIM 09-009B authorizes additional meetings of the Electronic Flight Bag (EFB) Users Forum. It extends the EFB Users Forum activities through December 2017. The EFB Users Forum assembles specialists in the areas of Flight Operations, Engineering, Information Technology and other disciplines related to aircraft network implementation and connectivity. The product of this activity is in the form of meeting reports.

APIM 08-11A

Cabin Equipment Miniature Modules
ARINC Project Paper 836A
Cabin Systems Subcommittee

APIM 08-11A calls for the development of ARINC Project Paper 836A to define miniature module enclosures for cabin equipment installed in a modular rack concept. The benefit is lower costs by reducing component size and weight and simplifying maintenance due to harmonized installation and quick replacement. A mature draft is expected in 2016.

The complete list of APIMs approved in 2014 is summarized in this report. Copies of the APIMs may be obtained from the AEEC website: www.aviation-ia.com/aeec.

INDUSTRY ACTIVITIES ADVISORY GROUP (IAAG)

IAAG Representation

The IAAG representatives for 2014 from left to right are Robert Swanson, FedEx; Marijan Jozic, KLM Royal Dutch Airlines; Jürgen Lauterbach, Lufthansa; and Jens Latendorf, Lufthansa Technik. Not pictured: Brandon Mazzacavallo, The Boeing Company, and Stephan Nowack, Lufthansa.

Purpose

The purpose of the Industry Activities Advisory Group (IAAG) is to assist ARINC IA and SAE ITC management in coordinating the technical efforts of the Industry Committees. This includes providing input on membership/sponsorship recruitment and budgetary matters. The IAAG consists of representatives, typically the Chairman and the Vice Chairman or Chairman Elect, of the AEEC, AMC, and FSEMC leadership committees.

Summary

The IAAG met in September 2014 at the new ARINC IA offices in Bowie, Maryland and received an overview of SAE International and its affiliates to include SAE ITC. The IAAG Leadership presented a number of organizational/strategic, commercial and general topics for discussion and consideration. The IAAG also discussed committee status reports, attendance registration analysis, members and sponsors joining and leaving, budget, and anticipated changes to the Combined Terms of Reference and the Organization and Procedures Guides as a result of the change in ARINC IA ownership.

The IAAG noted that many organizations around the world benefit from the work of AEEC, AMC, and FSEMC. However, there are many organizations that have not joined as members and sponsors.

The IAAG thanks those organizations that participate actively and fully as members and sponsors and encourages more organizations to join, participate, benefit, and share in the cost to ensure continued sustainment of the ARINC IA enterprise.

Enrollment is available on-line at www.aviation-ia.com/MembershipAndSponsor.

AEEC
Message from the Chairman

AEEC Chairman 2014-2015

By: Jürgen Lauterbach,
Lufthansa German Airlines

2014 was indeed a historical year for ARINC Industry Activities; the ownership changed to the SAE International's Industry Technologies Consortia (SAE-ITC) on December 23, 2013. SAE-ITC is a non-profit organization supporting industry needs, including development and publication of standards.

The name ARINC Industry Activities (ARINC IA) will be retained and it is now an Industry Program of SAE-ITC. Our standards will continue to be called ARINC Standards. The main difference may be that we will see some SAE-ITC branding in our documentation.

It seems to me, that after all the discussions about the future of ARINC IA, the uncertainty is now gone. We found a good home, a new foundation to build the future on, for AEEC, AMC, and FSEMC.

Speaking about a new home, ARINC IA staff moved from Annapolis to Bowie in 2014. This office is just 20 miles from Washington DC, but we all know what it means to change your office and your IT platform. In this case, it was not only the office but also leaving hundreds of former colleagues behind. The majority of the ARINC staff stayed with the "mother company" as it became part of Rockwell Collins.

I congratulate the ARINC IA staff: the move from Annapolis to Bowie felt – at least for the outsider – like a very smooth and seamless one. There was basically no interruption in service.

The ownership change marks an important milestone. Aviation Industry has changed tremendously since the time when AEEC was started in 1949 as an airline organization. For over 75 years, ARINC was an airline owned company. As part of ARINC, the AEEC was initiated by the big five (US airlines) of the time. Founding members like PanAm and TWA have since disappeared, but AEEC is still prospering. So, is everything in good shape?

Yes, the ARINC IA staff does a great job and together we are writing many new ARINC Standards. However, the focus of our standards has changed. In the early days, it had been packaging standards, radio, and navigation definitions; in other words, very basic technical things to achieve reliable scheduled flights. In those years, the flying experience was different; I guess really exciting compared to the hectic routines we experience today. Lack of reliable radio communication and interchangeability of boxes, underperforming electronics, and unique equipment were creating high costs, delays, and cancellations.

At that time, AEEC, together with the many players in the market, started to standardize avionics – led and guided by the airline owned organizations. Equipment suppliers quickly started building the new ARINC equipment and

airframe manufacturers integrated it into the airplanes. A competitive market developed. Suddenly it was possible to use a spare part from a different airline if you experienced a problem on the other side of the planet.

Many airline engineers were involved in those early years. I remember vividly my first AEEC meeting attendance in 1989 in Vancouver. It was the Data Link Users Forum and I was deeply impressed. Not only by the revolving restaurant on top of the hotel, but also by the number of participants and the heated discussion. I felt like a small kid learning how to walk. At that time, Lufthansa was at the very verge of starting the first data link trials. About 5 years later, data link was routine and soon we started experiencing a delay if data link was down.

Today's challenges are different: commercial flights have become a commodity like driving cars. Competition amongst airlines is fierce, regulation of airlines is history in most markets.

The amount of standards has increased and today includes many cabin standards. The passenger product has become a new focus in the past 20 years, e.g., the galley, IFE, and passenger communication has become a whole new area of ARINC Standards. That is good, we all make our living from the fact airlines sell tickets to passengers!

For many years now we have experienced a shift from the "old" hardware standards (Form, Fit, and Function (FFF)) towards software. We have learned how to handle hardware very efficiently; software is different. Often it requires different processes and confronts us with new challenges, e.g., you cannot fix a software bug just by loading the software again. In the future, such recent developments may find more reflection in our standards.

While the airline business has become very global, AEEC is still an US/European dominated organization; we were not able to expand to a more global airline membership. Why? We tried hard!

Ten years ago, we changed visibly and invited Airbus and Boeing to become member organizations and AEEC offered them a seat on the AEEC Executive Committee. As responsible integrators of ARINC Standards into their airplanes, the airframe manufacturers are key contributors for continued AEEC success.

Aircraft today still use ARINC Standards; however, several new models do not use the advantage for competition and interchangeability of systems anymore, one key historical reason why AEEC was created by the big five.

ARINC Standards are still of high value for the industry. Because our industry and associated benefit scenarios have changed, it is important for AEEC to develop in concert with the changing global aviation industry.

I wish all of you many happy landings and look forward meeting many of you at the 2015 co-located AEEC | AMC General Session in Prague.

