A small, dedicated staff supporting a large group of members to produce tangible results.

—Margaret Jenny, President, RTCA
# TABLE OF CONTENTS

- President’s Message .......................... 2
- RTCA Governance ............................. 3
- Who is RTCA? ................................. 4
- RTCA Federal Advisory Committees ......... 5
- Special Committees ............................ 8
- Publications .................................. 15
- Outreach .................................... 17
- Awards ....................................... 21
- Membership .................................. 24
- Financial Report ............................... 31
PRESIDENT’S MESSAGE
2014: RTCA – Results Through Collaboration in Aviation

What began nearly 80 years ago as the Radio Technical Commission for Aeronautics, has progressed in response to the needs of the air transportation community to become the premier venue that provides Results Through Collaboration in Aviation. Though our scope has expanded to more than our original mission, our core values have remained unchanged. In forging consensus on some of the toughest facing aviation, we stay true to our values of objectivity, transparency, inclusiveness, accountability and excellence. Our stakeholders hold diverse and competing interests, but have a single focus on improving the global air transportation system. It continues to be the hallmark of the RTCA community that, even in the midst of the Washington D.C. partisan environment, we find common ground and continue to move the ball forward on NextGen, delivering a return on investment to all who participate.

By all accounts, 2014 was an exceptional year for RTCA and its stakeholders. Working in close partnership with the FAA, our stakeholders reached consensus on key aspects of NextGen. At the forefront was the NextGen Integration Working Group (NIWG), a joint FAA-Industry team operating under the NextGen Advisory Committee (NAC).

Driven by a willingness to work out compromises, we were able to set priorities, obtain commitments and lay out a detailed plan for delivering operational capabilities over the next three years. This progress would not have been possible without the exceptional leadership of the FAA and the aviation industry. Both have agreed to hold themselves accountable to commitments, to track progress, identify problems early and resolve them together, and to leverage opportunities along the way. This is where NextGen becomes real.

Solutions to some of the toughest challenges of NextGen were advanced by the NAC, the Program Management Committee (PMC), over 20 Special Committees and the Tactical Operations Committee (TOC). The NAC issued the Blueprint for Success to Implementing Performance Based Navigation (PBN) Procedures, which captures the lessons learned from PBN implementations across the country and provides a “checklist” to be followed by future PBN implementations to avoid potential pitfalls and expedite the delivery of benefits. This PBN Blueprint report can serve as guidance for PBN procedures around the world.


The PMC also established new committees addressing Emergency Locator Transmitters (ELTs), Airborne Weather Detection Systems, Terrain Awareness Warning Systems (TAWS), and Airborne Selective Calling Equipment.

The TOC delivered seven recommendations vital to the FAA, aircraft operators and airports. These covered the modernization of the Notice to Airman (NOTAM) System, GPS/PBN Transition – Implementing the VHF Omni-directional Range Minimum Operating Network (VOR MON) and Mitigation of Obstructions within the 20:1 Visual Area Surface.

Our work is also closely aligned with the FAA Administrator’s four strategic focus areas: (1) Ensure Safety and security of U.S. Lives, (2) Ensure Efficient Global ATS to Support U.S. Economy, (3) Ensure Aviation Growth While Reducing Environmental Impacts, (4) Ensure U.S. Industry Participation in Global Marketplace. It is not enough just to ensure the success of the NextGen evolution; we must also work to establish a globally harmonized air transportation system that enables operators to equip and obtain benefits wherever they fly and stimulate the global market place. To that end, RTCA redoubled its efforts in 2014 to facilitate global harmonization in the air transportation system by signing a global partnership with the International Air Transport Association (IATA). Under this partnership, working closely with ICAO regional offices, CANSO and others, we launched a government/industry task force to facilitate the deployment of common capabilities, defined in the ICAO Global Air Navigation Plan (GANP). We will continue to work closely with our members and international stakeholders to play our part in facilitating a more seamless air transportation system with strong aviation markets around the world.

Additionally, RTCA and EUROCAE signed a Memorandum of Cooperation in November 2014 that reiterated our ongoing commitment to work toward harmonized standards.

It is without a doubt, the hard work done by you, our many volunteers, made our many tangible results possible. So I want to say thank you. Thank you for your collaboration. Thank you for your results. Thank you for being RTCA.

Margaret T. Jenny
President, RTCA, Inc.
RTCA GOVERNANCE

The RTCA Board of Directors, comprised of individuals from RTCA member companies, provides management and fiduciary oversight by reviewing and approving the annual operating budget. The Board of Directors also works in conjunction with the RTCA Policy Board to establish RTCA policies and programs.

Board of Directors 2014

Carl Esposito  
(Chair)  
Honeywell Aerospace

Mark Baker  
Aircraft Owners and Pilots Association

Edward M. Bolen  
National Business Aviation Association

Nicholas E. Calio  
Airlines for America

Craig L. Fuller  
The Fuller Company

Margaret T. Jenny  
(ex officio)  
RTCA, Inc.

Policy Board 2014

The Policy Board serves as an important link between the members of RTCA and the organization’s policy development activities by establishing RTCA policies and programs. Individuals from RTCA member organizations are elected to serve on the Policy Board. The Policy Board includes all the members of the Board of Directors and the following:

Ed Bolton  
(ex officio)  
Federal Aviation Administration

Teri Bristol  
(ex officio)  
Federal Aviation Administration

Pete Bunce  
General Aviation Manufacturers Association

Roger Cohen  
Regional Airline Association

Paul Engola  
Lockheed Martin Corporation

Marke Gibson  
NextGen Institute

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Eddie Mayenschein  
Transportation Security Administration

Debby McElroy  
Airports Council International – North America

Steve Pennington  
Department of Defense

Paul Rinaldi  
National Air Traffic Controllers Association

Lillian Ryals  
The MITRE Corporation

Rich Swaze  
(ex officio)  
Federal Aviation Administration

Stephen Timm  
Rockwell Collins, Inc.

Todd Zarfos  
The Boeing Company

Mary Beth Guaspari  
(Corporate Secretary)  
RTCA, Inc.
WHO IS RTCA?

Founded in 1935 as a unique collaboration of aviation system users, providers and regulators, RTCA’s recommendations have achieved worldwide acceptance and continue to help shape and harmonize the future of aviation.

RTCA’s recommendations represent the consensus of thousands of experts from all corners of the aviation industry, functioning in an open, collaborative, consensus-driven environment. Committees are established and tasked by RTCA in response to requests from the FAA. Dedicated volunteers log thousands of hours annually, participating in an active network organized and managed by RTCA. This unique public-private partnership provides an effective venue for all interested parties to be heard and work constructively towards solutions to some of the toughest challenges to air transportation modernization.

RTCA is a DC-based, not-for-profit association. Our 490+ member-organizations employ tens of thousands of people worldwide.

RTCA is...

- Drives the evolution of the air transportation system by convening interested stakeholders to respond to requests from the government for consensus advice on policy, operational and investment decisions, and the associated performance metrics critical to maintaining a safe, secure and efficient air transportation system.
- Generates products that support the continuing evolution of the US ATC system, an essential service to both government and industry.
- Forges recommendations developed by aviation community volunteers working in a collaborative, consensus-driven environment.
- Supports FAA leadership and international harmonization.
- Covenes federal advisory committees of private sector participants in a manner consistent with US anti-trust laws.
- Generates performance standards serving as a basis for certification and helps expand the competitive marketplace of aircraft equipment and avionics.
- Produces comprehensive products leading to measurable outcomes:
  - Minimum Performance Standards for aircraft equipage
  - Industry consensus policy recommendations for the government
  - Training courses for technical standards and guidance
RTCA brings people together to find solutions to complex challenges facing the aviation industry. This is done under a charter with the FAA that establishes the organization as a Federal advisory committee. The solutions take the form of advice on policies, tactical operational enhancements and technical performance standards. Since the advice is routinely adopted by the FAA, the volunteers who devote time and energy to our committees see their efforts pay off in a safer, efficient, environmentally friendly air transportation system.

The NAC is comprised of executives from the airlines, airports, general aviation, pilots, air traffic controllers, the Department of Defense, environmental interests, unmanned aircraft systems, international interests and providers of air traffic control technology. The NAC met three times in 2014, under the leadership of retired Chairman and CEO of Alaska Air Group Bill Ayer.

The Committee approved a recommendation for a set of integrated plans on four focus areas of NextGen capabilities. These were developed by a joint FAA-Industry team, the NextGen Integration Working Group (NIWG), operating under the NAC. The goal is to deliver measurable benefits by dates certain, thereby increasing the community’s confidence in NextGen. The recommendation also included pre-implementation areas for analysis or assessments as an important step for fielding some of the capabilities.

