On the Horizon
Alumni are leading the autonomous systems industrial revolution

PAGE 12
FROM THE PRESIDENT

This issue focuses on autonomous systems. From a technology perspective, they can help us collect data without putting anyone in harm’s way. We can restore independence to people by giving them new mobility options. We can move materials expeditiously. As impressive as the “how” of these systems is — now, more than ever, I want to acknowledge the “why.” We don’t pursue these projects to create gizmos and gadgets. We create them to put technology in service to society.

Applying science, technology, engineering and mathematics — STEM skills — to real-world problems goes back to our roots in early aviation. So does a sense of duty to our communities. At 17, John Paul Riddle volunteered to drive his town’s doctor to house calls. The 1918 influenza pandemic hit his hometown of Pikeville, Kentucky, so hard that officials were too overwhelmed to report all the deaths to the board of health. Riddle got the flu but recovered to enjoy 82 more years. Today, Embry-Riddle Aeronautical University continues to live up to our founder’s example of civic service and resilience.

In the present pandemic, our staff and faculty moved quickly to protect students and our communities, migrating programs online and instituting wellness checks for those who needed to remain on campus. We also extended our resources to help younger students keep learning during school closures. In March, we began offering free, online programs for young learners and seven college-credit courses to high school students in Arizona and Florida. Our Massive Open Online Course (MOOC) on aviation fundamentals reached more than 3,000 homebound students across the world.

Beyond our campus communities, our work as a global research and engineering institution has far-reaching impact and potential. This issue describes how an alumnus — through his employer — is using autonomous systems to deliver medical supplies to remote areas in Rwanda and Ghana. Our unmanned aerial systems (UAS) faculty and students have also surveilled cultural sites in Kosovo, monitored the aftermath of hurricanes and fires, helped farmers mitigate climate change with high-resolution imagery, and are developing robots that remove microplastics from beaches.

Our students will be qualified for the more than 100,000 “disruptive” jobs projected by 2025 in transportation, energy, telecommunications, the government, military and even entertainment. Embry-Riddle has always been synonymous with “all things aviation.” Our tradition of excellence continues as we become synonymous with “all things autonomous,” inspired by a spirit of service.

Sincerely,

P. Barry Butler, Ph.D.
President
Embry-Riddle Aeronautical University

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ON THE COVER: A Zipline drone launches in rural Africa to deliver precious medical supplies. Alumnus Joseph Marshall (’18) is helping Zipline bring its delivery service to the United States (see Page 12). Photo courtesy of Zipline.
EMBRY-RIDDLE'S 2020 ACHIEVEMENTS ARE HIGHLIGHTED IN SPRING 2020 NEWS & NOTES FROM THE WORLD OF EMBRY-RIDDLE

ALUMNI.ERAU.EDU

Eagle Accepts Prestigious International Aerospace Award

Embry-Riddle student Shlok Misra was one of only five students worldwide awarded top honors in the 14th annual Association of United States and European Aerospace Industries Representatives (USAIRE) Student Awards Program. Misra and his research partner, Tanish Jain, a student at the University of California San Diego, won scholarships and were flown to Paris in November to attend the USAIRE gala and present their paper to global industry and government leaders. The two students spent six months researching and writing a comparative analysis of two emerging military powers — India and Israel — and their defense capabilities for the award program’s prescribed topic: “Protectionism in the Defense Aerospace Industry in a Multipolar World.”

“Going to Paris was a great opportunity to interact with leading industry executives and represent Embry-Riddle at a global platform,” Misra says.

USAIRE includes representatives from over 100 American and European companies in the aviation, aerospace and defense industries. Its student awards program aims to identify the next generation of administrators, directors and visionaries.

— James Roddey

Park Place

Embry-Riddle’s Research Park fills in

The university’s new Applied Aviation and Engineering Research Hangar is now at capacity. Home to the Eagle Flight Research Center, the hangar also provides more than 7,500 square feet of flexible lease space for corporate and research partners, with direct taxiway access to the Daytona Beach International Airport. The unique facility combines the attributes of a research complex with the capabilities of an aircraft hangar and engine test bed. The Research Hangar is the latest addition to Embry-Riddle’s John Mica Engineering and Aerospace Innovation Complex (MicaPlex) at the Research Park.

The new Applied Aviation and Engineering Research Hangar, which includes the Eagle Flight Research Center, combines a research complex with an aircraft hangar and engine test bed.

“Since the debut of the MicaPlex in spring 2017 entrepreneurs have secured more than $27 million in seed funding for their ideas,” says Rodney Cruise, senior vice president for administration and planning. Additionally, the Research Park has created 115 internships and 71 high-paying jobs. Supported by more than $3 million in State of Florida grants, $1 million from the U.S. Department of Commerce Economic Development Administration and a grant from Volusia County, the Research Hangar was established to spur innovation within the state’s aeronautical cluster.

“We want to create a working lab where innovative companies advance aviation,” says Embry-Riddle President P. Barry Butler. “We want to welcome entrepreneurship onto our campus so that students gain inspirational models and hands-on opportunities. And we want to help high-paying jobs take root here. The Research Park’s facilities and tenants help us achieve all three goals.”

From left: Jason M. Ruckert, Shanan Gwaltney Gibson and Rhondie Voorhees.

Staffing Up

New VP of enrollment, two deans named

Embry-Riddle recently named a new vice president for enrollment management and welcomed two new deans to its ranks.

Jason M. Ruckert started as vice president for enrollment management on April 1, managing enrollment across the university. Joining Embry-Riddle in 2006, he was the Worldwide Campus’ vice chancellor and chief digital learning officer, as well as a College of Business faculty member.

“As a nationally recognized authority on technology-enhanced education, Dr. Ruckert has the leadership skills and expertise to help us advance our strategic goals related to student recruitment and retention,” says University President P. Barry Butler.

Ruckert holds a Ph.D in Leadership and Education from Barry University, with a specialization in higher education administration and is a Fellow of the Royal Aeronautical Society.

Shanan Gwaltney Gibson became dean of the David B. O'Maley College of Business at the Daytona Beach Campus, also in April. A scholar with expertise related to job analysis, entrepreneurship and small business development, Gibson most recently served as dean and professor of management within the College of Business at Texas A&M University-Commerce. She holds a master’s degree and a Ph.D. in Industrial and Organizational Psychology from Virginia Tech.

Rhondie Voorhees has nearly a year under her belt as dean of students at the Prescott Campus. Starting in July 2019, she joined Embry-Riddle from the University of Montana, where she served as the dean of students since 2012. Voorhees has more than 30 years of higher education experience, including a Ph.D in Higher Education and Student Affairs from the University of Maryland.

BY THE NUMBERS


2020: 2177
2019: 2274
2018: 2283
2017: 2299
2016: 2219
2015: 2177
2014: 2147
2013: 2071
2012: 2000
2011: 1940
2010: 1877


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FROM THE EDITOR

Calling all writers! Embry-Riddle is establishing a volunteer Eagle Writing Corps to help us expand and enrich our content with stories and news that matter to you. Journalists, authors or bloggers who have a flair for authentic storytelling are encouraged to apply. Those selected for the Eagle Writing Corps will develop articles for Lift and write digital and website features for a variety of online platforms. This is an opportunity to support your alma mater through your talent and skills, build personal connections with your Eagle Network and expand your writing portfolio. Submit writing samples to liftmag@erau.edu for consideration.

— SARA WITHROW, EDITOR

EDITORS NOTE:

Lift is the student publication of the Embry-Riddle Aeronautical University. Student journalists are encouraged to apply. Those selected will develop articles for Lift and write digital and website features for a variety of online platforms. This is an opportunity to support your alma mater through your talent and skills, build personal connections with your Eagle Network and expand your writing portfolio. Submission does not guarantee publication.

Submission does not guarantee publication.

FEEDBACK

FROM EMBRY-RIDDLE ALUMNI AND FRIENDS

COMMENTS AND OPINION

ALUMNI AND FRIENDS

Send us your story in Other Words gives you the opportunity to share your industry-related or personal perspective with Lift readers. Email submissions/proposals to liftmag@erau.edu.

What Makes an Engineer Tick?

BY KEN HURT ('97)

On the heels of Engineers Week (Feb. 16-22), I find myself reflecting on why I became an engineer. The answer is simple. There was never any other choice. The best way to describe it is to tell my story.

As a young boy picking strawberries in the field with my mom, I could not help but look up every time a Grumman F-14 Tomcat flew overhead. I was an aircraft nut, and I remember being so excited when I was selected to be a volunteer flight test pilot for Grumman at the age of 17. I had just completed my final training in Pensacola for the Navy Retired, Mustang Class 71-01. I was excited to have a front row seat to what I considered to be one of the most amazing aircraft ever built, the F-14 Tomcat.

In my early years of being an engineer, I was asked what makes an engineer tick. I was inspired to learn as much as I could about the aircraft that I was working on. I would often spend my weekends at the Grumman facility in Bethpage, Long Island, New York, to learn as much as I could about the aircraft. I would often spend my weekends at the Grumman facility in Bethpage, Long Island, New York, to learn as much as I could about the aircraft. I would often spend my weekends at the Grumman facility in Bethpage, Long Island, New York, to learn as much as I could about the aircraft.

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Ken Hurt’s ‘97, journey to the U.S. Naval Academy is a small liberal arts college to Embry-Riddle.

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“Engineers are wired to solve problems and to create new things, to challenge the status quo and push the limits. When we do, incredible things happen.”

Focus on Throughput

In response to fall 2019: “Terminal Reinvention” as director of aviation in Denver between 1984 and 1992, I had the privilege of leading a very talented team that planned, designed and constructed Denver International Airport. We had the opportunity to build a major airport from scratch.

Our goal was to make it the most efficient large hub airport ever built, and a breakthrough airport at every major airport from scratch.

