This League of Oregon Cities Award of Excellence nomination is for the City Council of Pendleton, Oregon, for their creation of the Pendleton UAS (drone) Range, an extremely innovative approach to rural economic development. The test range has revitalized Pendleton's WWII-era airport, more than doubled the airport's average annual revenue, created over 60 high-paying aerospace jobs (and counting), attracted over $5.5 million in grants, and has become a major economic driver in the community. First launched in fall 2013, the project was slow to develop, bearing no fruit until 2016, which itself is a testament to their uncommon stick-to-it-iveness, in an era heavily influenced by social media rants and 24-hour news cycles. As you will read, this economic development project is well worthy of this award.

The City of Pendleton is a remarkable community, best known for whiskey, wool and rodeo, but the truth is that the whiskey is bottled elsewhere, and the wool is mostly imported nowadays, and the rodeo is absolutely amazing...for one week every year. The City has a wonderfully historic Main Street and a surprisingly diverse economy, but like many rural communities without a clear and compelling comparative advantage, it struggled to attract high tech jobs in high paying industries. Furthermore, "Brain Drain" of its youth is a very real problem, because many farm kids don't want to farm, and $12-$18 an hour jobs don't hold the same allure for Millennials and Generation Z-ers as they once did for their parents and grandparents.

City leaders knew something had to change; however, ideas were few or far-fetched, and over a decade a strange discontent slowly infected the City. As the world grew up around them, suddenly the community, whose strong identity had helped build several world-renowned brands, was now in the midst of an identity crisis. Many citizens just wanted to sit around grousing about what their community didn't have, often envious of industries that existed in other communities, but never really realizing that economic development is just a jigsaw puzzle process, and certain industries just fit perfectly into certain communities. Like so often happens, residents stopped recognizing the very unique attributes and assets that had been sitting right beneath their noses, like the largest airport between Portland and Boise; albeit, a grossly underutilized one for the prior two decades.

In late 2012, as the country arose from "The Great Recession", just as a new City Manager and Economic Development Director were coming on board, a strange but intriguing economic development opportunity presented itself. A small statewide coalition had recently started an effort to get Oregon designated as one of the six soon-to-be-named national unmanned vehicle test sites in the nation, and they were looking for interested partners. Crazy idea, right? Wrong, because Pendleton's airport was already home to the only UAS (drone) unit in the State. Uniquely skilled workforce. They were also the only unit flying their 250-lbs. UAS at a public airport, Pendleton's airport. Highly marketable attribute. And when the Guard unit was asked, they informed City staff that UAS test ranges are almost always in remote places with low population, very little air traffic and very little ground cover. Sounded a lot like Pendleton, Oregon. Lastly, a range needed aviation infrastructure with very little manned traffic. That sounded a lot like Eastern Oregon Regional Airport in Pendleton. It was well known that it was

going to be a highly competitive, highly political long shot, but the City definitely had some comparative advantages for a change, so they threw their hat in the ring.

Long story short, in late December 2012, the FAA named the Pan Pacific UAS Test Range Complex, a partnership between Alaska, Oregon and Hawaii, as one of the six nationally designated unmanned vehicle test sites, of which Pendleton's UAS Range was a part. Since non-military UAS test ranges had never really existed before, there was no pre-existing business model to mirror the range after. Everything—be it policies, paperwork, or infrastructure—had to be created from the ground up. The City Council committed over $350,000 to hiring a consultant to stand up the range. They committed another $120,000 to building 15-UAS test pads, which were unheard of at the time, before they even had any customers to utilize them. Through a lot of hard work and perseverance, and money, the Pendleton UAS Range was announced as operational in summer 2013. And then, thanks to bunch of bureaucratic red tape and a lack of industry awareness, *nothing happened*…for four long years.

There were probably 100 "go/no-go" decision points in that four years, where the Council could have easily just told staff, "Enough is enough, let's cut our losses and move on." The public was grumbling, and Council was taking flak every time they went outdoors, so quitting on the project would have been a really easy decision to make. That is not at all what they did. They knew there was an ever-present risk of failure, but they still saw the opportunity, they believed in the opportunity, and they trusted their City staff to steer them down the right path. In other words, they stayed the course; avoiding one of the biggest mistakes that communities and economic development professionals make.