Jürgen Lauterbach
Lufthansa German Airlines

AEEC Chairman 2014-2015

AEEC
Executive Committee Members (As of December 31, 2014)

Jürgen Lauterbach, Chairman
Lufthansa German Airlines

Mario Araujo
TAP Portugal

Piet van den Berg
KLM Royal Dutch Airlines

*** Jens Bjarnason**
IATA

Brian Gleason
Southwest Airlines

Jim Lord
Delta Air Lines

Thomas Laxar
Austrian Airlines

Mike Nebylowitsch
British Airways

Thierry Harquin
Airbus

Kathleen O'Brien
Boeing

James McLeroy
UPS

John Melvin
Alaska Airlines

Ken Przeslica
US Airways

David Setser
US Air Force

Rich Stillwell
United Airlines

Robert Swanson
Chairman-Elect
FedEx

Dennis Zvacek
American Airlines

*** Paul Prisaznuk**
Executive Secretary
ARINC Industry Activities

* Non-voting members.

For information about AEEC Executive Committee Membership, contact Paul Prisaznuk at pjp@sae-itc.org.

AEEC

AEEC Mission

The AEEC improves cost effectiveness and reduce life-cycle costs by conducting engineering and technical investigations and developing voluntary engineering and technical standards for airborne electronics.

AEEC Overview

The Airlines Electronic Engineering Committee (AEEC) is an international standards organization that represents technical positions of the air transport industry. The AEEC provides a forum for collaboration, teamwork and decision making. The products of AEEC's efforts are published as ARINC Standards that collectively promote market competition and economies of scale. Aircraft manufacturers and avionics suppliers work with the AEEC in this endeavor. As a whole, the work of the AEEC is effective in minimizing aircraft life-cycle costs.

AEEC Composition

AEEC Membership is open to airline operators, airframe manufacturers, general aviation and the military. These organizations fund a significant portion of the AEEC work program and are eligible to be voting members of the AEEC Executive Committee.

The AEEC Executive Committee serves in a leadership role and as one of three decision making bodies for ARINC Standards development. Decisions made by the AEEC Executive Committee fully consider inputs of the supplier community, regulators, and other stakeholders.

Supplier companies and other organizations that benefit from doing business with the airlines are invited to participate as Corporate Sponsors. Corporate Sponsors provide a portion of the financial support for the AEEC, AMC, and FSEMC work programs.

The AEEC General Session and the AEEC Mid-Term Session are meetings held for the purpose of coordinating the work of the many active AEEC Subcommittees that are responsible for the preparation of technical standards.

The value of AEEC membership has been demonstrated over six decades:

- Improving the efficiency of air transportation through the development of new operating concepts and technologies.
- Influencing the development of new aircraft and derivatives.
- Shaping aircraft capabilities necessary for operating in NextGen, SESAR, CARATS airspace environments.
- Developing consensus-based industry standards reflecting the collective views of aircraft operators, airframe manufacturers, equipment suppliers, regulators and other stakeholders.
- Ensuring the viability of AEEC as a long-standing technical resource for the airline industry.

The success of the AEEC is a result of a simple, yet refined, approach to collaborative decision making. This approach yields standards that are used voluntarily by the airline industry and their suppliers; standards that no one organization could possibly develop on its own.

AEEC

AEEC Subcommittee and Working Group Activities

Activity Name	Acronym	Leadership
Air-Ground Communications System	AGCS	Kenny Blankenship, American Airlines
Aeronautical Data Bases	ADB	Brian Gilbert, Boeing
AOC Standardization	AOC	Dirk Zschunke, Lufthansa
Avionics Application/ Executive Software	APEX	Frederic Aspro, Airbus Gordon Putsche, Boeing
Cabin Systems Subcommittee	CSS	Dale Freeman, Delta Air Lines
Controller Area Network	CAN	Thomas Joseph, GE Aviation
Cockpit Display System Interfaces	CDS	Chad Weldon, Rockwell Collins
Data Link Systems	DLK	Bob Slaughter, American Airlines
Data Link Users Forum	DLK	Colin Galant, British Airways
Electronic Flight Bag	EFB	Sonja Schellenberg, Lufthansa Systems Maurice Ingle, American Airlines
Electronic Flight Bag Users Forum	EFB	Philip Haller, Austrian Airlines Will Ware, Southwest Airlines
Fiber Optic Interfaces	FOS	Robert Nye, Boeing
Galley Inserts	GAIN	Ralph Schnabel, Airbus Scott Coburn, Boeing
Ku/Ka Band Satellite Communications	KSAT	Peter Lemme, Totaport
Navigation Data Base	NDB	Chuong Phung, FedEx
Network Infrastructure and Security	NIS	Steve Arentz, United Airlines Jean-Paul Moreaux, Airbus
NextGen/SESAR	SAI	Sam Miller, MITRE
Selective Calling (SELCAL)	SAI	Robert Holcomb, American Airlines
Software Data Loader	SDL	Ted Patmore, Delta Air Lines Rod Gates, American
Systems Architecture and Interfaces	SAI	Bob Semar, United Airlines Reinhard Andreae, Lufthansa
Traffic Surveillance (TCAS & XPDR)	TCAS	Jessie Turner, Boeing
Underwater Locator Beacon (ULB)	DFDR	Robert Swanson, FedEx

AEEC
AEEC Subcommittee and Working Group Activities

Air-Ground Communications Systems (AGCS)
Chairman: Kenny Blankenship, American Airlines
Secretary: José Godoy

The goal of the Air/Ground Communications Systems (AGCS) Subcommittee is to ensure that current and emerging air-ground communication systems are specified based on airline operational requirements and defined for cost-effective implementation based on established aircraft architectures. The current activity is focused on developing standards for Iridium NEXT satcom services.

Aeronautical Data Bases (ADB)
Chairman: Brian Gilbert, Boeing
Secretary: Peter Grau

This activity is responsible for the standardization of the aeronautical data base structures for airport surface data, terrain data and obstacle data. The ADB Subcommittee works in conjunction with RTCA SC-217. Overall, it is developing the capabilities to improve the pilot's situational awareness of the airport facility and the terrain. XML Compression standards are being developed as well.

AOC Standardization (AOC)
Chairman: Dirk Zschunke, Lufthansa
Secretary: José Godoy

A standardized set of Airline Operational Control (AOC) messages are defined by this activity. The messages are defined independent of the medium. The AOC messaging application can by hosted on an Electronic Flight Bag (EFB). The message types are common to all types of operations. They are intended to be used by multiple airlines on multiple aircraft types.

Application/Executive (APEX)
Co-Chairman: Frederick Aspro, Airbus
Co-Chairman: Gordon Putsche, Boeing
Secretary: Scott Smith

This activity is responsible for developing software interface standards for Real-Time Operating Systems (RTOS) used with Integrated Modular Avionics (IMA). **ARINC Specification 653:** *Avionics Applica Software Standard Interface* defines a standard interface between avionics application software and the software operating system capable of providing RTCA DO-178B, Level A service.

