NEXTGEN COMMITTEE ADDRESSES CURRENT AND FUTURE NEXTGEN IMPLEMENTATION

The NextGen Advisory Committee (NAC) met in late June, acting on several critical issues affecting NextGen implementation. The Committee is led by Chairman Dave Bronczek, President & COO of FedEx Corporation, and
The rapid emergence of unmanned aircraft into our lives presents challenges to the “status quo” of aviation unlike anything seen since the development of the jet age. Complex air traffic control systems, aircraft certification processes, regulations, pilot certification and training requirements are just a few of the areas affected by the introduction of unmanned aircraft. While the benefits of this exciting technology continue to be identified, the demand for needed change in the established aviation system to fully integrate unmanned aircraft grows. Routine access to airspace remains the key impediment to growth of this industry. However, we all recognize that the safety of all stakeholders operating in the global airspace system is of utmost importance.

The changes needed in regulation and certification of unmanned systems are significant. Adopting rules and regulations pertaining to traditional manned aircraft has only limited impact on the overall effort to seamlessly and safely integrate this technology. Partnerships with industry and government to cooperatively analyze, modify, or develop regulations and procedures leading to routine and safe airspace access is the most effective way to reach our goal.

In 2013, RTCA and the FAA partnered to create a new special committee tasked to develop the first set of performance standards for unmanned systems. Challenged to address two of the most technically significant safety-related issues affecting full integration, Special Committee 228 (SC-228) was formed to develop and publish Minimum Operating Performance Standards (MOPS) for unmanned aircraft Detect And Avoid (DAA) and Command and Control (C2) systems. The multi-phased effort began in 2013 and completed Phase 1 of its work earlier this year with the publication of three standards addressing DAA and C2 for unmanned aircraft transitioning from the surface to the base of Class A airspace. The 500-member committee comprised of industry and government representatives worked cooperatively with other regulators and industry groups across the globe to develop standards that could be adopted by international regulators and air navigation service providers. The publication of these initial standards will provide a baseline for the establishment of unmanned aircraft certification requirements and will help facilitate operational approvals in the future. See page fourteen for more details about each of the documents.

The work of SC-228 is far from over as it is now embarking on Phase 2 of standards development focusing on DAA and C2 for sustained operations of unmanned aircraft in other classes of airspace. Phase 2 is targeted for completion in 2020.

The significance of SC-228’s work cannot be overstated. While the recently published standards pertain primarily to larger unmanned aircraft operating at higher altitudes for long duration, the phased approach of SC-228 is helping the industry prioritize technology development. Standards for the definition of “well clear” terrestrial command and control link performance, airborne detect and avoid, and air-to-air radar DAA functionality developed in Phase 1 will be expanded upon in subsequent work, supporting continued industry efforts to evolve the technology for all classes of unmanned aircraft. An example of this relates to work Insitu is doing in Australia to develop DAA capability for smaller Group 2/3 unmanned systems. The Insitu team in Brisbane has been working tirelessly on DAA solutions to allow expanded beyond visual line of sight operations supporting oil, gas, and mining operations. ■
newly appointed FAA Deputy Administrator/Chief NextGen Officer, Dan Elwell, who serves as the Designated Federal Officer (DFO).

Two reports were presented and approved by the Committee during the meeting:

1. Goals and Priorities for Improving Operations in the Northeast Corridor - Phase One

The NEC encompasses airports and airspace stretching from Washington, DC/Baltimore to Boston. The recommendation defines the performance goals for the initiative to be operating the full operation, on-time, and predictably. The evaluation metrics are: completion factor; delay versus schedule; block times; and throughput. The recommendation also includes a list of capability objectives that are prioritized to achieve the goals and emphasizes the following points:

• Adverse weather is a major issue in accomplishing goals in the NEC

With the completion of Phase One, work has begun on Phase Two of the FAA Tasking, a collaborative effort by the industry and the FAA to identify specific implementations to achieve the goals. The initial 18-month plan will be reported to the NAC in October, and the longer-term plan finalized by February 2018. The recommendation will address the technical, operational and community issues that must be identified up front and then mitigated through the NAC collaborative process.


Completing over eight months of work, the recommendation endorses the use of Space Based ADS-B as the means for enhanced surveillance capability in FAA controlled oceanic

continued on page 4
airspace. According to the report, Space-based ADS-B technology, when coupled with Future Air Navigation System (FANS), controller-pilot data link (CPDLC), Automatic Dependent Surveillance-Contract (ADS-C), and required Navigation Performance Level 4 (RNP4) capabilities appears to be closer to providing a reduced separation of 15/15 than ADS-C when coupled with CPDLC and RNP4. The industry also recommends that the FAA should (as an ANSP) bear the financial burden for enhanced surveillance costs as it does domestically.

During the meeting, the Committee also addressed:

NextGen Integration Working Group Reports – Teams from the four priority areas (DataComm, Multiple Runway Operations, Performance-Based Navigation (PBN) and Surface) of the joint FAA-Industry NextGen Integration Working Group (NIWG) identified key challenges/risks being addressed by teams in each area as they continue to work collaboratively to meet their collective milestones.

- **DataComm** – Issues associated with the Pegasus 1 Flight Management System B757/767 aircraft prevents the FMS's from being able to receive reroutes while airborne. Budget constraints are delaying the implementation of full EnRoute services. EnRoute DataComm service will allow pilots to request reroutes while airborne and is an important DataComm benefit long-sought by the aviation community.

- **Multiple Runway Operations** – Vertical navigation (VNAV) requirements for parallel approaches procedures are currently being discussed to determine how to proceed.

- **Performance Based Navigation** – Mixed equipage has a direct correlation on the ability to implement and achieve the full benefit of PBN procedures. The NAC has tasked the NAC Subcommittee to generate a complete and accurate inventory of the fleet as well as identify the PBN NIWG plans affected by the issue.