The NIWG is a new model of collaboration between the Industry and FAA that is designed to more quickly implement foundational NextGen capabilities. The following priority areas were addressed in the recommendation:

- Performance Based Navigation (PBN)—Metroplex (Optimization of Airspace Procedures in the Metroplex); Established on RNP; Equivalent Lateral Spacing Operations; and Single Site PBN location.
- Surface and Data Sharing—Airport participation in Collaborative Decision Making and access to surface data; Airport Surface Departure Metering; Providing Real-Time Traffic Management Updates to New York Air Traffic Control Towers, flight and aircraft operators; and Utilize Earliest Off Block Time for short range flights.
- Closely Spaced Parallel Runways/Multiple Runway Operations (MRO)—Wake Recategorization replaces the existing weight based wake turbulence separation category with approved wake turbulence categories; MRO to improve access to parallel runways including closely spaced parallel runways in less than visual approach weather minimums.
- DataComm—Surface DataComm pre-departure clearances; and En route Controller-Pilot DataLink Communications (CPDLC).

The NAC also approved several actionable recommendations addressing Performance Based Navigation Procedures:

- More than 60 Federal Advisory Committee Meetings
- 305 Meetings, Work Groups, Task Groups, etc.
- 2,336 Attendees from 358 Unique Organizations
- 24 New or Updated Documents and 9 Policy and Technical Recommendations Developed
- Blueprint for Performance-Based Navigation Procedures Implementation Report: PBN Blueprint Task Group recommendation identifying and capturing the lessons learned from PBN implementations across the country and building on those lessons to create a checklist for future implementations. The PBN Blueprint is not only important for the United States, but is also relevant for implementation of PBN in other parts of the world.

NAC Members, December 2014

Richard Anderson  
(Chair)  
Delta Air Lines, Inc.

The Honorable Mike Whitaker  
(Designated Federal Official)  
Federal Aviation Administration

Eddie Angeles  
Federal Aviation Administration

Mark Baker  
Aircraft Owners and Pilots Association

Ed Bolen  
National Business Aviation Association

Ed Bolton  
Federal Aviation Administration

Frank Brenner  
Eurocontrol

Teri Bristol  
Federal Aviation Administration

Pete Bunce  
General Aviation Manufacturers Association

Tim Canoll  
Air Line Pilots Association

Paul Cassel  
FedEx Express

Russell Childs  
SkyWest, Inc.

Carl D’Alessandro  
Harris (CGS) Civil Business Unit

Mario Diaz  
City of Houston Department of Aviation

Carl Esposito  
Honeywell Aerospace

Florian Guillermet  
SESAR Joint Undertaking

Jeff Hamiel  
Metropolitan Airports Commission

John Harris  
Raytheon Technical Services

Ryan Hartman  
Insitu, Inc.

John Hickey  
Federal Aviation Administration

Stephanie Hill  
Lockheed Martin Corporation

Margaret Jenny  
RTCA, Inc.

Jeff Martin  
JetBlue Airways

T. Allan McArtor  
Airbus Americas, Inc.

Per Noren  
The Boeing Company

Mike Perrone  
Professional Aviation Safety Specialists

Brad Pierce  
NOISE—Aurora City Council

Paul Rinaldi  
National Air Traffic Controllers Association

Lillian Ryals  
The MITRE Corporation

Rich Swayze  
Federal Aviation Administration

Giovanni Tuck  
United States Air Force

Andy Cebula  
(RAC Secretary)  
RTCA, Inc.
Program Management Committee (PMC)

The PMC is comprised of senior executive leaders from RTCA member organizations including the airlines, the Department of Defense, aircraft manufacturers, pilots, providers of Communications, Navigation and Surveillance (CNS) and air traffic management (ATM) technology. The PMC approves the establishment of Special Committees, tracks the progress, provides important oversight in guiding the technical work and approves the final products for submittal to the sponsoring organization. PMC members are appointed by the RTCA President in accordance with the RTCA Bylaws. The PMC met four times in 2014. Keeping current and responding to new and emerging issues, three new Special Committees were established by the PMC in 2014.

PMC Members, December 2014

**Dr. Chris Hegarty**  
(Chair)  
The MITRE Corporation

**Richard Jennings**  
(Designated Federal Official)  
Federal Aviation Administration

**Douglas Arbuckle**  
Federal Aviation Administration

**Chris Baum**  
Air Line Pilots Association

**Steve Brown**  
National Business Aviation Association

**Lawrence Dibble**  
U.S. Army

**Chris Durkin**  
Honeywell International, Inc.

**Robert Grove**  
Garmin Ltd.

**Richard Heinrich**  
Rockwell Collins, Inc.

**Jens Hennig**  
General Aviation Manufacturers Association

**Robert Ireland**  
Airlines for America

**Richard Jennings**  
(Designated Federal Official)  
Federal Aviation Administration

**Margaret Jenny**  
RTCA, Inc.

**Dr. George Ligler**  
Project Management Enterprises, Inc.

**Michele Merkle**  
Federal Aviation Administration

**Col. Juan Narvid**  
U.S. Air Force

**CDR Donald Sigley**  
U.S. Navy

**Jessie Turner**  
The Boeing Company

**Harold Moses**  
(PMC Secretary)  
RTCA, Inc.
SPECIAL COMMITTEES

RTCA Special Committees (SC) function as Federal advisory committees and are formed to address technically-oriented topics leading to the publication of minimum performance standards for key components of air transportation. They are established by the RTCA Program Management Committee in response to a request from government or industry. Special Committee recommendations, published as RTCA documents (e.g., DO-252A), are frequently referred to by the FAA in Technical Standard Orders and Advisory Circulars and provide, at the very least, a partial basis for the certification of equipment. RTCA documents are also used by the private sector for development, investment and other business decisions.

21 RTCA Special Committees were active in 2014:

**SC-135, Environmental Testing**, established October 1, 1977, continues to maintain RTCA DO-160 (current version is DO-160G), *Environmental Conditions and Test Procedures for Airborne Equipment*. This document is the international de facto standard for environmental testing of commercial avionics and provides standard procedures and environmental test criteria for testing airborne equipment to determine their performance characteristics. DO-160G was published in December 2010, and an update of the Users’ Guide material for this document was developed in 2014 (DO-357, *User Guide: Supplement to DO-160G*), with the aim of providing rationales, guidance and background information for the environmental test procedures and requirements, as well as lessons learned from aircraft and laboratory experience.

*Chair:* Brad Green, Honeywell International, Inc.
*Designated Federal Official:* Lee Nguyen, FAA

**SC-147, Traffic Alert & Collision Avoidance System (TCAS),** established November 1, 1980, has defined and updated the TCAS and TCAS II performance standards, thereby contributing to one of the most significant advances in aviation safety in the past twenty years. The Committee has started work on a new Aircraft Collision Avoidance System for NextGen, or ACAS X. The foundational system to be specified will be ACAS Xₐ, with the “A” denoting active surveillance. ACAS Xₐ will be a “drop-in” replacement for TCAS II with an expected MOPS completion date of December 2018.

*Co-Chairs:* J. Stuart Searight, FAA; Dan Tillotson, Rockwell Collins, Inc.
*Designated Federal Official:* Steve Plummer, FAA

**SC-159, Global Positioning System (GPS),** established March 1, 1985, is developing minimum standards that form the basis for FAA approval of equipment using GPS as a primary means of civil aircraft navigation. The Committee’s most recent publication, DO-229D with Change 1, *Minimum Operational Performance Standards for Global Positioning System/Satellite-Based Augmentation System Airborne Equipment*, contains Minimum Operational Performance Standards (MOPS) for airborne navigation equipment (2D and 3D) using the Global Positioning System (GPS) augmented by the Satellite-Based Augmentation System (SBAS). The Committee is monitoring GNSS developments for the next activity; developing a dual frequency/multi-constellation MOPS.

*Co-Chairs:* Chris Hegarty, The MITRE Corporation; George Ligler, Program Management Enterprises, Inc.
*Designated Federal Official:* Ken Alexander, FAA

**SC-186, Automatic Dependent Surveillance-Broadcast (ADS-B),** established February 1, 1995, is developing operational requirements and minimum performance standards for airborne and ground user applications of ADS-B. Over 70 ADS-B operational capabilities have been identified that could provide enhanced safety, increased capacity and improved efficiency. The Committee has completed over 20 ADS-B documents, including the MASPS document for ADS-B and Aircraft Surveillance Applications (ASA), several MOPS documents, and is currently developing safety, performance and interoperability requirements documents for specific ADS-B applications. The Committee completed four documents in 2014: DO-317B, *MOPS for Aircraft Surveillance Applications (ASA) System*; DO-317B Supplement, *MOPS for Aircraft Surveillance Applications (ASA)*;
SC-206, Aeronautical Information Services (AIS) Data Link, established February 11, 2005, is identifying the AIS (Aeronautical Information Services) and MET (Meteorological) data link services that are envisaged to be implemented within the next decade. In 2014, they published DO-252A, Minimum Interoperability Standards (MIS) for Automated Meteorological Transmission (AUTOMET), and DO-349, Architecture Recommendations for Aeronautical Information (AI) and Meteorological (MET) Data Link Services. SC-206 SG5 is finalizing the MOPS for Flight Information Services - Broadcast (FIS-B) with Universal Access Transceiver (UAT) and will present this new document to the PMC in March 2015 for approval. In December 2014, SC-206 was tasked to work on two new documents in addition to the MASPS for AIS and MET Services developed by SG6. SG4 will develop “MOPS for the Eddy Dissipation Rate” and a new SG7 has been created to develop “Guidance for Data Linking Forecast and Real-Time Wind Information to Aircraft”.