AEEC
AEEC Subcommittee and Working Group Activities

Cabin Systems (CSS)
Chairman: Dale Freeman, Delta Air Lines
Secretary: Tom Munns

This activity develops cabin and In-Flight Entertainment (IFE) standards for passenger entertainment. The objective is to define cost effective and valuable network infrastructure for the airlines to offer news and entertainment that will exceed passenger expectations. This includes interface standards to allow airlines to implement their preferred systems for their passengers. Cabin communications, interface protocols, and connector standardization are integral parts of this activity.

Cockpit Display System (CDS)
Chairman: Chad Weldon, Rockwell Collins
Secretary: Peter Grau

This activity develops the flight deck display interface standard for primary display systems and their interface to avionics equipment (e.g., communication, navigation, and surveillance systems). ARINC Specification 661 is intended to support new airplane development programs for air transport, regional, general aviation, military, and rotorcraft. The updates will ensure growth for CNS/ATM applications that provide advanced operational concepts increasing aviation safety, capacity and efficiency.

Controller Area Network (CAN)
Chairman: Thomas Joseph, GE Aviation
Secretary: Vanessa Mastros

The goal of the Controller Area Network Working Group is to produce **Supplement 3 to ARINC Specification 825:** *General Standardization of Controller Area Network (CAN) for Airborne Use*. Supplement 3 is being prepared to respond to a specific Boeing request to support a near-term need for the B777X airplane program in accordance with APIM 13-004A.

Data Link Systems (DLK)
Chairman: Bob Slaughter, American Airlines
Secretary: José Godoy

The Data Link Systems Subcommittee develops standards that promote reliable, uniform, and cost efficient transfer of data between the aircraft and various locations on the ground. These standards cover the existing Aircraft Communications Addressing and Reporting System (ACARS®) and the emerging Aeronautical Telecommunications Network (ATN) as defined by the ICAO SARPs. Ground locations include civil aviation agencies, manufacturers of avionics and engines, data link service providers, weather providers, and departments within the airlines such as payroll, maintenance, operations, engineering, and dispatch.

Data Link Users Forum

Co-Chairman: Colin Gallant, British Airways
Secretary: Vic Nagowski/José Godoy

The Data Link Users Forum is a coordinating activity among airlines and cargo carriers, data link service providers, aircraft manufacturers, avionics manufacturers, and others. It focuses on technical issues of mutual interest to operators. The discussions lead to the identification and resolution of numerous issues that collectively improve data link performance. The product of this activity assures that operators received significant operational and economic benefits of air/ground communication services. This activity provides input on the direction and schedule of new Air Traffic Service (ATS) data link programs.

Electronic Flight Bag (EFB)

Co-Chairman: Sonja Schellenberg, Lufthansa Systems
Co-Chairman: Maurice Ingle, American Airlines
Secretary: Peter Grau

The EFB Subcommittee is developing hardware and software standards for the EFB. This includes EFB hardware installation standards as well as EFB software application standards. This is a rapidly evolving technology with wide-ranging applications. Airlines, airframe manufacturers, and EFB suppliers are expected to benefit from reduced EFB integration costs.

Electronic Flight Bag (EFB) Users Forum – a Joint Activity with IATA

Co-Chairman: Phillip Haller, Austrian Airlines
Co-Chairman: Will Ware, Southwest Airlines
Secretary: Peter Grau

The Electronic Flight Bag (EFB) Users Forum is a joint activity with IATA that enables airlines and other aircraft operators to voice their preferences in the evolution of EFB hardware and software, as well as EFB connectivity to an airline's infrastructure. The goal is to maximize the operational and the economic benefit of the EFB and associated EFB applications. Flight Operations, Information Technology, Engineering, and Maintenance disciplines are represented among the participants of the EFB Users Forum.

Fiber Optic Interfaces (FOS)

Chairman: Robert Nye, Boeing
Secretary: Scott Smith

The goal of this activity is to develop standards for fiber optic components and interfaces. This effort includes the preparation of fiber optic design guidelines, component criteria, testing and maintenance procedures. The standards specify the performance requirements with an objective of minimizing the cost of procurement, implementation, and maintenance.

AEEC Subcommittee and Working Group Activities

Galley Insert (GAIN)

Co-Chairman: Ralph Schnabel, Airbus
Co-Chairman: Scott Coburn, Boeing
Secretary: Tom Munns

The GAIN activity standardizes the physical dimensions and electrical interfaces for Galley Inserts. Areas of standardization are electrical and mechanical. This includes electrical interfaces, standard wiring, CANbus protocols, standard electrical connectors, water connectors, physical interfaces, and equipment mounting rails.

Ku/Ka Band Satellite Communication System (KSAT)

Chairman: Peter Lemme, Totaport
Secretary: Tom Munns

The KSAT activity is developing Ku-band and Ka-band satellite system installation provisions, electrical interfaces and mechanical interfaces. This type of equipment is intended to provide broadband communication to the aircraft using Internet Protocols (IP). Airlines, aircraft manufacturers, avionics suppliers, cabin equipment suppliers, EFB suppliers, and service providers are participating in this activity.

Navigation Data Base (NDB)

Chairman: Chuong Phung, FedEx
Secretary: Sam Buckwalter

The NDB activity is updating ARINC Specification 424 used by all aircraft operators, airframe manufacturers, Flight Management System (FMS) developers, and data base suppliers. The goal is to maximize the operational and economic benefits of the FMS by the use of navigation data that improves overall aircraft performance.

Network Infrastructure and Security (NIS)

Co-Chairman: Steve Arentz, United Airlines
Co-Chairman: Jean-Paul Moreaux, Airbus
Secretary: Vanessa Mastros

The NIS Subcommittee is developing Gatelink and related security data logging standards. The goal is to enable fleet-wide solutions based on open standards for lower development cost, increased flexibility, higher reliability, reduced complexity, longer lifespan, and ease of configurability and maintenance.

NextGen/SESAR Avionics

Industry Editor: Sam Miller, The MITRE Corporation
Secretary: Paul Prisaznuk

The NextGen/SESAR Working Group has prepared recommendations for avionics architectures for CNS/ATM. The product of this activity is **ARINC Report 660B:** *CNS/ATM Avionics Architectures Supporting NextGen/SESAR Concepts*. The goal is to share a common understanding of NextGen/SESAR concepts between the aeronautical industry and the airlines.

Selective Calling (SELCAL)

Chairman: Robert Holcomb, American Airlines
Secretary: Paul Prisaznuk

The SELCAL Working Group was activated to prepare **ARINC Project Paper 714A:** *Mark 4 Airborne Selective Calling (SELCAL).* This objective is to define a 32-tone SELCAL system that, when implemented, will expand the pool of available SELCAL codes from 10,920 aircraft codes to 215,760 aircraft codes. This is expected to improve HF and VHF voice communications. A mature draft is expected in 2015.