I find the new trend of using valuable space for needed services such as parking and other unnecessary activities to be terribly wrong headed. These simple obstacles to passenger flow, increase the unused walk distances and take up space for needed services such as restrooms and seating.

Numerous headquarters moved to regional locations to reduce costs and reduce the carbon footprint of the industry. In our case, the move to Phoenix saved Embry-Riddle and its students millions of dollars in a three-year period.

While working on the expansion of the airport, I was assigned to a project to develop a new hub airport in the U.S. that would serve as the nation’s largest airport.

The Riddle of T. Higbee Embry

In the spring edition 2019: “Wings of Legacy: The Riddle of T. Higbee Embry”, I read about the origins of the Embry-Riddle School of Aviation and its humble beginnings in Cincinnati, Ohio.

I am from Cincinnati, and as a teenager I used to pat the pool hall that was in the downtown area of Hyde Park as well as “Buskin Bakery.” To read that I walked perhaps the same paths as T. Higbee Embry is quite astonishing given my career path. And while I was aware that Cincinnati had a significance in the early beginnings of what we know today to be Embry-Riddle, the Hyde Park connection was a new revelation for me.

The casual reader, the article may have some historical relevance. For me, it took forward going back to Cincinnati to visit with family and to visit Lunken Airport, the place where I once played as a child, to see what it has become after some 45 years. And of course, my ultimate desire is to drive through Hyde Park, to see if there are any historical landmarks that mark the birthplace of T. Higbee Embry, one of the founders of our great aeronautical institutions.

Anyone Remember AHP?

I am trying to find some information about a chapter of AHP at Embry-Riddle at the Miami Campus in 1960 or 1961. I was a charter member of a new chapter there, along with about 18-20 other students. I still have my black mug with gold AHP on it. I don’t have any other records or formation, but I do know that we had an AHP chapter. Since there seems to be no record that I can find that it ever existed, I am assuming that for some reason it was dropped from the records.

W. Emory Chronister

Former student

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“It was like a big hotel; everything was in there, travel agencies and other businesses; they just all had rooms in it,” Jerry says, describing the school’s unique setting.

Finding His Footing
Allen started his college education at Michigan Tech, but admitted he floundered there. He quit school and went to work as an engineering aide at Pratt & Whitney in West Palm Beach.

“After a couple of years, I got a feel for what the engineering field was like and the people in it — how smart they were, how smart they weren’t. And, I said, ‘I can do that,’” he says.

By now, Jerry had completed an associate degree in aeronautical engineering and was working at the Martin Company (now Lockheed Martin) in Cape Canaveral. “Jerry had gotten a job immediately out of Embry-Riddle, so I ended up going there as well,” Allen recalls.

It was a time of transition. At the urging of Jack Hunt, then a consultant for Embry-Riddle, President Isabel McKay moved to reorganize the school as a nonprofit corporation. The new status would open doors for federal aid. A few years later, Hunt, now president, recommended the school consolidate its South Florida operations on one larger property that would allow for future growth. The board ultimately chose Daytona Beach as the school’s new home.

Operation Bootstrap
Allen was a student at the time (1966) and helped with the move, which became known as “Operation Bootstrap,” because of the human resource and volunteer labor it took to accomplish.

“I disassembled some of the equipment down there and loaded up trucks. Then, I helped unload the trucks and set up some of the labs, wind tunnels and a lot of the lab equipment [in Daytona Beach],” Allen says, who shortly thereafter was elected president of the first Student Council.

Fly Boy
Enter Cal. “When I got out of high school [1964], I knew I wanted to fly,” he says. “My whole purpose in life was to get in the U.S. Air Force.”

After working and saving money for a year, Cal enrolled in the flight training program at Allen’s alma mater. “My dad thought all his sons were engineers, so I ended up going there as well,” Cal recalls. He graduated in 1966 with a B.S. in Aeronautical Science, worked for Chrysler at Cape Canaveral and contributed to NASA’s Apollo program.

Jerry, who returned to Embry-Riddle in 1966 to earn a bachelor’s degree, worked for Chrysler at Cape Canaveral and contributed to NASA’s Apollo program. In 1969, he returned to Michigan to take over the family business, Imperial Plastics Inc. He sold the business in 1989 and retired in 2001.

A lieutenant colonel in the Air Force, Cal retired in 1994 after 24.5 years of service. His final assignment was Air Force representative to the Federal Aviation Administration’s (FAA) Southern Region. He continued to work for several different companies on FAA telecommunications projects, retiring in 2014.

Coming ‘Home’
The Betz brothers returned to Embry-Riddle for the 2019 Homecoming Weekend. Today’s campus is nothing like the school they attended, but Allen says some things have not changed.

“This is the real deal. When you come to Riddle, you run into people who are trying to get someplace.”

| Embry-Riddle's history, including its move from Miami to Daytona Beach and its transformation from a flight training/technical school to a fully accredited nonprofit university.

The Betz brothers returned to Embry-Riddle for the 2019 Homecoming Weekend. Today’s campus is nothing like the school they attended, but Allen says some things have not changed.

“This is the real deal. When you come to Riddle, you run into people who are trying to get someplace.”

The Betz brothers, from left, Calvin (’70), Allen (’65), Norman (’73) and Gerald (’60, ’66), returned to the Daytona Beach Campus for Homecoming last fall to experience the metamorphic changes at their alma mater.
Space Eagles

Alumni team contributes to historic Boeing Starliner capsule landing

BY SARA WITHROW

It’s almost 6 a.m. (MST) on Dec. 22, 2019. A bank of spotlights focuses on the pre-dawn sky above the desert at White Sands Space Harbor, New Mexico. Minutes later, a spacecraft recovery team — and the world via NASA TV live — witness a first-of-its-kind engineering feat. Suspended by three parachutes and surrounded by six specially designed airbags, the Boeing Crew Space Transportation-100 Starliner spacecraft descends gently to the Earth’s surface.

Among those celebrating the landmark moment were more than a dozen Embry-Riddle alumni who work for the Starliner program. Proving the ground-landing capability of the spacecraft is a critical step to advancing Boeing’s business model for Starliner, Atchison said in an early December phone interview. “The reusability of the vehicle helps us give the customer the best value on this particular capsule platform.”

Starliner’s nominal landing was the highlight of its inaugural Orbital Flight Test (OFT). “The hardest parts of this Orbital Flight Test were successful,” said NASA Administrator Jim Bridenstine in a statement released after Starliner’s successful touchdown. Bridenstine also “The reusability of the vehicle helps us give the customer the best value on this particular capsule platform.”

Starliner’s Dec. 22 for the Orbital Flight Test (OFT). At least 15 Eagles were involved in preparing for and executing the OFT. The Boeing CST-100 Starliner spacecraft lands in White Sands, New Mexico, after an abbreviated Orbital Flight Test.

Eagle Team
Together with Atchison, at least 14 Embry-Riddle alumni and one student have touched nearly every aspect of the historic spacecraft’s development. This Eagle team includes electrical, materials, manufacturing and production engineers, a materials management lead, a systems test conductor, assembly and operations for Starliner.

Largely working behind the scenes, Kimberly C. Fuentes-Lehtonen (’17), an occupational health and safety specialist for the Starliner program, has helped ensure workplace safety for her Starliner teammates since January 2018.

The most common safety hazards — as at any construction site — relate to “slips, trips and falls,” she said in an early December interview. “You’d be surprised how many areas have to be reached when working on [Starliner].”

Still, jobsite mishaps have been rare to none, she said. “Space is a very safe industry, because it has to be,” Fuentes-Lehtonen explained. She helps keep it that way by listening to employees, mitigating safety hazards and conducting safety training. “I’ve trained technicians to NASA engineers to astronauts,” she said. “To be a part of this program is so unique. We’ve never built a capsule like this before.”

Orchestrating the Launch

The conductor of the launch-day countdown, Atchison earned a B.S. and an M.S. in Engineering Physics from Embry-Riddle. After eight years with Boeing’s satellite division, he was originally brought on to the Commercial Crew Program as a flight test director. Five years ago Atchison was asked to create Starliner’s launch architecture. The plan coordinates multiple teams and activities to operate in lockstep, so the heritage Atlas V rocket system marries up seamlessly with Starliner for a successful liftoff, he said. “It’s been a very interesting journey integrating all of the pieces of this puzzle.”

Mating the concept of a ground landing for the reusable capsule was another of Atchison’s challenges. “The [spacecraft] shuttle landed on a runway. … This is an off-road, expedition-type spacecraft recovery,” he explained. Starliner’s landing isn’t the only thing that makes it distinct from the Space Shuttle and NASA’s previous capsule programs, Gemini and Apollo. “It’s a lot like comparing a 1955 Corvette to a 2020 Vette or a 1975 Cessna to a 2019 Cessna. The avionics, the fit, the finish, the feel — everything is completely different from [Gemini and Apollo],” Atchison said. “The challenge with Starliner is that most of what we’re doing is new.”

Discovery Is Part of Development

“We have a custom, one-of-a-kind, hand-built spacecraft,” affirmed Gary Wedekind (‘81, ’83, ’91, ’92). Still, jobsite mishaps have been rare to none, she said. “Space is a very safe industry, because it has to be,” Fuentes-Lehtonen explained. She helps keep it that way by listening to employees, mitigating safety hazards and conducting safety training. “I’ve trained technicians to NASA engineers to astronauts,” she said. “To be a part of this program is so unique. We’ve never built a capsule like this before.”

With more than 37 years of experience, including multiple roles within the Boeing Starliner Program as an integration engineer, manufacturing engineer, test engineer, test conductor, test director and Boeing mission support room manager for test flights, Wedekind is intimately familiar with crew and service module designs and as-built configurations.

“The primary goal of the DFT is to perform on-orbit testing and performance checks for systems that cannot be tested on the ground, and to understand all the successes and any problems that occur,” Wedekind said in a phone interview prior to Starliner’s Dec. 20 launch.

