RTCA SYMPOSIUM EXAMINES KEY ISSUES

More than 200 experts and leaders from across the world attended the RTCA 2019 Global Aviation Symposium on June 5th. Sponsors of the event included Collins Aerospace, Delta Airlines, Honeywell Aerospace, NATCA and NBAA.

RTCA President and CEO Terry McVenes hosted the event, beginning with a salute to attendee David Watrous, who retired in 2008 after nineteen years with RTCA. This was followed by a welcoming address given by RTCA Vice Chairman, Steve Timm.

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Timm highlighted the recent evolution of RTCA, which has returned to its roots as a standards development organization, after serving as a federal advisory committee. RTCA is currently working with twenty active committees, majority functioning as joint committees with EUROCAE.

“RTCA is an influential organization built on the principle of open collaboration as it shapes the future of aviation. That is the attitude and direction of RTCA in the future as we look to establish two or possibly three new committees, finalize agreements to double our training sessions and examine critical issues from new leaders and exciting new technologies. We’re in it for the long haul,” said Timm.

In 2018, RTCA published thirteen standards documents, and so far seven have been completed in 2019.
Circling with the 50th Anniversaries of both the moon landing and the first Concord flight, an exciting era of aviation is again upon us in 2019, said Scholl, who founded Boom Supersonic five years ago.

Boom Supersonic’s mission is to bring supersonic flight back by around 2020, more than fifteen years after the Concorde’s last flight. Their philosophy is that speed matters because it opens up the world with more people able to visit more places, more quickly. He illustrated his point by discussing how continental flight expanded major league baseball travel and intercontinental flight brought us The Beatles and innovations like Nike shoe technology from Japan in the 1960s.

Supersonic flight also began in the late 60s as the Concorde, a collaborative project between the governments of England and France that ushered in an age that saw a marvelous technological accomplishment bringing vastly quicker flights at luxury prices. “I think we can do better,” said Scholl, who believes this effort is a mission that will inspire people.

Scholl is confident the noise they anticipate, which would be quieter than the Concorde, could further be reduced.

Improvements in fuel efficiency, aerodynamics, turbo power which does not require afterburners, carbon fiber material to replace quick-to-heat aluminum, and the elimination of the tire problems that plagued the Concorde, are all reasons Boom Supersonic has already started developing its one-third scale prototype, XB-1, and is poised to complete production and begin testing later this year.

Boom Supersonic’s new plane is expected to seat 55 to 75 and travel at Mach 2.2, reducing flight times from seven hours to three hours, 15 minutes New York to London, from eleven hours to five hours, 30 minutes San Francisco to Tokyo and from fifteen hours to six hours, 45 minutes Los Angeles to Sydney. At the beginning, the company would target the 500+ daily transoceanic routes and later work to overcome over-land supersonic flight restrictions.

Challenges Boom Supersonic is facing include addressing the noise of the sonic boom and reducing take-off and landing noise. Scholl is confident the noise they anticipate, which would be quieter than the Concorde, could further be reduced.

Scholl fielded several audience questions after his presentation. These questions included the length of the runway needed, which would be the same as a 777; the issue of noise, which could be minimized because it would be capable of a steeper approach angle; the issue of wing separation, which would be no different than current parameters as this plane would be smaller than the Concorde; the plane’s future iterations, which could see an 80 to 150 seat plane capable of more, as aerodynamics on a larger version would create better fuel efficiency and corresponding lower prices, and possibly future advancements, including a variable cycle engine and additional improvements in aerodynamics.
SUPERCSONIC TRANSPORTATION INNOVATIONS

Moderator: Terry McVenes, President and CEO, RTCA, Inc.
Panelists: Captain Joe DePete, President, ALPA
Eli Dourado, Head of Global Policy and Communications, Boom Supersonic
Chris Rocheleau, Executive Director for International Affairs, FAA
Nancy Young, Vice President, Environmental Affairs, A4A

DePete began his comments with a reminder of everyone’s shared commitment to safety with supersonic flight and praised the proactive approach the entire industry has taken. He applauded the design of the aircraft seen in artist renderings and recognizes numerous new entrants and new capabilities into the airspace must mesh with current entrants. He believes we need to invest more in infrastructure and feels aggressive data collection will help determine the success of supersonic flight, which he sees as a pre-cursor to suborbital travel.