- **Surface** – The need for operators (including airports) to exchange data elements with the FAA that are vital to the FAA’s Terminal Flight Data Manager program remains a key issue.

**Time, Speed, Spacing Tools** – The Committee discussed the FAA’s response to the October 2016 recommendation on implementing decision support tools: ground-based time, speed and spacing metering tools essential for the successful implementation of PBN. Members emphasized the need to address pilot/controller/dispatcher cultural changes and the need for collaborating on change management to be successful, rather than simply deploying specific tools.

The next meeting is scheduled for October 4th in Chicago, IL, hosted by United Airlines. For additional information on the work of the NAC, see the NAC Page.

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**RTCA TO ADDRESS NEXTGEN ISSUES**

RTCA President Margaret Jenny will speak at this year’s *Avionics for NextGen* conference in Herndon, VA, on November 15.

President Jenny will highlight the work of RTCA, bringing together diverse and competing stakeholders to find common ground for the continual modernization of the national airspace. Furthermore, her keynote address will focus on the crucial role RTCA has played in the FAA’s mission to modernize the National Airspace System with its NextGen program.

For more information about this conference, please visit [www.avionicsfornextgen.com](http://www.avionicsfornextgen.com). As a member of RTCA, you are eligible for an exclusive $50 discount by using promo code RTCA while registering.
Minimum Aviation System Performance Standard for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP)

DO-343A, Minimum Aviation System Performance Standard for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP)
PROGRAM MANAGEMENT COMMITTEE

The Program Management Committee (PMC) held a meeting in July to approve two new documents, two revised documents, and revisions to Terms of References (TORs) for two Special Committees (SCs) to name a new committee secretary and to update a drafting guide format.

SC-159 prepared DO-368, Minimum Operational Performance Standards for GPS/GLONASS (FDMA + antenna) L1-Only Airborne Equipment, for approval. This document defines performance and testing requirements for a combined GPS/GLONASS receiver capable of using GPS and GLONASS L1 signals with Aircraft-Based Augmentation System. They also brought forth two revised documents for approval: DO-253D, Minimum Operational Performance Standards for GPS Local Area Augmentation System Airborne Equipment, which defines the minimum operational performance standards (MOPS) for Global Navigation Satellite System (GNSS) airborne equipment augmented with the Local Area Augmentation System (LAAS). The other revised document approved by the PMC was DO-246E, GNSS-Based Precision Approach Local Area Augmentation System (LAAS) Signal-in-Space Interface Control Document (ICD). This document is the ICD that defines the Signal-in-Space for the GNSS augmented with the LAAS. The LAAS has global application as a Ground-Based Augmentation System (GBAS) to GNSS.

SC-206 prepared DO-369, Guidance for the Usage of Data Linked Forecast and Current Wind Information in Air Traffic Management (ATM) Operations, for approval. The document examines the impact of wind information on three ATM operations: wake mitigation, Required Time of Arrival (RTA), and Interval Management (IM), and provides guidance in the form of findings and recommendations on the use of wind information and related airspace procedure impacts based on previously and newly completed studies.

Also during the meeting, The FAA briefed the PMC on actions previously published documents, European/EUROCAE Coordination, and SC Chair reports, including SC-225’s progress on DO-311A.

The next PMC meeting is scheduled for September 21 at RTCA.

COMMITTEE ADVISING FAA ON OPERATIONAL CHANGES DUE TO NEXTGEN

The Tactical Operations Committee (TOC) met in June and received the FAA’s response to updates on previous recommendations, including Airport Construction and Graphical Temporary Flight Restrictions (TFRs). The TOC was also briefed on draft recommendations for Aeronautical Information Management Modernization (AIMM) Segment 3 (S3). AIMM S3 will deliver near real-time information on Special Activity Airspace enabling operators to plan more efficient flight routes and maximize utilization of available airspace.

Additionally, the meeting kicked off a new task focused on the operational impacts of the DoD’s GPS interference testing and training. In a NAS that is becoming more PBN-centric, many operators rely on GPS-based equipment for navigation or other functionality. Intentional interference has become an important issue to consider for both operational and potential safety impacts. The Intentional GPS Interference Task Group will build understanding of the actual impacts of interference testing, identify mechanisms to inform operators and mitigate negative impacts.

This meeting was the final one for Dale Wright of NATCA, as Co-Chair of the TOC. The TOC and RTCA thank Mr. Wright for his outstanding leadership during his tenure. Mr. Jeff Woods of NATCA will co-chair alongside Captain Bart Roberts of JetBlue, with Ms. Elizabeth “Lynn” Ray, Vice President Mission Support, Air Traffic Organization, FAA, serving as the Designated Federal Officer.

For additional information about the Committee, please visit the TOC webpage.

DO-365, Detect and Avoid Minimum Operational Performance Standards Phase I (DAA MOPS)
NEW MEMBERS

AAC Engineering
Bloomington, Minnesota USA
Craig Mueller

Applied Aerospace Concepts, PLLC (AAC Engineering) is a professional engineering firm located in the Twin Cities area, and serves clients locally, nationally and worldwide. The firm is comprised of a team of engineers and technical specialists serving clients in multiple industries including, aviation, residential and commercial building, commercial transportation, renewable energy and more. Services range from engineering design, evaluation and management services to product design/prototyping and automation.

ADS Infrastructure Partners, LLC
McLean, Virginia USA
Michael Dyment

ADS Infrastructure Partners is the catalyst for taking a common-sense approach for building and implementing a plan that can accomplish both Federal Aviation Administration (FAA) infrastructure modernization and UTM infrastructure now, and is also a logical stepping stone should privatization become appropriate in the future. The business focus of ADS Infrastructure Partners LLC is to provide off balance sheet debt financing (loans) to those companies that build aerospace infrastructure. The fund will use alternative and innovative financing tools, including reinsurance where appropriate, such that desperately needed private capital can be provided along with private sector best practices.