“Sometimes stand-alone hardware will pass qualification and is integrated onto the vehicle; now that box has to respond correctly with other boxes and other systems, and you realize it doesn’t play well with others. It’s based on these unplanned discoveries that you now work to resolve them so they don’t occur again,” Wedekind said.

“Though most important thing is we get it right for the people who will fly our spacecraft.”

SOURCE: BOEING SPACE

REACHING FOR THE STARS
Eagles on the Starliner Team

Louis Atchison (‘02, ‘04) Carnegie Moore (‘08)
Catherine Ayotte (‘18) Lou Potocnik (‘50)
David Curry (‘18) Evan Rollowson (‘16)
Vincent D’Aurose (‘18) Sean Rose (‘16)
Deanna Dobson (Embry-Riddle student) Gary Wedekind (‘81, ’83, ’91, ’92)
Kimberly C. Fuentes-Lehtonen (‘17) Michael L. Wilson (‘16)
Yvens Joseph (‘01, ‘03) Robin Zwic (‘60, ‘81)
Jason McBride (‘96) *Last Starliner Program in 2020

*Abbreviated Orbital Flight Test.

Embry-Riddle alumni, from left, Evan Rollowson, David Curry, Lou Potocnik, Gary Wedekind, Kimberly C. Fuentes-Lehtonen and Louis Atchison stand in front of the CST-100 Starliner that launched Dec. 22 and landed on Dec. 22 for the Orbital Flight Test (OFT). At least 15 Eagles were involved in preparing for and executing the OFT.
rising sea levels, warmer temperatures and increased human activity are taking a toll on Florida’s coastal ecosystems. Intent upon safeguarding this delicate habitat, Embry-Riddle students and professors are using unmanned aircraft systems (UAS) to collect critical data on the changing coastal environment.

“There is no reason to believe our climate is changing,” says Dan Macchiarella, a professor of aeronautical science at Embry-Riddle.

In collaboration with the University of Central Florida’s (UCF) National Center for Integrated Coastal Research, a group of students used UAS to survey oyster reefs in the Indian River Lagoon system on the east coast of Central Florida in 2019. The project is now expanding to investigate the potential for dead reefs to be used as nesting sites for threatened birds, including the American oystercatcher and least terns.

“Collaboration started organically — the best way,” says Linda Walters, a biology professor at UCF. “Embry-Riddle and UCF coastal scientists met and realized we could help each other better understand and hopefully help improve the Indian River Lagoon and associated biodiversity.”

UAS are flown over the oyster reefs at low tide, taking photos that are stitched together to make high-quality images that are about 25 times more detailed than Google Earth’s, Macchiarella says. The UAS images create a baseline of data that can be used to measure the changes in an area. The next step is to use lidar — a remote sensing method that uses laser light to measure distance — to make digital 3D representations of the survey site.

“Lidar also gives us the ability to penetrate vegetation and mangroves, which grow a lot around oyster reefs,” Macchiarella says. “They share the same habitat.”

Researchers used high-quality drone images to create 3D models of the oyster beds.

UAS: Tools for Conservation

To further their research, the Embry-Riddle-UCF team is applying for a state grant to conduct a topographical analysis of wading bird nesting sites for habitat protection. As increased coastal development and human activity have reduced the beach areas where wading birds have traditionally nested, some birds are now nesting on oyster reef tops.

“Their habitats have been disturbed by development,” Macchiarella says. “Where they traditionally go is not as viable.”

The research will look at elevation, among other metrics, in site selection for nesting. The findings could help guide future restoration and conservation efforts in the Indian River Lagoon.

The researchers agree that UAS, which can easily collect data in hard-to-reach areas, are ideal tools for environmental research projects.

“I’m interested in testing this technology for understanding many important human impacts — one being quantifying the number and level of damage by boat strikes to oyster reefs, shorelines and seagrass beds in the Indian River Lagoon, and to see if we could use drones to count oysters on a reef — to minimize field efforts in the future,” Walters says.
PIOLATING
THE WAVE
OF THE FUTURE

BY MELANIE STAWICKI AZAM AND ALAN MARCOS PINTO CESAR

The delivery is one of more than 31,000 packages of blood, medicine and vaccines that have been airdropped since 2016 by Zipline — the first drone delivery company to operate commercially — to hospitals and other medical facilities in Rwanda and Ghana.

Now, Embry-Riddle alumnus Joseph Marshall (’10) is working with the Federal Aviation Administration (FAA) and the North Carolina Department of Transportation (NCDOT) to expand Zipline’s medical delivery service to the United States.

Somewhere in rural Rwanda a small, autonomous, fixed-wing aircraft whizzes off a launcher into the sky. Its cargo is precious, and time is of the essence. Instead of traveling by car over bumpy, undeveloped roads and risking delays caused by weather or civil or political unrest, this insulated box of lifesaving blood will reach its patient in minutes, not hours.

“Zipline is saving lives,” says Marshall, who is the San Francisco-based company’s director of UAS flight operations. “For me, it was an opportunity to do something bigger than myself, for really the first time in my career.”

It may seem like the stuff of science fiction — delivery drones, self-driving semitrucks and flying taxis — but Embry-Riddle alumni and faculty who are autonomous systems experts say what once was futuristic is now just on the horizon.

Zipline’s drones can deliver lifesaving medical supplies to rural Rwanda villages in minutes, instead of hours.
A joint study by Embry-Riddle and Oklahoma State University found that drones can only be seen by about 35% of the pilots during the frontal phase of their flights. "Dangerous close encounters between aircraft and drones are becoming an increasingly common problem," says Ryan J. Wallace, assistant professor of aeronautical science at Embry-Riddle and an author of the study. Wiggins says some airports are using drone detection devices, but they are not flawless. In December 2019, the FAA proposed a new UAS regulation that may help with this problem. [See sidebar: Managing the Highway in the Sky.]

"No matter the size of the UAV, a reliable, smart "brain" is needed when autonomous flight is being considered," Hwang says.

Hwang sees the industry's future in fixed-wing UAS with vertical take-off and landing (VTOL) capabilities. Featuring electric rotors for takeoff and landing, and a gas pusher motor for horizontal flight, the Volansi autonomous delivery aircraft she's developing will be able to transport a payload of up to 20 pounds over 360 miles.

"Fixed-wing configurations allow longer flight time because they're much more efficient. The beauty of these systems is that you have the flexibility to have both systems, and having both systems is that you have the advantage of stable flight," Hwang says. "But with drones, it is a detect-and-avoid system that the FAA has to approve, so they are the ones held accountable if something happens. The rules slow us down, but the FAA has to do their due diligence."

Still, Marshall predicts BVLOS drone delivery will be operational, at least in some regions in the United States, within the next one to three years. "Zipline has proven the technology is scalable," he says. "Everyone wants to get there fast, but I think slow and steady wins the race."

"Slow and steady wins the race"

"Package delivery is closer than most realize. The concept is proven," affirms Josh Olds (’11, ’15), president and co-founder of the Unmanned Safety Institute.

Darshon Dikavan (’11), an executive aviation consultant and a UAS program engineer with NCDOT’s Division of Aeronautics, agrees, but says the technology advancements should not be rushed. "Companies and agencies are saying we can do beyond visual line-of-sight (BVLOS) operations, but the FAA needs data to prove the safety case, before they are OK with that." The FAA's Unmanned Aircraft Systems (UAS) Integration Pilot Program (IPP) is establishing the foundation for airspace management and other regulations related to the integration of UAS into the National Airspace System. As part of the program, nine regions, including Raleigh, North Carolina, are working with the FAA to test commercial UAS applications.

North Carolina’s IPP status means the state’s private partners, including Zipline, are able to test more advanced UAS operations, Dikavan says. Data collected from those operations will help with the eventual integration of UAS on a larger scale.

"Marshall acknowledges safety comes first. In manned aircraft, pilots are responsible for seeing and avoiding other aircraft. With an autonomous UAS, that responsibility shifts, he says. "With drones, it is a detect-and-avoid system that the FAA has to approve, so they are the ones held accountable if something happens. The rules slow us down, but the FAA has to do their due diligence."

Still, Marshall predicts BVLOS drone delivery will be operational, at least in some regions in the United States, within the next one to three years. "Zipline has proven the technology is scalable," he says. "Everyone wants to get there fast, but I think slow and steady wins the race."

"Slow and steady wins the race"

"Package delivery is closer than most realize. The concept is proven," affirms Josh Olds (’11, ’15), president and co-founder of the Unmanned Safety Institute. A drone delivery company and on-demand, taxi-like aircraft, the technology must be proven safe for public use — and laws, policies and regulations must be enacted to ensure their safe operation.

David Hansell (’04), global head of aviation relations and policy at Loon — an Alphabet subsidiary — and a former air traffic controller, believes commercial drones are being built with safety as a top priority. "I don’t know a single manufacturer or operator out there who is not supremely concerned about the risk to the general public. Never mind the business considerations: In the minds of people I talk to on a daily basis, it’s about doing the morally right thing when it comes to safety."

"Testing is important to mainstreaming the technology," says Will Shaler (’14), a systems engineer at Anduril Industries. Just like full-scale aircraft, drones must undergo hardware and software validation, bench testing, hardware-in-the-loop simulation and testing in safe environments. He says. "Redundant systems and appropriate recovery modes are keys to mitigating failure."

Shaler adds. "Joseph Marshall (’10), director of UAS flight operations at Zipline, agrees. "I look at the aircraft — even though they are smaller — and the crews monitoring them, no differently than I would a Boeing aircraft or Delta Air Lines flight crew. That is the most important thing, because if we fail to maintain that mindset, safety will naturally be degraded."

Policy Advancements

In the past five years, there has been a host of regulatory and policy changes at the national, regional and international levels in support of unmanned aircraft systems (UAS) integration, Hansell says.