Dourado said he sees supersonic flight coming back as the result of pent-up creative energy and the desire of people to buy into an exciting future for aviation and a positive vision for uniting people. He is confident of its safety and ability to fit into the global system. Dourado believes the commercial market for supersonic flights would be stronger than the private jet market, and that their goal of Mach 2.2 would bring great benefits in reduced travel times, allowing for day flights rather than red-eye overnight hauls. He also highlighted improvements over the Concorde, which include the addition of flap capability, the ability to hit 160 knots on approach, improvements in tires over the last five decades, a more effective propulsion system and better combustors.
Rocheleau credited the current Administration with embracing innovation, and the government’s desire to be a part of the journey and the investment of time, treasure and talent. He went on to say October 2018’s FAA reauthorization and the Committee on Environmental Protection would have positive impacts on the goal of supersonic flight. He said take-off and landing standards are needed, data-informed decisions will happen and working with other countries is integral to the process. He concurs with DePete that existing infrastructure presents a challenge.

Young expressed concern for both how supersonic would integrate into the current system and how it fits in with sustainability goals, but said she sees opportunities within the challenge. She reminded attendees of upcoming noise standards, expected to be developed by 2022 and finalized by 2025, and that while noise is decreasing, complaints are increasing. Young said it is critical to have international standards for supersonic flights that are done right, with government at the forefront and without corners being cut.

**Cybersecurity Applications & Challenges Within Aviation Standards**

**Moderator:** Siobhan Nyikos, Associate Technical Fellow, The Boeing Company

**Panelists:**
- Captain Stuart Fox, Director, Flight Operations, IATA
- Steve Hofmann, Owner, CCxH
- Captain Wolfgang Koch, Aviation Security Chair, ALPA
- Jeff Troy, Executive Director, Aviation ISAC

Nyikos set the scene by speaking on the complexity of the aviation ecosystem and the threats it faces, which include attacks on the reservation system, customer’s credit card transactions and aircraft systems, either by individual bad actors or nation states intent on harm. She called for a coordinated response, a coherent set of standards, compatible legislation and a focus on cybersecurity across the ecosystem.

Fox urged the audience to think about how to encourage others to have a cyber security mindset, making sure to question whether it is safe to accept an incoming message, and said everyone at every level in an organization should be thinking in this way.

Hofmann, whose military background taught him there’s a lot to be learned from the way other agencies react to security concerns, believes empowering agencies to share and declassify information will help. Through building trust and enacting legislation, systems can be secured without interrupting services, Hofmann said. He said great credit should go to RTCA for developing standards and coordinating consensus and believes we should be concerned with working at the speed of cyber with the goal of capturing live data. Moving forward, every level should work together, from the writer of documents...
to NASA, the National Security Council, Congress and the President. This will necessitate a cultural change and financial resources, as well as the implementation of the Presidential mandated Aviation Cyber Initiative with the authority to set standards with laws backing up their efforts.

**Industry needs to look for vulnerabilities and the FAA must come up with standards for monitoring for cyberattacks that should have real-time capabilities.**

Koch focused his remarks on securing airplane systems without sacrificing performance and the connectivity airline customers demand. He also said flight crews need procedures to deal with a cyberattack. He believes the industry needs to look for vulnerabilities and the FAA must come up with standards for monitoring for cyberattacks that should have real-time capabilities.