The Pendleton UAS Range is arguably the most active unmanned vehicle test range on the West Coast. It employs 3 full-time staff and its customers now employ another 60-65 aerospace workers, a number expected to double in the next year. Between FTE's and transient workers, the range has produced over 225,000-man hours in the last 3.5 years, which translates to millions of year-round dollars infused into hospitality, housing, construction, rentals, etc. For the first time in decades, the Airport now operates in the black, and UAS range revenue will likely exceed $1 million this fiscal year, an absolutely unfathomable figure just a couple years ago. Airport ground and building rents are now 5-6 times higher than they had been historically. The Pendleton UAS Range has played host to some of the most high-profile UAS projects in the world, like the Vahana Project from Airbus, an unmanned flying taxicab. Aerospace companies from 6 states now consider Pendleton their flight test home, and buildings are under construction, because there is no available space to lease at the airport. Blue Mountain Community College (BMCC), Intermountain ESD, Pendleton High School and Sunridge Middle School have all worked closely with the UAS range to create internships and new educational opportunities. The FAA recently named BMCC one of 26 training centers in the US, and they will soon have a fully accredited 2-year UAS program. The City is in the midst of constructing a $15 million UAS Industrial Park for which there is considerable interest from the industry.

All this good fortune is because of a City Council, unpaid, that was willing to stay the course much longer than most would have been willing to do so, in an effort to try to make a better quality of life for their citizens. The City and its citizens seem re-energized these days, and they've now added a new and unique facet to their identity; they're now best known for whiskey, wool, rodeo…and drones. Who would have ever seen that coming? Only the Pendleton City Council most likely. In a great state like Oregon, the selection of the LOC Award for Excellence is undoubtedly a very difficult one, but what this City Council, and some of their predecessors, accomplished was really unprecedented and definitely worthy of recognition.

A rural Oregon city has become a hub for drone testing. Now, it wants to expand its capacity

By TOM BANSE (/PEOPLE/TOM-BANSE) • NOV 9, 2018

(//www.nwnewsnetwork.org/sites/northwestnews/files/styles/x_large/public/201811/110918TB_CubicAresUAV.jpg)

The latest variant of the Cubic Ares unmanned reconnaissance drone during flight testing at Pendleton on October 28.

CUBIC CORP.

Listen

3:45

A dream to make rural Pendleton, Oregon into a drone testing mecca is becoming very real. It's so real, in fact, that the city-owned airport has run out of hangar space to rent to global aerospace companies. Now, the Pendleton airport is seeking millions more in public funding to help expand.

Darryl Abling, the Pendleton Unmanned Aircraft Systems Range (https://www.pendletonuasrange.com/) manager, remembers that turning Pendleton into a haven for unmanned aircraft testing was "a big gamble" at the beginning. That was back in 2013, when the city applied to become a federally-approved flight test range for drones of all sizes.

"And then it was really like the dog chasing the car that finally catches it," Abling said. "You know, what do I do?"

The Eastern Oregon Regional Airport used city and state money to build a new hangar, renovate another, pave new aircraft staging pads and outfit a mission control center. Abling said business started out slow in a place better known for vast wheat fields, woolen blankets or its big rodeo. Then about two years ago, business picked up pace.

"Once you got one or two major players in, the word got out. 'Hey, Pendleton is the place to test,'" Abling said. "You've got outstanding customer service. You've got great infrastructure, good weather, open space. It has just snowballed from there."

(https://mediad.publicbroadcasting.net/p/northwestnews/files/styles/x_large/public/201811/110918TB_PenDrones.jpg)

Pendleton UAS range manager Darryl Abling and airport manager Steve Chrisman next to their mobile mission control RV.

CREDIT TOM BANSE / NW NEWS NETWORK

The range has attracted all sorts of exotic military and commercial unmanned aircraft. In the early days, you could have seen Yamaha Motor Company's remotely guided crop-dusting helicopter, the RMAX (https://www.yamahamotorsports.com/motorsports/pages/precision-agriculture-rmax). Last year, there was the U.S. Department of Energy's "Arctic Shark," a high altitude atmospheric research drone remotely

piloted by scientists with the Pacific Northwest National Laboratory.

These days, defense contractor PAE ISR might be out flight testing newly produced, vertical-takeoff-and-landing reconnaissance drones. The Virginia-based company makes the 18-foot wingspan Resolute Eagle (https://static1.squarespace.com/static/5a674279b7411c324dfe0468/t/5b3be47703ce64db40b45a31/1530651773237/Resolute+Eagle+VT

"We had a place on the East Coast that we flew, but we really didn't have enough space; as in you could launch, but you had to stay inside a one mile corridor," said Ken Bisconer, director of West Coast operations for PAE ISR. "We came out and we did some test flights out here and we really loved the support we were getting from the city and the Pendleton range guys."

Also settled in at the Pendleton airfield is an Airbus division based in Silicon Valley known as A^3 or “A-cubed." It is flight testing the first prototype (https://vahana.aero/first-flight-behind-the-scenes-3a067f619cbf) of a single seat, electric, self-flying shuttle craft called “Vahana," an allusion to Hindu mythology and flying carpets.