Josh Olds (’11, ’15), president and co-founder of the Unmanned Safety Institute, says one such policy relates to operator certification. "Now it’s a matter of proving [each UAS] type is safe, through data compilation, building the safety ecosystem to ensure compliance under certification and existing regulation — or obtaining waivers from those that can’t be met — and implementing the plan."

The Federal Aviation Administration took a step forward in December 2019 when it issued proposed rules for the remote identification of drones, says Sarah Nilsson (’03, ’06), an aviation and drone law attorney licensed in Arizona and an Embry-Riddle professor. The drone ID will be like a UAS license plate or digital signature, she explains.

"You would be made aware of traffic in your area and who is around you," she says. "It is the foundation of air traffic control down the road."

"The biggest hurdles to industry growth are public adoption, public perception and reliability."

— JOSH OLDS (’11, ’15), PRESIDENT AND CO-FOUNDER OF THE UNMANNED SAFETY INSTITUTE

Going Public

Hansell says full-scale adoption and integration of UAS — and later urban air mobility (UAM) vehicles — into the national airspace system will take time. "I think this will be a gradual change over years of gaining social acceptability, building consistent safety cases, partnering with forward-leaning regulators who are willing to take different risks in controlled environments, proving every day that it’s safe," he says.

Olds agrees. Large-scale UAS and UAM integration will probably take a crawl, walk, run approach, he says. "The biggest hurdles to industry growth are public adoption, public perception and reliability."
Self-driving technology company Waymo, formerly the Google self-driving car project, has logged more than 20 million miles on public roads, says Tracy Murrell, director of safety operations for the company and a current Embry-Riddle graduate student. Waymo One is the company’s fully autonomous ride-hailing service serving more than 1,500 riders in the Phoenix-metro area, but none are currently available for sale.

“Our vehicles recognize construction zones, school zones and other unique situations and take appropriate action in those areas,” Murrell says. “Meanwhile, we are heavily investing in weather testing from foggy San Francisco to snowy Michigan and rainy Washington State, to ensure that our vehicles learn to drive in a variety of challenging weather conditions.”

Murrell says Waymo’s investment in custom-designing its hardware sensor suite, and over a decade of experience developing the complex machine learning behind its self-driving technology, positively impacts its deployment of Level 4 autonomous capable vehicles.

**A Complicated System**

From an environment perspective, fully automated vehicles have more obstacles than UAS, when it comes to integration. Will Shaler (’14), a systems engineer at Anduril Industries who participated in robotics and automation competitions as a student at Embry-Riddle, says, “It’s much more difficult to deal with an autonomous vehicle. Just to get from one place to another, you need a GPS and an INS (inertial navigation system), and it needs to be much more accurate. You’re moving much slower and more precisely than an aircraft... you have obstacle avoidance, complications with wheel slip, with localization. It requires a whole different approach.”

However, Eric Coyle, associate professor of mechanical engineering, says autonomous cars do have an advantage over UAS. “It’s much harder to deal with UAS when something goes wrong. You can’t just cut the motors off and be safe. With a car, you can usually coast or brake to a stop and move to a safe area.”

**TRAINING THE NEURAL NETWORK**

Autonomous systems have come a long way in a relatively short time, thanks to developments in how they “learn.” “One of the big advances that’s come recently is the learning-based approaches,” says Patrick Currier, associate chair and associate professor of mechanical engineering. In the “old-school method,” you would try to basically program a vehicle to reduce an image down to certain objects, so the computer could understand how to react to those objects — be it a car, a person or a trash bin.}

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“This is my generation’s moonshot. This is our way to contribute to positively changing the world.” — BRENT TERWILLEGHER (’06, ’05)

Beyond Freeways

If fully autonomous cars are possible in the medium term, urban air mobility (UAM) — low-altitude, on-demand passenger and cargo air transportation services, commonly referred to as air taxis — is just over the horizon. Investment in this sector has grown substantially; most recently, Toyota invested $384 million in Joby Aviation, a company that boasts a four-passenger UAM aircraft capable of VTOL.

Paul Andreoli (’18), an unmanned aircraft pilot for ULC Robotics and a New York City resident, envisions a day when UAM aircraft will shuttle Manhattan residents to weekend vacation homes in the Hamptons, avoiding traffic-snarled highways. “I think this is the next hurdle in aviation and the future of modern-day urban transportation,” he says.

Pat Anderson, professor of aerospace engineering, agrees. “Models show a very favorable chunk of a very large market of intercity travel can be absorbed in a UAM network,” he says, but it comes with two significant and interlinked challenges.

The first is noise, not just from the engines, but from the propellers. Anderson is researching solutions to the acoustic challenge as part of a 5-year NASA grant.

“Beyond Freeways” is for the propulsion system alone. “I am developing simplifications to the networks that allow more efficient use of bandwidth,” he says.

There are definite steppingstones to mature the public confidence in automation, Martos says. “The desire to progress to a pure passenger model is there. This work is in direct support of that, to make it easier for pilot licensing and operations of these vehicles.”

In the short term, Martos says UAM will likely launch with a traditional pilot. “That’ll have to change for the UAM model to be profitable,” he adds.

“MOONSHOT” With several FAA approvals still pending for UAM operations, UAM-for-hire is likely much further from reality at this point. But alumni and faculty experts, alike, say it will happen… someday.

“The next decade is really going to be the decade of unlocking the potential and economic viability of UAM,” Marshall says. “And I think UAM won’t be far behind. It’s the wave of the future.”

“This is my generation’s moonshot,” Terwilliger adds. “This is our way to contribute to positively changing the world.”

Embry-Riddle Researchers Help Pave the Way to UAM Development

BY KELLY PRATT AND JON O’NEILL

Urban air mobility (UAM) innovation and the development of new aircraft propulsion systems are more possible today, thanks to revised Federal Aviation Administration (FAA) standards that went through much of their formatting stages at meetings hosted by Embry-Riddle over the past decade.

Driven by Congress’ Small Airplane Revitalization Act of 2013, updating the FAA’s Code of Federal Regulations required overhauling its Part 23 airworthiness standards for general aviation airplanes weighing less than 19,000 pounds with 19 or fewer seats, with an eye toward getting safety-enhancing technologies to the marketplace more quickly. The revised rules—effective August 2017—give manufacturers leeway to employ what are known as consensus standards to meet airworthiness requirements.

“Embry-Riddle really was one of the cornerstone locations for all of this to begin,” says Greg Bowles (’98), an aerospace engineering graduate who is now working at Joby Aviation, a UAM startup. Bowles helped organize stakeholder meetings during his time as a vice president of global innovation and policy for the General Aviation Manufacturers Association (GAMA).

Professor of Aerospace Engineering Pat Anderson, whom Bowles studied under when he was a student, played a vital role in getting the revision effort off the ground. Working with GAMA, Anderson organized meetings and conferences that helped create the consensus the FAA was looking for to drive the revision of Part 23.

“The rules had been outdated for 30 years,” says Anderson, chair of GAMA’s Electric Propulsion Committee. “It was very prescriptive with means of compliance written directly into federal law. It was essentially a guide on how to build an aluminum airplane.”

Building something as unique as a flying taxi or a personal air vehicle and bringing it to market wouldn’t have been possible until the regulation overhaul. Thanks to private industry’s efforts to work hand in hand with the FAA, Part 23 went from 277 pages down to 74 pages of rules, and established new means of compliance contained in consensus standards that groups like GAMA helped create.

With Embry-Riddle on the leading edge of UAM and new technologies such as hybrid electric propulsion, helping change outdated standards is key to pioneering future aircraft. Anderson says, “This allows significantly more innovation because you don’t have to change the rules to do something novel.”
David Rogers (‘89) never imagined his career path would lead to blockchain technology. Powering Investment in Clean Energy

Starting Again, at a Startup
Around 2016, the software company where Rogers served as director of software quality assurance moved into a different business sector, leaving Rogers, then 50, to hustle contract gigs, mostly in the med-tech industry. “One day, I met this greengar-ous Scotsman on a diving range who was looking for someone to manage the software side of his startup business,” he recalls. At that point, Zyen’s focus was industry-specific government and private contracts for bid. For example, the owners of a cement company could sign up to receive push-notification alerts when new construction contracts had been posted that they could potentially bid on.

From there, Zyen founder and CEO Alastair Caithness noticed that many contracts crossing his desk involved oil wells in Texas and the Illinois Basin, which had been abandoned during the most recent industry bust. “These unused wells were sitting around like Solo cups after a barbecue,” Rogers says, “and while larger companies wouldn’t bother with them, for a smaller company, a $30 million oil field looks good on the bottom line.”

Originally, Caithness suggested acquiring the wells in terms of interest — taking advantage of existing wells, rather than drilling in pristine resources — and, in an ironic turn, using wind turbines to power the oil production.

“Because of this boutique idea, Zyen began to be invited to join conferences with some big energy players,” Rogers says. “We were on the downs with people from Shell, BP and Exxon, and as part of those interactions we heard that many companies had begun looking toward blockchain for their secure contracts. We thought, ‘How can Zyen apply blockchain?’”

That’s when Caithness’ original concept began to evolve. Instead of a small-scale, well-by-well approach, Zyen could use blockchain as the catalyst to transform the global energy sector from fossil-based to zero-carbon before the second half of this century.

Diving Into Blockchain Technology

With blockchain — a shared, decentralized information record that can pass information from one entity to another in an automated, secure manner — one party initiates a transaction by creating a block, which must beverified by a chain of network computers before the next step begins. The best-known uses of blockchain, such as Bitcoin, use it for monetary transactions because blockchain requires no transaction or currency conversion charges from banks or credit card companies.