Designated Federal Official: Eldredge Frazier, FAA


Co-Chairs: Thomas Pagano, Regulus Group; Robert Saffel, Rockwell Collins, Inc.

Designated Federal Official: John Fisher, FAA


Co-Chairs: Tim Etherington, Rockwell Collins, Inc.; Patrick Krohn, Universal Avionics Systems Corporation

Designated Federal Official: Trent Prange, FAA

SC-214, Standards for Air Traffic Data Communication Services, established March 22, 2007, is developing Safety and Performance Requirements (SPR) and Interoperability Requirements (INTEROPS) documents for the Air Traffic Services (ATS) supported by data communications to be implemented in the United States by the NextGen Data Communications Program in defined environments through 2025, and in Europe as part of the Single European Sky ATM Research (SESAR) operational improvements. Data communications will introduce services that allow evolution from the current workload-intensive, voice-based air traffic control concepts, to collaborative, management-by-exception operations. Advanced data links between ground and airborne systems are envisioned to increase capacity, allowing greater user access and more efficient flight routing. The Committee completed seven documents in 2014: Change 1 to DO-224C, Signal-In-Space Minimum Aviation System Performance Standards (MASPS) for Advanced VHF Digital Data Communications Including Compatibility with Digital Voice Techniques; Change 1 to DO-280B, Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1 (ATN B1 Interop Standards); Change 1 to DO-281B, Minimum Operational Performance Standards (MOPS) for Aircraft VDL Mode 2 Physical Link and Network Layer; DO-350, Volume 1 & 2-Safety and Performance Standard for Baseline 2 ATS Data System; DO-348, Safety, Performance and Interoperability Requirements Document for Traffic Situation Awareness with Alerts (TSAA); and DO-354, Safety and Performance Requirements Document for CDTI Assisted Visual Separation (CAVS).

Co-Chairs: Rocky Stone, United Airlines, Inc.; Jessie Turner, The Boeing Company

Designated Federal Official: Don Walker, FAA
Communications (Baseline 2 SPR Standard); DO-351, Volume 1 & 2 Interoperability Requirements Standard for Baseline 2 ATS Data Communications (Baseline 2 Interop Standard); DO-352, Interoperability Requirements Standard for Baseline 2 ATS Data Communications, FANS 1/A Accommodation (FANS 1/A-Baseline 2 Interop Standard); and DO-353, Interoperability Requirements Standard for Baseline 2 ATS Data Communications, ATN Baseline 1 Accommodation (ATN Baseline 1-Baseline 2 Interop Standard). The Committee is working on revisions to the SPR, DO-350 and Interops documents DO-351, DO-352 and DO-353 to incorporate additional requirements for new operations, Dynamic RNP, Advanced Interval Management (AIM) and ATC Winds, with a due date of December 2015.

Co-Chairs: Jérôme Condis, Airbus SAS, Chuck Stewart, United Airlines, Inc.

Designated Federal Official: Gregg Anderson, FAA


Co-Chairs: Dan Johnson, Honeywell International, Inc.; Chuck Royalty, The Boeing Company

Designated Federal Official: Varun Khanna, FAA

SC-217, Aeronautical Databases, established March 13, 2008, is developing a revision of DO-200A, Standard for Processing Aeronautical Databases; DO-272C, User Requirements for Aerodrome Mapping Information; DO-276B, User Requirements for Terrain & Obstacle Data; and DO-291B, Minimum Interchange Standards for Terrain, Obstacle and Aerodrome Mapping Data, to support future ATM requirements of Next-Gen and SESAR. The applications need additional aeronautical information beyond the requirements captured in the current RTCA documents DO-272C, DO-276B and DO-291B. The DO-200A revision is necessary to be aligned with ICAO, ARINC and EUROCAE changes in standards and with the implementation of Aeronautical Data Quality (ADQ) for Single European Sky (SES). The revision of DO-200A, DO-272C, DO-291B and DO-276B will be finalized in 2015 and be submitted to the PMC in June and September 2015 for approval.

Co-Chairs: John Kasten, Jeppesen; Stéphane Dubet, SIA

Designated Federal Official: Michael Burski, FAA

SC-222, AMS(R)S, established October 2, 2008, is developing Minimum Aviation Performance Standards (MASPS) for the Aeronautical Mobile-Satellite (R) Service (AMS(R)S), incorporating DO-270 satellite subnetwork material and aligning with ICAO’s Global Operational Data Link (GOLD) document. SC-222 will also define system level requirements and equipment specifications for the production of “Technique Specific Appendices” to Change 4 to DO-210, as necessary, to add safety service capability to SwiftBroadband. SwiftBroadband is Inmarsat’s latest generation aviation service and is currently a non-safety service. In 2014, the Committee developed DO-262B, Minimum Operational Performance Standards for Avionics Supporting Next Generation Satellite Systems (NGSS).

Chair: E. F. Charles LaBerge, EFC LaBerge Engineering & Analysis, LLC and UMBC

Designated Federal Official: Dave Robinson, FAA

SC-223, Aeronautical Mobile Airport Communication System (AeroMACS), established August 7, 2009, is developing standards for the Airport Wireless Surface Communications System. These standards are required to support data communication developments for collaborative decision making (CDM), surveillance broadcast system (SBS) and system wide information management (SWIM), as well as weather and flight information systems (FIS) efforts on the airport surface. The Committee published DO-346, Minimum Operational Performance Standards (MOPS) for the Aeronautical
Mobile Airport Communication System (AeroMACS), in 2014.

**Chair:** Aloke Roy, Honeywell International, Inc.

**Designated Federal Official:** Brent Phillips, FAA

**SC-224, Airport Security Access Control Systems,** established September 15, 2010, is restructuring DO-230D, *Integrated Security System Standard for Airport Access Control*, into separate sections that will allow asynchronous updates from the main document. All U.S. commercial airports nationwide rely on this document as the primary resource for baseline minimum performance standards for design of airport access control systems and the related electronic security systems, and as the basis for meeting minimum requirements for Airport Improvement Program (AIP) funding.

**Chair:** Aloke Roy, Honeywell International, Inc.

**Designated Federal Official:** Brent Phillips, FAA

**SC-225, Rechargeable Lithium Batteries & Battery Systems,** established December 8, 2010, is developing certification guidance for small- and medium-sized rechargeable lithium batteries and battery systems. The development of minimum standards for rechargeable lithium batteries and battery systems will help to ensure safety and efficiency in battery design, testing, installation and system management.

**Chair:** Richard Nguyen, The Boeing Company

**Designated Federal Official:** Joe Hebert, FAA

**SC-227, Standards of Navigation Performance,** established December 13, 2011, is developing navigation standards intended for designers, manufacturers and installers of avionics equipment; airspace managers and service providers; and the users of these navigation systems for world-wide operations. The revision to DO-283, *Minimum Operational Performance Standards (MOPS) for Required Navigation Performance for Area Navigation*, will provide guidance for the development of airspace and operational concepts needed to obtain the benefits of enhanced navigation capability in the aircraft; this revision will be aligned on the MASPS DO-236C Change 1 developed to cover the Time Of Arrival Control (TOAC) and wrong runway monitoring. Moreover, the MOPS will be compatible with the upcoming ICAO navigation specification for advanced RNP, to be published in the update to the ICAO PBN Manual, Document 9613. In 2014, the Committee published DO-236C Change 1, *Minimum Aviation System Performance Standards (MASPS): Required Navigation Performance for Area Navigation*. This Change defines the four dimensional standards that support both RNP and trajectory-based operations and a standard for wrong runway monitoring in support of aviation safety initiatives.

**Co-Chairs:** Dave Nakamura, Advanced PBN Solutions; Sylvain Raynaud, Airbus

**Designated Federal Official:** Barry Miller, FAA

**SC-228, Minimum Operational Performance Standards for Unmanned Aircraft Systems,** established May 20, 2013, is working to develop the Minimum Operational Performance Standards (MOPS) for Detect and Avoid (DAA) equipment and Command and Control (C2) Data Link MOPS establishing L-Band and C-Band solutions. The initial phase of standards development will focus on civil UAS equipped to operate into Class A airspace under IFR flight rules. The Operational Environment for the MOPS is the transitioning of a UAS to and from Class A or special use airspace, traversing Class D and E, and perhaps Class G airspace. A second phase of MOPS development is envisaged to specify DAA equipment to support extended UAS operations in Class D, E, and perhaps G airspace. Phase I preliminary MOPS for DAA and C2 are expected in July 2015 with final MOPS planned for July 2016.