The Vahana aircraft has eight electric motors attached to two sets of tilting wings. One day, it might zip you in and out of urban heliports.


(https://mediad.publicbroadcasting.net/p/northwestnews/files/styles/x_large/public/201811/110918tb_vahana_alpha_one.jpg)

An Airbus subsidiary is testing this prototype of a self-flying air taxi at the Eastern Oregon Regional Airport.

CREDIT PROJECT VAHANA

San Diego-based Cubic Corporation is the latest arrival in Pendleton. Its new variant of its stubby, propeller-driven Ares surveillance drone shelters in a snowplow garage between flight tests.

Cubic ISR Systems director Rick Mercer said it's easier to operate at Pendleton than at the military test ranges his company used before.

"Things that would take me two weeks to do at a government range, I can do here in 15 minutes — coordinating airspace and things like that, it's very easy to do," Mercer said in an interview.

The city of Pendleton is preparing to up the ante now that its initial gamble on the test range is paying off. The city council recently voted to go ahead with design and engineering for a 100-acre unmanned aircraft systems industrial park beside a dedicated runway for drone aircraft.

"I think we're just at the tip of the iceberg. I think there's a lot more growth to occur," said Steve Chrisman, the Pendleton airport manager as well as the city's economic development director.

"Facilities are our biggest need," Chrisman continued. "If I had three more hangars I think I would have three more aerospace companies here operating on a semi-permanent basis anyway."

City leaders are waiting to hear if they won a $3 million federal grant before launching construction of roads and utilities for the industrial park. Local water and sewer ratepayers would foot the majority of the estimated $16 million bill to attract more unmanned aircraft industry tenants.

"That's an awful lot of money to spend on a small number of permanent jobs," said Rex Morehouse, who unsuccessfully ran for city council earlier this year. "It's getting harder and harder to pay the utility bills."

Morehouse said he is glad to see the drone test range succeed, but is skeptical about sinking more public money into the airport unless tenants make firm commitments to occupy spaces.

But so far, the rural city's elected leadership is all in. Chrisman said he wants to engage an independent consultant to prepare an economic impact analysis so people can be armed with hard numbers.

"We're seeing a lot of jobs getting created," Chrisman insisted. "I only see that growing. We're just scratching the surface."

Pendleton competes against six other FAA-designated unmanned aircraft systems test range complexes around the country in Nevada, North Dakota, New Mexico, New York, Virginia and Texas. Several of them enjoy much higher levels of state subsidy.

The Pendleton range is one of three in Oregon that are incorporated separately but share oversight under an umbrella FAA approval that is managed by the University of Alaska Fairbanks. The other Oregon test locations — at the Tillamook airport and over the Warm Springs Indian Reservation — have attracted less flying action.

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ArcticShark takes flight at Pendleton UAS Range

George Plaven
Mar 8, 2017

“I think we’re making history here,” said Beat Schmid, associate director of the Atmospheric Sciences & Global Change Division at PNNL.

Developed by Navmar Applied Sciences Corporation, an engineering firm based in Pennsylvania, the ArcticShark was originally created for military applications. It is based on the TigerShark model used for surveillance and reconnaissance by the U.S. Navy.

Instead, the system was revamped for the Department of Energy as a climate measuring tool. Schmid, who manages the Atmospheric Radiation Measurement aerial facility at PNNL, said the agency has pushed for some time to determine what value drones can add to their research.

“You can take a little more risk with an unmanned aircraft,” he said.

PNNL has flown smaller drones before at the Pendleton range, which is part of the Pan-Pacific UAS Test Range Complex and one of six official test sites across the country designated by the Federal Aviation Administration.

The ArcticShark, however, is a different animal. It took about a year to get FAA approval to fly the vehicle because of its size and capabilities.

Marcel Piet, president of UAS services for ArgenTech Solutions in Vancouver, Washington, said his company provided technical assistance for getting the operation certified. Normally, a drone license will allow flights up to 400 feet for vehicles under 55 pounds, but the ArcticShark is more than 10 times as big and able to fly up to 15,000 feet. By comparison, most commercial jets cruise at an altitude of 33,000 feet.

Piet said the FAA is famously risk-averse, and it was a lengthy process to prove PNNL could handle the unconventional drone.

“You have to demonstrate to the FAA you know how to fly,” Piet said. “They want to make sure you know what you’re doing.”

The Department of Energy took ownership of the ArcticShark on Sunday, and pilots are now being trained how to monitor the aircraft from a specially manufactured mobile flight center on the ground. The drone is equipped with a 60-horsepower engine and can fly up to eight hours at a time.