Unlike the unparalleled cryptocurrency Bitcoin, however, Zyen was proposing a new digital currency, called ZiyenCoin, backed by energy assets, that would report to the U.S. Securities and Exchange Commission and follow the agency’s guidelines. Information about each new project, including geological and financial statements and tax distributions, would be available on a newly developed ZYEN platform, giving the public the opportunity to invest in its equity through “tokens,” or digital shares. Blockchain tokens representing the asset would be tradable on secondary markets, just like traditional securities. By the end of 2020, the ZYEN platform will make it possible for users to invest in oil and gas projects alongside renewable energy projects for the first time in history.

“Today, if someone wants to support renewable energy and the reduction of carbon emissions, they’re fairly limited in their options. They can drive an electric car, put solar panels on their roof, perhaps buy stock in Tesla,” Rogers says. “The tokenization of assets of renewable projects will allow much broader, democratic opportunity for people on the street to invest in these projects.”

Refinancing Renewable Energy
In four years, Rogers has helped Zyen pivot from providing bidding-contract software to purchasing oil leases, to producing blockchain technology that supports renewable energy projects. “This whole thing grew up around us,” he says. “You don’t want to end up in a 9-to-5 job you’re bored with. Here, I’m exposed to new, cutting-edge ideas every day, and I think that’s terribly exciting. Having the opportunity to get into something that’s going to be new to the market and enable companies to ‘bootstrap’ projects that much faster is so worthwhile.

“Everyone says we need to move from traditional to renewable energy, but that’s not a matter of just flipping a switch. We need to plan that transition.” — DAVID ROGERS (‘89)
Expanding Horizons
FedEx, Spirit Airlines’ scholarships encourage diversity in aviation

Scholarships for Women
The FedEx Purple Runway Aviation Scholarship is awarded to aviation maintenance science students at Embry-Riddle, with a goal to expose women and other underserved populations to aviation careers, while the Spirit Airlines Charitable Foundation has funded two scholarships, with a preference for female students.

“This scholarship allows me to be one step closer to achieving my goals and to concentrate more on my studies,” says Newport, who received a FedEx Purple Runway Aviation Scholarship.

Building a Diverse Workforce
Aeronautical science student Hailey Auterson was thrilled to become the first Spirit Airlines scholarship recipient. “This scholarship is very important,” Auterson says. “Going through college and becoming an airline pilot is very costly, but I am determined to find a way to earn my degree no matter what life throws my way.”

President of the Spirit Airlines Charitable Foundation Laurie Villa says students, like Auterson, represent the future of aviation.

“We believe that change starts by giving back in the communities where we live and work, and part of our mission is to inspire women to go into the field of aviation, aeronautics and STEM. This will ensure that our industry continues to be diverse, inclusive and equitable for everyone.”

Female Initiatives
Attracting and retaining more talented female students is a university initiative, as well. Women comprise roughly 23% of Embry-Riddle’s collective undergraduate student body (residential campuses). “Given the pilot shortage that we’re facing, it’s critical that we tap into the entire potential talent pool and do a better job of recruiting more women into the pilot pipeline,” says Michele Halleran (’04), a professor of aeronautical science and the director of diversity initiatives for the College of Aviation at the Daytona Beach Campus.

Halleran leads the university’s Women’s Initiative Committee. Composed of female faculty and staff, the group’s mission is to recruit, retain and support female students.

A mentoring program for aspiring female pilots was launched in 2019. Other initiatives include a university-wide Women’s Giving Circle, which will raise funds for scholarships for female students, and a Women’s Alumni Network.

To get involved, contact Stephanie Kenyon at erau.edu.

DOUBLING THE IMPACT
Board of trustees launch Scholarship Endowment Matching Challenge

At the direction of Chairman Mori Hosseini (HonDoc ’13; ’78, ’79, ’82), the Embry-Riddle Board of Trustees has launched a Scholarship Endowment Matching Challenge to provide more students with tuition assistance, in perpetuity.

The challenge will match, dollar for dollar, cash gifts or pledges of up to five years that total $100,000 or more and are directed to scholarship endowment funds at the university. Leading the charge to build the scholarship endowment, Vice Chair of the Board of Trustees Jim Henderson (HonDoc ’13) was the first to take the challenge.

“I can’t identify a better use of money than to help a student get through college,” Henderson says. “And there is such a visible benefit of that gift.”

A trustee since 2003, Henderson has been connected to Embry-Riddle since 1969, when he served as the school’s external auditor.

“I started a scholarship several years ago, and this contribution honors and builds upon that commitment,” says Henderson, who designated his gift to support business students with financial need.

Henderson, who is chairman and CEO of AssuredPartners, a private insurance brokerage firm, says the board’s matching incentive was attractive, but he also made his gift to encourage other trustees, community members, alumni and friends of the university to support scholarships, as they are financially able.

In addition to Henderson, board of trustees members Joe Martin (HonDoc ’13; ’78, ’79, ’82), Neal Keating and Glenn Ritchey, and University President P. Barry Butler and his wife, Audrey Butler, have also made scholarship commitments to take advantage of the challenge.

“This pool of matching funds is limited,” explains Senior Vice President of Philanthropy and Alumni Engagement Marc Archambault, “so those wishing to seize the opportunity to double the impact of their own contribution are encouraged to reach out promptly.”

To make a gift
To contribute, visit givingto.erau.edu/100kchallenge or contact Marc.Archambault@erau.edu or 386-226-7770.
Rowing the Distance

Former Air Force aviator sets world record for completing the longest solo, nonstop, unsupported ocean row across the Pacific from North America

BY JENNY QUILL

It’s 3 a.m. and Jacob Adoram Hendrickson (’02, ’13) has been rowing nearly nonstop for 16 hours. He has spent the last 335 days paddling across the Pacific, and he’s within 5 miles of his destination: Cairns, Queensland, Australia. Strong winds and ocean currents have made the final hours especially challenging, but Hendrickson’s blog post from that final day reveals his unsinkable nature:

“As the skies give way to darkness, I attempt a quick rest break. The second I stop rowing I immediately start losing angles to the north. I can’t afford breaks. I eat as quickly as possible then get back to it. Quitting isn’t an option. It’s the last major push towards shore on day 335 at sea; I’ll row until something breaks.”

Hendrickson crash-landed on Trinity Beach the following day, June 8, 2019, with a lot to celebrate.

Looking for a Challenge

The seed for Hendrickson’s 7,145-mile journey was planted eight years earlier when the U.S. Air Force fighter pilot was assigned to an air liaison role—a desk job—in Fort Irwin, California. He had dreamed of being a fighter pilot since high school and had attended Embry-Riddle’s Daytona Beach Campus because it boasted the largest Air Force ROTC detachment. Having flown 170 combat missions in his dream job, this new assignment was a gut check. “I wasn’t feeling good about the direction of my career,” Hendrickson says. “I wanted to find out how I could become more fulfilled and find more meaning in life. I wanted to do something physically challenging.”

Hendrickson zeroed in on a challenge: completing the longest solo, nonstop, unsupported row across the Pacific Ocean from North America. At the time, the only person in history to come close was British rower Peter Bird, who rowed from San Francisco to Australia in 1982 but had to be rescued a quarter mile off the Great Barrier Reef. In 2015, John Beeden completed the challenge by successfully making landfall. But unlike Bird and Beeden, Hendrickson had zero rowing or ocean-going experience, and he was planning to row a greater distance without any resupplies or stops along the way.

Building the Perfect Boat

To accomplish his goal, Hendrickson needed a boat. A Google search led him to naval architect Eric Spornberg. They discussed the project for nearly two years while Hendrickson was still in the Air Force. When Hendrickson’s Air Force career ended in 2014, Spornberg began designing in earnest. The result was a 28-foot-long, 2,400-pound ocean rowboat capable of storing a year’s worth of food, equipment and electronics; a forward cabin dedicated to Hendrickson’s living area; and a hardtop-covered rowing station situated in the center.

The task of building the boat fell to Schooner Creek Boat Works of Portland, Oregon. Construction came in fits and starts as Hendrickson worked to finance the project. But in 2018, the boat—christened Emerson after Hendrickson’s favorite English bulldog—was complete.

To train for the journey, Hendrickson spent three years getting into shape, even going so far as to bike the entire length of the United States in 2015. He studied maritime weather and navigation. Once Emerson was complete, he spent 12 weeks with her, training, testing and organizing. The final two weeks prior to departure were spent rowing in Neah Bay, Washington, including his first and only open-ocean trial run.

Moxie vs. Mother Nature

Hendrickson departed Neah Bay on July 7, 2018. His first day at sea proved a hard slog as strong currents hindered his progress. During the trial run, it had taken two hours to paddle out into the open ocean; on this day, it took eight. “I felt like I was rowing through mud,” Hendrickson says. “I was tired, sore, anxious and having all kinds of doubts.”

Eventually, the tides turned in his favor, and he settled into a rhythm. Each day, he rowed an average of 10 to 12 hours, listening to podcasts, music and audio books to pass the time. The sheer vastness of his surroundings intimidated and inspired. From his blog, day 265:

“The silence is almost painful. There can’t be anything else like it. Maybe there is, but I’ve never been fortunate enough to stumble upon such intense serenity.”

Hendrickson’s most challenging day at sea came at the hands of Tropical Cyclone Ann. “All of a sudden it went quiet,” Hendrickson says. “And then a wave hit broadside. Water rushed in, and I hit my head on the ceiling. When the boat finally came back upright, I started hearing this crazy loud creaking sound I had never heard before.” In the pitch black, rain pouring down, Hendrickson fumbled for the source of the sound, discovering that his spare ears had ripped off the side of the boat and were dangling by a lashing. He pulled them back in, cutting his hands badly in the process. Undeterred, Hendrickson rode out the storm, grateful for Emerson’s self-righting capabilities.

Now, Hendrickson is gearing up for his next great adventure: finding a job, a home and, possibly, settling down. “I realize I want to pay attention to what I do and do it mindfully,” he says. “I’m realizing that maybe getting married and having kids is more important than I thought it would be.”