Troy, a former FBI agent in the Cyber Crimes Division, urged the group to think about cyberattacks as a shared risk for all members, from airports to airlines and others, since their interconnectedness mean there is a greater threat risk to every participant in the system. He said that although the aviation industry is competitive, it should develop relationships built on trust and an environment of sharing risks and best practices to create a level playing field when it comes to safety. This should extend internationally to drive a global information sharing network, said Troy, and it should be done with a concentration on only conveying valuable information. He agrees with Hofmann that the implantation of the Aviation Cyber Initiative will help focus efforts and foster collaboration.
2019 is shaping up to be the biggest year to celebrate space travel, said Stallmer. Commercial space launches by private companies have increased from 24 in 2017 to 32 in 2018 to an estimated 40 by the end of this year. The global snapshot of private space travel companies shows it to be a $365 billion industry worldwide that includes more than 435 different companies. This year also saw the announcement that NASA is committed to returning to the moon by 2024.

There are several factors driving the success of this burgeoning industry: costs have fallen as competition has risen; reusability has improved as boosters can be brought back and reused; we are miniaturizing what we are putting into space; we have international partnerships we can utilize; we have seen great advances in 3D printing technology; the National Space Council Advisory Board has formed; and there is a commitment from the current Administration, including champion Vice President Pence.

To that end, The White House has issued four space policy directives: sustainability, streamlining the regulatory process, getting the Department of Commerce involved and figuring out ways to operate collectively to come up with common sense recommendations and the upcoming formation of a Space Force.

Negatives facing the industry include a divisive Congress and the costs associated with spaceflight, thought costs to go into space are expected to come down for the aforementioned reasons.

Additional positives include that the technology utilized can have practical applications, such as being able to view deforestation of a rainforest and being able to direct refugee camps to water sources to aid in humanitarian efforts. The industry has also sparked a resurgence of jobs and hope in Florida, and finally, technology is allowing us to catalog even smaller debris in space and with that will come innovative ways to bring it down.
OVERCOMING BARRIERS TO UAS INTEGRATION

Moderator:  Brigadier General Paul D. Nelson, Raytheon

Panelists:  Calos Cirilo, Director ATM Infrastructure – Safety and Flight Operations, IATA
          Doug Davis, Director, Office of Independent Airworthiness, Research, Technology and Engineering, Northrop Grumman Aerospace Systems
          Todd Donovan, Vice President, Digital Aviation, Thales
          Captain Henry Krakowski, CEO, Conure Aviation Group, LLC

Nelson began by commenting on the explosion of UAS, with the projection there would be one million in use by 2020, requiring standards as soon as possible. He also spoke about the balance between safety and risk and acquiring data to inform decisions.

Cirilo, a former member of the Brazilian Air Force, expanded on the use of UAS internationally and the combination of human use and AI technology being necessary, while remaining focused on integration that does not impact safety. He believes in prioritizing aircraft to maintain safety and in including the drone community in ongoing discussions.

Davis, who worked for FAA in the past when it concentrated on large craft before demand required it to shift to what he called the tsunami of small aircraft, focused his remarks on how air traffic control would be able to clear for visual approach and visual separation. He imagines the need for real-time routing and addressing cyber threats. He
also spoke of applying economic principles to UAS, much like managing peak travel times at airports, to equitably manage airspace, and using a performance-based approach.

_UAS can be beneficial when it comes to delivering disaster relief and called for the collection of more data._

Donovan, an air traffic management expert who served on the NextGen Advisory Committee, spoke on UAS being a significant challenge to address, identifying a tradeoff between safety and security with integration. He spoke about the use of UAS for border surveillance and cargo deliveries and the need for airspace users to have more say.

Karkowski cautioned stakeholders—aircraft, news helicopters, airports, local populations and politicians—must be aware what is being done to address UAS during the process. He spoke about a paradigm shift from pilot to controller to data and believes that integration may not have to be full integration, but could be separate in the airspace. He acknowledged UAS can be beneficial when it comes to delivering disaster relief and called for the collection of more data.
EUROCAE PERSPECTIVES

This brief session brought together RTCA President and CEO Terry McVenes and EUROCAE Secretary General Christian Schleifer-Heingartner to discuss their historic 2014 Memorandum of Cooperation before signing the updated 2019 version.

Schleifer-Heingartner’s remarks recognized the importance and growth of standards organizations, the fact they added value and their challenge not to develop in isolation, but to adapt to the changing needs of the community, particularly in Europe where they have more air traffic management systems than in the U.S. He stressed how critical humans are to the loop, that they needed to be armed with technology and information, so they have the right information to make the right decision.