Both wings are capable of holding 50 pounds of laser mapping instruments, which will be used to take precise measurements of things like water vapor, carbon dioxide gas and aerosol particles in the Arctic atmosphere.

Schmid described the Arctic as one of the planet’s most sensitive regions, a place where climate change is happening at a much faster rate than previously predicted. The data captured by ArcticShark will allow scientists to better understand the processes at work.

“It’s ultimately, of course, about better predicting the Earth’s climate,” Schmid said.

Testing will continue on and off at the Pendleton range throughout the year before ArcticShark is sent to an atmospheric research base on the North Slope of Alaska.

Darryl Abling, Pendleton UAS Range manager, said it is their biggest project to date. More potential clients have also shown interest in the range, he said, but couldn’t specify.

“For the city and the range, ultimately we desire to become a high-tech UAV center,” Abling said.

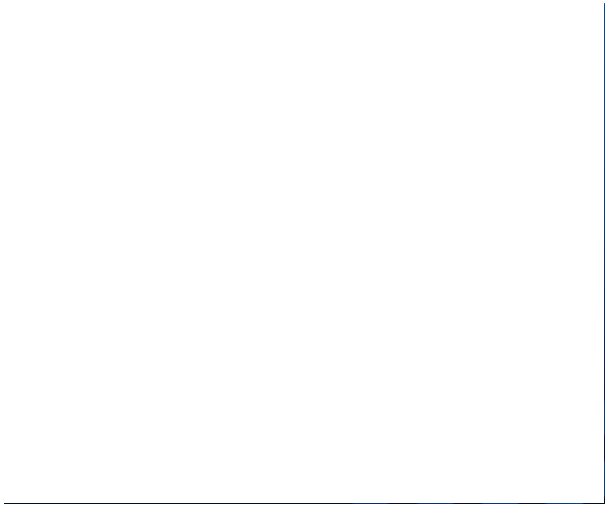
Steve Chrisman, Pendleton’s economic development director and airport manager, said the city is excited to capitalize on new opportunities the drone industry may bring to the area.

Beat Schmid, associate director of the Atmospheric Sciences & Global Change Division at PNNL, talks about the scientific payload of the ArticShark unmanned aerial vehicle to a group of Pendleton dignitaries on Wednesday at the Pendleton UAS

Dark clouds and drizzle did not hinder test flights Wednesday of the largest drone ever to fly at the Pendleton Unmanned Aerial Systems Range.

The ArcticShark, a 625-pound behemoth with a 22-foot wingspan, is destined to prowl the clouds over the Arctic coast of Alaska carrying more than a dozen instruments to gather some of the most sophisticated climate data ever recorded.

But first, researchers must fine-tune the aircraft and get their pilots up to speed in preparation for the 2018 mission. Flight testing and training began Feb. 27 at the Pendleton UAS Range, led by the Pacific Northwest National Laboratory in Richland, Washington.



Project leaders hosted an open house Wednesday afternoon at the Eastern Oregon Regional Airport to give members of the public an up-close look at the ArcticShark.

In a rural Oregon airport, Airbus is testing what could become the world's first autonomous flying air taxi – in other words, a flying, self-driving car. "CBS This Morning" got an exclusive look at the tests.

One of Airbus' Oregon projects is Vahana, a prototype of a single-seat autonomous air taxi that takes off vertically, like a helicopter. In Sanskrit, Vahana means "that which carries, that which pulls."

After it takes off, its wings rotate, allowing it to fly like a plane. The battery powered aircraft can hit speeds of over 100 miles an hour, and fly up to 35 miles.

The prototype could be the answer to urban gridlock – but convincing the public could pose a challenge.

Hervé Hilaire, the project manager for Vahana, said he believes that people will get used to the idea of a flying vehicle that doesn't have a pilot "over time." But even among 18- to 24-year-olds, only about 1 in 5 say they'd fly in something without a pilot.

Hilaire has a plan to change people's minds. "You want to demonstrate perfect safety and real added value for the customer," he said. "And this is really about saving time in a convenient and safe way."

Airbus' Silicon Valley incubator A3 took Vahana from a sketch to flight testing in less two years, using materials that were already commercially available. Matt Deal, head of flight test at Vahana, says that the team is currently working on "showing that we can execute a safe test flight, from take-off through transition to over 100 mph, and return safely to the ground."

Right now, the test flights only last a few minutes at a time. One of the challenges will be developing better, lighter batteries that let the planes fly father and longer.

Morgan Stanley predicts flying cars will be a $1.5 to $3 trillion business in 20 years, meaning the race is on to develop a fleet of ridesharing autonomous air taxis. Boeing's prototype took its first flight earlier this year.