**Co-Chairs:** George Ligler, Project Management Enterprises, Inc.; Paul McDuffee, Insitu, Inc.

**Designated Federal Official:** Steve Van Trees, FAA

**SC-229, 406 MHz Emergency Locator Transmitters (ELTs),** established December 18, 2013, is working to update DO-204A standards addressing the latest design, performance, installation and operational issues for 406 MHz emergency beacons. These standards should be useful to users, designers, manufacturers, and installers of ELTs and will help ensure a more standardized approach in these systems and the installations approval process. The revision to DO-204 is warranted for several reasons: First, Cospas-Sarsat is upgrading its satellite ELT detection system by placing search and rescue transponders on new GPS, GLONASS, and GALILEO satellites. These new transponders will dramatically improve the speed and accuracy of ELTs. Second, analysis of recent aircraft accidents has created a call from air safe-
SC-230, Airborne Weather Detection Systems, established December 18, 2013, is working to develop recommendations for an advisory circular for airworthiness approval for aircraft weather radar systems. The outdated RTCA/DO-220 and DO-220 Change 1 will be revised and updated to the minimum operational performance standards for aircraft weather radar equipment. RTCA/DO-220 provides the current Minimum Operational Performance Standards for Airborne Weather Radar with Forward-Looking Windshear Capability. It was published in 1993, with Change 1 added in 1995. Since then, significant technological advances in weather radar systems have occurred, but the MOPS has not been updated to accommodate these improvements. Modern weather radar systems may also include turbulence detection or other related features and functions that are not currently addressed by the MOPS. Revised guidance will enable a more efficient and standardized certification approach across the industry.


Designated Federal Official: Lee Nguyen, FAA

SC-231, TAWS, established March 18, 2014, is working to develop an industry consensus set of TAWS (Terrain Awareness Warning System) standards reflecting the mature nature of this technology and incorporating enhanced requirements and new capabilities. The new MOPS will also incorporate the revised GPWS requirements (from DO-161A) and will be useful to designers, equipment manufacturers, aircraft manufacturers, airlines, and aircraft operators, installers, and aviation authorities. The new MOPS for TAWS will provide the foundation for the revision to Technical Standard Orders (TSOs) - TSO-C151c.

Co-Chairs: Yasuo Ishihara, Honeywell International, Inc.; Rick Ridenour, ACSS

Designated Federal Official: Charisse Green, FAA

SC-232, Airborne Selective Calling Equipment, established June 17, 2014, is working to revise RTCA DO-93, Minimum Operational Performance Standards (MOPS) for Airborne Selective Calling Equipment, issued February 2, 1959. Airworthiness and operational authorities intend to use the MOPS to update FAA Technical Standard Order (TSO) - C59. The SELCAL system is a signaling method used to alert an individual aircraft that a ground station wishes to communicate with the aircraft. SELCAL signals are capable of being transmitted on en-route frequencies with existing High Frequency (HF) or Very High Frequency (VHF) ground-to-air communication transmitters and receivers. With the SELCAL calling system, the normal voice calling method is replaced with the transmission of coded tones to the aircraft over the voice communications channel. Based on the current 16-tone system, SELCAL code assignments provide for a total of 10,920 unique codes. However, there are currently over 30,000 existing assignments and new requests are averaging approximately 200 per month. To meet the requirements for new assignments, it is necessary to assign duplicate codes. Therefore it is necessary to update the SELCAL standards to allow unique code assignments to each aircraft.


Designated Federal Official: David Robinson, FAA

SC-233, Addressing Human Factors/Pilot Interface Issues for Avionics, established December 16, 2014, is working to identify a recommended process for evaluating the human factors/pilot interface aspects of avionics as well as to document some prevalent human factors issues that may aid the early identification and resolution of these issues as part of the design and evaluation process. Industry input would be gathered for designs of systems, features, and functions that are “best practices” and have been previously approved, and can be publically shared (non-proprietary) to facilitate future approvals and streamline the certification process. The intent is to raise the level of awareness about human factors to facilitate the identification and resolution of human factors issues by the individuals who are responsible for design and evaluation of avionics, specifically FAA Flight Test Pilots, Engineers and Human Factors Specialists within the FAA Aircraft Certification Offices as part of their review and approval process.

Co-Chairs: Susan Taylor, Gulfstream; Trish Ververs, Honeywell International, Inc.

Designated Federal Official: Michelle Yeh, FAA
Tactical Operations Committee (TOC) – Tackling Real World Issues with Practical Solutions

The purpose of the TOC is to provide an open venue for the FAA and those who operate in the National Airspace System (NAS) to work in partnership to identify and resolve near-term, tactical issues affecting the efficiency of the NAS, and to recommend resolutions to those issues and challenges.

The Committee is comprised of senior leaders from key stakeholders who operate in the NAS, including commercial and regional air carriers, business and general aviation, the Department of Defense, airports, air traffic controllers, pilots, dispatchers and the FAA. The Committee members are appointed by the RTCA President in consultation with the FAA and serve as representatives of aviation-related organizations. They speak for, reach out and commit their organizations to the necessary segments of the aviation community to answer specific requests from the FAA.

The TOC met four times during 2014. The following five Recommendations/Reports were developed by two standing task groups and one task group established for a specific task in 2014.

Scott Jerdan of the FAA presents the NOTAM Search Implementation Roadmap at NOTAM Industry Day
### NOTAM Task Group

- **NOTAM Success Criteria and Metrics:** Recommendation to provide the FAA with success criteria to comply with the Pilot’s Bill of Rights as well as a recommendation of metrics to ensure continued compliance and reporting to outside entities.
- **NOTAM Search and Filter Options:** Report to the Federal NOTAM System (FNS) to provide clarification of search and filter terms, prioritization of search and filter options and to answer specific questions from the FAA response letter, all to help the FAA prioritize the capabilities to be implemented immediately in the FAA’s NOTAM Search tool.

### VOR MON Task Group

- **VOR MON Criteria Prioritization:** Report focused on the review and validation of the draft candidate VOR MON list.
- **VOR MON Outreach, Education and Required Modifications:** Recommendation and Report to address outreach and education required to successfully implement the VOR MON and to advise the FAA of what existing policies, processes, procedures or training needs modification for successful implementation of the MON.

### 20:1 Visual Approach Surface Task Group

- **Mitigation of Obstructions within the 20:1 Visual Area Surface:** Recommendation and Report to review and develop recommendations related to the FAA Memorandum, “Mitigation of Obstructions within the 20:1 Visual Area Surface” (FAA 20:1 Memorandum), and to provide the sufficiency of time and clarity expectations in the verification stage; a plan to improve the planning and mitigation stages; clear guidance for what actions must be taken to mitigate risk regarding visibility and night operations; and recommendations for the best mechanism(s) to communicate the process to key stakeholders.

### TOC Members, December 2014

- **Jim Bowman**  
  (Co-Chair)  
  FedEx Express

- **Dale Wright**  
  (Co-Chair)  
  National Air Traffic Controllers Association

- **Lynn Ray**  
  (Designated Federal Official)  
  Federal Aviation Administration

- **Chris Baum**  
  Air Line Pilots Association

- **Carlos Cirillo**  
  International Air Transport Association

- **Bruce DeCleene**  
  Federal Aviation Administration

- **Stacey Bechdolt**  
  Regional Airline Association

- **Mark Hopkins**  
  Delta Air Lines, Inc.

- **Margaret Jenny**  
  RTCA, Inc.

- **Nancy Kalinowski**  
  Federal Aviation Administration

- **Christian Kast**  
  Airlines for America/United Parcel Service

- **Bob Lamond**  
  National Business Aviation Association

- **Joe Miceli**  
  Airline Dispatchers Federation

- **Doug Molin**  
  The MITRE Corporation

- **Col. Juan Narvid**  
  U.S. Air Force

- **David Newton**  
  Southwest Airlines

- **Chris Oswald**  
  Airports Council International - North America

- **Melissa Rudinger**  
  Aircraft Owners and Pilots Association

- **Trin Mitra**  
  (TOC Secretary)  
  RTCA, Inc.
RTCA COMMITTEES PROVIDE ESSENTIAL GUIDANCE

RTCA’s Committees developed 24 guidance documents that cover issues ranging from technical performance standards to operational concepts for air transportation. This was accomplished through the expertise and hard work of hundreds of volunteers who provided thousands of hours to make all of these documents possible.

