



THE ARMSTRONG X-PRESS

Volume 61 Number 6 August 2019

LAS test near flawless

By Jay Levine

X-Press editor

NASA Armstrong staff were in the control rooms when the agency successfully demonstrated the Orion spacecraft launch abort system at Cape Canaveral, Florida, July 2. The system is designed to take astronauts to safety during an emergency.

About a dozen people from the California NASA center were monitoring systems that the team had developed and tested. In fact, Armstrong had a number of tasks for the Ascent Abort-2 (AA-2), which was a key milestone in preparation for Artemis missions to the Moon that will lead to astronaut missions to Mars.

Gary Martin, AA-2 project manager at Armstrong, said the test went well.

“The recent launch was an outstanding success partly due to the contributions of more than 50 Armstrong people,” Martin said. “Team members made critical contributions to the Orion AA-2 Developmental Flight Instrumentation (DFI) subsystem. This crucial subsystem collected and transmitted all of the engineering data and onboard video that will allow the Orion AA-2 engineering team to determine whether or not the 38 mission objectives were successfully achieved.

“Everything worked the way it was supposed to. In my 43 years of doing this, this is as close to flawless



NASA TV

Ascent Abort-2 successfully launched July 2 from Space Launch Complex 46 at Cape Canaveral Air Force Station in Florida.



AFRC2019-0201-4

NASA/Lauren Hughes

Dan Nolan and Lucas Moxey show the camera system they developed for the AA-2 launch vehicle, and a replica of the ejectable data recorders that were jettisoned from the vehicle. The system in the photo was the backup to the one that flew. At top right is an image from the video taken by the camera.



as I've seen.”

Chuck Rogers, Armstrong's Orion program manager, said, “the launch was really exciting” as the system launched skyward.

“There was a lot of anticipation because we have worked on this for four years and then it's all over in minutes,” said Rogers.

The test was a relatively quick three minutes – enough time for a test version of Orion to be boosted to the correct aerodynamic test conditions and the sequence of the launch abort system motor firings to occur.

Nikki Martin was a member of the Armstrong team assisting at Cape Canaveral.

“It was exciting to hear the roaring of the rocket and see the actual abort,” she said. “It was a very emotional moment knowing that our team had played an important role in making the launch a success. Even more exciting was being able to review the data from the launch.”

Rose Blomquist, Ernest Nwajagu

Launch Abort System, page 8

Lab provides key support

By Jay Levine

X-Press editor

At the Armstrong Calibration Laboratory, more than 80% of what the staff does focuses on preparing tools used to work on aircraft, gauges used in the cockpit, or the equipment and meters used to service aircraft.

The laboratory handles all of the center's calibration needs including air data and pitot static systems, altitude and fuel quantity gauges, force tools such as torque wrenches, dimensional tools such as calipers, electrical multimeters and gas detection safety sensors.

Those measurements have to be right every time for flight and mission safety, said David Swindle, lead operations manager. The calibration laboratory also is a value, costing significantly less than sending items to outside specialists, he added.

In total, about 5,200 items, including some unique, one-of-a-kind tools, are tracked in the lab's metrology database (metrology is the science of measurement) and in the NASA Aircraft Management Information System, or NAMIS, database.

Documentation is used to recall each item and a barcode system is used to verify correct processing. NAMIS can pinpoint where every item was used and on what project. In addition, a list of tools due for calibration is distributed weekly to branch chiefs who are responsible for those items.

"When we do find equipment out of tolerance, a notification goes out and the user of the item has five days to respond," Swindle said. "For example, if a tool isn't working properly, everything that tool was used on during the current calibration cycle will be re-checked to ensure quality. For example, if such a tool was used on a tire, or an engine, that work would have to be verified or redone."

Swindle, four technicians and



AFRC2019-0098-01

NASA/Ken Ulbrich

The Armstrong Calibration Laboratory has a workload that is 80% related to items used in preparing aircraft for flight. To successfully complete that work requires a staff, which includes from left, Paul Craig, James Kelly, David Swindle, Arnold Gonzalez, Ronnie Juvinall, Anita Solorio and Alex Rivera. They are flanking a 1948 calibration tool they call the boat anchor, which still is a valued asset.



AFRC2019-0098-01 NASA/Ken Ulbrich



AFRC2019-0098-01 NASA/Ken Ulbrich

At far left, Arnold Gonzalez uses a digital protractor to calibrate an item.

At left, Alex Rivera calibrates a cylindrical plug gauge.