Schleifer-Heingartner said EUROCAE and RTCA must adapt and make sure the processes and procedures these organizations put in place maximize quality. “What hasn’t changed is our partnership,” said Schleifer-Heingartner.

We work in cooperation and there’s worldwide recognition of our standards, that we speak with one voice.

“We put in extra effort to make it happen, we’re showing our community, that we have worldwide participation, a transparent process that addresses comments and that we’re not commercially-driven, but here to serve our members, our community. We work in cooperation and there’s worldwide recognition of our standards, that we speak with one voice.”

Said McVenes, “From our last agreement in Brussels in 2014 to today, this shows we’ll continue working together to reach a harmonization goal.”
ELECTRIC/HYBRID PLANES, AND EVTOL VEHICLES: BUILDING FUTURE AIR MOBILITY TODAY

Moderator: Lowell Foster, Director, Global Innovation & Engineering, GAMA

Panelists: Greg Bowles, Head of Government Affairs, Joby Aviation
Doug Davidson, Innovation Executive, EmbraerX
Bill Goodwin, Head of Policy, Regulatory and Legal, Skyryse
Mike Nichols, SVP, Strategy and Innovation, NBAA

Foster, who gave statistics on commuting time and how that could necessitate the use of eVTOL vehicles, talked about the challenges of urban air mobility as: reliability, battery life, safety, noise and air traffic control.

Bowles identified the focus on saving people time, being safe, reducing noise and being cost effective. He said he would like to see ongoing discussions with regulators to develop requirements on battery management systems, and he wants to ensure standards organizations operate neither in conflict with others nor duplicating work. In addition, Bowles would like standards to be performance-based and broad enough to involve a wide range of aircraft.

Davidson took a holistic view, looking to make people’s lives more productive and fun through air mobility. He sees standards as necessary, so all entities play by the same rules and operate with compatibility. Finally, he said standards organizations must do what they do best while keeping involved organizations abreast of developments and using the strengths of others along with way. He sees FAA as a great partner in this endeavor.

Goodwin spoke about innovation creating possibilities, giving the example of test marketing motorcycle delivery of Burger King to commuters stuck in traffic, and said he views aviation as being in the middle of the end to end transportation spectrum. He suggested diligence in monitoring immediate and emerging issues. Moving forward, Goodwin would like to see buy-in from experienced helicopter pilots with the goal of hitting the same level of safety as commercial aviation. He believes the current, robust system is capable of handling more, and sees data and case studies as the key. The appetite is there conceptually, said Goodwin, though it is a huge challenge to see how different components of the system will interact with the others.
Nichols cited advances in avionics that could ease congestion and allow seamless transportation. He talked about the increasing number of eVTOL programs under development and the prevailing thought the industry could be profitable by 2030. He sees this as an exciting opportunity and also a challenge, particularly as the median age of pilots is currently 51 and aviation schools are experiencing record enrollment. This is a great thing for the aviation industry and we need to proactively engage current pilots and accomplish outreach through AOPA, he said.

The panel also tackled the question of whether the system should be integrated or segregated airspace. The thinking has changed, said Bowles, from wanting to keep drones out of the way to recognizing the need to integrate, and solid engineering would hold the key. Davidson believes in maintaining openness across all regulatory bodies, and applying technology. Goodwin believed giving certainty to the market is important as a predictability helps show how this market can grow. Safe integration is the key, said Nichols.