### AeroMACS

<table>
<thead>
<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO-346</td>
<td>Minimum Operational Performance Standards (MOPS) for the Aeronautical Mobile Airport Communication System (AeroMACS)</td>
<td>SC-223</td>
</tr>
</tbody>
</table>

### Aeronautical Telecommunication Network

<table>
<thead>
<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change 1 to DO-280B</td>
<td>Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1 (ATN BI Interop Standards)</td>
<td>SC-214</td>
</tr>
</tbody>
</table>

### Automatic Dependent Surveillance – Broadcast (ADS-B)

<table>
<thead>
<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
</tr>
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<tbody>
<tr>
<td>DO-317B</td>
<td>Minimum Operational Performance Standards (MOPS) for Aircraft Surveillance Applications (ASA) System</td>
<td>SC-186</td>
</tr>
<tr>
<td>DO-317B Supplement</td>
<td>Minimum Operational Performance Standards (MOPS) for Aircraft Surveillance Applications (ASA) System</td>
<td>SC-186</td>
</tr>
<tr>
<td>DO-348</td>
<td>Safety, Performance and Interoperability Requirements Document for Traffic Situation Awareness with Alerts (TSAA)</td>
<td>SC-186</td>
</tr>
<tr>
<td>DO-354</td>
<td>Safety and Performance Requirements Document for CDTI Assisted Visual Separation (CAVS)</td>
<td>SC-186</td>
</tr>
</tbody>
</table>

### Communications

<table>
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<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
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<tbody>
<tr>
<td>Change 1 to DO-224C</td>
<td>Signal-In-Space Minimum Aviation System Performance Standards (MASPS) for Advanced VHF Digital Data Communications Including Compatibility with Digital Voice Techniques</td>
<td>SC-214</td>
</tr>
<tr>
<td>Change 1 to DO-281B</td>
<td>Minimum Operational Performance Standards (MOPS) for Aircraft VDL Mode 2 Physical Link and Network Layer</td>
<td>SC-214</td>
</tr>
<tr>
<td>DO-350</td>
<td>Safety and Performance Standard for Baseline 2 ATS Data Communications, Initial Release (Baseline 2 SPR Standard) Volumes I and II</td>
<td>SC-214</td>
</tr>
<tr>
<td>DO-351</td>
<td>Interoperability Requirements Standard for Baseline 2 ATS Data Communications, Initial Release (Baseline 2 Interop Standard) Volume I and II</td>
<td>SC-214</td>
</tr>
<tr>
<td>DO-352</td>
<td>Interoperability Requirements Standard for Baseline 2 ATS Data Communications, FANS 1/A Accommodation, Initial Release (FANS 1/A - Baseline 2 Interop Standard)</td>
<td>SC-214</td>
</tr>
<tr>
<td>DO-353</td>
<td>Interoperability Requirements Standard for Baseline 2 ATS Data Communications, ATN Baseline 1 Accommodation, Initial Release (ATN Baseline 1 - Baseline 2 Interop Standard)</td>
<td>SC-214</td>
</tr>
</tbody>
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### Environmental Test

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<tr>
<th>RTCA Document</th>
<th>Title</th>
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<tbody>
<tr>
<td>Change 1 to DO-160G</td>
<td>Environmental Conditions and Test Procedures for Airborne Equipment</td>
<td>SC-135</td>
</tr>
<tr>
<td>DO-357</td>
<td>User Guide: Supplement to DO-160G</td>
<td>SC-135</td>
</tr>
</tbody>
</table>

### Flight Information Services

<table>
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<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO-349</td>
<td>Architecture Recommendations for Aeronautical Information (AI) and Meteorological (MET) Data Link Services</td>
<td>SC-206</td>
</tr>
</tbody>
</table>

### Performance Based Navigation

<table>
<thead>
<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>APBN-1</td>
<td>Blueprint for Success to Implementing Performance Based Navigation</td>
<td>NextGen Advisory Committee</td>
</tr>
</tbody>
</table>

### Required Navigation Performance (RNP)

<table>
<thead>
<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
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<tbody>
<tr>
<td>DO-236C Change 1</td>
<td>Minimum Aviation System Performance Standards: Required Navigation Performance for Area Navigation</td>
<td>SC-227</td>
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</tbody>
</table>

### Security

<table>
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<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
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</thead>
<tbody>
<tr>
<td>DO-355</td>
<td>Information Security Guidance for Continuing Airworthiness</td>
<td>SC-216</td>
</tr>
<tr>
<td>DO-356</td>
<td>Airworthiness Security Methods and Considerations</td>
<td>SC-216</td>
</tr>
</tbody>
</table>

### Unmanned Aircraft Systems (UAS)

<table>
<thead>
<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP-1</td>
<td>Detect and Avoid (DAA) White Paper</td>
<td>SC-228</td>
</tr>
<tr>
<td>WP-2</td>
<td>Command and Control (C2) Data Link White Paper</td>
<td>SC-228</td>
</tr>
</tbody>
</table>

### Weather Detection

<table>
<thead>
<tr>
<th>RTCA Document</th>
<th>Title</th>
<th>Prepared by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO-252A</td>
<td>Minimum Interoperability Standards (MIS) for Automated Meteorological Transmission (AUTOMET)</td>
<td>SC-206</td>
</tr>
</tbody>
</table>
RTCA OUTREACH

RTCA 2014 Global Aviation Symposium

RTCA’s 2014 Symposium highlighted collaboration and examined moving ahead with NextGen. Attended by more than 300 participants, the event focused on vital aviation policy and technical issues and included keynote speeches from Bill Ayer, Chair, NextGen Advisory Committee and Former Chairman and CEO, Alaska Air Group; Mark Baker, President and CEO, AOPA; Carl Esposito, Vice President of Marketing & Product Management, Honeywell Aerospace; and Nancy Graham, Director, Air Navigation Bureau, ICAO.
Supporting Members

Communications

The RTCA Digest provides RTCA members with the most current updates of the work of thousands of committee volunteers and coverage of current issues of interests to RTCA Organizations, including RTCA Documents and other RTCA-related work.

RTCA continued to provide education to the aviation community through training courses on documents that enhance the understanding and use of global standards. RTCA has been eager to assist key aviation stakeholders in implementing the new standards developed within RTCA Special Committees.

During 2014, RTCA partnered with Wichita State University’s National Institute for Aviation Research (WSU-NIAR) to offer high quality training covering RTCA’s DO-160G, Environmental Conditions and Test Procedures for Airborne Equipment. This training course provides an understanding of the use of DO-160G and how it fits in with the requirements, design, certification and Technical Standard Orders (TSOs).

In addition to the DO-160G course, RTCA continued to offer training on DO-178C, Software Considerations in Airborne Systems and Equipment Certification and the Supplements to DO-178C. Course participants continued to rate all three courses high on relevance, as well as usefulness and appropriateness for the course content.

The National Air Traffic Controllers Association released a new publication providing updates on NextGen, and included editorials from RTCA’s President. In it, she explained the important roles of RTCA Committees, helping to modernize the US air traffic control system, shaping global harmonization and tackling NextGen initiatives.
RTCA regularly conducts outreach that communicates the work of its committees and addresses related topics. The following are examples of the work of RTCA and its members during 2014:

**RTCA Special Committee Receives Industry Award for Innovative Work**

The members of RTCA SC-213, Enhanced Flight Vision Systems and Synthetic Vision Systems (EFVS/SVS), were recognized by *Aviation Week* with a prestigious Laureate Award for their work in Avionics and Systems.

Committee Co-Chairs Tim Etherington, Rockwell Collins, Patrick Krohn, Universal Avionics System Corp., Trent Prange, Federal Aviation Administration Designated Federal Official, and Committee Member Glenn Connor, Discovery Technologies, received the award on behalf of the members of SC-213. The award was given to recognize its development of global, consensus-based system and performance standards that are allowing the FAA and industry to push the boundaries of vision-aided operations in a safe and efficient way.

President Jenny attended the IATA Ops Conference in Kuala Lumpur, Malaysia and spoke on a panel regarding Global Infrastructure Issues and Regional Implementation.

Margaret Jenny participated in NATCA’s annual Communicating for Safety (CFS) conference where she discussed “Greener Skies Implementation and Expansion”
RTCA and EUROCAE Formalize Commitment to Harmonize Industry Performance Standards

RTCA and the European Organization for Civil Aviation Equipment (EUROCAE) signed a Memorandum of Cooperation in November at the EUROCAE General Assembly in Brussels, Belgium. This agreement formalized the relationship of the two standard developing bodies to strengthen the collaboration and harmonization between standards in the United States and Europe.

The agreement brings together the two respected organizations known for consensus-based standards to provide a single global voice on many issues to the International Civil Aviation Organization (ICAO) for their Standards and Recommended Practices (SARPs). Both organizations are known for their time-honored consensus process that leverages industry expertise to solve challenging problems, so this formal Memorandum thus boosts global harmonization.