As for Emerson, she was recently on display at the Portland Boat Show, and Hendrickson is in talks with a maritime museum regarding her possible acquisition.
Eagle Impact

Around the globe, alumni step up to combat and contain pandemic

Months before the novel coronavirus started circulating around the planet, we planned to launch a new Lift department that would highlight the university’s global impact and its internationally connected alumni. We didn’t expect to inaugurate this new Global section during an unprecedented pandemic, but given the timing, we’d be remiss not to address it.

Eagles who work for airlines, airports and the Federal Aviation Administration and in medical settings became front-line workers, as they continued to report for duty, despite the virus threat. Other alumni stepped up to help their communities.

For example, Phil Rosnik, a volunteer command pilot and chief mentor pilot for Angel Flight West (AFW) alumni stepped up to help their communities.

Others, like Gabriel Bontz (’15), a partner at Slant 3D, used their engineering and manufacturing skills to create protective face masks for front-line medical workers. “We have redirected our 3D printing farms to help medical personnel and have been manufacturing 1,000 3D-printed face shields per day, in order to address the protective equipment supply shortages felt during the COVID-19 epidemic,” Bontz says.

At Embry-Riddle, 22 staff people have been mobilized to serve as digital engagement officers. “With many states adopting a stay-at-home ordinance during the pandemic, we are engaging alumni and friends through video and telephone visits to share words of support and encouragement during these difficult times,” says Donald Hale, executive director and digital engagement officer.

As many Eagles moved to their home offices to telework during the pandemic, several shared their experiences with us. Following are a few of their stories.

Spanish Lockdown

“Sushi restaurant chain owner, to shipbroker, to now Realtor in southern Spain. My company is called We Sell Homes In Paradise, and currently it’s ironic, as what’s going on in Spain is not paradise at all. Right now, we have been locked in for more than a week and this has been extended to the middle of April. I am based in Sotogrande, southern Spain, with my wife and four kids trying to work from home. It’s very hard, and I think this photo sums it up.” — Stewart Craig (’88)

Sewing for a Purpose

“I’m making face masks with all my spare fabric for the #Millionmaskchallenge! (A global sew-a-thon supporting healthcare workers and those in need)” — Embry-Riddle Associate Professor Kelly George (’15)

Mobile Hospital View

“I just took this picture off my deck. These are crazy times we are in.” — Douglas Muir (’84)

Read more alumni coronavirus coping stories: alumni.erau.edu/athome.

Virtual Space

Embry-Riddle establishes joint space research lab with the University of Luxembourg

By Cynthia Pickett

Researchers at Embry-Riddle and the University of Luxembourg are collaborating in network-connected labs to develop technology for future space missions.

The Joint Space Research Lab is a partnership between Embry-Riddle’s Engineering Physics Propulsion Lab (EPPL) at the Daytona Beach Campus, the Worldwide Campus and the University of Luxembourg’s Research Unit in Engineering Science.

“The new lab explores steam propulsion technology for deep space exploration and prospecting missions,” says Edder Jose Rabudan Santana, a University of Luxembourg postdoctoral researcher helping to build the lab.

As humans go into deep space, it will become more critical for them to generate their own products with local materials, a practice called in-situ resource utilization (ISRU). The new lab will use virtual tools that simulate spacecraft control on the surface of the moon, Mars and asteroids to develop environment technologies for ISRU.

“The lab will provide Embry-Riddle with a partner in Europe to work with on joint research and access European grants,” says Bob Walton, associate professor at Embry-Riddle’s Worldwide Campus College of Business and EPPL representative in Europe.

Vision

Walton and Sergei Draelov, professor of engineering physics and director of EPPL, saw the potential to extend projects into Europe, and the University of Luxembourg was similar to Embry-Riddle, in terms of space interest, which made it an ideal partner.

The Joint Space Research Lab will explore steam propulsion technology and in-situ resource utilization for deep space exploration.

“This kind of collaboration is very exciting because it presents unique student exchange opportunities. The ability for students to conduct simultaneous research in labs either in the United States or Luxembourg, without physical parameters, not only enhances the environment for learning, it also enhances the potential for new ideas and collaborations,” says John Watret, chancellor of Embry-Riddle’s Worldwide Campus. “This cooperation strongly supports strategic global initiatives that are in Embry-Riddle’s Strategic Plan to provide students with robust international learning opportunities.”

The partnership with the University of Luxembourg is possible because Embry-Riddle is fully licensed in Berlin, Germany, with a campus that opened there in 2007. “Not every university can do this. We have experienced tremendous success with expansions in Brazil and Singapore, and we are very excited to have this unique partnership in Europe as it allows us to provide global opportunities for student and faculty interaction,” Watret says.

The new lab explores steam propulsion technology for deep space exploration and prospecting missions.”

Students discuss attitude determination and control system testing protocols, which monitor and control satellite systems, at the Luxembourg space research lab.

Read more alumni coronavirus coping stories: alumni.erau.edu/athome.
FULL STEAM AHEAD

Marie-Jeanne Steady Ndiaye ('13) is using hands-on learning techniques to inspire and educate young people in West Africa

BY CYNTHIA PUCKETT

When she’s not working fulltime as a human interface devices (HID) human factors engineer, Marie-Jeanne Steady Ndiaye ('13) is demystifying science and igniting a passion for flight in the hearts of young people in Senegal, Africa.

In 2019, she helped organize the Saly Airshow in Dakar, Senegal. It was the first international aeronautic event of its kind in West Africa and drew a crowd of nearly 3,000. As the co-founder and technical director of the Senegalese Alternative Learning Association (SALA), she’s also working to integrate hands-on science, technology, engineering, art and mathematics (STEAM) projects into Senegalese classrooms.

“On the day of the airshow, a 6-year-old boy came up to me while they were doing aerial performances, and he said, ‘I could never put myself in that airplane. My heart is not meant for it. But I can be the one to build that plane and myself in that airplane. My heart is not meant for all those things.’ That’s the whole point of SALA and the Saly Airshow,” Ndiaye says.

Classroom Change Agent

Ndiaye co-founded SALA in 2017 with her husband, Frederic Ndiaye ('04, '12), executive director of enrollment, student success and retention at Embry-Riddle, and her best friend Codou Mbow. A STEAM advocacy group devoted to promoting all things science, Ndiaye conducts most of her work for SALA from her home office in the United States, but makes frequent trips to Senegal.

“SALA is a stark departure from Franco-Senegalese methodology, which is very heavy on theoretical teachings,” Ndiaye says. “Ours is a totally different approach to teaching. We’re introducing science at an early age, in fun ways, through hands-on workshops. Our motto is science always, in all ways.”

“We’re introducing science at an early age, in fun ways, through hands-on workshops. Our motto is science always, in all ways.”

As SALA’s technical director, Ndiaye creates curriculum and tailors it so it’s relevant to the environment and makes sense to young students. She also networks to find and pair mentors with students and promote workshops.

“Private schools pay us for our workshops, and we use the money to buy materials to do free workshops in underserved and underprivileged communities. We also do workshops in underfunded public schools and in the remote areas where the government almost forgets that there are people,” she says.

Personal Motivation

Ndiaye can relate to the students her program benefits. She says she struggled in school in Senegal, because European teaching methods weren’t conducive to her learning style. After attending a physics and math camp in the United States that involved solving real-world problems, everything changed and she excelled.

Ndiaye earned both bachelor’s and master’s degrees in human factors from Embry-Riddle, and has worked for United Space Alliance, NASA (Kennedy Space Center), Embry-Riddle, The Boeing Company and now Apple. She credits her career success in part to Embry-Riddle, for teaching her how to network — a skill she uses broadly today in her role at SALA.

Traveling home to Senegal between semesters in college with kits donated by NASA, Ndiaye led science workshops in community centers, churches and schools. In 2011, the U.S. Embassy asked her to speak with parents of prospective international students about her experiences studying in the United States as a representative for the newly launched EducationUSA program.

Education Game-Changer

Ndiaye believes science can be used to catapult individuals and their families into higher economic and social levels and set them on a path toward financial freedom.

“The reality is, a brilliant young girl living in a remote area is not necessarily prioritizing school, but at about 12 to 13 years old, her father sees her as a financial liability and wants to marry her off to someone who is financially secure. This young girl is not thinking about science and math, she’s thinking about not getting married,” Ndiaye says. “I can teach her technical skills and turn her from a financial liability to a financial asset, she’s going to be left alone.”

The Senegalese Alternative Learning Association, co-founded by Marie-Jeanne Steady Ndiaye, organizes science, technology, engineering and mathematics workshops in underfunded public schools and in remote areas of Senegal.

Marie-Jeanne Steady Ndiaye ('13), a United Airlines pilot and programs co-chair for the Organization of Black Aerospace Professionals, partners with SALA to inspire students to pursue aviation careers.

SALA workshops are a departure from Franco-Senegalese teaching methodology, which focuses on theoretical teachings, as opposed to hands-on instruction.
MESSAGE FROM THE EXECUTIVE DIRECTOR

Have an aeronautical day

Earlier this year, I had lunch with some visiting alumni at Embry-Riddle’s new dining experience at the Daytona Beach Campus: Boundless. Branded as an all-you-care-to-eat restaurant, this mini-mall of elevated food stations offers a smorgasbord of tasty offerings — and limitless servings — all for one price. After ordering a salad from one of the dining stations, I was handed a carefully crafted custom bowl of leafy greens, fruit, nuts and cheese, and greeted with a friendly, “Thank you, have an aeronautical day!”