Aerial Drone Support, LLC
Fairfield, Connecticut USA
Marc Rosenblum

Aerial Drone Support, LLC provides an end-to-end solution for recreational users, commercial users, and emergency service entities which seek to acquire and use drones. Their primary mission will be to train drone users to operate safely and within FAA guidelines. Their strong partnerships with HobbyTown and unmanned Aerial Vehicle Systems Association (UAVSA) makes Aerial Drone Support the leading source for all your drone, FAA regulations, and training needs.

Through their affiliation with HobbyTown, Aerial Drone Support helps their clients select, purchase and maintain drone equipment and peripherals.

Alaska Center for Unmanned Aircraft System integration, University of Alaska Fairbanks, Geophysical Institute
Fairbanks, Alaska USA
Catherine Cahill

The Alaska Center for Unmanned Aircraft Systems Integration - RDT&E, or ACUASI, was established in December 2012 by the University of Alaska Board of Regents in recognition of the importance and growth of the unmanned aircraft program. It was established under the University of Alaska Fairbanks in the Geophysical Institute where it originated, but was given the role of leading all unmanned aircraft programs for the entire system. It was also tasked to pursue opportunities with the Federal Aviation Administration (FAA) such as the FAA test sites. The program originated in 2001, and over the years has expanded in scope, the equipment it operates, and the variety and complexity of research projects it executes. In 2013, ACUASI submitted its proposal to the FAA to become one of the six test sites established by the 2012 FAA Modernization and Reform Act, and in December 2013, the FAA announced that the University had been selected. The Pan-Pacific UAS Test Range Complex reports to ACUASI, but also includes principal partners in Oregon and Hawaii as well as 56 non-state partners located all over the US and internationally. Ranges are in the three states as well as in Iceland, their key international partner.

ACUASI’s mission is to maintain a world class research center for unmanned aircraft systems, providing integration of unique payloads and supporting pathfinder missions within government and science communities, with a special emphasis on the Arctic and sub-Arctic regions.

Alpha Numero Technology Solutions
Irvine, California USA
Rajnikanth Sriramoju

Alpha-Numero Technology Solutions is a product engineering design services organization primarily focused on aerospace, embedded hardware and software development, and application development services.

Their professional team provides value added services to their stake-holders with their deep expertise ranging from safety critical applications, complex board design, ASIC/FPGA design, development, verification and validation, re-engineering and integration, merchandising and stores, supply chain and logistics, customer experience, enterprise mobility, and maintenance and sustainability projects.

Alpha-Numero has extensive experience working on various systems such as flight controls, engine controls, and navigation systems. With obsolescence management support, they can upgrade obsolete hardware and software to match the latest technological upgrades.

The company’s Aerospace & Defense department has a strong and focused services portfolio with deep expertise in safety critical avionics systems, system architecture, and system integration. Their engineers have experience in supporting SOI audits on various stages of involvement from I to IV for the Federal Aviation Administration (FAA) and European Aviation Safety Agency (EASA). They can also provide DER support and have an internal process flow compliant with DO-254 processes and have successfully helped customers complete all FAA Design Assurance Level (DAL) certification requirements with their first DO-254 product lines.

Aurora Flight Sciences
Manassas, Virginia USA
Tom Clancy

Aurora Flight Sciences is a leader in the development and manufacturing of advanced unmanned systems and aerospace vehicles. The company is commit-
New Members (continued)

ted to the science of autonomous flight: whether that means a fully autonomous drone, or a program that is breaking new ground in the interface between man and machine, as it relates to flight.

Aurora Flight Sciences has been in business for over 27 years with a track record of success in many areas including aero structures manufacturing, innovative technology development and unmanned flight operations. Their clients range from Silicon Valley tech companies, to the U.S. military, to other aerospace companies seeking premier build and design capabilities.

The company is headquartered in Manassas, Virginia, and operates production plants in Bridgeport, West Virginia and Columbus, Mississippi. Aurora has Research and Development Centers in Cambridge, Massachusetts; Dayton, Ohio; Mountain View, California; and a European office, Aurora Swiss Aerospace, located in Luzern, Switzerland.

BNSF Railway
Fort Worth, Texas USA
Todd Graetz

The BNSF Railway is one of the largest freight railroad networks in North America, second to the Union Pacific Railroad (UP), its primary competitor for Western U.S. freight, and is one of seven North American Class I railroads. It has 44,000 employees; 32,500 miles (52,300 km) of track in 28 states, and over 8,000 locomotives. It has three transcontinental routes that provide rail links between the western and eastern United States. BNSF trains traveled over 169 million miles (272 million km) in 2010, more than any other North American railroad. The BNSF and UP have a duopoly on all transcontinental freight rail lines in the Western U.S. and share trackage rights over thousands of miles of track.

The BNSF Railway is among the top transporters of intermodal freight in North America, and also hauls bulk cargo. The railroad hauls enough coal to generate roughly ten percent of the electricity produced in the United States.

Headquartered in Fort Worth, Texas, BNSF Railway is a wholly owned subsidi-

ary of Berkshire Hathaway, Inc.

Cavan Solutions
Washington, District of Columbia USA
Greg Feldman

Cavan Solutions is a Service-Disabled Veteran Owned aviation consulting company that combines systems engineering, operational expertise, and government business acumen to realize benefits of the evolving National Airspace System (NAS).

Their principals are recognized leaders who have successfully managed billion dollar air traffic system modernization programs; participated in concept exploration, R&D, and field trials of NextGen technologies; and successfully navigated the technical, procedural, fiscal, and political complexities of deploying new systems and capabilities.