James Kelly, who is responsible for pickup and delivery of items, and Anita Solorio, administrative assistant, manage the daily workload. The laboratory staff completes many of the items in three to five days, except for items such as unique aircraft electronics boxes that are sent to outside

specialists. Of the 5,200 calibrated items, about 4,000 of those a year are completed at Armstrong.

With that many items, some requiring multiple inspections per year, the laboratory staff is always concerned about schedules. In addition, Building 703 in Palmdale, which houses

Armstrong's science aircraft and the Stratospheric Observatory for Infrared Astronomy, is on the lab's route for service deliveries and pickups twice a week.

Don Griffith, equipment specialist and metrology program manager,



AFRC2019-0168-30

NASA/Ken Ulbrich

Shin says 'thank you'

Jaiwon Shin, who has been associate administrator for NASA's Aeronautics Research Mission Directorate for more than a decade and with NASA in a number of roles for three decades, is retiring Aug. 30. He was at Armstrong recently to thank center employees for their support and hard work helping ARMD to advocate and receive support for two new X-planes. The X-57 Maxwell, a distributed electric propulsion aircraft, and the X-59 Quiet SuperSonic Technology (QueSST) demonstrator that will validate reduced volume sonic booms, are expected to validate technology for a new era in aviation.

Haering wins scholarship

The NASA Armstrong Employee Exchange Council has presented its 2019 Joseph R. Vensel Memorial Scholarship Award to Benjamin Haering.

Haering is a 2019 graduate of Paraclete High School in Lancaster, California. He is planning to major in industrial engineering at California Polytechnic State University, San Luis Obispo, California, in the fall.

"It was pretty exciting," Haering said. "Dad called to tell me I won and I was surprised. I see engineering as what I am geared for and I find high-level problem solving rewarding."



AFRC2019-0194-1

NASA/Lauren Hughes

The Armstrong Employee Exchange Council recently awarded its 2019 scholarship to Ben Haering, second from left. Armstrong Center Director David McBride, at right, presented the award. Also in the photo are Haering's parents Ed and Kathy Haering.

News at NASA

Orion LAS hot fire is a success

The Northrop Grumman built attitude control motor (ACM) on Orion's launch abort system was successfully tested on Aug. 22, at its facility in Elkton, Maryland.

The 30-second trial by fire was the penultimate test before the ACM can be qualified for human spaceflight on Artemis 2, the first mission with astronauts. During the static test, the ACM produced more than 7,000 pounds of thrust from eight valves, providing enough force to steer Orion and its crew to a safe distance.

The launch abort system is designed to transport Orion and its crew to safety in the event of an emergency during launch or ascent. It consists of three solid rocket motors: the abort motor pulls the crew module away from the launch vehicle; the ACM steers and orients the capsule; and the jettison motor ignites to separate the launch abort system from Orion for parachute deployment and a safe crew landing.

All three motors will be certified for future crewed flights after qualification tests are successfully completed later this year. The launch abort system was stress tested earlier this year during the successful Ascent Abort-2 test.

These achievements bring Orion closer to safe flights with astronauts, paving the way for the first woman and the next man to land on the Moon by 2024.