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At this month's Uber Elevate summit, nearly a dozen flying car concepts were on display, including helicopter maker Bell's full size but non-flying Nexus demonstrator. Nexus seats four passengers, and aims to enter customer service by the mid-2020s -- flying at 150 miles an hour for up to 150 miles. For a time, it will have a human operator onboard, but the goal is to make it fully autonomous.

"A lot of us grew up watching 'The Jetsons' and thought that was far-fetched," said Chad Stecker, the program manager for Nexus. "The reality is here today."

"When you look at the explosion and expansion of the population growth within cities [...] there's really no ground based solutions that will be able to resolve those challenges," Stecker added.

Acting FAA Adminsitrator Dan Elwell says it's too early to talk about timelines.

"Well, we're not ready today," he said. "We're all about gathering data to assure us of the safety for these vehicles. And unmanned is a much, much higher bar than a piloted vehicle for sure and we have a ways to go."

Regulations and a system to manage increasingly crowded airspace still need to be developed. For Airbus, Vahana is a bit like a first draft. It'll be up to future models to prove they can safely fly passengers.

It will be years before people are flying in autonomous air taxis -- but already, a company in London is buying up rooftop space for landing pads, so they'll be prepared when the technology is ready to take off.

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TECHNOLOGY

Video: Here's what the first flight of the air taxi being developed in San Jose looked like

Airbus said it conducted the first successful test flight of the Vahana electric vertical take-off and landing (eVTOL) aircraft on January 31st. The project is being run by a unit of the company based in San Jose and the flight happened in Oregon.

COURTESY PHOTO

By Cromwell Schubarth
TechFlash Editor, Silicon Valley Business Journal

Feb 22, 2018, 6:23am PST
Updated Feb 24, 2018, 12:21pm PST

The flight happened at the end of last month in Pendleton, Oregon, and involved the drone taking off, hovering about 16 feet off the ground and landing, all without human navigation.

The project is one of at least 19 different air taxis being developed by companies that include Santa Cruz-based startup Joby Aviation Inc., Boeing, Uber and Kitty Hawk, which is owned by Google co-founder and Alphabet CEO Larry Page.

They are all racing to provide autonomous vehicles that can fly above traffic congestion, which would likely be welcomed by those who can afford it in the Bay Area.

Before then, though, Airbus needs to show that it can do more than go up and down autonomously, as it is seen doing in the video that accompanies this story.

The Airbus drone Vahana runs on electric power and has eight rotors. Its airfoils are designed to adjust for horizontal flight after take off and back when it's time to land.

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News (https://uasweekly.com/category/news/) November 18, 2017 (https://uasweekly.com/2017/11/18/)

PAE ISR’s Resolute Eagle Completes First Commercial Airspace Flight

PAE ISR recently proved its ability to integrate unmanned aerial system (UAS) operations into commercial airspace. The successful commercial airspace flight of PAE ISR's Resolute Eagle took place on Nov. 8 at the Pan-Pacific UAS Test Range located at Pendleton Airport in Oregon operating under a Federal Aviation Administration Certificate of Waiver or Authorization.

"This event signifies PAE ISR's ability to successfully fulfill U.S. commercial and civilian requirements in addition to U.S. military missions," said Chico Moline, President of PAE ISR. "We are excited by this achievement as it represents our ability to offer our dynamic platform to a broader customer set."

The Resolute Eagle is a Group 3 fixed wing tactical UAS delivering advanced performance in payload capacity, available power, and a small logistical footprint to support a variety of mission profiles. It carries multiple intelligence payloads and offers long endurance capability at an affordable price.

PAE ISR LLC a joint venture of PAE (http://www.pae.com/), American Operations Corporation (AOC) (http://www.aocwins.com/), and Battlespace Flight Services, LLC (BFS) (http://battlespacefs.com/), that provides intelligence, surveillance, and reconnaissance solutions and services to U.S. government agencies, NATO and other international organizations. As a lead systems integrator and full service provider for unmanned aerial systems, PAE ISR has significant experience in system integration, test and evaluation, operations and maintenance, logistics, training, deployment support, and leased UAS services.

For additional information, please visit our website at PAEISR.com (https://www.pae.com/isr/)

This Oregon hangar that once housed WWII bombers sat empty for decades. Now it's buzzing again

By TOM BANSE (/PEOPLE/TOM-BANSE) • NOV 5, 2018

(//www.nwnewsnetwork.org/sites/northwestnews/files/styles/x_large/public/201811/110518TB_Hangar.JPG)

The historic WWII bomber hanger at Eastern Oregon Regional Airport has a new tenant, unmanned aircraft maker PAE ISR.