CCX Technologies
Ottawa, Ontario CANADA
Charles Eidsness

CCX Technologies designs, tests, and manufactures custom networking and telecommunication solutions for defense and aerospace Original Equipment Manufacturers (OEMs). Custom solutions can include hardware, software, and/or cloud-based services which are rebranded by an OEM and integrated into a larger system.

The company is in the process of developing a set of rugged-ized networking equipment that will conform to multiple industry and military standards.

City of Los Angeles
Los Angeles, California USA
Adrienne Lindgren

The City of Los Angeles, often known by its initials “LA.,” is the cultural, financial, and commercial center of Southern California. With a U.S. census-estimated population of 3,976,322, it is the second most populous city in the United States (after New York City) and the most populous city in the state of California. Located in a large coastal basin surrounded on three sides by mountains reaching up to and over 10,000 feet (3,000 m), Los Angeles covers an area of about 469 square miles. The city is also the seat of Los Angeles County, the most populated county in the country. Los Angeles is the center of the Los Angeles metropolitan area, with 13,131,431 residents, and is part of the larger designated Los Angeles-Long Beach combined statistical area (CSA), the second most populous in the nation with an estimated population of 18.7 million.

Nicknamed the “City of Angels” in part because of how its name translates from the Spanish, Los Angeles is known for its Mediterranean climate, ethnic diversity, and sprawling metropolis. The city is also one of the most substantial economic engines within the nation, with a diverse economy in a broad range of professional and cultural fields. Los Angeles is also famous as the home of Hollywood, a major center of the world’s entertainment industry. A global city, it has been ranked 6th in the Global Cities Index and 9th in the Global Economic Power Index. The Los Angeles CSA also has a gross metropolitan product (GMP) of $831 billion, making it the third-largest in the world, after the Greater Tokyo and New York metropolitan areas. Los Angeles hosted the 1932 and 1984 Summer Olympics, and will host the Olympics for a third time in 2028.

Eric Garcetti is the 42nd and current mayor of Los Angeles. A member of the Democratic Party, he was first elected mayor in 2013, and won reelection in the 2017 election. Garcetti is the city’s first elected Jewish mayor, as well as its youngest and second Mexican American mayor in over a century.

Creager Certification Services, LLC
Kentwood, Michigan USA
Kurt Creager

Creager Certification Services, LLC is an airborne software certification consulting firm.

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NEW MEMBERS

New Members (continued).

COMAC America
Newport Beach, California USA
Mingwei Wang

COMAC America Corporation provides engineering technology and management consultancy in the civil aviation industry. It also offers business development in airworthiness certification, supplier management, marketing, and customer and staff training services. The company was founded in 2013 and is headquartered in Newport Beach, California. COMAC America Corporation operates as a subsidiary of Commercial Aircraft Corporation of China, Ltd.

Covell Solutions, Inc.
Vienna, Virginia USA
Stephanie Fraser

Covell Solutions is a woman-owned small business that provides engineering and analytical services for government and commercial customers. The company has decades of experience supporting the FAA’s NAS performance improvement and NextGen concept development initiatives, and have been supporting Unmanned Aircraft Systems (UAS) integration since 2013. Their experience spans the entire lifecycle and all stages of FAA AMS, from mission analysis to operational support. Their core capabilities include: performance measurement and analysis, operations research, concept and requirements development, modeling and simulation, business case development (benefits/costs), system engineering and program management.

Cyber Security Development Assurance
Kentwood, Michigan USA
Nathan Romine

Cyber Security Development Assurance provides Stage of Involvement and Design Review support services for organizations. The company also provides interface with European Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA), as contracted, to find compliance by following intent of the regulations.

DM Radiocom
Belodene, Bouches Du Rhone FRANCE
Bonat Bernard

DM Radiocom acts as a radio transmission specialist in areas like mobile robotics, telemetry and remote-control applications. The company is also known for designing and adapting its radio communication systems to harsh environments.

DM Radiocom is present in a wide range of applications such as mobile robotics teleoperation for interventions in radioactive environments; telemetry transmission from severe environments like fenestron of an helicopter, where a transmitter is mounted on the tail rotor; radio flight termination control system for missile; radio managed minefield imitation for soldier training, embedding radio transmitters in very small packages; and vehicle outdoor remote-control, using real time video and telemetry transmissions.

FirebirdSE, LLC
Oakton, Virginia USA
Bruce Eckstein

FirebirdSE, LLC provides system engineering expertise to the aviation community to enable both manned and unmanned aircraft to perform their missions in the National Airspace System.

Gryphon Sensors, LLC
North Syracuse, New York USA
Stephanie Hubert

Gryphon Sensors provides the most sophisticated systems to detect, track and identify low-altitude, small unmanned aircraft systems, birds and other hard-to-detect airborne traffic.

Using an innovative multi-spectrum approach, Gryphon Sensors provides low-cost, best-in-class products to serve the drone security market and protect critical infrastructure from drones.

As a leader in this emerging industry, Gryphon Sensors is also helping to safely integrate Unmanned Aircraft Systems (UAS) into the National Airspace System (NAS). Their Skylight™ solution helps enable Beyond Visual Line of Sight (BVLOS) operations for commercial applications.

Insta ILS Oy
Tampere, FINLAND
Sami Hakola

Insta Group Oy is an industrial automation, digital security and defense technology expert organization that helps its customers to develop and ensure their operational performance and results.

Insta is a strategic partner of the Finnish Defense Forces. Other important customer industries are in the process industries, energy production, material handling, water treatment plants, and the government.

International Air Traffic Automation Systems (IATAS)
Eilat, ISRAEL
Ori Shloosh

IATAS specializes in automated infrastructure and tools for maximized safety, situational awareness and efficiency for Air Navigation Service Providers (ANSPs), airlines, GACs and major stakeholders.