Software Data Loading (SDL)

Co-Chairman: Ted Patmore, Delta Air Lines
Co-Chairman: Rod Gates, American Airlines
Secretary: Scott Smith

The Software Data Loading Subcommittee is developing and improving standards for software data loading. This includes the development of standards for a high-speed data loader with high-density storage media. Standards for file format, media type, part numbering, and terminology will be developed in a way that can be used for various data loading devices and communication protocols.

Systems Architecture and Interfaces (SAI)

Co-Chairman: Bob Semar, United Airlines
Co-Chairman: Reinhard Andreae, Lufthansa
Secretary: Paul Prisaznuk

The SAI Subcommittee provides technical leadership in the development of standards for new aircraft programs and major derivative programs. It coordinates top-level avionics requirements for emerging airspace environments, namely NextGen, SESAR, and CARAT. The SAI Subcommittee works with international air navigation service providers to develop standards for CNS/ATM, including ADS-B. Working together with several AEEC Subcommittees, the SAI Subcommittee investigates the application of new technologies and prepares new project proposals (APIMs) where operational benefits are financial benefits are achievable.

Traffic Surveillance

Chairman: Jessie Turner – Boeing
Secretary: José Godoy

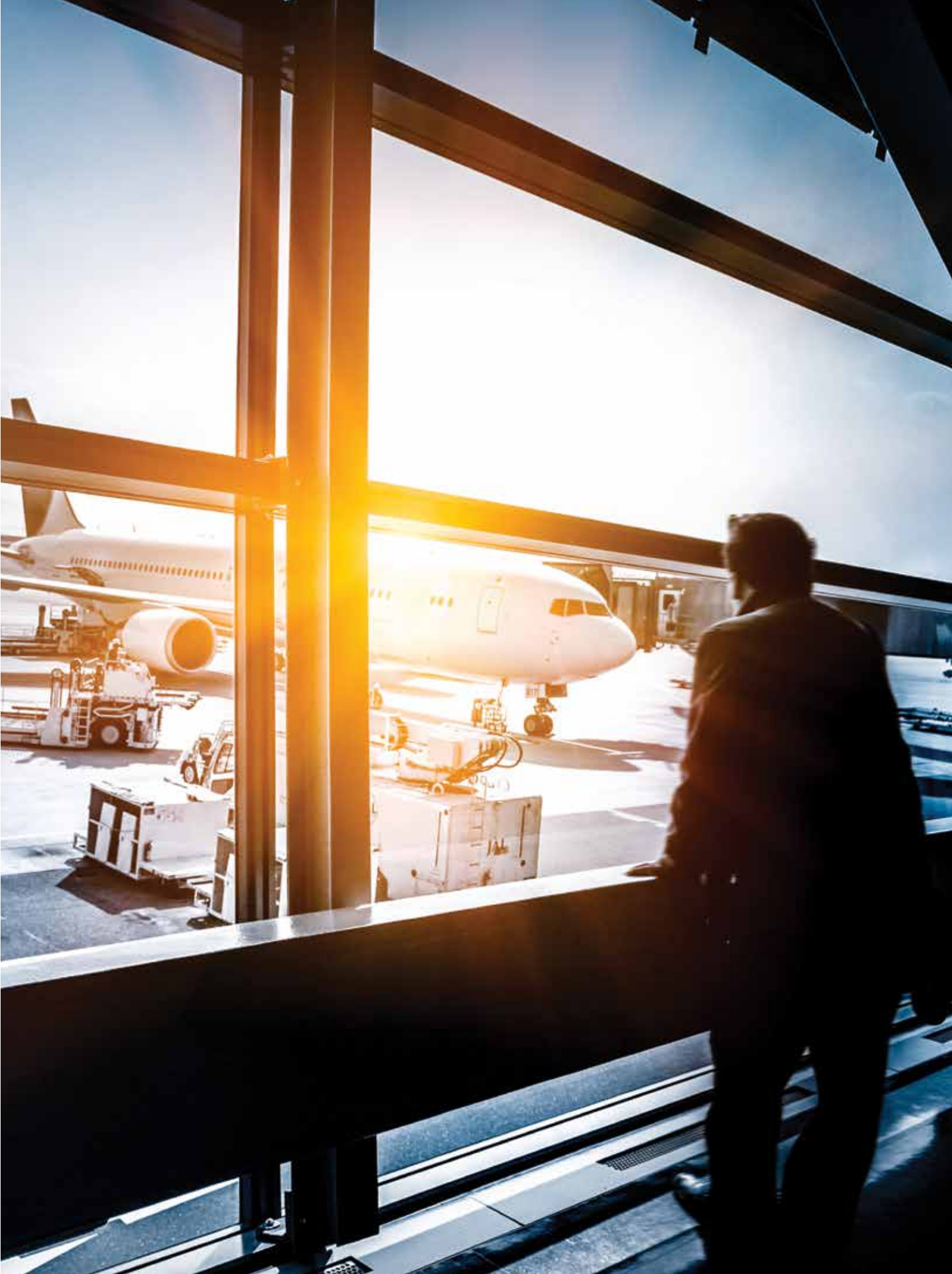
This activity defines traffic surveillance equipment suitable for operation in the NextGen, SESAR and CARATS airspace environments. This includes traditional Traffic Alert and Collision Avoidance System (TCAS) and Automatic Dependent Surveillance-Broadcast (ADS-B). Traffic surveillance requires the use of the Air Traffic Control Transponder and Traffic computer. An update to ARINC Characteristic 735B is in development to define hybrid surveillance using TCAS and ADS-B.

Underwater Locator Beacon (ULB)

Chairman: Robert Swanson - FedEx
Secretary: Paul Prisaznuk

Thu ULB Working Group is preparing ARINC Project Paper 677 to define the mechanical installation requirements for an 8.8 kHz locator beacon. The ARINC Standard is expected to include the definition of the ULB mounting points, the maximum space envelope, the mounting bracket and standards for battery check and change.

The list of active AEEC Subcommittees and Working Groups is summarized in this report. As this information is subject to change, readers are encouraged to visit the AEEC website at www.aviation-ia.com or contact the AEEC Executive Secretary, Paul Prisaznuk (pjp@sae-itc.org).



AMC
Message from the Chairman

AMC Chairman 2012-Present

By: Marijon Jozic,
KLM Royal Dutch Airlines

The AMC | AEEC held another successful conference in Toronto, hosted by CMC Electronics. The meeting was well attended. The AMC Steering Group is working diligently to fine tune the details based on the survey results we received from our constituents.

The AMC and ARINC Industry Activities have been an industry stalwart for more than 60 years (6 decades, more than a half century). The avionics environment has changed a lot in those years and the AMC has no other choice than to change. It is proven to be the unique formula and it is an ultimate success but that is not enough. The great number of airlines and OEMs who are attending the conference are showing that it is important for everyone to come together and be cooperative in solving problems. The same attendees are also realizing that changes are necessary to remain competitive in the industry.