AFRC2019-0135-78

NASA/Ken Ulbrich



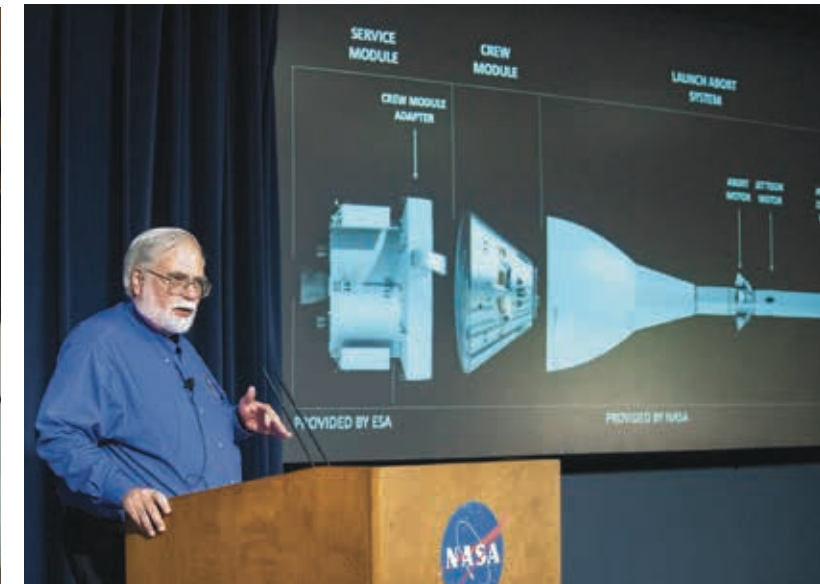
AFRC2019-0135-35

NASA/Ken Ulbrich



AFRC2019-0135-120

NASA/Ken Ulbrich



AFRC2019-0159-57

NASA/Ken Ulbrich

Apolo-Soyuz Astronaut Vance Brand speaks one-on-one with attendees at NASA Armstrong's Apollo 50th Anniversary event.

NASA engineer Larry Cliatt spoke about sonic boom research at the Apollo 50th event in the Antelope Valley.

An attendee of the 50th Anniversary of Apollo event took advantage of an opportunity to see Moon rocks.

Chuck Rogers, Armstrong's Orion program manager, explained elements of the AA-2 to Armstrong employees during an Apollo celebration and barbecue.



Apollo 50th

Antelope Valley and a center celebration and barbecue focus on Apollo plus a look back at the X-Press archives on a movie reference

By Elvia Valenzuela
Armstrong Public Affairs

NASA Armstrong partnered with the American Institute of Aeronautics and Astronautics, Antelope Valley chapter, to host an Apollo 50th anniversary event called Small Steps to Giant Leaps. The event honored the historic moment when mankind first landed on the moon and looked ahead to NASA's future of space exploration with the Artemis program.

The science, technology, engineering and math (STEM) focused family event featured Apollo-Soyuz astronaut Vance Brand, who was the keynote speaker. Brand also commanded three space shuttle missions, logged 746 hours in space and more than 9,669 hours as a pilot. He was part of the crew on four space missions including Apollo-Soyuz and three space shuttle missions for Space Transportation System (STS)-5, STS 41-B and STS-35.

Brand shared a special presentation on his Apollo-Soyuz

space exploration mission and how NASA is creating a new era of exploration by sending humans back to the moon by 2024.

The Artemis program is leading this effort with innovative new technologies and systems to explore the lunar surface. NASA will send the first woman and the next man to the moon with the goal of sending astronauts to Mars.

Larry Cliatt, a NASA engineer presented a talk on sonic booms, a very loud sound people currently hear on the ground when an aircraft is flying supersonically. His presentation focused on the quiet supersonic technology that NASA and Lockheed Martin are developing as part of the X-59 experimental airplane.

Attendees also were able to learn more about Armstrong's current projects through STEM displays and activities that aimed to encourage the next generation of explorers into those job fields.

Displays included a lunar sample exhibit, an X-59 low-boom flight interactive demonstration, a space glove and helmet interactive exhibit, LED paper light-up circuits, and local FIRST Robotics Competition team demonstrations.



AFRC2019-0159-35

NASA/Ken Ulbrich

Armstrong Chief Historian Christian Gelzer detailed to Armstrong employees the center's contributions to Apollo, such as the Lunar Landing Research Vehicle shown in the image behind him.

What would Armstrong have seen in 1962?

"First Man," which had segments filmed at Edwards Air Force Base and celebrates the Apollo 11 Moon mission, included a cameo appearance of the NASA Armstrong newsletter the X-Press, or at least a facsimile of it.

In the movie, a copy of a 1962 X-Press was

Armstrong, page 6



AFRC2019-0159-06

NASA/Ken Ulbrich

Grill master Pat Stoliker prepares rows of hot dogs for employees at a center Apollo 50th celebration, special event and barbecue for Armstrong employees.

Armstrong... from page 4

on Armstrong’s desk after he had concluded an X-15 flight with an article calling for astronaut candidates on the front page. That was a little Hollywood magic.

However, had Neil Armstrong seen the official issue that was published April 22, 1962, he would have seen a picture of himself on the cover. That image was taken before his X-15 flight April 20, 1962, when had reached 207,000 feet altitude and flew 3,818 mph.

The newsletter in the film had the headline, “NASA To Select Astronauts for Project Gemini,” for the NASA Center that then was called the NASA Flight Research Center. The X-Press general appearance in the film, including the X-15 drawing across the top were indicative of that era’s newsletter.

While there wasn’t a call for astronauts on the front page, as in the film, the back page of the



X-Press had an article “NASA Will Select More Astronauts,” which was seeking candidates for piloting future spacecraft. Also of note was a piece about John Glenn, who orbited the Earth three times in Friendship 7, touring the world with the spacecraft.