JHW Unmanned Solutions, LLC
Reston, Virginia USA
James Williams

JHW Unmanned Solutions, LLC is a small consulting firm specializing in engineering, regulatory, and policy advice on aviation issues with a focus on unmanned aircraft.

Kemtah
Albuquerque, New Mexico USA
Kevin Koppenhaver

Kemtah, a Belcan company, is an IT outsourcing specialist that delivers IT infrastructure and support that transforms the way clients perform IT by incorporating standards (TOGAF, ITIL, ISO, COBIT, and PMBOK), real-world experience and a practical approach to ITSM best practices. The company provides services and products such as IT strategic planning, Cloud strategy, BYOD in a secure environment, virtualization, Meaningful Use, ICD-10 conversion, Identity Management, enterprise

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energy management and sustainability, legacy transition management, and privacy and security compliance.

**Lone Star UAS - Texas A&M University**  
Corpus Christi, Texas USA  
Tuan Phung

Offering more than 80 of the most popular degree programs in the state, Texas A&M University-Corpus Christi has been proudly providing a solid academic reputation, renowned faculty and highly-rated degree programs since 1947. The University is also a part of the distinguished Texas A&M System.

The prestige of a Texas A&M-Corpus Christi degree is known worldwide. They are one of only six federal test sites for Unmanned Aircraft Systems (UAS) in the nation. Their College of Nursing and Health Sciences has been recognized by the White House on several occasions. And, their Harte Research Institute, leader of the Texas One Gulf Center of Excellence, is dedicated to advancing the long-term sustainable use and conservation of the Gulf of Mexico.

The Lone Star UAS Center of Excellence & Innovation (LSUASC), founded at Texas A&M University-Corpus Christi in 2013, was established in response to a Federal Aviation Administration (FAA) initiative to integrate UAS into the national airspace. LSUASC is composed of a team of highly engaged researchers, entrepreneurs and aviation industry professionals.

**magniX Technologies**  
Arundel, Queensland AUSTRALIA  
Robert Criner

magniX, a subsidiary of Heron Energy, is a privately-owned company based in Queensland which develops and commercializes advanced, power dense and energy-efficient motors and generators.

magniX is leading energy innovation to deliver cost effective electrification and decarbonization of our world by developing ground breaking patented superconductor and permanent magnet rotating machines based on magniX.

**Small UAV Coalition**  
Washington, District of Columbia USA  
Gregory Walden

The Small UAV Coalition is a partnership of leading consumer and technology companies who believe that U.S. leadership in the research, development, production, and application of unmanned aerial vehicles (UAVs) will benefit consumers in all walks of life. As a group, they support and advocate for a range of law and policy changes that will not only embrace, but encourage, the growth of the UAV industry. These include: measures to permit the operation of small UAVs beyond visual line-of-sight; support the development of infrastructure to safely manage the widespread use of low-altitude airspace; enable broader UAS access to commercial mobile services and unlicensed spectrum vital to the safe and widespread integration of UAS; and embrace the carriage and delivery potential of UAS technology in a wide array of capacities, ranging from humanitarian aid to commercial operations.

As a Coalition, they are working to resolve existing policy and regulatory barriers that inhibit small UAV development, sales, job creation, and services. The Coalition’s purpose is to work with the Federal Aviation Administration (FAA), other government agencies, and the U.S. Congress in shaping a risk- and performance-based regulatory framework for Unmanned Aircraft Systems (UAS) operations that will permit Beyond Visual Line of Sight (BVLOS) flights with varying degrees of autonomy and for all viable purposes.

The Small UAV Coalition is advocating for risk-based regulations which will allow for the safe and expedited integration of small UAVs into the national airspace system (NAS). The Small UAV Coalition is working with policymakers and regulators to achieve these objectives, ultimately allowing for the safe commercial operation of small UAVs in the foreseeable future.

**Softronics, Ltd.**  
Marion, Iowa USA  
Burt Roberson

Softronics, Ltd. is a veteran-owned, AS9100C and ISO 9001:2008 certified small business with over 1000 staff-years of experience in the design and manufacture of state-of-the-art electronic equipment and radio systems for any application.

**South West Aero Group**  
Quartz Hill, California USA  
Glen Mills

The South West Aero Group specializes in aircraft modification program management and FAA certification.

**Spectralux Avionics**  
Redmond, Washington USA  
Frank Hummel

Spectralux Avionics is a leading aerospace electronics company that develops and manufactures high reliability data link communication equipment that provides FANS 1/A, ATN CPDLC, AOC ACARS, and Condition-based Global Flight Tracking. Additionally, Spectralux Avionics provides human machine interface products that span the gamut of aviation requirements for critical aircraft systems that impact crew efficiency, performance and control, and announcement and lighting.

Spectralux Avionics has a proven record providing data link communication products as well as lighted panels, keyboards, complex electronic assemblies and controls to regional and commercial air transport, business aviation, military programs, and now, space with control panel assemblies for the Orion Spacecraft.

In addition to providing highly reliable products, Spectralux Avionics also maintains an FAA and EASA approved part-145 repair center covering class 2 and 3 accessories (#VLXR781L).

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New Members (continued)

Terrafugia, Inc.
Woburn, Massachusetts USA
Seth Allen

Terrafugia is a small, privately held corporation that is developing a roadable aircraft called the Transition, and a flying car called the TF-X. The Transition and TF-X are designed to be able to fold their wings, enabling the vehicles to also operate as street-legal road vehicles.

The Transition is the world’s first practical flying car. It offers the convenience of driving and the speed of flight, and will incorporate autonomous technologies that will make the Transition safer than any other small aircraft in the sky. Terrafugia has already developed and flown two full-scale prototypes, and has received all the special legal approvals necessary to bring the Transition to market in the US, including four exemptions from National Highway Traffic Safety Administration (NHTSA) and two exemptions from the Federal Aviation Administration (FAA). First delivery of the Transition is expected in 2019.

