It’s hard to believe this is our last issue of 2018! As I write this, we are closing on a busy fall tradeshow season. ERA General Assembly, NBAA-BACE, Helitech International, MRO Europe, Airshow China – those are just a few of our recent shows, and a good look at some of the different markets we serve (commercial, regional transport, and helicopter).

This issue starts with an article spotlighting one of our customers, Barry-Wehmiller, a global supplier of manufacturing technology and services. I want to send a big thank you to Jeff Schneider, Director of Flight Operations with BW, for taking the time to chat with us about the culture of the company and how their company jets contribute to maintaining it. I think we can all pull something meaningful from this article.

Next up, we sit down with Lynn Root, UA’s Senior Principal Engineer. We chat with Lynn about what it was like for a woman starting a career in the avionics industry in the 1980s and touch on some other topics like FANS and what it’s like to work for UA.

Our last two articles focus on the future of aviation. First, we look at the upcoming pilot shortage threatening the commercial aviation market. Then, we talk with our CEO Paul DeHerrera and Elbit Systems’ VP of Commercial Aviation, Dror Yahav, to get their perspectives on what the industry will look like in the future.

We hope you enjoy these articles and encourage you to share your feedback with us. Please shoot us an email at universalflyer@uasc.com to let us know how we’re doing.

Business Aviation Spotlight | How one company uses business aviation to promote Truly Human Leadership.

The Woman Behind the Development of UniLink™ | A conversation with UA’s Lynn Root.

Commercial Aviation Is About to Change | Upcoming market forces and how they’ll change the way we fly.

Imagining the Future | UA leaders share their vision of what flight decks will look like in the future.
CEO Bob Chapman refused to let his people go when his company, Barry-Wehmiller, hit hard times during the economic downturn in 2009. Bob asked himself, “What would a caring family do when faced with a crisis…The family members would all take a little pain so that no member of the family would have to experience a dramatic loss.” After some thought, Bob decided to institute a furlough, where every employee (including Bob) would take four unpaid weeks off in order to balance finances and allow the company to survive. After nine months, the St. Louis, Missouri based supplier rebounded and Bob’s “Truly Human Leadership” would prove its worth for the years to come.

Truly Human Leadership

In a TEDx Talk, Bob says that true leadership means creating an environment where people can discover their gifts, develop them, share them, and be recognized for doing so. It’s an environment where everybody matters and feels valued. As humans, we have a tremendous need to feel like we matter.

Rather than saying “Barry-Wehmiller is a global supplier of manufacturing technology and services serving a diverse platform of industries…” Bob says “Barry-Wehmiller builds great people. Our primary role is to invite people into our organization and give them skills and abilities, and an opportunity for a meaningful life. To do that, we produce machinery and consulting services.” He puts the focus on the people vs the product.

Truly Human Leadership is about having an obligation to continue allowing lives to be everything they were meant to be and accept the responsibility for the lives that have joined the organization. It’s about a culture where the worth of every individual is validated. And it wouldn’t be nearly as effective without the use of the company’s airplanes.

Building Great People Through Business Aviation

What can a leader do to best validate the worth of each one of us? They can listen. An integral part of that is BW’s Flight Operations Department. BW operates two Dassault® Falcon 2000 aircraft, based at the Spirit of St. Louis Airport (KSUS) in Chesterfield, Missouri USA. The aircraft play a key role in BW’s Truly Human Leadership, allowing Bob the flexibility to be in front of the company’s operations around the world.

As Jeff Schneider, Director of Flight Operations with BW says, “it would be impossible for Mr. Chapman to be visible and available to our over 100 companies, plus meet the demand for Truly Human Leadership without the aircraft.”

The aircraft are also vital for recognition and celebration, and allowing Bob to present all kinds of awards to BW’s 12,000 team members. When awards are presented, the airwaves fill with worthiness and people go home feeling fulfilled. Bob’s vision of Truly Human Leadership has made a large, positive impact on the lives of BW’s employees and their families.