While our vocabulary doesn’t define us, it can certainly add flavor and meaning to our encounters with others. The salad artist at Boundless must recognize this truth. Like the cherry on top of an ice cream sundae (which I avoided this time), or the sprig of mint afloat in an iced beverage, she joyfully seasons each transaction with a unique-to-Embry-Riddle garnish. She’s not alone. As I cross the country and travel abroad meeting with alumni — now close to 140,000 strong — I find a similar aviation-minded and purely Embry-Riddle spirit.

Our alumni share a collective drive to achieve, to lead, to innovate, to design-build, to rise to great heights — 30,000 feet … and beyond. And, to make a difference for others — especially their fellow Embry-Riddle Eagles. Everywhere I go (physically and virtually), I see Eagles helping Eagles. From offering résumé advice and mentoring, to sharing business leads, doing beach and park cleanups, running 5 and 10Ks for charity, helping build homes for the needy, leading club sports for our students, and volunteering for university and community boards and committees.

It’s the Embry-Riddle way. It’s not only our passion for aviation and aerospace that we share. It’s the way we treat our co-workers, family, friends and neighbors. We see the difference we can make in the world with the skills and aptitudes we’ve developed through our lifelong love of learning and in our professions, and we choose to apply those skills to help others. We give of our talent, time and treasure. It’s just who we are. It’s part of our vocabulary.

I’m proud to be an Embry-Riddle Eagle, and I’m proud of all of you. In the words of my friend at Boundless, “Thank you, and have an aeronautical day.”

Forever an Eagle,

Bill Thompson (’87)
Executive Director

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instagram.com/erau_alumni/
alumni.erau.edu/podcast
Grand Fam

Eagle baseball players share a lifelong bond

BY MICHAELA JARVIS

That’s why every other year the athletics department invites former players from all eras of the Daytona Beach Campus baseball program back to St. Augustine, to challenge the current players in an alumni baseball game. “It’s about bridging the gap between old and new players,” says Assistant Coach Chuck Stegall. “And, it gives them a chance to see each other!”

Chuck and his brother, Head Coach Randy Stegall, established the biennial tradition in 2010. This past year, about 30 former players from as far back as the 1990s came for the game.

One of those who returned to campus, Phillip Reamy (’10, ’13), an Eagle pitcher and now an air traffic controller in Syracuse, New York, says, “You put so much time and effort into it when you’re playing here, you cannot help but want to stay invested.”

Richard “Richie” Cormier, who played on the team from 2003-2005 and now owns his own insurance company in Sebring, Florida, agrees. “We may have never played together, but we have a bond. It’s a brotherhood.”

Guys Weekend

Martin and a smaller group of alumni have taken the biennial game to another level, getting together every year in a different city to maintain the friendships they began in the late 1990s — an era when the team brought home its first conference championships, won its first regional title and achieved the baseball team’s first No. 1 ranking in the National Association of Intercollegiate Athletics.

Fast-forward through graduation, bachelor parties, weddings and random get-togethers, and Martin and his former teammates decided to make time together an annual priority. Guys Weekend was born.

The first Guys Weekend took place in 2009. Since that time, the group — about 10 guys — has met in cities all over the country.

“The trips have gone from all-night liver killers to golf and catching up with best friends,” says Mike Magee (’99), a pitcher and the founder of a Maryland golf and catching up with best friends, “says Mike Magee (’99).”

Martin adds, “We laugh about the evolution of this and what it will look like 15 years from now. Someone will have a walker, and we won’t even leave the house we rent.”

An old adage says one of the reasons to go to college is to broaden your perspective and your circle of connections, and these former Embry-Riddle baseball players can certainly attest to that.

“My experience at Embry-Riddle shaped who I am today,” says Kevin Hawkins (’01), pitcher and now an engineering director at Qualcomm in San Diego. “I still remember moments in classrooms just like I remember moments on the field. Maybe most importantly, I have this bond with the guys in this group.”

Magee agrees. “As I get older I realize how few ‘lifetime’ friends I’ll make and most of those friendships were developed at Embry-Riddle. Getting together with best friends and catching up on life, family, business — what could be better?”

I may have never acknowledged to members of the Embry-Riddle baseball team at the tail end of the 20th century that they were establishing lifelong friendships that would affect their lives for decades. But they were.

“We were all so young,” says Luke Martin (’02), a left-handed pitcher and now global logistics manager for Lockheed Martin. “For most of us, it was our first time out of the house. So, we kind of grew up together through all the ups and downs of being 18 or 19 years old, playing collegiate-level athletics, and having to go to classes and keep your grades up.”

Martin and a tight-knit group of his teammates have stayed in touch ever since. Eagle baseball alumni — regardless of when they played on the team — share a similar connection.

A tight-knit group of Eagle baseball alumni get together in a different city every year for Guys Weekend. The first Guys Weekend took place in 2009 (top photo). At a more recent Guys Weekend (above), the guys participated in Embry-Riddle’s Golf Tournament. Pictured, from left, Kevin Hawkins, Johnny Yazzolino, Mike Magee and Luke Martin.
Share your Class Notes with Lift and your fellow alumni. Email announcements to eralumni@erau.edu or go to: lift-erau.edu/submit-class-note.

Career News

1970s

Rick Pultak ('76) received the Federal Aviation Administration's (FAA) Wright Brothers Master Pilot Award, which recognizes individuals who have exhibited professionalism, skill and aviation expertise for at least 50 years while piloting aircraft.

Beverly Drake ('77, '02, '05) was awarded the FAA Pilot of the Year Award by the Guyanese Army, Drake is a program manager for air traffic operations at TRAXXALL, a business-aviation maintenance management partner.

Capt. Mike Lundeen ('79) was named to the Tampa Bay Business Journal's Young Professionals Hall of Fame. Lundeen is a systems administrator at Phantom Eagle in Virginia.

1980s

Capt. David Singleton ('87) was the FAA's senior non-commissioned officer, Hamann is president of his own consulting company, WxWar Consulting.

Capt. Dennis R. Haber ('84) was recently promoted to Boeing 787 Line Check Airman at Atlas Air.

1990s

Capt. Mark Farquharson ('87) is a systems administrator at Phantom Eagle in Virginia. He shared: “At 50 and after 40-plus years, I’m finally pursuing the rest of my dream all the way to ATP. About to start on my instrument rating after BFR, then commercial, complex aircraft, multi-engine and on to ATP.”

Brian Mahoney ('90) is owner of Airline Aviation Safety Consulting (AASC) in Miles, North Dakota. He founded the U.S. Air Force as an air traffic controller, then a pilot. He retired from the military after 29 years and started his own business as an aviation safety and operations consultant.

2000s

Capt. Robert Scott Laedlein ('90) was recently promoted to director of training at FlightSafety's Dallas Fort Worth offices in the sky. The airline captain was named on the Prescott Campus Chancellor’s Alumni Hall of Fame in October 2019, in recognition of his service to students and the aviation industry. “Since 2011, Kurtis has connected with close to 6,000 students about piloting careers,” says Bill Thompson (’87), executive director of alumni engagement. These connections were largely fostered through his involvement with the education committee for the Prescott Campus Pilots Association ACE Club.

Other Industry News...

Several Embry-Riddle graduates credit Ludwig for helping them achieve career success. Capt. Scott Singleton ('14) is one. “I wouldn’t be where I am without Kurtis. His guidance and insight into this industry allowed me to grow into the airplane pilot I am today,” Singleton says. An Airbus A220 captain for Delta Air Lines, based in New York City, Ludwig graduated with a bachelor’s degree in aeronautical science from the Prescott Campus. He worked as a flight instructor at the Daytona Beach Campus before starting his career as a commercial pilot for cargo, corporate and passenger operators. Ludwig met his wife, Alicia, as a student at Embry-Riddle. The couple have two daughters, Shelby and Kailie.

EDITOR’S NOTE: The Chancellor’s Alumni Hall of Fame was established in 2012 to honor the significant contributions of alumni to their profession, the community, the campus and the university. Since that time, 23 awardees have been recognized.
Diana Roe Lt. Col. Charles Samuel
36 37
JetBlue Airways. first officer on the Airbus A320/321 for around the world. Gambino serves as a operations officer with the U.S. Air Force, stationed at Columbus Air Force Base in Mississippi.

Tyler Christenson ('19) is a pilot at Delta Air Lines. He shared, “Along with flying the line as a 737 First Officer in Atlanta, I have been working with the Delta Prop Pilot Career Path Program for the past year as a co-lead with Embry-Riddle Daytona Beach Campus. It has been a lot of fun working with my alma mater and current students during this exciting time in aviation.”

Elise Laguistron ('13) and Madeleine Edmon ('11) both competed in the 2019 IronMan 70.3 Victoria in Victoria, British Columbia, Canada. Both were student-athletes at the Daytona Beach Campus. Laguistron was on the women’s tennis team and Edmon played on the women’s soccer team.

Daniel Mondragon ('13, '15) is a retired basketball player at Davis & Elkins College in Elkins, West Virginia. Mondragon worked as an assistant coach at Embry-Riddle from 2012 to 2016 and played professional basketball for the Eagles from 2009-13. Mark Newpower ('13) completed his Ph.D. in Medical Physics from the University of Texas MD Anderson Cancer Center, University of Texas Health Graduate School of Biomedical Sciences in Houston, Texas.

Capt. Keith Novatnak, Jr. ('15) and First Officer Alice Novatnak ('18) are pilots for Piedmont Airlines. Originally from Pettenpolonia, the siblings both began flying at age 15, and Keith was Alice’s first flight instructor. Alice represented Embry-Riddle in the 2018 Women's Air Race Classic and was a flight instructor at Embry-Riddle.

Albert Apaloo ('16, '18) is a quality assurance analyst for the NASA Goddard Space Flight Center. Ferullo shared, “After leading the ISS Robotics Control Center. Our robotics team worked tirelessly through multiple failures and management requests this entire mission.” Fellow Eagles Rick Funkhauser ('04), a retired commercial pilot, flight instructor and air traffic controller, recently received the FAA Wright Brothers Master Pilot Award. Michael Ferullo ('07, '18) is a regional IT systems analyst/project lead. John Chiumento ('06) is a national manager of pilot scheduling operations for Delta Air Lines.