Terrafugia’s vision for the future is the TF-X, a mass-market flying car with the potential to revolutionize the way we all get around. An all-electric vehicle with vertical takeoff and landing (VTOL) capabilities and computer-controlled flight, the TF-X is the flying car of the future.

United for Aviation Technology Services (ATS)
New Cairo, EGYPT
Reda El Madbouly

United ATS is the first private Egyptian company to provide Aviation Technology Services in The Middle East and Africa. With over fifteen years of history, United ATS has supported many private companies, governments and military authorities to optimize and enhance their airspace and increase their capacity. The company also provides all related services for airport certification.


XiDrone Systems, Inc.
Naples, Florida USA
Dwaine Parker

XiDrone Systems, Inc. is a developmental stage, counter-UAS technology, Florida-based corporation. The company identified early on that there was a significant need for a cost-effective counter-UAS technology that could bridge the gap between the military and civilian operational environments. Additionally, current military air defense systems are large, expensive equipment with little design in minimizing collateral damage to surrounding areas when employing a counter Unmanned Aircraft Systems (UAS) within non-combat areas.

In 2014, XiDrone Systems, Inc. was formed and began research to develop a cost-effective, off-the-shelf technology that would also be sensitive to the complexities that commercial Unmanned Aircraft Vehicle (UAV) operations pose, with respect to a person’s right to exploit a valuable new technology with the government’s responsibility to provide privacy and security for its citizens. In June 2017, they were the first company in the U.S. and Europe to be granted a Multi-Sensor Counter UAS patent with a second patent being granted in July 2017. They have a third patent that will cover Europe and it is currently in a patent pending status with their full expectation that it too will be granted based on their other two U.S. patents.

Their mission is not to produce or sell any counter drone systems but rather identify a technology that makes counter drone systems better by being cost effective, using off-the-shelf equipment and an alternative to a Department of Defense (DoD)-developed solution. There are approximately twelve companies currently utilizing their technology within the commercial market place.

Zephyr UAS, Inc. (ZUI)
Yorba Linda, California USA
Marc Canas

ZUI utilizes a fleet of Unmanned Aerial Vehicle (UAVs) for a variety of applications in mapping, inspection, construction monitoring, pre-condition surveying, and aerial photography.

Zephyr UAS pilots are licensed under FAA Part 107 and certified specifically for small unmanned aerial vehicles.
STAFF SPOTLIGHT: CLIVE GRANT

Having started at the organization in February 2017, Receptionist and Office Administrator Clive Grant quickly became an integral part of the staff as he took on the many tasks of maintaining an orderly, high-functioning office environment.

“Clive has become a key part of our team in a short time,” said RTCA President Margaret Jenny. “And in all of his dealings with members and volunteers who spend their time at RTCA, he always reflects our values of openness and teamwork.”

Having worked for several non-profits before coming to RTCA, Clive said it was a perfect fit for him, and he was immediately attracted to the opportunity. He had a general idea about how the organization operated, and having studied business administration, he knew he could thrive in the position.

“As the receptionist and office administrator, I do a variety of tasks,” says Clive. “I welcome visitors and maintain employee and department directories. I also work extensively with our content management system, as well as managing clerical and administrative tasks.” Additionally, Clive supports RTCA staff and attendees during events like the recent RTCA Symposium.

Clive notes that RTCA doesn’t have a large staff, but they accomplish huge amounts of work. That extraordinary level of service to the aviation industry means that Clive’s job on the front lines of the organization is critical not only to RTCA, but to numerous aviation industry constituents as well. “We have an entire industry counting on us, and we deliver,” Clive says. “It feels good to be part of such an impactful organization.”

Despite the hard work, Clive states that RTCA staff and volunteers all do their jobs with smiles. “I like the culture here at RTCA. Everyone works hard and is very collegial,” he said. “My time here at RTCA has been great from the beginning, and I’m looking forward to continuing with them into a productive future.”

DRONE COMMITTEE REVIEWS TASKINGS

The Drone Advisory Committee (DAC) met July 21st to hear updates from its DAC Task Groups (TG), deliberate and provide guidance.

The Committee discussed funding the integration of UAS into the National Airspace (NAS). TG3 Co-Chairs presented an overview of an Interim Report which detailed the background of the UAS funding tasking, the group’s consensus guiding principles, the methodology used by the group, as well as an overview of their interim recommendations. The group recommended that regulations, policies and standards necessary for drone integration be developed by the FAA in collaboration with industry. They also recommended that R&D, communications, and training over the next 24 months be shared between government and industry. The group indicated their preference, that funding structure for UAS integration into the airspace not alter the current structure for manned aviation. TG3’s leadership then outlined the next steps for refining the interim report into a final report to be delivered to the Committee in November.

The Roles and Responsibilities Task Group (TG1) leadership provided an update on their progress, though had no recommendations to present. They reminded the DAC members that they are analyzing state and local government interests as preparation for forging consensus recommendations on the relative roles and responsibilities of federal and local authorities for making and enforcing regulations. They commented that RTCA and the FAA should continue to solicit participation from representatives of city, county and state authorities to participate on TG1.

The DAC is led by Brian Krzanich of Intel, with Dan Elwell, FAA Deputy Administrator, presiding as the Designated Federal Officer. The next meeting is planned for November 8 and will be hosted by Amazon in Seattle, Washington. More information will be made available on the RTCA website, www.rtca.org, soon.
FIRST IN THE WORLD PUBLISHED STANDARDS FOR UAS

As of May 2017, RTCA published the first performance based standards for Unmanned Aircraft Systems (UAS) in the world. These three Minimum Operating Performance Standards (MOPS) lay the framework for UAS to operate in the National Airspace while maintaining safe operations for both manned and unmanned participants.