In the history of aviation it has never been easy to be successful. Now, almost in the middle of the decade it is even more challenging than ever. Aviation, and especially the avionics environment, is very dynamic. New aircraft are entering the market and everything is changing. The stability of operations of days past is not good tomorrow. We are witnessing vast changes almost every day.

The new era of B787 and A350 aircraft are introducing new business models. The romanticized era of a cooperative aviation business is seemingly disappearing little by little. The new focus is efficiency, high reliability, and expensive Line Replaceable Units (LRUs). The equipment OEMs are in full control of aftermarket and airframers are in full control of aircraft configuration.

Previously, traditionally airlines/operators have been in control of maintenance and engineering. To be successful, they developed the ability to help sister airlines and perform maintenance for others. In the seventies and up until the beginning of the millennium, this was normal operations. Starting in 2000, the system evolved and you could clearly see that airlines with strong maintenance departments become the leading MROs and started to earn significant amounts of money on third party maintenance activities. Low cost airlines elected to outsource maintenance. Because of a lack of capacity, some OEMs started to increase their maintenance departments and guess what? They discovered that there is vast amount of potential in the aftermarket. That was just the beginning.

The next step is what we are experiencing now. It is the new revolution in aircraft maintenance. The revolution was well prepared, is firmly entrenched, and we are

now witnessing the situation that airlines, who have traditionally done third party maintenance, are forced, whether they like it or not, to do the maintenance only on their own fleet. Doing the third party work has become extremely difficult, if almost impossible. Not because they are not knowledgeable, but because they are legally bound by contractual requirements.

The only way to stay in the maintenance business is to accept the new rules of the game and increase efficiency. The engineers must overcome the challenges of new technologies like Ball Grid Array (BGA), optical electronics, large scale system integration, and software configuration management. That is the new playing field. But! Besides all of the physical challenges, they must fight legal battles to obtain the data and software, as well as establish new maintenance capabilities. Therefore, they must enter the world of licensing and the delegation of maintenance rights.

Of course we all have to respect the hard work of the OEM engineers who design the systems and software. We should not forget the thousands of hours of research they put into development of software and hardware. Therefore, the intellectual property of OEMs should be protected. We still have to figure out the most cost effective way to protect their intellectual property. There is one more invisible task, which should be accomplished by airline engineers. That is the task to educate their corporate management that the world has changed. This is probably one of the most frustrating tasks. Many senior managers are not yet convinced that the world is changed. This is exactly the frustration of many engineers involved in maintenance within airlines and MROs.

The AMC Conference and new ARINC Standards like the Standard for Cost Effective Acquisition (SCEA) is a great tool for airlines to learn how to negotiate new contracts. The AMC has more great ideas being documented in new standards as we speak. Also, some new ideas are in development to provide avionics engineers, and subsequently the airlines, with a solid base to enter the new world of aircraft operation and to help them convince their internal organizations that the changes are irreversible.

It is obvious that we have much to do in next few years. But there is also one cunning opponent. We have to work hard to keep our AMC | AEEC family together. This is our major threat. If our member airlines are not be able to show the benefits of Avionics Maintenance Conference to their managers, their valuable membership will come under pressure. So, besides all our worries in fighting for every passenger, we must keep fighting to keep ARINC Industry Activities alive. We cannot afford to lose this vital force multiplier. Therefore, on all levels we all should realize that this will be our ultimate task for the next few years. The task of keeping the AMC family together and staying brave if important and difficult decisions need to be made.

Fortunately, we work with the best and brightest in the aerospace industry. I have no doubt we can continue to produce the standards, solve problems, meet the industry's needs, and keep the continuity of the AMC and ARINC Industry Activities.

The most important task of all is to pass on our passion for the industry to newcomers. We took the spirit of our industry from our predecessors and we should pass our passion for the industry to others. This is our noble duty.

Marijan Jozic
KLM Royal Dutch Airlines

AMC Chairman 2012 – Present

AMC

AMC Steering Committee Members (As of December 31, 2014)

Marijan Jozic, Chairman
KLM Royal Dutch Airlines

Jens Latendorf, Vice Chairman
Lufthansa Technik

Anand Moorthy
American Airlines

Ricardo de Azevedo e Souza
Azul

*** Sam Buckwalter, Executive Secretary**
ARINC Industry Activities

Roger Kozacek
Delta Air Lines

Ted McFann
FedEx

Dan Ganor
El Al Israel Airlines

Satomi Ito
Japan Airlines

Prewitt Reaves
Southwest Airlines

Dean Connor
United Airlines

Kevin Kramer
US Airways

* Non-voting members

For information about AMC Steering Group Membership, contact Sam Buckwalter at sbuckwalter@sae-itc.org.

AMC

AMC Mission

Reduce life cycle costs of air transport components by improving maintenance through the exchange of technical information.

Introduction

The objectives of AMC are to promote reliability and to reduce operating and life cycle costs of air transport avionics by improving maintenance and support techniques through the exchange of technical information.

AMC consists of representatives from the technical leadership of the air transport avionics maintenance community. The membership of AMC consists of the representatives of commercial air transport operators. AMC accomplishes its objectives through a number of activities including: the annual Avionics Maintenance Conference, known worldwide as the AMC; Steering Group meetings; Plane Talk,® a quarterly newsletter; AMC Task Group activities to define industry best practices; and through liaison with the other ARINC IA organizations, AEEC and FSEMC, and other aviation or electronic industry organizations.

The benefits of AMC for airlines are long-term success in economic management and operation of commercial aircraft. This long-term success will require a more holistic approach to AMC (i.e., maintenance) and AEEC (i.e., engineering) aspects of aircraft equipment. Simply put, what is built today based on a new design specification has to be maintained tomorrow.

In the forum created by the Avionics Maintenance Conference, the airlines have various opportunities to influence and determine future directions in system and component design, reliability, and cost effectiveness. Speaking in the context of their daily operations, airlines can bring together ideas for improved standardized maintenance concepts and provide valuable feedback to the equipment manufacturers in their daily operations, thus closing the loop in the total process to minimize complex issues.

AMC
AMC Working Groups (2014)

Aircraft Support Data Management (ASDM) Working Group

Chairman: Selcuk Yigit, Delta Airlines
Secretary: Tom Munns

This Standards Activity will develop standard airline-industry guidance to manage upload, verification, and activation of aircraft support data. This content is media, applications, scripts that are not subject to the field-loadable software regulations, and procedures. In general, this content does not affect the core function or operation of on-board systems, require supplier formal acceptance test or configuration control, reside within the onboard loadable software control system or Illustrated Parts Catalog (IPC), or require aircraft paperwork or technician touch labor to install.

Aircraft support data are important to the operators because they can directly affect the passenger experience. These items can be transient, that is, be loaded quickly to provide a targeted message and are often quickly removed and replaced with new data.