**RULES OF THE SKY: FOSTERING AND REGULATING ON-DEMAND AIR MOBILITY**

**Moderator:** Jens Henning, VP, Operations, GAMA

**Panelists:** Rick Domingo, ED, Flight Standards, FAA
Maureen Keegan, Director of Operations Concepts, Validation and Requirements; ATO's UAS Integrator, FAA
Jeff Richards, Ret. Co-Lead for Unmanned Aircraft Systems, NATCA
Dr. Mike Romanowski, Policy & Innovation Division Director – Aircraft Certification Service, FAA

Domingo believes collecting data is the key to safety, as well as looking at the complexity and diversity of products offered. He said piloting skills are most needed because systems can fail. With the sophistication and the uniqueness of what is out there, standard development is important, particularly with the pace of change. He believes in looking at this as a team sport and says in the future, we need to work openly and collaboratively so when one person leaves an organization, it is not left floundering. Early engagement is an important return on investment and participants will require knowing why they are making the decisions that are made along the way.

Keegan, who started her work with UAS in 2010 looking at Class A large UAS, now works with the rest of the industry to concentrate on smaller craft. She believes heavy-duty simulation is needed to analyze the complexities of airspace and the greater volume of aircraft working together. She also said safety and predictability are key.

Richards cautioned on how quickly the industry is changing and believes the ability to manage risk is the key to moving forward. He said integrated risk analysis is important for safety and the regulatory framework must be adequate to certify new vehicles. Also, the industry needs to look at the safety continuum and how important it is to be flexible, such as having the ability to certify different types of vehicles. Further, the industry needs to work with participants as early as possible, in order to be more effective, to identify critical issues earlier, and to foster a cooperative mindset. He also sees the industry needing to figure out a way to electronically authorize airspace.

Romanowski said in the past, they tried to identify problems to help systems run smoothly, but today, the issue is dealing with larger volumes of single operators in a challenging urban environment.

_Early engagement is an important return on investment and participants will require knowing why they are making the decisions that are made along the way._
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.

Pengfei (Phil) Duan is a Software Engineer at Tesla working on autonomous vehicle technologies. He obtained his Ph.D. degree from Ohio University in Athens, Ohio in 2018 where he also obtained his M.S.E.E. degree in 2011. His research focuses on aircraft state awareness, state estimation and prediction, conflict detection and resolution, and integrated navigation systems.

Phil Duan accepting his William E. Jackson Award

I’m excited to receive this year’s W. E. Jackson Award for my dissertation. I’m honored to be apart of the aviation community and to be able to contribute to improving aviation safety”

-Phil Duan
Significant Contributor Award

The RTCA Significant Contributor Award recognizes individuals for very important and noteworthy contributions in their respective Special Committees.

Congratulations to RTCA Significant Contributors!

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- David Baker
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- Anthony Barber
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- Christophe Bernus
  Airbus
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Outstanding Leader Award

The RTCA Outstanding Leader Award recognizes the added demands placed on RTCA Committee Chairs and participants who serve in leadership roles, to ensure their respective committees publish high-quality documents.

Congratulations to RTCA Outstanding Leaders!

Randy Bailey
NASA

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RTCA GLOBAL AVIATION SYMPOSIUM ATTENDEES IN ACTION
IN CLOSING

McVenes began by thanking RTCA staff and Symposium participants, as well as all Sponsors. He then recognized RTCA’s place at the current time, at a crossroads, as the aviation community is evolving and adapting to include new entrants and new technologies that will become integrated into the aviation ecosystem. He identified RTCA’s ongoing goal of meeting the needs for standards more quickly without compromising safety. McVenes echoed previous speakers in saying we are living in the most exciting time for aviation during our lifetime, as technology is moving rapidly, as government and industry leadership are working to meet challenges and as we continue to create a vibrant transportation system.

Finally, McVenes announced the dates for RTCA’s Global Aviation Symposium 2020, expanded again to two days. The event will take place in mid-June, back at the Hyatt Regency in Crystal City, VA. More details to follow.

“We are living in the most exciting time for aviation during our lifetime, as technology is moving rapidly, as government and industry leadership are working to meet challenges and as we continue to create a vibrant transportation system.”

-Terry McVenes

Terry McVenes thanking his staff for all of their tremendous work on the 2019 Symposium
We hope the 2019 Global Aviation Symposium was informative and worthwhile. You helped make this event a great success, and your enthusiasm helped to make our time together productive and enlightening. We look forward to seeing you next year!

—Sincerely,
YOUR RTCA Staff

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