RTCA and EUROCAE conducted a Bilateral Coordination meeting in October with the organizations’ secretariats. During the two-day technical interchange, the parties identified synergies and areas of common interest and renewed commitment to work to facilitate the harmonization of aviation standards.

Collaborative Effort to Promote a More Seamless Air Transportation System Launched

RTCA is working in partnership with the International Air Transport Association (IATA) to bring together the world class leader in consensus-based standards and aviation policy with the global voice of air carriers to find solutions to some of the most vexing challenges in air transportation.

The two groups are leveraging their strengths with governments and air navigation service providers (ANSPs) to prioritize the International Civil Aviation Organization (ICAO) Aviation System Block Upgrades (ASBUs) and accelerate their CNS/ATM modernization efforts for international regions through a coordinated process. The intent is to produce concrete, actionable and operationally beneficial implementation plans for international regions.
RTCA AWARDS

Highlighting the Dedication of RTCA Volunteers

Recognizing the leadership and dedication of RTCA volunteers, the annual Awards Luncheon honors the achievements of individuals during the previous year. Awards were presented in five categories – the President’s Award, the Achievement Award, the William E. Jackson Award, the Outstanding Leader Award and the Significant Contributor Award.

RTCA Achievement Award

The RTCA Achievement Award is the organization’s highest honor, recognizing an individual or group who has made significant contributions to RTCA’s mission, and supported the aviation community over a sustained period. The RTCA Policy Board selects the recipient of this award and presented the 2013 Achievement Award to Dr. Christopher J. Hegarty, Director for CNS Engineering & Spectrum with The MITRE Corporation. Chris has contributed to RTCA activities since 1992, especially within Special Committee 159 (GPS), and as the Chair of the Program Management Committee (PMC) since 2006.

RTCA President’s Award

The President’s Award is given on special occasions to an outstanding leader deemed by the RTCA President to have gone above and beyond, helping RTCA achieve its goals for a sustained period. Craig Fuller was presented with this award because of his continued leadership and steadfast commitment to forge win-win solutions to the challenges facing the aviation community. He is the Chairman of The Fuller Company, the former President and CEO of AOPA, a member of the RTCA Board of Directors, charter member of the NextGen Advisory Committee and current member of the FAA Management Advisory Council.

William E. Jackson Award

RTCA presents the William E. Jackson Award to an outstanding graduate student in the field of aviation electronics and telecommunications. This award is a memorial to William E. Jackson, a pioneer in the development and implementation of the nation’s air traffic control system and an enthusiastic supporter of student engineers. The award recipient receives a personalized plaque and a $4000 honorarium. This year’s winner Dr. Fabrice Kunzi, earned a BS in Mechanical Engineering from the University of North Dakota, and an MS and PhD in Aeronautical Engineering from MIT. During his undergraduate study, he completed a minor in Professional Flight, obtaining a Commercial Pilots License with an IFR and Multi-Engine Rating. Dr. Kunzi completed his dissertation on “Development of a High-Precision ADS-B Based Conflict Alerting System for Operations in the Airport Environment”.

William E. Jackson Award
Outstanding Leader Award

The Outstanding Leader Award recognizes RTCA Special Committee Chairs and other RTCA participants who serve in leadership roles. This year’s winners are listed below:

Joslin Carino  
Federal Aviation Administration  
SC-147: Traffic Alert & Collision Avoidance System  
DO-300A: Minimum Operational Performance Standards (MOPS) for Traffic Alert and Collision Avoidance System II (TCASII) Hybrid Surveillance

Daniel Domey  
Esterline CMC Electronics  
SC-159: Global Positioning System  
DO-229D with Change 1: Minimum Operational Performance Standards for Global Positioning System/ Satellite-Based Augmentation System Airborne Equipment

Laurence Mutuel, Ph.D.  
Thales Group

Bridger Newman  
Air Line Pilots Association  
SC-203: Unmanned Aircraft Systems  
DO-344: Volume 1 & 2, Operational and Functional Requirements and Safety Objectives (OFRSO) for Unmanned Aircraft System (UAS) Standards

Mike Burski  
Federal Aviation Administration

Stéphane Dubet  
SIA

Brian Gilbert  
The Boeing Company  
SC-217: Aeronautical Databases  
DO-342: Guidelines for Verification and Validation of Aerodrome Mapping Databases (AMDB) Aerodrome Surface Routing Networks (ASRN) for Routing Applications

Johan Gericke  
Cobham SATCOM  
SC-222: Aeronautical Mobile-Satellite (R) Service  
DO-343: Minimum Aviation System Performance Standard for AMS(R) S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP) in Procedural Airspace

Brent Phillips  
Federal Aviation Administration

Aloke Roy  
Honeywell International, Inc.  
SC-223: Aeronautical Mobile Airport Communication System  
DO-345: Aeronautical Mobile Airport Communications System (AeroMACS) Profile  
DO-346: Minimum Operational Performance Standards (MOPS) for the Aeronautical Mobile Airport Communication System (AeroMACS)

Steve Diehl  
The Boeing Company

Richard Nguyen  
The Boeing Company

David Vutetakis, Ph.D.  
Concorde Battery Corporation

SC-225: Rechargeable Lithium Batteries & Battery Systems  
DO-347: Certification Test Guidance for Small and Medium Sized Rechargeable Lithium Batteries and Battery Systems

Don Hamilton  
Alto Aviation

Allan Prince  
Cobham Aerospace Communications  
SC-226: Audio Systems and Equipment  

Mike Cramer  
The MITRE Corporation

Art Kosatka  
TranSecure, Inc.

Christer Wilkinson, Ph.D.  
AECOM  
SC-224: Airport Security Access Control Systems  
DO-230D: Standard for Airport Security Access Control Systems

Mike Cramer  
The MiTRE Corporation

Dave Nakamura  
The Boeing Company  
SC-227: Standards of Navigation Performance  
DO-236C: Minimum Aviation System Performance Standards: Required Navigation Performance for Area Navigation
Significant Contributor Award

The Significant Contributor Award recognizes individuals for important and noteworthy contributions to Special Committees and their products. This year’s winners are listed below:

Tomas Elder  
MIT Lincoln Laboratory

Charles Rose  
MIT Lincoln Laboratory  
SC-147: Traffic Alert & Collision Avoidance System  
DO-300A: Minimum Operational Performance Standards (MOPS) for Traffic Alert and Collision Avoidance System II (TCASII) Hybrid Surveillance

Joshua Silbermann  
The Johns Hopkins University  
SC-147: Traffic Alert & Collision Avoidance System  
DO-185B Change 2: Minimum Operational Performance Standards for Traffic Alert and Collision Avoidance System II (TCAS II)

Timothy Duston  
Raytheon Company

Marca Johnson  
Padina Group  
SC-203: Unmanned Aircraft Systems  
DO-344: Volume I & 2, Operational and Functional Requirements and Safety Objectives (OFRSO) for Unmanned Aircraft System (UAS) Standards

Britta Eilmus  
Avitech Gmbh

Tom Evans  
National Aeronautics and Space Administration

Beby Rakotoarindriaka  
Airbus SAS  
SC-217: Aeronautical Databases  
DO-342: Guidelines for Verification and Validation of Aerodrome Mapping Databases (AMDB) Aerodrome Surface Routing Networks (ASRN) for Routing Applications

Art Ahrens  
Harris Corporation

James Scheer  
Rockwell Collins, Inc.  
SC-223: Aeronautical Mobile Airport Communication System  
DO-345: Aeronautical Mobile Airport Communications System (AeroMACS) Profile  
DO-346: Minimum Operational Performance Standards (MOPS) for the Aeronautical Mobile Airport Communication System (AeroMACS)

Michel Colin  
Airbus SAS

Dan Gauger  
The Bose Corporation

Don Nault  
The Boeing Company  
SC-226: Audio Systems and Equipment  

Sam Miller  
The MITRE Corporation

Sylvain Raynaud  
Airbus SAS  
SC-227: Standards of Navigation Performance  
DO-236C: Minimum Aviation System Performance Standards: Required Navigation Performance for Area Navigation

James McGuire  
TranSecure International, Inc.

Jeanne Olivier  
Port Authority of New York and New Jersey  
SC-224: Airport Security Access Control Systems  
DO-230D: Standard for Airport Security Access Control Systems

Mark Schwallier  
L-3 Avionics Systems

Brett Williams  
Mid-Continent Instruments and Avionics  
SC-225: Rechargeable Lithium Batteries & Battery Systems  
DO-347: Certification Test Guidance for Small and Medium Sized Rechargeable Lithium Batteries and Battery Systems
Members of RTCA actively engage with the aviation industry and government professionals who are building consensus on the vital issues facing our community and shaping the future of aviation. This consensus forms the recommendations for policies, procedural guidance and equipment standards that affects the way business is done globally and in the future. RTCA ended the year with 494 members.