The scope of this activity is to identify applicable aircraft support data that will be considered and to establish guidance and best practices for managing and documenting the upload, verification, and activation of the applicable data. The goal is consistent procedures throughout an operator's fleet and among applicable operators, system suppliers, and data providers.

Design Maintainability and Testability (DMaT) Working Group

Co-Chairman: Dean Conner, United Airlines
Co-Chairman: Karsten Montebaur, Lufthansa Technik
Secretary: Sam Buckwalter

Goal: **ARINC Report 607:** *Design Guidance for Avionics Equipment* represented the desires of the airline industry for the guidelines for the design of avionics equipment for many years. It was intended to be used by avionic equipment designers and airframe manufacturers. The standard was last updated in August of 1998.

However, ARINC Report 607 does not address maintainability and testability, which in today environment of one time use does not lead to cost effective maintainability for aircraft that operate from more than 25 years or more. Additionally, its contents regarding design recommendations are out of scope to be used for current and future component design.

The DMaT Working Group will create a new standard (ARINC 847) using ARINC Report 607 as the foundation, but will include Design, Maintainability, and Testability Guidance for Avionic Equipment.

The design has a big impact to the maintainability of an avionic component. It determines directly the future maintenance cost of the component. Following issues shall be worked out:

- Determining definitions:
    - What is good design?
    - What is good maintainability?
    - What is good testability?
- What is the goal of good design?
    - Extended lifetime
    - Avoidance of obsolescence
    - Long term parts availability
    - Short Testing time
    - Documentation
    - Avoidance of operating and storage limits
    - Support of external Troubleshooting tools
    - Test Covering up to 100% of piece parts
    - Use of Industry Standards (Public Domain)
- What is component design, maintainability, and testability affected by?
    - Use of industry standards for
        - Hardware parts
        - Interfaces
    - Initial specification of component
    - Mechanical design
    - Easy handling during assembly/disassembly
    - Avoidance of use of special tools
- Supporting of troubleshooting aids

Note: Project chairmen and secretary assignments change from time to time. For a current list of projects and their chairmen and secretaries, please visit our web site at www.aviation-ia.com/amc/projects.

FSEMC
Message from the Chairman

FSEMC Chairman 2014 – Present

By: Brandon Mazzacavallo, The Boeing Company

Greetings,

With one year under my belt as FSEMC Chairman, I have to confess to being both awed and inspired by the team of simulation industry experts I have had the opportunity to get to know both professionally and personally. Those of you whom I have worked with the past two decades in the industry continued to impress and the new relationships I was fortunate to make helped to strengthen my impression that as an organization we are heading in the right direction. It continues to be an exciting time for FSEMC as we continue to grow and adapt, remaining always flexible, motivated, and responsive. I would like to take a few minutes of your time to lay out where we stand as an organization and our plan for advancing the technology, utility, and value of flight simulation training via FSEMC.

I would be remiss to not begin by recognizing and thanking our friends and colleagues at FlightSafety International for hosting our annual FSEMC Conference in Broken Arrow, Oklahoma. FlightSafety International demonstrated true southern hospitality in allowing our herd to take over the town for a few productive and inspired days. It was a trying year for me as, due to an unfortunate accident on a Colorado mountainside, I was laid up for several months and regrettably unable to attend. This was personally very disappointing to me; however, I knew as an organization we were in good hands with our members and fellow Steering Committee representatives. The 20th annual conference was attended by 40 simulator user organizations, 57 products and service providers, 3 airframe manufacturers, 8 simulator manufacturers, and 4 regulatory authorities. There were 352 delegates from 29 countries. The reports back to me indicated the conference and surrounding events went extremely well and the feedback from our surveys showed continued enthusiasm from our constituents.

With the lessons learned both personally and professionally over the last year, I want to share my continued vision for the FSEMC's future. As new aircraft continue to be rolled out with a stream of new advancements in materials, design, and technology we, as the training arm supporting these new fleets and resulting flight training equipment, must advance not in step with the aircraft but ahead. As the aviation industry stretches into new areas and brings forth new challenges, we need the flexibility to adapt existing practices to a changing world as well as develop new methods and tools to address the unknown of tomorrow. While 2014 proved to be a profitable year for many commercial airlines, we are still driven in the simulation industry to maximize the value we provide the aviation community

via technology, hardware, and training advancements. As members of the FSEMC, we must be the leaders pushing our industry forward to stay ahead of the oncoming wave. We are all in an industry that moved at glacial speeds in the past; today the changes and challenges are constant and require us to be adaptive and responsive.

The FSEMC is dedicated to applying new technology to the industries toughest challenges. Software driven aircraft, electric motion systems, Liquid Crystal on Silicon (LCoS), and Digital Light Processing (DLP) visual systems – these are all concepts that were dreams in an engineer's mind just a decade or two ago. Today we are installing and maintaining these systems on platforms that see 20-24 hour usage, 365 days a year.

A unique challenge for the industry is the equally important maintenance of our legacy flight training equipment. We face parts obsolescence, skill/knowledge/training issues, and machines that take more and more of our resources as they age. The FSEMC provides a collective of tribal knowledge that often solves difficult problems simply by connecting our colleagues directly at the conference itself and fostering the relationships that are developed. We must continue to operate as a team to maximize the gains and minimize time spent reinventing the wheel.

A goal of the FSEMC is to grow our membership equal to, or greater than, the global industry growth. This means we need to make inroads to the hottest aviation markets today: Asia, India, Russia, South America, and the Middle East. We made inroads in this area over the past year and the FSEMC Steering Committee will continue to meet with the airlines from these regions to foster mutually beneficial relationships, to welcome them to the FSEMC, and enrich our overall experience.

We are known as a technical conference; this is opposed to other trade show atmosphere conferences. We discuss technical problems, review technical presentations, and trade information at every turn to help all our organizations achieve cost goals and efficiency. In addition, the FSEMC Steering Committee is responsive to the delegates' vision and often implements changes to the conference to keep it fresh and engaging. The technology workshop continues to be a resounding success. In a completely open forum we discuss hot topics to flush out if they merit further attention or perhaps a working group to develop industry standards of excellence.

Though I have said this many times before, I continue to reiterate that as a technical body, we simply will not thrive in an isolated environment. We continually cross boundaries to engage with the Royal Aeronautical Society, the Airlines for America STIG group, as well as ICAO, IATA, and the regulatory community. Earlier this year, I was fortunate enough to chair a panel at an AIAA modeling and simulation conference where we further pushed our presence with outreach into new areas. Often we arrive at an idea for a working group or conference topic after speaking with these groups. We will continue, as well as expand, our communication throughout the world to bring the FSEMC's message to the industry.