Calibration Lab... from page 2

said some of the work is complex. “Sometimes as many as five pieces of equipment are linked together for a single measurement,” Griffith said.

Electronic metrology technicians Ronnie Juvinal and Paul Craig perform complex calibrations, which include high-level RF, or radio frequency, items; attenuators, which are electrical devices that reduce signal power, the reverse of an amplifier; and spectrum analyzers, which measure input signal strength.

“In the calibration world there are two combined aspects to performing the calibration,” Griffith said. “There is the science, knowing the physical properties and environmental influences that must be considered for a quality measurement and the art, the je ne sais quoi that enables technicians to make accurate and precise measurements beyond the black and white of procedural steps and equipment specifications. It used to be 50-50, these days most of it is the science of the measurement

and yet there is still an element of the art form. There is always a good way to do something we call best practices.”

Metrologist Arnold Gonzalez, a 20-year veteran of the lab and a 40-year veteran of dimensional metrology, is a key asset in developing and refining those practices. Gonzalez uses experience and specialized precision tools to test torque wrenches and dimensional measuring tools to ensure they are properly calibrated. Shrink wrapping tools is one such best practice for infrequently used tools that can extend calibration requirements.

Alex Rivera, a metrology technician in the pressure lab, is focused on calibrating gauges for aircraft and for items that service them, such as nitrogen carts. Altimeters that show the altitude of the aircraft are calibrated, as are digital readings from mechanical equipment, such as gas relief valves and tire pressure gauges.

Regardless of what calibration the lab staff is working, there can be no doubt that the proper completion of the task makes flying safer.

Scholarship... from page 3

The annual scholarship provides \$2,000 a year for up to four years for attendance at a four-year college or university. The recipient must maintain a minimum grade-point average of 3.0 or higher to retain the scholarship. Applicants must be high school seniors whose parents work at Armstrong.

Benjamin Haering is the son of Ed and Kathy Haering of Lancaster, California. Ed Haering is a research engineer in the Aerodynamics and Propulsion Branch. He supports the Commercial Supersonic Transport project in the area of sonic boom measurement, prediction and propagation. He has been the principal investigator of many research efforts and projects related to sonic booms.

His parents said they are proud. “I was excited and Ben was

my first call when I learned he had earned the scholarship,” Ed Haering said.

Kathy Haering added, “I am proud of Ben for applying for the scholarship and thrilled that he earned this scholarship to help with the expenses of college.”

Haering earned a 4.57 grade-point average and was a valedictorian of his graduating class. In addition to excelling in advanced placement and honors classes during his high school career, he was a member of the National Honor Society and a member of the California Scholarship Federation. Haering also was involved in Spanish, Math, English and Science Honor Societies and the Key Club. He demonstrated his leadership and analytical skills through Mock Trial, where he led his team to

many tournament victories, including a championship.

He also served as an intern for Assemblyman Tom Lackey and was a member of the Lancaster Youth in Government Program.

Haering participated in school athletic programs including cross country and track and field. He was a member of the Paraclete Liturgy Band and Choir, president and founding member of the local Cyber Patriots, a youth organization targeting cyber security and a writer for the Paraclete newspaper. Haering also volunteered at the Doggy Smiles Rescue adoption organization, collected food and clothing for the needy and volunteered at hospice care centers.

In the Boy Scouts of America, Haering earned the rank of Eagle

Scout in November of 2018 with his project to improve the Paraclete campus. He is also a member of the Order of the Arrow, which is the Boy Scout’s National Honor Society. Haering is completing a term as a vice chief of his local Boy Scouts chapter.

The Armstrong Exchange Council scholarships are named for former employees of NASA’s Armstrong Flight Research Center, with honorees selected on a rotating basis, as was Vensel this year. Vensel was a former director of flight operations at the center and a former NACA pilot at the Langley Research Center in Hampton Virginia. He retired from what was then the Dryden Flight Research Center in 1966. Scholarship funds are raised from council activities, including proceeds from vending machines, the Armstrong Gift Shop, cafeteria sales and fundraising events.