Top Companies Use Business Aviation

- 95% of Fortune Magazine’s “100 Best Places to Work” are business aircraft users
- 100% of the “100 Most Trustworthy Companies in America” are business aircraft users
- 98% of Fortune Magazine’s Top 50 “World’s Most Admired Companies” are business aviation users
Women in STEM: Within STEM, men and women tend to study different fields:

Higher Education:

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<th>Field</th>
<th>Men</th>
<th>Women</th>
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<tr>
<td>Computer Sciences</td>
<td>82%</td>
<td>18%</td>
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<tr>
<td>Physics</td>
<td>81%</td>
<td>19%</td>
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<tr>
<td>Engineering</td>
<td>53%</td>
<td>47%</td>
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Overall Workforce:

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<tr>
<th>Field</th>
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<th>Women</th>
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<tr>
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<tr>
<td>Physics</td>
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<td>19%</td>
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<tr>
<td>Engineering</td>
<td>72%</td>
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The First Lady

In 1927, Elizabeth (Elsie) MacGill became the first woman to receive an Electrical Engineering degree in Canada from the University of Toronto. Two years later, with a degree from the University of Michigan, she became the first woman in North America (maybe even the world) to receive a master’s degree in Aerospace Engineering. She later pursued a doctoral degree at MIT. After graduating, Elsie was appointed Chief Aeronautical Engineer of the Canadian Car and Foundry Company. There, she designed the Maple Leaf II trainer and became the first female aircraft designer in the world. During WWII, Elsie led production of the Hawker Hurricane fighter planes.

Editors’ Note: This article was first published by Avionics Magazine: “Behind the Datalinks with UASC’s Goddess of UniLink,” by Nick Zazulia | July 6, 2018
Young, non-native English-speaking, non-military pilots used a 787 simulator temporarily modified with synthetic-vision displays to demonstrate that they could learn to use synthetic vision to land the airplane under stressful situations. Scenarios include the Boeing climbing out of Ecuador’s Mariscal Sucre International, one of the busiest airports in South America. Volcanic ash suddenly enveloped the 787, shutting down the engines, disabling the auxiliary power unit (APU) and leaving only one hydraulic system working.

This was one of the situations in which 24 junior pilots from Avianca used synthetic vision to perform a near safe landing — with no prior experience with the equipment. These pilots were in the earliest stages of their career, preparing to obtain a type rating and begin flying commercial passenger-carrying aircraft.

Avianca’s training manager said their performance using the technology was better under those scenarios than it would have been while using the current technology they fly with, which he attributed to the new generation and what they’re used to handling earlier in life. They use the iPads and the touchscreens at a very early age, so it made it easier and natural for them to use this type of virtual world representation that they could see on the display, even if they could not see outside of the cockpit.

Younger generation of pilots understand SVS and EVS better than today’s pilots

Pilot Shortage: Aviation in Crisis

Aviation is in crisis with the growing demand for new pilots as the airline industry continues to experience global shortages in the number of certified pilots. It is like the elephant in the room for commercial aviation at present. In the next 20 years, airlines in North America alone are going to be in need of around 117,000 new pilots. The projected shortage of airline pilots in the U.S. is expected to increase to over 2,000 by 2026, compared to the recorded pilot deficit of 155 in 2016. Airlines are cancelling flights and in extreme cases, ceasing operations due to a lack of pilots. Training academies and transition from militaries can’t keep up.

Avionics Automation Will Reduce Cockpit Crew

Aircraft manufacturers are working to adapt jets to reduce the number of pilots needed for long-haul flights and design new flight decks for a single pilot, to ease the pilot shortage crisis and drive down airlines’ costs.

Airbus and Thales expect the number of cockpit crew members on long-haul flights (typically three or four) to decrease to two by 2023 thanks to new technologies to reduce pilot workload.