FSEMC
Message from the Chairman

This past year was full of activity for the FSEMC. We had two active working groups developing guidance for the industry:

- The Simulator Documentation Delivery (SDD) Working Group is busy developing guidance for training device manufacturers in the type, nature, and content of documentation delivered with the simulator required for successful maintenance and operations over the lifecycle of the training device. We expect this work will be completed later this year so look out for further information.
- The Simulated Air Traffic Control Environments (SATCE) Working Group previously produced **ARINC Report 439:** *Guidance for Simulated Air Traffic Control Environments in Flight Training Devices*. The document gives simulator users, manufacturers, and ATC system suppliers the requirements for fidelity, features, and capabilities needed to implement a robust air traffic control system in training. The continued activity is to harmonize the activity being done in the proposed ICAO 9625 4th Edition.

Following this successful year, the FSEMC is looking forward to assisting the industry with new activities:

- 2nd Exploratory Meeting on Qualification Test Guides (QTGs) intends to gather data on the present uses of QTGs and study potential alternatives for simulation training device qualification. If the meeting indicates sufficient support for the activity, a working group may be chartered. The next meeting will be held in Europe to continue to formulate the basis for a full-fledged working group. We feel for an endeavor which may have such far reaching impact, it is prudent to carefully and methodically gain acceptance and consensus on what goals we set and fully understand perspectives from around the world.

Though the past year was personally trying, I have found I have come out of it stronger and more dedicated to handle whatever challenges come my way and I feel the same way about the FSEMC community. I could not have been prouder of the support given, ideas exchanged, and steps taken in the past year by our team. As a forward leaning group, we welcome new ideas and inspirations in our discussions. Feel free to contact me, a steering committee member, or the ARINC Industry Activities staff for more information.

I trust that you share my passion, my enthusiasm, and my vision for a great future for the flight simulation training industry and I look forward to the positive changes we can make together.

Thank you

Brandon Mazzacavallo
The Boeing Company

FSEMC Chairman 2014 – Present

FSEMC

FSEMC Steering Committee Members (As of December 31, 2014)

Brandon Mazzacavallo, Chairman
The Boeing Company

Stefan Nowack, Vice Chairman
Lufthansa Flight Training

*** Sam Buckwalter**
Executive Secretary
ARINC Industry Activities

*** Scott Smith**
Assistant Executive Secretary
ARINC Industry Activities

Howard Gallinger
Air Canada

Eric Fuilla-Weishaupt
Airbus

Hiromitsu Koyano
All Nippon Airways

David Neilson
American Airlines

Troy Fey
TRU Simulation

Jean Bergeron
CAE, Inc.

Neil Cothran
Cathay Pacific

Rick Helms
Delta Air Lines

Adel M. Sowedan
EgyptAir

Mike Jackson
FedEx

Joshua Brooks
FlightSafety International

Richard Van de Nouweland
KLM Royal Dutch Airlines

Jeremy Wise
L-3 Link Simulation and Training

Marc Cronan
Rockwell Collins

Jose Azevedo
TAP Portugal

* Non-voting members

For information about FSEMC Steering Committee Membership, contact Sam Buckwalter at sbuckwalter@sae-itc.org.

FSEMC

FSEMC Mission

To provide cost effective solutions to simulator operational and maintenance problems through a widely respected international conference and establish technical standards that increase simulator readiness and reduce operational costs.

Introduction

Attended by more than 300 flight simulator experts from around the world, FSEMC has grown from existing only as a dream to becoming the premier annual event in flight simulation. The annual conference identifies technical solutions to flight simulator engineering and maintenance issues resulting in immediate and long-term savings and increased efficiency for simulator users. This was confirmed by Embry Riddle Aeronautical University selecting FSEMC for their Pinnacle Award. Why? Because FSEMC brings people together to solve difficult flight simulator problems through its annual conference and working group activities and the industry benefits.

The diversity of flight simulator industry is what helps to make it so exciting. For the technical staff, the daily tasks are as varied as any job you can imagine. The Simulator Technician can be involved in aircraft systems, electronics, mechanics, hydraulics, or software to name a few. In many cases they may be concerned with a combination of several systems.

Simulators Engineering can be equally as wide-ranging. Involvement with all the different aircraft systems from the different airframe manufacturers both large and small can prove to be complex and daunting. Whether the engineering function is related to an update of a 10-year old simulator or the development of a simulator for an aircraft that has yet to fly, the diversity of challenges is extreme and tackled daily by individuals attending this conference. FSEMC is the place to solve your engineering needs and the place to promote your engineering abilities.

FSEMC includes users of flight and cabin simulators (dynamic and static). Users include airlines, commuter airlines, and other simulation users. Participants include airframe manufacturers, aircraft equipment suppliers, and simulator equipment suppliers.

For those who attended the FSEMCs, there should be little need to urge your return. For those who are still not convinced, try answering the following questions:

- Does your company have chronic simulator engineering and maintenance questions?
- Would your company benefit from one-on-one access to a broad cross-section of simulator equipment manufacturers and suppliers, service organizations, airframe manufacturers, and other users in one location?

FSEMC
FSEMC Working Groups

Simulated Air Traffic Control Environments (SATCE) Working Group
Chairman: Ted Chapman, FlightSafety International
Secretary: Scott Smith

The Simulated Air Traffic Control Environments Working Group (SATCE) completed work on **ARINC Report 439:** *Guidance for Simulated Air Traffic Control Environments in Flight Simulation Training Devices*. This document provides guidance on the design, implementation, and use of air traffic control interfaces used in simulated flight training. The guidance defines levels of immersion for each task or evolution of training phase, including generic, representative, and specific. The document describes the features and fidelity of all air traffic control interactions with student aircrew, as well as a primer on the increasing usage of datalink in air transport operations.

A secondary accomplishment of the SATCE was the interface with the ICAO International Pilot Training Consortium (IPTC). The guidance found in ARINC Report 439 will shape the ICAO Flight Simulation documents in the near future.

Simulator Documentation Delivery (SDD) Working Group
Co-Chairman: Josh Brooks, FlightSafety International
Co-Chairman: Mark Gouviea, FedEx
Secretary: Scott Smith

The flight simulation manufacturing and operator community has identified an opportunity for improvement in the documentation provided by Training Device Manufacturers (TDMs), Airframe Manufacturers, and third party vendors. The group intends to improve the amount, depth, and comprehensiveness of the content that is delivered with a Flight Simulation Training Device (FSTD). This is our opportunity to provide guidance to the TDMs and all of their vendors with regards to what is expected to be delivered in a FSTD Support Documentation Package.

EASA FSTD Technical Group

Chairman: Stefan Nowack, Lufthansa Flight Training
Secretary: Sam Buckwalter

In recent years, the FSEMC constituents have repeatedly asked for a direct technical exchange meeting with the European Aviation Safety Agency (EASA) on flight simulation issues. The EASA FSTD Technical Group met in November 2013, discussing regulatory issues common to airlines and simulator users governed by EASA regulations. The attendees remarked on the outstanding value of having a face-to-face meeting with the EASA FSTD team and the candor with which the discussions were held. Acknowledged as a resounding success, the FSEMC will continue this activity in the future.

