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# High-Tech Jackets

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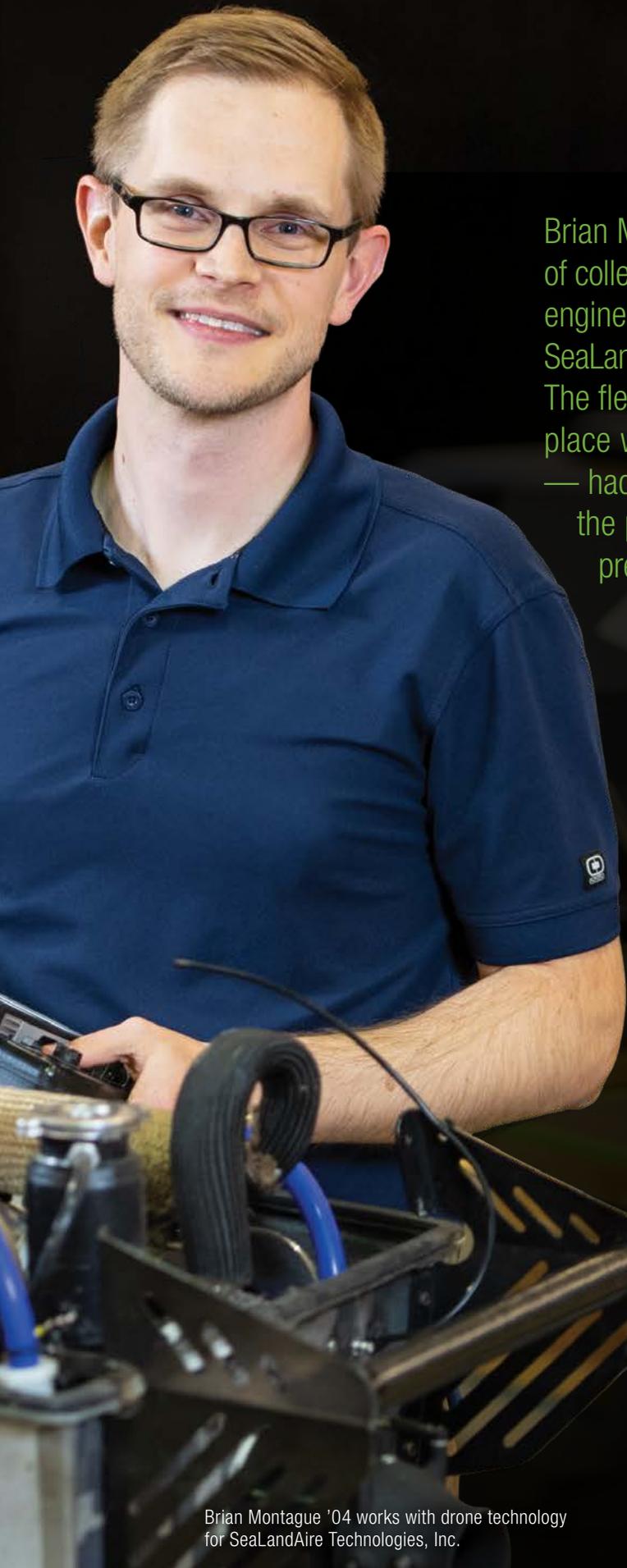
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# HIGH-TECH JACKETS

BY JEFF GILBERT '87





Brian Montague '04 was about four months out of college, newly married, and working at his first engineering job, when he was told his employer, SeaLandAire Technologies, Inc., was out of money. The fledgling drone development company — a place where he had interned since high school — had been focused on a single project. When the project died, the money dried up and the president retired.

“It was stressful,” Montague said. “But God provided for us in a way that’s even hard for us to understand when you think of all the things that had to happen.”

Soon after he stopped getting paid, Montague placed second at a national speech contest for engineers — an event he qualified for while still at Cedarville. The competition featured a cash prize, which helped him and his wife get through the next two months. At work, David Sparks was named company president, and he relied on Montague to help him submit proposals to save the Jackson, Michigan, company. They began winning bids on small jobs.

“Once we started hearing back on a few of the bids, that was very exciting,” Montague said. “But it was also trying.”

The small projects were great, but for SeaLandAire to stay afloat it needed a lucrative deal. On December 27, 2004 — Sparks’ birthday — the big deal came: a two-year, \$1.6 million job with the Defense Advanced Research Projects Agency to develop a small autonomous boat. Two months of no paychecks was over, and the company was viable again.

“We couldn’t have done it without Brian,” Sparks said. “I believe that. He added so much to our proposals.”

SeaLandAire has been depending on Cedarville engineering graduates ever since in its quest to develop small autonomous vehicles for sea, land, and air that aid the U.S. military in surveillance and reconnaissance.

Brian Montague '04 works with drone technology for SeaLandAire Technologies, Inc.

Montague was the first Cedarville hire in 2004. He now serves as the Director of Engineering, supervising 25 engineers who work in six teams on 12 to 15 projects at a time. Six of those engineers are Montague's fellow Cedarville graduates.