TOM BANSE / NW NEWS NETWORK

Listen

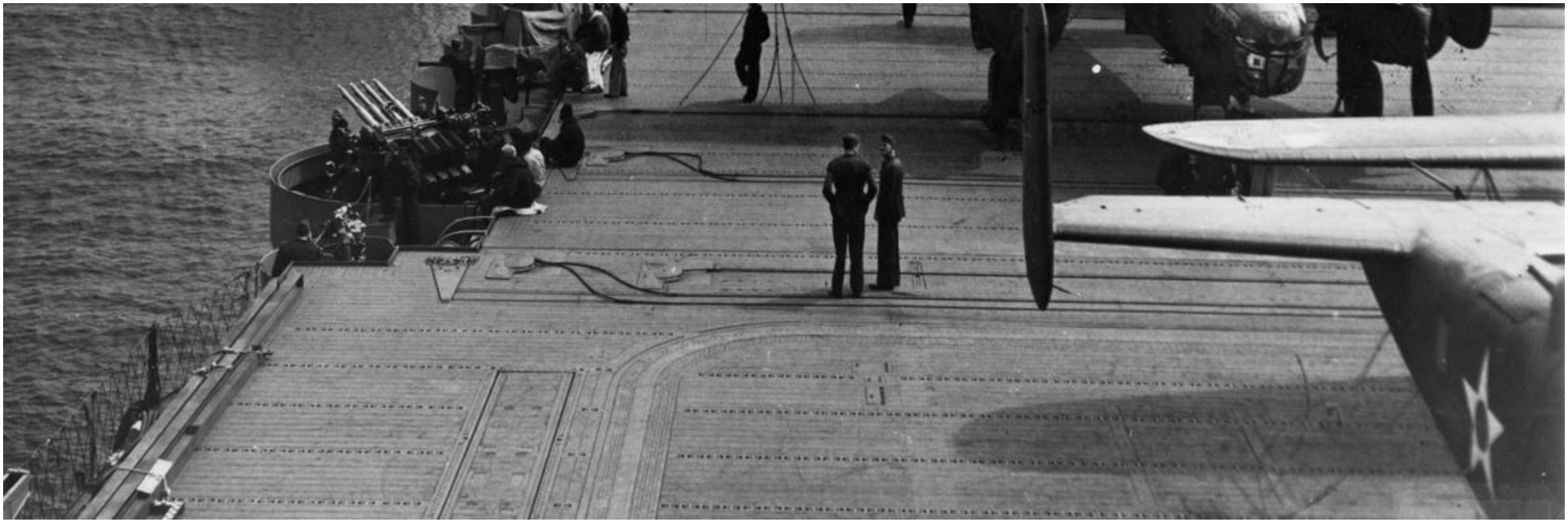
1:08

During World War II, the Pendleton, Oregon airport served as homebase to a bomber wing that flew anti-submarine patrols along the West Coast and took part in a daring mission called the Doolittle Raid. Now after many decades of slumber, the Army Air Corps' historic hangar is buzzing again.

Lt. Col. Jimmy Doolittle selected crews and planes from the Pendleton wing to carry out the first U.S. air raid on Japan. The crews trained for the top secret mission on the East Coast before traveling by aircraft carrier to the far Western Pacific. The surprise bombardment in 1942 of the Japanese heartland boosted morale on the American home front.

After the war, the federal government transferred ownership of Pendleton Field to the city. Airport manager Steve Chrisman said the Doolittle hangar was underused and in disrepair for decades — until defense contractor PAE ISR moved in this year.

"It's exciting to see it being reborn 75 years after its heyday," Chrisman said. "Hopefully, it's going to have another. (Actually,) it is having another heyday right now."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B-25 bombers on the USS Hornet prior to launch on the daring Doolittle Raid in April 1942.

CREDIT NATIONAL MUSEUM OF THE USAF

The new tenant is using the rehabbed hangar as a base for flight testing of reconnaissance drones. PAE ISR's drone model is named the Resolute Eagle (https://static1.squarespace.com/static/5a674279b7411c324dfe0468/t/5b3be47703ce64db40b45a31/1530651773237/Resolute+Eagle+VT It has an 18-foot wingspan.

PAE ISR announced a contract with NASA last month to use the Resolute Eagle to demonstrate ways to safely integrate manned and unmanned aircraft in shared airspace. NASA is helping the Federal Aviation Administration work out automated aircraft identification, tracking and collision avoidance procedures, and technology so that commercial drone operations at altitudes above 500 feet can someday become routine.