Note: Project chairmen and secretary assignments change from time to time. For a current list of projects and their chairmen and secretaries, please visit our web site at www.aviation-ia.com/fsemc/projects.

ANNUAL AWARDS

Edwin A. Link Award

Each year, FSEMC encourages the contribution of ideas, leadership and innovation by allowing individuals to be nominated for the Edwin A. Link Award prior to the annual FSEMC. The award recognizes one individual for outstanding personal achievement. The Edwin A. Link Award has become world-renowned as the simulation industry's highest award for individual achievement.

Over the past 14 years, Edwin A. Link Awards have been presented to outstanding members of the simulation community. The Edwin A. Link Award is likely to be the most important award they have ever received.

Recipient: Itash Samani, CAE
September 2014- Tulsa, Oklahoma

Roger Goldberg Award

In an effort to honor Roger, an award was created by AMC and FSEMC for those individuals who have done something extraordinary for either the AMC or FSEMC. The first Service Award was given to Roger S. Goldberg, posthumously, in recognition of the extraordinary ideas, outstanding service, and endless passion.

AMC Recipient: Axel Mueller, Lufthansa
April 2014 – Toronto, Canada

FSEMC Recipient: Shigeru Otomo
September 2014 - Tulsa, Oklahoma

ANNUAL AWARDS

Trumbull Award

The Trumbull Award is given annually to an airline employee who has made an outstanding contribution to the work of the Airlines Electronic Engineering Committee by his or her leadership in the development of ARINC Standards or for other related activities.

The award is named in honor of Austin Trumbull, an engineer working for United Airlines, who “developed the concept into its final form, made the original drawings, and consummated the follow-up work to make it a successful and acceptable Standard” for ARINC 404 which was renamed Austin Trumbull Radio (ATR) Racking. ARINC 404 was first published in 1940 and was renamed in 1967 by a unanimous act of the AEEC. Austin Trumbull received what would become the first Trumbull Award.

The Trumbull Award recipient is an airline employee that has demonstrated a personal commitment to AEEC goals through their contribution of time and effect towards the achievement of these goals.

Recipient Mário Araújo, TAP Portugal
April 2014 – Toronto, Canada

Volare Award

Each year, the Airline Avionics Institute (AAI) encourages the contribution of ideas, leadership, and innovation by allowing individuals to be nominated for Volare Awards prior to the annual AMC and AEEC conference. These awards recognize individuals in airline and supplier organizations for outstanding personal achievement.

The Volare Awards that are offered at the conference allow individuals to be nominated in the categories of Airline Avionics Maintenance and Engineering and Avionics Product Support. In addition to these Volare Awards, AAI presents a Pioneer Award and a Chairman's Special Award on an as-deserved basis.

Over the past 40 years, Volare Awards have been presented to outstanding members of the airline avionics community.

Avionics Engineering
Recipient Charles Sobey, Bombardier Aerospace
April 2014 – Toronto, Canada

Avionics Engineering
Recipient Michael Matyas, The Boeing Company
April 2014 – Toronto, Canada

Avionics Engineering
Recipient Arnold Oldach, ACSS
April 2014 – Toronto, Canada

ANNUAL REPORT ACRONYM LIST

AAI	Airline Avionics Institute
ACARS	Aircraft Communications Addressing and Reporting System
ADB	Aeronautical Data Bases
ADBP	Avionics Data Broadcast Protocol
ADIF	Aircraft Data Interface Function
ADS-B	Automatic Dependent Surveillance-Broadcast
AEEC	Airlines Electronic Engineering Committee
AeroMACS	Aeronautical Mobile Airport Communications System
AGCS	Air-Ground Communications System
AGIE	Aircraft/Ground Information Exchange
AIAA	American Institute of Aeronautics and Astronautics
AID	Aircraft Interface Device
AIS	Airline Information Services
AMC	Avionics Maintenance Conference
AOC	Aeronautical Operational Control
APEX	Avionics Application/Executive Software Interface
APIM	ARINC Industry Activities (IA) Project Initiation/Modification
APM	Airplane Personality Module
ASA	Aircraft Surveillance Application
ASDM	Aircraft Support Data Management
ATC	Air Traffic Control
ATM	Air Traffic Management
ATN	Aeronautical Telecommunications Network
ATR	Air Transport Radio/Austin Trumbull Radio
ATS	Air Traffic Services
BITE	Built In Test Equipment
BGA	Ball Grid Array
CAN	Controller Area Network
CAN FD	CAN Flexible Data Rate
CARATS	Comprehensive Assessment and Restructure of the Air Traffic Services
CDS	Cockpit Display System
CNS	Communications, Navigation, Surveillance
COTS	Commerical Off The Shelf
CSS	Cabin Systems Subcommittee
CVR	Cockpit Voice Recorder
DGSS/IS	Data Link Ground System and Interface Specification
DLK	Data Link
DLP	Digital Light Processing
DMaT	Design, Maintainability, and Testability
EFB	Electronic Flight Bag
FMS	Flight Management System
FOS	Fiber Optics Subcommittee
FSEMC	Flight Simulator Engineering and Maintenance Conference
FSTD	Flight Simulation Training Device

GAIN	Galley Inserts
GFI	General Format Identifier
IAAG	Industry Activities Advisory Group
IATA	International Air Transport Association
ICAO	International Air Transport Association
IMA	Integrated Modular Avionics
IP	Internet Protocol
IPC	Illustrated Parts Catalog
IPTC	International Pilot Training Consortium
KSAT	Ku/Ka Band Satellite Communications
LAN	Local Area Network
LCoS	Liquid Crystal on Silicon
LRU	Line Replaceable Unit
MAGIC	Manager of Air Ground Interface Communications
MOPS	Minimum Operational Performance Standards
MRO	Maintenance, Repair, and Overhaul
NDB	Navigation Data Base
NextGen	Next Generation Air Transportation System
NIS	Network Infrastructure and Security
OEM	Original Equipment Manufacturer
PIES	Passenger Information and Entertainment Services
PWI	Predicted Wind Data
PWM	Predicted Wind Modification
QTG	Qualification Test Guide
RF	Radio Frequency
RTCA	Radio Technical Commission for Aeronautics
RTOS	Real Time Operating System
SAE ITC	Society of Automotive Engineers Industry Technologies Consortia
SAI	Systems Architecture and Interfaces
SARP	Standards And Recommended Practices
SATCE	Simulated Air Traffic Control Environments
Satcom	Satellite Communication
SCEA	Standard for Cost Effective Acquisitions
SDL	Software Data Loader
SELCAL	Selective Calling
SESAR	Single European Sky ATM Research
SSM	Sign Status Matrix
STAP	Simple Test Avionics Protocol
SWIM	System Wide Information Management
TCAS	Traffic Alert and Collision Avoidance System
TDM	Training Device Manufacturer
ULB	Underwater Locator Beacon
WMO	World MET Organization
XML	Extensible Markup Language