Boeing is also examining the possibility of having reduced manning in the flight deck of a proposed mid-sized jet that it aims to have in service by 2025 if it proceeds with a launch decision next year.

The sponsors of reduced numbers in the flight deck say the move, which could begin with cargo flights, is inevitable, just as pilot numbers were cut from three to two in the 1980s when flight engineer positions went away with new aircraft like the Boeing 757.

Replacing the collection of discrete knobs and switches with more digital interfaces familiar to today’s teenagers could also help to shorten the amount of time it takes to train pilots, easing the well-documented pilot shortage. New pilots coming out of glass cockpit training aircraft and programs may swallow their gum when placed in a regional airline’s turboprop sim with steam gauges and the 1970’s traditional six-pack of flight instruments. The senior training pilots, chief pilots, flight technical and standards captains that one has to retain to survive, normally won’t stay with commercial carriers and corporate flight departments that fly “junk” avionics.

Aviation safety critics say there are good safety reasons for having more than two pilots in the cockpit on long-haul flights and at least two on shorter journeys, with the costs outweighed by the benefits.

Regardless, manufacturers are pushing ahead with projects like embedding Artificial Intelligence (AI) into the flight deck and connectivity that allows for more decision-making on the ground.

Commercial Aviation is about to change

We are about to face a major disruption in the commercial aviation market—one that could fundamentally change the way we fly today.
According to the FAA, there were about 827,000 pilots in America in 1987. Over the past three decades, that number has decreased by 30%.

IATA predicts that, over the next 20 years, air travel will double.

The global AI in aviation market is expected to be valued at USD 152.4 Million in 2018 and is likely to reach USD 2,222.5 Million by 2025.

Aviation has come a long way in the last century. From the first flight across the Atlantic in 1919 to breaking the sound barrier in 1947, the industry continues to grow and improve.

What does the future of the industry look like? Top leaders at UA share their thoughts on what the future of aviation will look like in 20 years and what it will take to get there.

### Disruption #1: Avionics Will Be More Automated.

**Future flight decks will be so technologically modern, practically anyone will be able to operate future aircraft.**

**Dror:** Avionics will be more user-friendly and simple. In 20 years’ time, we will see the flight deck easier to operate and more intuitive as a result of the increasing demand and shortage of well-trained pilots. Simplified avionics is a solution to this issue. Primary flight controls will be easier compared to today's complex systems.

**Paul:** The simplification of avionics is important because the future flight deck will most likely be operated by only one pilot.

### Disruption #2: Bringing VR into the Flight Deck.

**Virtual Reality (VR) and AI elements in the flight deck will play a key role in simplifying the flight deck or may even replace it.**

**Dror:** Flight information will be seen with elements of VR in flight deck displays, mostly employed via sight tracking and voice command. Tasks that have been done in the past by two pilots can be completed visually by only one.

**Paul:** Imagine sitting in the flight deck, visually looking at a dial out of reach that you need to turn, that dial is highlighted and using a control in your hand you will be able to tune the visually selected dial. You won’t have to physically turn the dial, you will be able to visually select it and adjust it with one control.

### Disruption #3: The Role of AI.

**Everything will be more automated. The pilot will be more of a manager when making a decision and AI will automatically take into consideration the fuel, conditions of the landing area, and weather. There will be more ability to control the flight deck with autonomous functions in the event the pilot is incapacitated.**

**Dror:** Integrated avionics is the key. In order to make this future a reality, the industry will need to further integrate avionics. Every part of the aircraft must be integrated - working together in sync and sharing information. All the functions will need to work together in a way that provides the necessary information at the right time to the right avionics components.

**Paul:** In the future, I see AI providing automatic routing for the pilot. It will sequence you in because it knows the current air traffic and will integrate you into a flight plan optimized for traffic and weather. It will tell you, versus you telling it. Pilots have to consider a lot of information before making the simplest of decisions and AI will soon start to play a major role in this process allowing a single pilot to operate an aircraft. AI will be the co-captain.