Virginia-based PAE ISR chose the FAA-approved Pendleton Unmanned Aircraft Systems Range (https://www.pendletonuasrange.com/) to host its test flights. The NASA drone integration contract runs through 2020.

Chrisman said before PAE ISR arrived in northeastern Oregon, the city was renting out the cavernous WWII-era hanger to an experimental aircraft club for just one dollar per year.

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NOV 9, 2018

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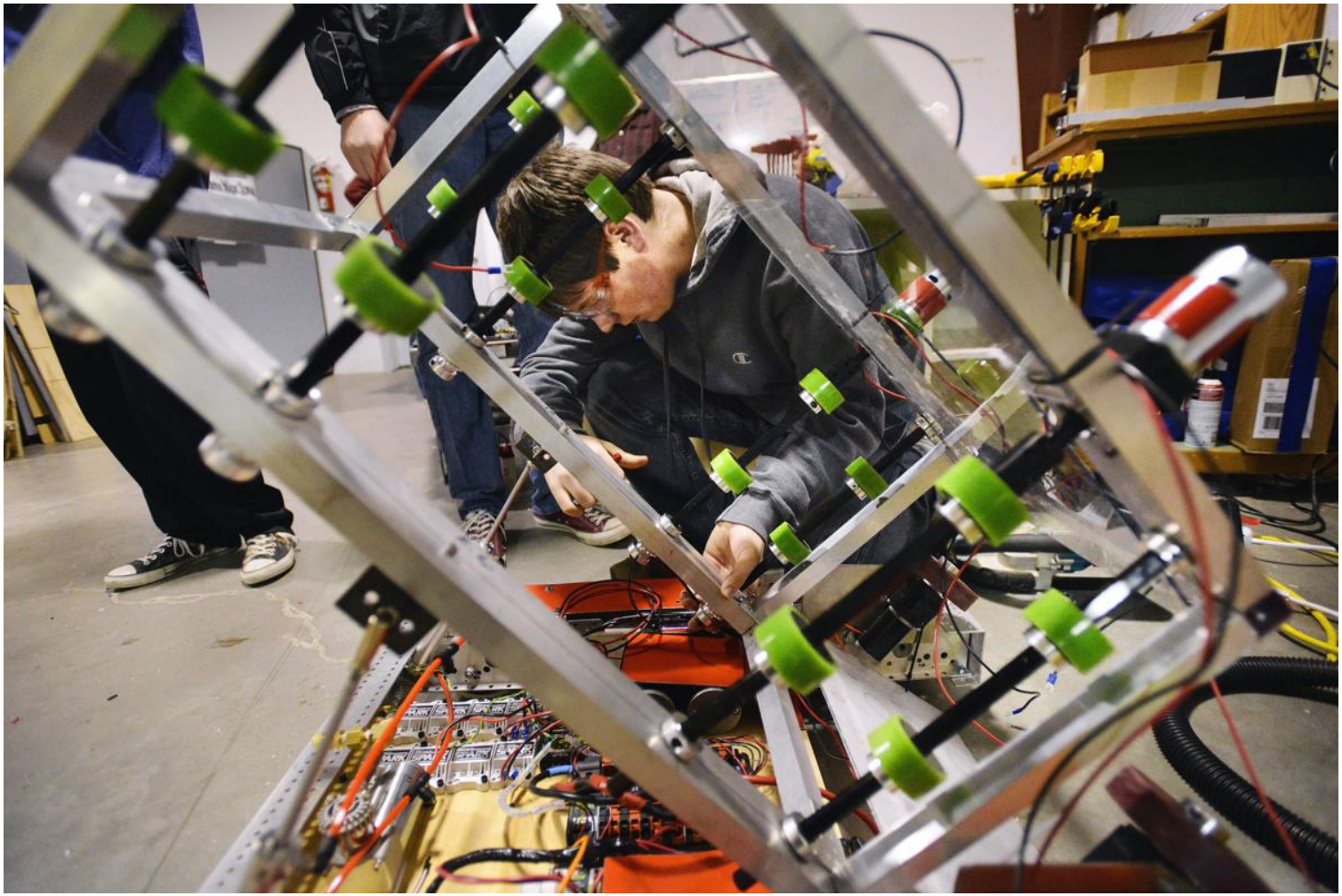
Robo revival

Antonio Sierra
Feb 24, 2018



Staff photo by E.J. HarrisSophomore Landon Thornburg works on mounting a sprocket for a drive system on the robot

On some afternoons, the focus of the innovation center at the Pendleton Unmanned Aerial Systems Range is decidedly ground-bound.

As workers from the drone industry leave the offices near the Eastern Oregon Regional Airport, the Pendleton High School robotics team takes over the facility.