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EAGLE AUTHORS
ON THE BOOKSHELF

Col. Augusto "Augie" Casado ('82) published the book My Hay!, a compilation of 365 daily emails Casado sent his sons, Ben and Alex. Casado is manager of the Federal Aviation Administration’s Flight Standards Strategic Planning and Financial Services Division. Serving in the Air Force Reserve, he is also the 10th Air Force director of logistics, engineering and force protection.

Capt. Scott Costin ('90, '93) authored The Doctor Won’t See You Now: Be the Savvy, Successful Biopharma Representative in a Rapidly Changing Industry, published in 2017. A U.S. Air Force veteran, Costin has worked as a manufacturer’s representative in the biopharmaceutical and pharmaceutical industry for the past 20 years.

Fr. Patrick Kokorlan ('98), M.M.A, authored and illustrated a graphic novel titled The Weapons of War: Brendan and Eric in Exile. Published in 2018 under Kokorlan’s pen name, Amadeus, it is the third volume in a series that seeks to inform and enlighten Catholics and non-Catholics about God and the church. Kokorlan was named abbot (head monk) of the Most Holy Trinity Monastery in Peterham, Massachusetts, on Sept. 24, 2019. He is the second abbot of his order, Maronite Monks of Adoration.


David J. McGowan ('74) authored and published in 2019 a memoir: Delta Shotgun: A Recce Pilot's Story, published in 2019. His three children, Emma, James and Mary Grace Sorenson, helped illustrate the book, which was inspired by stories Sorenson would tell his children when they were younger. For every 10 books sold, the author donates one to a library kid zone. Sorenson is a current Embry-Riddle student studying homeland security.


Donna Roberts ('10), associate professor and chair of the social sciences and economics department and chair of undergraduate research at the Worldwide Campus in Germany, authored Psychographic Segmentation: Psychological Measures Related to Consumer Behavior and Lifestyle, published in 2019 by Verlag Dr. Kovac.

Houbing Song, an assistant professor of electrical engineering and computer science at Emby-Riddle, is the co-editor of four books. The latest, Big Data Analytics for Cyber-Physical Systems: Machine Learning for the Internet of Things, was published in 2019 by Elsevier.

Capt. Walter F. Sorenson Jr. ('84) authored Do You Live in a Barn? A Children’s Story, published in 2019. His three children, Emma, James and Mary Grace Sorenson, helped illustrate the book, which was inspired by stories Sorenson would tell his children when they were younger. For every 10 books sold, the author donates one to a library kid zone. Sorenson is a current Embry-Riddle student studying homeland security.

ARE YOU AN AUTHOR? eagleauthors features traditionally and self-published books authored by Embry-Riddle alumni and faculty. To have your book considered, email liftmag@erau.edu.

Anurada Hindle ('19) is an A320 First Officer for Airbus in Ho Chi Minh, Vietnam.

Jorge Morante ('19) is now a Boeing 777 First Officer.

Felipe Orzoco ('19) is an engineer at Raytheon in McKinney, Texas.

Chad Steams ('19), who is a former president of the Student Government Association at Embry-Riddle’s Daytona Beach Campus, received the Florida Association of Colleges and Employers Student of the Year Award.

Marriages/Engagements

1990s

Jeff Forste ('90) and Catrina Riediger Forste ('90) celebrated 24 years of marriage in November 2019. They are also the parents of a senior and a freshman in college, both of whom are attending Embry-Riddle’s Daytona Beach Campus.


2010s

Brittany Novy-Mackey ('13) and Andrew Zack ('14) got engaged Oct. 9, 2019, while celebrating their seven-year anniversary in Iceland. Novy-Mackey writes: “On that night, in our rented cabin under the Northern Lights and Milky Way, with not a soul for miles, we danced to our song, ‘We’ll Meet Again,’ by Vera Lynn, and he asked me to be his forever.”

Jenna Ludwig Slater ('14, '17) and Jesse Slater ('14) were married in February 2019. This past year, they moved to Tampa, Florida, where she works for the ICON Aircraft company’s flight center, and he is a data analyst and professor at Emby-Riddle’s Worldwide Campus.

Elijah Gravenhorst ('19) proposed to his girlfriend, Emily Ashley, while being serenaded by the Embry-Riddle AcaFellas singing group after the Dec. 16, 2019, commencement ceremony at the Ocean Center in Daytona Beach, Florida.

Other

1980s

Capt. Ron Barnard ('80) piloted an American Airlines B-777-200 on Oct. 18, 2019, from Miami to Barcelona, Spain, with two other Eagles: First Officer Kent Thorpe III ('81) and Craig Feinberg ('82). Barnard was Thorpe’s first primary flight instructor.
They’d Never Get Me to Wear [That]

“The photo taken in Prescott is of the ACES Group, which stands for Alumni Council for Enrollment Support (ACES). The group visited the Prescott Campus in 1989 for a training session. ACES volunteers helped leverage the efforts of Embry-Riddle’s office of admissions by attending and meeting with prospective students at college fairs near their homes. The program was later dissolved.

Wes Olezowski (’87)
B.S. Aeronautical Science

The Western Theme

“The photo is likely an Alumni Council for Enrollment Support (ACES) meeting at the Prescott Campus in 1988 or 1989. The nephews of the Prescott campus for what week.”

Joseph Hillmon (’87)
B.S. Aeronautical Engineering

Goofy Bandanna

“I am on the extreme right (red shirt, goofy bandanna). I supported ERAU for years as an alumni rep to various high school college nights. I remember visiting the Prescott Campus and looking over the (new) electrical engineering program, the first program that did not specifically reference an aviation tie-in.”

Douglas K. Manuel (’90, ’93)
B.S. Professional Aeronautics, M.S. Technical Management

Training Alumini to Engage Potential Students

“Yes, I am in this picture. This event in 1989 was an alumni training retreat at the Prescott Campus for a program called ACES. It was hosted by admissions and trained alumni to participate and engage potential students at college fairs across the country. Some of the participants in the photo — those I can recall — are John Weighttongton (’79), Greg Patscheke (’81), Wes Olezowski (’87), Teresa Olezowski (’88), Marcus Burke (’89, ’87), and Doug Auld (’78).”

Garrrett Iloski (’87)
B.S. Aeronautical Studies

ACES Gather at the Prescott Campus

Readers identified the alumni pictured in this photo (published in the fall 2019 edition of Lift) as volunteers for the Alumni Council for Enrollment Support (ACES). The group visited the Prescott Campus in 1989 for a training session. ACES volunteers helped leverage the efforts of Embry-Riddle’s office of admissions by attending and meeting with prospective students at college fairs near their homes. The program was later dissolved.

In Memoriam

1950s

Joseph “Joe” George Hajjaj (’73)
June 6, 2019

Richard Alan Wanner (’76)
Oct. 17, 2019

Lee Joseph Hairig (’78)
Nov. 8, 2019

Retired Maj. Brooks W. “Buster” Lovelace Jr. (’50)
Nov. 3, 2019

Robert H. Campbell (’57)
Oct. 24, 2019

Dale G. Heckman (’57)
Oct. 19, 2019

James H. Connell (’59)
Sept. 19, 2019

Richard E. Demars (’59)
Oct. 1, 2019

Capt. Chelsey Wells Berry (’54)
Sept. 18, 1919

Theodore R. McLean (’54)
May 21, 2019

Ronald Chivers (’55)
July 19, 1919

Michael W. Dolphin (’50)
Sept. 30, 1959

David A. Forney (’58)
June 3, 2019

Joseph A. “Joe” Henbury III (’59)
Dec. 27, 2019

Robert J. Spyio (’59)
Oct. 31, 2019

James Creston Welch (’71)
May 29, 2019

Joseph Michael “Mike” Krywunzyki (’72)
Oct. 27, 2019

1960s

Joseph “Joe” George Hajjaj (’73)
June 6, 2019

Richard Alan Wanner (’76)
Oct. 17, 2019

Lee Joseph Hairig (’78)
Nov. 8, 2019

Retired Maj. Brooks W. “Buster” Lovelace Jr. (’50)
Nov. 3, 2019

Robert H. Campbell (’57)
Oct. 24, 2019

Dale G. Heckman (’57)
Oct. 19, 2019

James H. Connell (’59)
Sept. 19, 2019

Richard E. Demars (’59)
Oct. 1, 2019

Capt. Chelsey Wells Berry (’54)
Sept. 18, 1919

Theodore R. McLean (’54)
May 21, 2019

Ronald Chivers (’55)
July 19, 1919

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Dec. 27, 2019

Robert J. Spyio (’59)
Oct. 31, 2019

James Creston Welch (’71)
May 29, 2019

Joseph Michael “Mike” Krywunzyki (’72)
Oct. 27, 2019

2000s

Samuel Ward Fritz (’94)
Nov. 4, 2019

David Marcus Tidwell (’97)
July 22, 2019

Charles Z. Walker (’08)
July 31, 2019

Steven M. Turley (’14)
May 26, 2019

Retired U.S. Navy Capt. Richard E. Carlson, M.D.
Former Faculty Member
June 19, 2019

Caleb Cole Origgens Daytona Beach Campus Student
July 2, 2019

George R. Mendonca
Longtime Supporter and Friend
June 25, 2019

Cndc. Irving E. Morrell
Former Faculty Member
May 5, 2019

David Rommel, M.D.
Former Board of Trustees Member
June 19, 2019

Thomas “Tommy” Townsend
Former Faculty Member
May 19, 2019

Lt. Col. Mathew “Pyr” McCarthy (’99)
Dec. 25, 2019
TAILWINDS

Vroom!

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Email: lifmag@erau.edu

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