### Membership Count by Category (as of December 31, 2014)

- **Domestic Members**: 58%
- **International Associates**: 34%
- **U.S. Government**: 2%
- **Academic Associates**: 6%

### Members as of December 31, 2014

- **Total Members**: 494

![Graph showing membership count by category from 2000 to 2014.](image-url)
AAI Corporation
ABX Air
ACC COLUMBIA Jet Service GmbH
Accord Software & Systems, Inc.
ACK Technologies, Inc.
ACR Electronics, Inc.
Adaptive Aerospace Corporation
Adaptive Aerospace Group
ADS-B Technologies
Advanced Management Technology, Inc.
Advanced Simulation Corporation
Advanced Technical Group, Inc.
Aero Engine Controls - North America
AERO&SPACE USA, INC.
AeroAntenna Technology, Inc.
AeroAstro GmbH
AeroConnext
Aerodata Systems & Services GmbH
Aeroflex Wichita, Inc.
Aeronautics Computing Technique Research
Institute (ACTRI)
Aerospace Vehicle Systems Institute
AES Aerospace Embedded Solutions GmbH
Agencia Nacional de Aviacao Civil - Gerencia Geral de Certicacao
AGROMAP Adam Ciecko
Air Canada
Air Informatics, LLC
Air Line Pilots Association
Air Wisconsin Airlines Corporation
Airbus Americas, Inc.
Aircraft Electronics Association, Inc.
Aircraft Owners and Pilots Association
Aircrafts of Long Island, Inc.
Aireon, LLC
Airlines for America, Inc.
AirnetSystems, Inc.
AIRPlus Engineering
Airports Council International (ACI North America)
Airports Council International (ACI World)
Airservices Australia
Airtran Airways
Airware
Airways Corporation of New Zealand, Ltd.
Alaska Airlines, Inc.
Albatroz Engineering
Alpha Star Aviation Services
Altreonic NV
American Airlines, Inc.
American Eagle Airlines
American Kestrel Company, LLC
Ampyx Power
Andre Consulting, Inc.
A-P-T Research, Inc
APX Resources, Inc.
AQL EMC, Ltd.
Archangel Aero
ARINC Incorporated
ASELSAN, Inc.
Asia-Pacific Engineering Consulting Services, LLC
Aspen Avionics, Inc.
Associated AirCenter, LP
Association for Unmanned Vehicle Systems International (AUVSI)
ASTAR Air Cargo
Astronautics Corporation of America
Astronics
ATAC Corporation
Atlas Air
Aurora Sciences, LLC
Austrian Military - AIR MATERIAL STAFF
Avia Satcom Company, Ltd.
Avia Technique, Ltd.
Aviage Systems
Aviation Data Communication Corporation
Aviation Management Associates, Inc.
Aviation Spectrum Resources, Inc. (ASRI)
AVIC Avionics Company Limited
AVIC Leihua Rockwell Collins Avionics Company
Avidyne Corporation
Avionic Tools, Inc.
Avionica, LLC
Avionyx
Avitech GmbH
AvMet Applications, Inc.
AvtechTyee

BAE Systems (Operations Limited) U.K.
BAE Systems, Inc. - Electronic Systems
Barron Associates, Inc.
Beacon Management Group
Beadlight, Ltd.
Becker Avionics, Inc.
Beijing Weibang Yuanhang Wireless Technology Company, Ltd.
Bell Helicopter Textron, Inc.
Berns Engineering Consulting GmbH
Blue Origin LLC
Bombardier Aerospace
Bundeswehr Technical and Airworthiness Center for Aircraft (wtd 61)
Burtis Group, LLC
BVR Technologies

Cahon Systems, Inc.
Cambria Corporation
Cameroon Civil Aviation Authority
Cape Air
CapstoneBlack Pty, Ltd.
CARERI
Caribbean Airlines, Ltd.
Cascade Technical Sciences, Inc.
Cathay Pacific Airways, Ltd.
Centum do Brasil Solucoes Tecnologicas Ltda
Certification Services, Inc.
Certisa International, Ltd.
Certon Software, Inc.
Cessna Aircraft Company
CETC Avionics Co., Ltd.
Chippewa Aerospace
City of Houston, Texas
Civil Aeronautics Administration MOTC, ROC
Civil Aviation Authority of New Zealand
Civil Aviation Authority of Singapore
Civil Aviation Bureau of Japan
Civil Aviation Flight University of China
Civil Aviation University of China
Clairus, LLC
CMI Defence France SAS
CMS Group in Orbit Communication Systems Ltd.
Cobham Aerospace Communications
College Edouard-Montpetit - Ecole Nationale D’Aerotechnique
COMAIR Airlines
Comant Industries, Inc.
CommutAir (Champlain Enterprises)
Compass Airlines, Inc.
Computer Sciences Corporation
Concept Solutions, LLC
Continental Airlines, Inc.
Cool City Electronics, Inc.
Cooper Antennas, Ltd.
Crane Aerospace & Electronics
Cranfield University

CSIRO Astronomy and Space Science
CSSI, Inc.

Dassault Falcon Jet Corporation
Dautec GmbH
DC Bars
DCS Consulting, LLC
DDC-I, Inc.
Defence Equipment & Support (UK MoD)
Defence Materiel Organisation
Defence Science Technology Laboratory (DSTL)
Defense Concept Associates, Inc.
Delta Air Lines, Inc.
Delta Engineering Corporation
Design Assurance
DevCom, Ltd. (DevCom spol. s r.o.)
DFS Deutsche Flugsicherung GmbH
DGA/DT/ST/IP/ASA (Ministere de la Defence-France)
DME Corporation
Dräxlmaier Aviation GmbH
Duke Pro, Inc.
Dynamic Aerospace, Inc.
Dynamic Analytical Solutions, LLC
Dynon Radio, LLC

Eagle Copters Maintenance, Ltd.
Ecole Nationale De L Aviation Civile (ENAC)
Ecole Polytechnique de Montreal
e-Infochips, Inc.
Electromagnetic Testing Services, Ltd.
Electronic Design Office Schlehaus
Electronic Navigation Research Institute
Electronics Test Centre
Embedded Office GmbH & Co KG
EMBRAER
Embry-Riddle Aeronautical University
EMC-Testcenter Zurich AG
Emergency Beacon Corporation
Empire Airlines
Endeavor Air (9E)
ENEA North America-Avionics Professional Services
Engineer for Safety Limited
Engineered Propulsion Systems, Inc.
ENSCO - Avionics
Environ Laboratories, LLC
Envoy Air
ES3
Esterline CMC Electronics
Esterline Technologies India Private Limited
EuroAvionics GmbH
EUROCAE
EUROCONTROL
Eurofins Product Service GmbH
European Aviation Safety Agency
Evergreen International Airlines, Inc.
ExpressJet Airlines
Extreme Engineering Solutions

F

FANS Group, LLC
FarEast Huaqiang Navigation and Position Co., Ltd.
Federal Aviation Administration
Federal Express Corporation
Federation Aeronautique International
Ferrell and Associates Consulting, Inc.
Flight Data Systems Pty., Ltd.
Flight Focus Pte, Ltd.
Flight Operations Engineering, LLC
FlightOps Consulting, LLC
Foliage, Inc.
ForeFlight, LLC
Frasca International, Inc.
FreeFlight Systems
FreeWave Technologies, Inc.
Frequentis USA, Inc.

G

Gables Engineering, Inc.
Gama Engineering
Garmin, Ltd.
Garrecht Ing. Ges. GbR
GE Aviation Systems, LLC
General Aviation Manufacturers Association
George Mason University
Georgian Aerospace Group, Inc.
German Aerospace Center - Deutsches Zentrum fur Luft und Raumfahrt
Gerogia Tech Research Institute
Globatrac, LLC
Glocom, Inc.
GMV (Spain)
Gogo Inc.
GoJet Airlines, LLC
Grand Canyon Airlines
Grays Engineering
Great Lakes Aviation, Ltd.
GSAero
Gulfstream Aerospace Corporation

H

H4 Aerospace (UK) Limited
Harris Corporation
Hawaiian Airlines, Inc.
HCL Technologies, Ltd.
HDA Technology, Inc.
HeliTrak, Inc.
Heriot-Watt University
Hilton Software, LLC
Honda Aircraft Company, Inc.
Honeywell International, Inc.
Hopkins Imaging
Horizon Air
Houghton Associates, Inc.