The students were putting the finishing touches on their robot Wednesday, or as teammate Landon Thornburg called it, the "get-everything-working phase."

Under the rules of the robotics league, FIRST, the PHS team had until 9 p.m. to complete its robot before bagging it for competition.

Thornburg spent much of Wednesday in a workshop toward the back of the building, installing and tinkering with various robot parts to ensure everything fits and functions.

Despite the occasionally harried atmosphere, everyone involved with the team said the conditions are night and day compared to last year.

The 2016-2017 team didn't have a dedicated workshop and needed to make an appeal to the Umatilla High School robotics team to help them with programming. Pendleton's team wasn't able to determine whether they had a functional robot until the final day of competition.

But most importantly, the team had little in the way of adult guidance or mentoring.

Thornburg's mother, Ronda, and several other parents stepped in and helped organize the team as it made a surprise run to the FIRST national competition in Houston.

Both mother and son were busy Wednesday, Landon grinding down a chain that was too big for the axles it was supposed to connect and Ronda sanding the robot's exterior.

As they worked, Ronda peppered in details as Landon recalled how he met Steve Lawn, the Pendleton UAS Range officer.

Landon met Lawn at a robotics event a couple years ago, where Landon mentioned that the high school team intended to compete in a more advanced division in the coming year.

The pair kept in touch and Landon and the team were eventually able to convince Lawn to come aboard as a mentor for the current season.

The connection has paid off.

Not only was Lawn able to lend the city's UAS facility to the robotics team, but some of its unique technological features and his expertise.

The mentoring team grew to include three other experts: Jeremy Lasater and Sam Allen from the InterMountain Educational Service District and tech consultant Devin McKeon.

While last year's team took a more all-hands-on-deck approach, this year's team has more defined responsibilities. Team captain Walker Paullus said team members' roles include building, programming, strategy and simulation.

While Landon and other members worked on the physical robot, programmer Makenzie Noggle was responsible for making it work.

Noggle was trying to figure how to assign one of the robot's actions to a button and sought help from McKeon. McKeon mapped out the controls on a white board, explaining how even subtle actions need to be programmed into a robot before they can be combined into more complex maneuvers.

Despite some of her struggles last year, Noggle said she loved robotics and programming.

"Basically, you're taking an inanimate object and making it do what you want," she said.

Besides new expertise, the team is also leaning on some of the new capabilities to improve on last year's results.

While the rules are more complex, FIRST competitions require contestants to make their robots pick up an object and deposit it in a designated location.

Teammate Evan Miller spent weeks building new elements onto a basic 3-D map, using the facility's design software to simulate the colors, cubes and robots that will be used in the competition.

The simulation was important in the design phase as members tried to figure out how to optimize the robot for competition. With the robot hardware done, the team hopes to use it to simulate the software and how it will operate in the field.

While some members were ambivalent about pursuing robotics, others see it as a stepping stone.

Paullus said he's been passionate about robots since he ordered his first kit in the fourth grade.

"I saw it and said, 'That's what I want to do,'" he said.

One of the drone range's top officials, Lawn took a similar route to his current profession.

Always interested in remote controlled vehicles, Lawn took a job out of high school at a hobby shop in Charleston, South Carolina.

While he was flying an RC helicopter one day, a man came into the store and, impressed with his skills, offered him a job at his unmanned aerial vehicle company.

Lawn began operating and working with helicopter UAVs, learning more about their technical side.

He was eventually laid off, and when he was denied a job at a top hobby distributor in Illinois because he lacked a college degree, Lawn decided to go back to school.

Lawn enrolled at Middle Tennessee State University, and while he obtained a degree in aerospace he also worked for the school's unmanned aircraft systems office.

Through his job at the university, he met Young Kim, the CEO of Digital Harvest, a Virginia agricultural drone company.

Lawn was hired by Kim within two days of graduating from college, and when the company established a Pendleton office to test and develop UAS at the Pendleton range, he moved west in 2016.

Excited by the possibilities the range offered, he took a job with the city in 2017.

Paullus isn't the only student hoping to turn toys and games into a professional career.

Noggle has already been accepted to Oregon State University, where she'll study computer engineering. She eventually hopes to study abroad in Japan, which has a thriving robotics industry.

Thornburg, who is only a sophomore, also wants to make robotics a long-term pursuit.

"It's stressful, but I thrive on stress," he said.

For now, the team's focus is on the competition.

With the robot under wraps until their first contest in Wilsonville, the team will have to wait until March 8 to see how much difference a year can make.

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Contact Antonio Sierra at asierra@eastoregonian.com or 541-966-0836.