SC-228, Minimum Performance Standards for Unmanned Aircraft Systems, under the leadership of Co-Chairs Rick Heinrich and Paul McDuffee, as well as Working Group (WG)-1 Co-Chairs Brandon Suarez and Don Walker, and WG-2 Co-Chairs John Moore and Stephen Van Trees, completed their Phase One work at the beginning of 2017. The initial three MOPS, DO-362, DO-365 and DO-366, provide the performance based requirements a system must achieve to define communication transmissions which describe a UAS’s responsibility for maintaining situational awareness.

DO-362, published in December 2016, provides guidance for the Command and Control Data Link MOPS for UAS. These standards are for the minimum Command and Non-Payload Communication (CNPC) function that enables an UAS to operate.

The latest two standards, DO-365 and DO-366, set the foundation for the UAS performance required to create and maintain situational awareness.

DO-365 addresses the FAA requirement for “See and Avoid”, called “Detect and Avoid” (DAA), for UAS. All pilots must use “see and avoid” techniques to prevent collisions with obstacles and other aircraft. DO-365 applies those requirements to UAS. The standard defines the necessary self-reporting for a UAS, as well as defining when to provide the Pilot-in-Command (PIC) with the information needed to take corrective action.

To further define a UAS participant’s responsibility in airspace, DO-366 specifies the performance requirements for reporting non-squawking participants in the surrounding area when using radar in the air.

All documents are available in the RTCA Store. Visit https://my.rtca.org/nc__store for more information.

SC-228 is continuing the work to define the additional standards to allow UAS integration into the NAS. Its next delivery will be a white paper which sets out the concept of operations for UAS and suitable environments for implementing these standards.

STANDARDS FOR WIRELESS AVIONICS INTRA-COMMUNICATION SYSTEM (WAIC) WITHIN 4200-4400 MHZ

SC-236 met Jointly with EUROCAE WG-96 in Renton, Washington
AERONAUTICAL INFORMATION AND METEOROLOGICAL DATA LINK SERVICES

SC-206 met twice during the summer: first, in Renton, WA, hosted by The Boeing Company, and second, virtually. Sub Group-7 (SG-7), under the leadership of Co-Chairs Ernie Dash of AvMet Applications, and Michael McPartland of MIT Lincoln Laboratory, lead a Final Review And Comment (FRAC) resolution on Guidance for the Usage of Data Linked Forecast and Current Wind Information in Air Traffic Management (ATM) Operations, which was presented and approved by the Program Management Committee (PMC) in July.

SG-4, under the leadership of Co-Chairs Tammy Farrar of the FAA, and Bill Watts of Delta Air Lines, Inc., received approval for release of their document, Guidelines for In Situ Eddy Dissipation Rate (EDR) Algorithm Performance for FRAC. They are expecting to present the document to the PMC for approval in December.

SG-5 is revising DO-358, Flight Information Services Broadcast (FIS-B) with Universal Access Minimum Operational Performance Standard (MOPS), and is expecting to deliver a revised document for approval in late 2018.

AERONAUTICAL DATABASES

SC-217 met jointly with EUROCAE WG-44 in Cedar Rapids, Iowa and was hosted by Rockwell Collins, Inc. The Committee continues its work addressing the updates requested to the joint document DO-201A/ED-77A, aligning to current industry standards, and is scheduled to be completed in 2018.

The focus of the Committee has been to address feedback from the Program Management Committee (PMC) concerning guidance for installation, testing and validation. The Committee was also asked to review the structure of the document to better align with the RTCA Minimum Operational Performance Standards (MOPS) guidelines, and to provide more requirements against the testing standards.

The document will be presented at the September PMC meeting for approval and publication.

SC-229 met jointly with EUROCAE Working Group (WG)-98 at RTCA Headquarters to complete the revisions to RTCA’s DO-204A and EUROCAE’s ED-62A to produce a technically equivalent specification for ELTs at 406 MHz. At the next Plenary, the joint committee will consider opening the document for concurrent Final Review And Comment (FRAC), and Open Consultation. The finalized document is expected to be delivered for publication in early 2018.
RTCA, Inc. has teamed up with The MITRE Aviation Institute to offer high quality and relevant training for the aviation industry in understanding the requirements and parameters for avionics software development necessary to obtain FAA certification.

The two world class organizations are using their collective experience and expertise to provide training on the new standards and recommended practices contained in the DO-178C, *Software Considerations in Airborne Systems and Equipment Certification*.

In addition to the comprehensive course manual developed by the experts at The MITRE Aviation Institute, each training course attendee will receive the latest standards developed over a six-year period by RTCA Special Committee 205.

The course is led by instructors who provide a thorough understanding of the requirements and the applicability of DO-178C; the fundamental techniques of software development considerations in airborne systems and equipment certification; and an introduction and overview of Software Tool Qualification Considerations, Formal Methods Supplement to DO-178C, Model-Based Development and Verification Supplement to DO-178C, and Object Oriented Technology and Related Techniques Supplement to DO-178C.

As an adjunct to DO-178C, this course will provide the background and scope on the four documents supporting DO-178C:

- **DO-330, Software Tool Qualification Considerations**
- **DO-331, Model-Based Development and Verification Supplement to DO-178C and DO-278A**
- **DO-332, Object-Oriented Technology and Related Techniques Supplement to DO-178C and DO-278A**
- **DO-333, Formal Methods Supplement to DO-178C and DO-278A**

Attendees will receive detailed instruction on DO-331 covering the objectives, activities, explanatory text and software life cycle data that should be applied when model-based development and verification are used as part of the software life cycle.

In addition, the training will cover the systems requirements linkage to the DO-178C and Supplement processes through an explanation of the interface to ARP 4754A, *Guidelines for Development of Civil Aircraft and Systems*. 