I

Ideal Aerosmith, Inc.
IFEN GmbH
Incline SoftWorks, LLC
INMARSAT
Insitu, Inc.
Instituto de Controle de Espaco Aero
Instytut Techniczny Wojsk Lotniczych
International Aero Navigational Systems Concern, JSC (IANS)
International Air Transport Association (IATA)
International Civil Aviation Organization (ICAO)
International Communications Group
International Federation of Air Traffic Controllers’ Associations (IFATCA)
Intertek Testing Services NA - Grand Rapids MI
Aerospace EMC Testing Group
INURV
Iridium Satellite, LLC
Island Air
Israel Aerospace Industries (IAI)-Malat Division
ITT Exelis
J
Jansky-Barmt Telecommunications, Inc.
Japan Aerospace Exploration Agency
Japan International Transport Institute, USA (JITI)
Japan Radio Air Navigation Systems Association
Jazz Aviation
Jeppesen
JetBlue Airways
Jetcraft Avionics, LLC
John Ferrara Consulting
Joint Stock Company Scientific Design Bureau of Computer Systems

K
Kaigai Corporation
Karem Aircraft, Inc.
Kent State University-Aeronautics
KNMI
Kollsman, Inc.
Korea Aerospace University
Korea Civil Aviation Development Association -KADA
Kuerzi Avionics AG
Kymeta Corporation

L
L&T Integrated Engineering Services-Avionics Group
L2 Consulting Services, Inc.
L-3 Communications
LC Peru
LeighFisher, Inc.
Leucadia Engineering, LLC
Lexavia Integrated Systems, Inc.
Liaoning General Aviation Academy
LightSquared, Inc.
Lockheed Martin Corporation
LS Technologies, LLC
Luma Technologies

M
Mannarino Systems & Software, Inc.
Marinvent Corporation
Marshall Aerospace and Defence Group
Meggitt Aircraft Braking Systems
Mesa Airlines
Meteksan Savunma San. A.S
Metron Aviation, Inc.
MICCAVIONICS GmbH
Micom Consulting, Ltd.
Microair Avionics
MicroPilot
Midwest Airlines
Millennium International
MIT Lincoln Laboratory
MJJF Strategies, LLC
MOASOFT Corporation
Mobile Power Solutions
Moog, Inc.
Mosaic ATM, Inc.
Nanjing University of Aeronautics & Astronautics
NASA
NASA Glenn Research Center
Nasteks, Inc.
National Air Carrier Association
National Air Traffic Controllers Association (NATCA)
National Air Transportation Association (NATA)
National Business Aviation Association (NBAA)
National Geospatial-Intelligence Agency
National Institute for Aviation Research (NIAR) at Wichita State University
National Safe Skies Alliance
NATO AEW&C PROGRAMME MANAGEMENT AGENCY (NAPMA)
NAV Canada
Navtech
NEC Corporation, Air Traffic Control Systems Division
NEC Corporation, Radio Applications Division
NetJets Association of Shared Aircraft Pilots (NJASAP)
New England Airlines
New Mexico State University Physical Science Aerospace & Autonomous Systems Laboratory
NIIAO (Institute of Aircraft Equipment)
Noblis, Inc.
NORTH Flight Data Systems, LLC
North Star Group, LLC
Northern Plains UAS Test Site (NPUASTS)
Northrop Grumman Corporation
Ohio University - Avionics Engineering Center
Orscheln Products, LLC
paconsult GmbH
Pambry Electronics, Ltd.
Panasonic Avionics Corporation
Parasoft Corporation
Parker Hannifin - Aerospace, Control Systems
Passur Aerospace, Inc.
Peckham Technology Inc.
Phasor Solutions, Ltd.
PHI Associates
Piedmont Airlines, Inc.
Porter Airlines
Pragmatic Software
Predesa LLC
Professional Aviation Safety Specialists, AFL-CIO (PASS)
Project Management Enterprises, Inc.
Project Performance International
Proxy Technologies, Inc.
PSA Airlines

Qualcomm Technologies, Inc.
Qualtest, Inc.
Queensland University of Technology (QUT)

R Cubed Engineering, LLC
Radiometrics Midwest Corporation
Ravn Alaska
RAYON TECHNOLOGY SOLUTIONS PRIVATE LIMITED
Raytheon Company
RDR Tec, Inc.
Red Star Aero Services
Redak Consulting GmbH
Regional Airline Association
Regulus Group, LLC
Republic Airways Holdings
Research Design Lab NAVIS
RESPIRA SDN BHD
Richland Technologies, LLC
RightHand Technologies, Inc.
Rockwell Collins, Inc.
ROSIQUE AIRCRAFT
Rosell Techsys - Engineering Division
Rotorcraft Systems Engineering and Simulation Center at the University of Alabama in Huntsville
Row 44, Inc.
Royal New Zealand Air Force

Saab AB
Saab Sensis Corporation
Safe Supportable Solutions, Ltd
Safety Analytical Technologies, Inc.
Sagem Avionics, Inc.
Sagedtech Corporation
SAIC
Sandel Avionics, Inc.
Sandia Aerospace
Scientific Research Corporation
Seaborne Airlines
Seamatica Aerospace Limited
Seattle Avionics Software
SEKAS GmbH
SELEX Sistemi Integrati, Inc.
Semper Fortis Solutions, LLC
Sennheiser Electronic GmbH & Co. KG - Aviation Division
SenseFly
Sensurion, Inc.
Septentrio Satellite Navigation
SESAR Joint Undertaking
SGT, Inc.
Shanghai Aircraft Airworthiness Certification Center of CAAC
Shanghai Shining Sunlight Aviation Science & Technology Co., Ltd.
Shuttle America
Sierra Nevada Corporation
Signum Altum, Inc.
Silver Airways
Sita
SkyCircuits Ltd.
Skyguide
Skyward IO, Inc.
SkyWest Airlines
Smithsonian Institution Libraries
Snowflake Software, Inc.
Soaring Society of America
Society of Japanese Aerospace Companies
Software Engineering Institute
SoHar, Inc.
Solers, Inc.
Southwest Airlines
Southwest Airlines Pilots’ Association
Space Coast Communication Systems, Inc.
Spectrum EMC Consulting, LLC
SPP Canada Aircraft, Inc.
Springton Technologies, Inc.
SRC, Inc.
Stanford University
State Research Institute of Aviation Systems (GosNIIAS)
S-TEC Corporation
STM A.S (Defense Technologies Engineering and Trade, Inc.)
Summit Avionics
Swedish Defence Materiel Administration
SyberJet Aircraft
Systems Consultants Services, Ltd.

TAG Aviation (Geneve Airport, Switzerland)
TAI - Turkish Aerospace Industries, Inc.
Technische Universitaet Muenchen - Institute of Flight System Dynamics
TechSAT GmbH
Tecnobit
Tek Fusion Global, Inc.
Tekever, Ltd.
Teledyne Controls Division
Telenergy
Telephonics Corporation
TESTCORP
THALES CETC AVIONICS
Thales Global Services
The Boeing Company
The Johns Hopkins University
The MITRE Corporation
The Padina Group
The Second Research Institute, Civil Aviation Administration of China
Thompson Aerospace
Thrane & Thrane A/S
Trans States Holdings Group
Transport Canada
Transport Workers Union of America
Transportation Security Administration
Trig Avionics Limited
Trimble Military and Advanced Systems (Trimble MAS)
Tucson Embedded Systems, Inc.
TUV SUD America, Inc.
TwiVision Engineering Services Group, LLC

U
U.S. Air Force
U.S. Army
U.S. Navy
U.S. Crest Group
U.S. Dept. of Agriculture Forest Service
U.S. Technical
UAC-Integration Center
Ukrainian Helicopters Aviation Private Joint-Stock Company
Union of Aviation Industrialists (UAI)
UNITE Alliance
United Airlines, Inc.
United Parcel Service
United Technologies Corporation
Universal Avionics Systems Corporation
University Corporation for Atmospheric Research
University of Idaho
University of Kansas
University of Malta
University of North Dakota
US Airways

V
Valerian Aero Solutions, LLC
Validated Software Corporation
VEROCEL, Inc.
Vestel Savunma Sanayi A.S.
Video Accessory Corporation
Volpe National Transportation Systems Center

W
Wendie L Kellington Attorney at Law, PC
William E. Payne & Associates, Inc.
Wind River Systems, Inc.
WOLF Industrial Systems, Inc.
Wolna Technology, Inc.

Z
Zee.Aero
Zodiac Aerospace
FINANCIAL REPORT

The graphs below show the sources of RTCA revenue and expenditures for fiscal year 2014.

2014 Operating Revenue

- **Membership Dues**: 71%
- **Other Income**: 1%
- **Training Seminars**: 9%
- **Symposium**: 6%
- **Document Sales**: 13%

2014 Operating Expenses

- **Committees and Task Forces**: 45%
- **Membership Development**: 2%
- **Publications**: 6%
- **Symposium**: 6%
- **Membership Services**: 4%
- **Program Development**: 4%
- **Training Seminars**: 7%
- **Public Education**: 2%
- **Management and General**: 24%