"The relationship's really helped us," Sparks said. "When we first hired Brian, it wasn't necessarily my intent to develop a relationship as good as it is now with Cedarville, but I'm super-pleased that it has developed into that because most of our best engineers are from Cedarville."

## FAIL FAST, LEARN FASTER

In SeaLandAire's expansive industrial-type lab area, Stephen Ziegenfuss '06, who has worked primarily in hydromechanics, demonstrates the hands-on approach that makes his job fulfilling. "I'm a crazy hands-on guy," he said as he works with Vince, a technician who previously served 25 years as a fishing guide on local rivers. Drone technology has brought together this unique pairing.

They methodically layer different fabrics on the body of a first-generation prototype of a high-efficiency, winged, unmanned air vehicle. Then they seal two large sheets of plastic together around it to form a vacuum. Ziegenfuss' goal is to build a vehicle as light as possible that can still carry the data-collecting payload. When they finish, an air compressor goes to work sucking air out of the bag they've created. This process — much like the trial-and-error nature of prototype development — is ongoing as they keep plugging tiny leaks in the makeshift bag. But there is a patience to their work that comes from advice Ziegenfuss got from his dad.

What Sparks values about Cedarville engineers is their systems mindset — an approach that combines technology, architecture, and people — and their willingness to get their hands dirty.

"A good engineer is a guy that knows he's going to make mistakes," he said as he goes about sealing the plastic. "A great engineer is a guy who knows he's

going to make mistakes and hurries up to make them as fast as he can."

That's why Ziegenfuss is in the lab now. He wants to see the scope of the idea and allow the engineering and building to synergize. Engineers often have ideas that are not feasible to build, so the sooner he can figure out what is feasible and what is not, the more efficient he becomes.

"It's all about getting that data out from a place that you wouldn't want to go or couldn't go, like 15,000 feet below the ocean surface or on a contested shoreline," Ziegenfuss said, referring to the drones he develops.

On another table in the lab sits a small camouflaged boat much further along in development that has been nicked up a bit in field tests. The surveillance camera that sits on top looks similar to one you would see hanging from a ceiling. Inside the boat is a diesel engine that can run for hours.

"We want to keep our guys away from bad guys," Ziegenfuss said. "So how can we make it better and more reliable so that when our guys need it, they can pull it out and throw it in the water in whatever condition and it will work?"

When SeaLandAire's prototypes are successful, they are turned over to a manufacturer. The engineers' goal is to create tools that help their U.S. Air Force, Navy, and Marine clients collect data and stay safe around the world.

## ALL HANDS ON DECK

What Sparks values about Cedarville engineers is their systems mindset — an approach that combines technology, architecture, and people — and their willingness to get their hands dirty. They bring a well-rounded approach from different engineering disciplines: Montague, Ziegenfuss, and Steve Smith '09 are mechanical engineers; Joe Niemiec '14 and Austin Russell '16 are electrical; Justin Engel '13 and Ethan Zonca '13 come from the computer side.

"Even though they are just mechanical or even though they are just electrical, they have a good grasp

on a systems basis,” Sparks said. “For a business our size and what we do, it’s a very important attribute that I value in engineers to do more than just whatever your major was.”

Montague’s collaborative desires that drew him back to SeaLandAire after college were nurtured in Cedarville’s senior design project under the leadership of Timothy Dewhurst, Senior Professor of Mechanical Engineering. As part of this project, students create solar-powered boats. Cedarville boats continually perform well in annual competitions, winning 10 of the last 14 years and three years in a row at the Collegiate World Championship of Solar Boating (for more information, read “Light Speed” on page 27).

“It set the stage really well for after school to understand that the way you attack a problem isn’t always the idealized way or even the textbook way,” Montague said. “There’s more of a process of taking it from open-ended to building something.”

Montague acquired that hands-on experience during his senior year in a more innovative way than he anticipated. The solar team had not done well for a few years, so it started from scratch. The team scrapped the traditional canoe-style boats, and Montague designed a hull style that looks like a small speedboat. Two years later, Ziegenfuss significantly reduced the weight

“My passion for doing this sort of thing started ... at Cedarville.”

– Stephen Ziegenfuss '06

of Montague’s design and helped design another boat for the DONG Energy Solar Challenge in the Netherlands in 2012, which

permitted outside help. Cedarville was the top university team in the international contest. SeaLandAire now assists Cedarville on the solar boat design, with a new vessel ready for this summer’s collegiate solar boating contest in Springfield, Ohio.

“My passion for doing this sort of thing started with the exposure that I got to this kind of complete process in senior design at Cedarville,” Ziegenfuss said. “That process, knowing that every time I do something I get better at it, is exciting for me.”

No one is more excited than Sparks to see this team of Cedarville graduates put their education into practice at SeaLandAire.

“It’s my belief we couldn’t have done it, at least to the extent that we have, without Brian — well, without all of our Cedarville guys.”

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**Jeff Gilbert '87** is Assistant Professor of Journalism at Cedarville University and a 22-year newspaper veteran.



Among the high-tech Jackets at SeaLandAire Technologies, Inc., are Austin Russell '16, Justin Engel '13, Stephen Ziegenfuss '09, Brian Montague '04, Ethan Zonca '13, and Joe Niemiec '14. Not pictured: Steve Smith '09.