*Unless otherwise noted, all training courses will take place at RTCA Headquarters, located conveniently in downtown Washington, DC. For additional information, please visit [www.rtca.org](http://www.rtca.org) or email training@rtca.org.*
DO-160G, ENVIRONMENTAL CONDITIONS AND TEST PROCEDURES FOR AIRBORNE EQUIPMENT, TRAINING COURSE

September 11-14 at WSU
December 12-15 at RTCA

RTCA, in partnership with Wichita State University’s National Institute for Aviation Research (WSU-NIAR), offers high quality training covering RTCA’s DO-160G, *Environmental Conditions and Test Procedures for Airborne Equipment*. The course will provide an understanding of the use of DO-160G and how it fits in with the greater picture of requirements, design, certification and TSOs.

Course participants will gain a clear and relevant understanding of the applicable FAA regulations, advisory material, certification procedures, design approaches/trade-offs, inspection and conformity requirements, as well as details of the necessary parts of a test plan, test report, compliance plan and compliance report. A strong focus is placed on the reduction of risk, cost and schedule throughout the design/certification process, by use of targeted design and increased first-pass success on design and testing. In addition to a comprehensive course manual, each training course attendee will receive a copy of RTCA’s DO-160G, supporting material, and will participate in real-world exercises applying the knowledge learned from the class.

DO-254, DESIGN ASSURANCE GUIDANCE FOR AIRBORNE ELECTRONIC HARDWARE, TRAINING COURSE

September 11-13 at RTCA
December 18-20 at RTCA

RTCA is hosting a three-day training course, tailored specifically to design/verification engineers and project/certification managers requiring DO-254 compliance.

This three-day course will:

- Provide an overview and application of RTCA DO-254, as defined by current FAA and EASA guidance in airborne electronic systems.
- Describe how to apply the DO-254 lifecycle and supporting processes; understand system safety assessments and the design assurance level (DAL); and set up a project correctly through proper planning and standards.
- Present techniques and writing requirements for electronic hardware, and how to optimize requirements for verification processes.
- Describe how to efficiently and effectively verify requirements with simulation and hardware tests.
- Address specific considerations for programmable logic devices (PLDs) such as FPGA/ASIC versus all electronics; commercial off-the-shelf (COTS) components usage; and tool assessment and qualification.

*Unless otherwise noted, all training courses will take place at RTCA Headquarters, located conveniently in downtown Washington, DC. For additional information, please visit [www.rtca.org](http://www.rtca.org) or email [training@rtca.org](mailto:training@rtca.org).*
In early July, SC-233 held its Plenary to approve opening the Final Review And Comment (FRAC) period for its guidance document, *Addressing Human Factors/Pilot Interface Issues for Avionics*. The document will be open for comments until August 14 and the Committee will meet at RTCA in September to address all comments. The document is on the agenda to be considered for publication by the Program Management Committee at its December meeting.

**Non-Rechargeable Lithium Batteries**

SC-235 met and completed their Final Review And Comment (FRAC) resolution on DO-227A, *Minimum Operational Performance Standard for Non-Rechargeable Lithium Batteries Installed on Aircraft*. This revision includes technology advancement, lessons learned, addresses AAIB safety recommendations, and improves clarity of the existing document based on past experiences from the industry. The document will be presented at the September Program Management Committee meeting for approval and publication.
DO-368, Minimum Operational Performance Standards for GPS/GLONASS (FDMA + antenna) L1-only Airborne Equipment

DO-369, Guidance for the Usage of Data Linked Forecast and Current Wind Information in Air Traffic Management (ATM) Operations
CALENDAR OF SPECIAL COMMITTEE PLENARY MEETINGS

August

August 3
SC-224, Airport Security Access Control Systems
Hosted by RTCA
Washington, DC

August 11
SC-135, Environmental Testing
Hosted by RTCA/Virtual

August 17
Hosted by RTCA/Virtual

August 21-25
SC-223, Internet Protocol Suite (IPS) and AeroMACS
Hosted by RTCA
Washington, DC

August 31
SC-225, Rechargeable Lithium Batteries and Battery Systems
Hosted by RTCA
Washington, DC

September

September 5-8
SC-229, 406 MHz Emergency Locator Transmitters (ELTs) Plenary
Hosted by EUROCAE
Saint-Denis, France

September 11-13
DO-178C Training
Hosted by RTCA
Washington, DC

September 11-13
DO-254 Training
Hosted by RTCA
Washington, DC

September 11-14
DO-160G Training
Hosted by WSU/NIAR
Wichita, Kansas

September 11-15
SC-206 Aeronautical Information and Meteorological Data Link Services
Hosted by RTCA
Washington, DC

September 13-15
SC-217 Aeronautical Databases
Hosted by EUROCAE
Saint-Denis, France

September 12-14
SC-216, Aeronautical Systems Security
Hosted by RTCA
Washington, DC

September 14
Supplements to DO-178C Training
Hosted by RTCA
Washington, DC

September 20
SC-227, Standards of Navigation Performance
Hosted by RTCA
Washington, DC

September 21
SC-147, Traffic Alert & Collision Avoidance System (TCAS)
Hosted by RTCA
Washington, DC

September 25-28
SC-233, Addressing Human Factors/Pilot Interface Issues for Avionics
Hosted by RTCA
Washington, DC

September 28
SC-224, Airport Security Access Control Systems
Hosted by RTCA
Washington, DC

October

October 5-6
SC-230, Airborne Weather Detection Systems
Virtual

October 16-20
Hosted by RTCA
Washington, DC

UPCOMING POLICY COMMITTEE EVENTS

September 21
PMC, Program Management Committee
Hosted by RTCA
Washington, DC

October 4
NAC, NextGen Advisory Committee
Hosted by United Airlines
Chicago, IL

October 26
TOC, Tactical Operations Committee
Hosted by RTCA
Washington, DC

November 8
DAC, Drone Advisory Committee
Hosted by Amazon
Seattle, WA