Summer students excel



AFRC2019-0109-1

NASA/Ken Ulbrich

Students who participated in the Pathways programs at Armstrong included, front row from left, Zachary Houghton, Lydia Hantsche, Cody Christiansen, Matthew Gray, Diana Franzone, Alyssa Lee, Nickelle Reid, Victoria Hawkins, Erica Patmon and Neil Malik. The middle row includes from left Zachary Bassett, Daniel Budolak, Brent Cano, Andrew Burrell, Annie Gardner, Erik Coltey, Julio Trevino III, Emily Glover, Erick Castillon, John Rudy, Abbigail Waddell and Vincent Moreno. The back row from left are Christopher Antony, Miguel Green Camara, Tyler Wharton, Joseph Morello, Max Greene, Andres Garcia Leyva, John Bodylski, Jonathan Lopez-Zepeda and Nathan Smith. The NASA Pathways programs provide opportunities for students and recent graduates to be considered for federal employment through the NASA Pathways Intern Employment program, the NASA Pathways Recent Graduates program and the NASA Pathways Presidential Management Fellows program.

Armstrong Education Office sponsored interns included from left to right: Amanda Short, Christopher Lang, Kevin Moran, Jonathan Richter, Ying Cheng Lin, Brian Frei, Jonathan Lokos, Hannah Smith, John Bodylski, Jean Claude Hasrouty, Garrett Jibrail, Danika Soberano, Justin Vanderveer, Aaron Mista, Sarah Estep, Jordan Conner, Christopher Morales, Mirin Morris-Ward, Jacob Pagel, Alex Healy, Rebekah Childers, Kevin Montalvo Vega, Michael Salazar, Dean Park, Tristan Minkoff, Mariah Gammill, Emily Morales, Christiana Kallemeyn, and Kristina Marotta. Students in the intern program also included Samuel Bever, Ayanna Kimbrough and Kendy Edmonds.



AFRC2019-0119-09

NASA/Ken Ulbrich

Launch Abort System... from page 1

and Joe Hernandez were in the abort test booster control room looking for anything out of the ordinary. They were monitoring data from the booster, the separation ring and the video system. Meanwhile, AA-2 DFI engineering lead David Dowdell, Leo Gross and Jeff Sutherland were in a separate control room monitoring the crew module (CM) and launch abort system (LAS).

“We monitored the crew module and launch abort system instrumentation and I was also in communication with the DFI team in the other control room to make sure everything was ‘go’ on their side for instrumentation,” Dowdell recalled. “We had one pressure sensor that was acting funny early on but after a power cycle (turning it off and on), it was ok. We were concerned for the mission as we are for all of the missions we work on, but we were confident it would be a success.”

It was a busy morning.

“We had so many parameters to watch for anything that might have been unexpected or strange,” Gross explained. For that reason, he only caught a glimpse of the separation and waited for the playback on NASA TV later to see the full launch.

Lucas Moxey, who was key in the development of the camera system and data retrieval system, viewed the launch at Cape Canaveral.

“I saw the video later in the day when the telemetry team was playing back the data,” Moxey said. “We saw the video and it was amazing. Of



AFRC2019-0170-1

NASA/Lauren Hughes

Members of the Armstrong Ascent Abort-2 management and engineering team contributed to the AA-2 launch at Cape Canaveral in Florida July 2. From left are Gary Martin, Rose Blomquist, Ernest Nwajagu, Lucas Moxey, Leo Gross, Jeff Sutherland, Chuck Rogers, Joe Hernandez, David Dowdell, Jeri Myers and Dan Nolan. Team members show how the separation ring, crew module and launch abort system fits together.

the 12 data recorders, they were all recovered within the hour and 11 of the 12 transmitted recovery location data. Launch data was successfully downloaded from all 12 recorders.”

“The first time I saw the video, I said wow,” Rogers added.

It will be a while before the team knows if all the data is good, Martin said.

“There is a huge quantity of data to look at,” he said. “There will be people continuing to pore over this data until they complete the final certification that the LAS is safe for human space flight prior to the Artemis 2 mission.”

Team members were excited about their roles.

“It’s an experience you have one or two times in a lifetime,”

Hernandez said. “We worked on all these different pieces and it was good to see the whole thing put together.”

There will be pride for the team when Artemis missions begin.

“I think it’s going to be really neat when we see these crewed missions to the Moon and we see that spindly thing on the front of the booster and we can say we did that,” Rogers said.

The X-Press is published the first Friday of each month for civil servants, contractors and retirees of the NASA Armstrong Flight Research Center.

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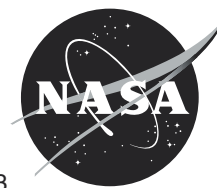
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