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AV Week recognizes ACAT

By Gray Creech
Dryden Public Affairs

The U.S. Air Force Research Laboratory's Automatic Collision Avoidance Technology Fighter Risk Reduction Program, or ACAT/FRRP, team, which includes Dryden, has won an Aviation Week & Space Technology magazine Laureate Award for its successful development and flight test of an Automatic Ground Collision Avoidance System.

The award was announced March 8 during the magazine's 54th annual Laureate Awards ceremony in Washington, D.C.

Dryden led the project's integrated test team, which was responsible for the technical content of the project's test and evaluation work, maintenance of the Air Force's F-16D test aircraft, and project management and engineering services. A Dryden pilot flew the test aircraft.

ED09 0070-01 **NASA Photo by Jim Ross**

The U.S. Air Force F-16D Automatic Collision Avoidance Technology aircraft cruises during a flight originating from Dryden.

"It is a tremendous honor to be recognized by Aviation Week this way," said Dryden's Mark Skoog, the team's project manager. "Speaking for the NASA and Air Force Flight Test Center team, we were proud to contribute to this effort by ironing out the system requirements with Air Combat Command, bringing improved digital data to the system, acquiring and preparing the test jet and conducting and evaluating the thrilling flight test," Skoog said.

The Automatic Ground Collision Avoidance System, or Auto GCAS, is a potentially lifesaving aircraft technology that incorporates on-board digital terrain-mapping data, a terrain scan pattern, and "time to avoid impact" algorithms that can predict impending ground collisions and, at the last moment, direct the aircraft in avoidance maneuvers. The result is a system that automatically prevents controlled flight into dangerous terrain, the leading cause of all fighter aircraft mishaps.

By flight-testing the Auto GCAS system across the entire F-16 flight envelope and in all terrain conditions, including in such extremes as flying just 100 feet above ground level in canyons and

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Global Hawk wraps up WISPAR flights

By Beth Hagenauer
Dryden Public Affairs

A NASA Global Hawk aircraft completed the third and final flight of the Winter Storms and Pacific Atmospheric Rivers, or WISPAR, field campaign March 10. The long-duration flights over the Pacific Ocean explored atmospheric rivers and Arctic weather and collected targeted observations designed to improve operational weather forecasts.

The National Oceanic and Atmospheric Administration-led WISPAR airborne campaign that began Feb. 11 was focused on improving scientists' understanding of how atmospheric rivers form and behave and evaluating the operational use of unmanned, high-altitude aircraft for investigating these phenomena. The research is also designed to assist NOAA in conducting potential offshore monitoring of atmospheric rivers to aid in future weather predictions.

Atmospheric rivers are narrow regions in Earth's atmosphere that transport large amounts of water vapor across the Pacific Ocean or other regions. Aptly nicknamed "rivers in the sky," they can transport enough water vapor in one day, on average, to flood an area the size of Maryland one foot deep, an amount that constitutes nearly seven times the average daily flow of water from the Mississippi River to the Gulf of Mexico.

An automated dropsonde system, developed for NOAA by the National Center for Atmospheric Research, was installed on NASA's Global Hawk for the study. When dispensed from the aircraft, a sonde – about the size of a paper towel roll – collects readings on temperature, wind, relative humidity and other elements as it descends through an atmospheric river or other weather feature.

"The experiment was very successful in evaluating the combined capabilities of the dropsonde system on the Global Hawk and exploring potential scientific and operational applications for NOAA," said Gary Wick, a physicist in the Physical Sciences Division of the NOAA Earth System Research Laboratory, Boulder, Colo. "I was very impressed

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Bikle set altitude record in 1961

By Christian Gelzer
Dryden Chief Historian

Fifty years ago, on Feb. 25, 1961, the late Paul Bikle set out for a sailplane flight that he hoped would set an altitude record. His quest was not to be denied.

Bikle, then director of NASA's Flight Research Center and president of the Soaring Society of America, was an avid and accomplished sailplane pilot with several records to his name. He was aware of the Sierra Wave program in Bishop, Calif., during the 1950s, during which sailplane pilots gathered to explore high-altitude waves of air for potential soaring lift, and he'd flown in national and international sailplane competitions. A fiercely competitive pilot, Bikle devoted every weekend to soaring, and his children were part of the team.

On the cold and windy February afternoon, Bikle and his son John headed to Lancaster's Fox Airfield, where his Schweizer 1-23E sailplane was positioned for launch, recalled eldest son Hugh Bikle during a recent colloquium presentation at Dryden about the record flight. At the event, John and Hugh Bikle, along with retired NASA research pilot and noted sailplane pilot Einar Enevoldson, outlined the elder Bikle's achievement, and his immaculately restored Schweizer was on display in a Dryden hangar.

ED11 0059-25 NASA Photo by Tony Landis

The Perlan sailplane in which Paul Bikle achieved his altitude record was on display at Dryden Feb. 25 as part of a celebration of the flight.

A small Luscombe towplane hauled Bikle aloft, and the pair headed north toward China Lake, near Ridgecrest. At about 10,000 feet altitude, Bikle released the towrope and began hunting for an updraft. Instead, he found sinking air. Rather than an altitude record, Bikle began looking for a place to set the sailplane down. At about 2,500 feet altitude, he suddenly flew into an updraft – the beginning of the rotor that would carry him to the lenticular cloud layer and beyond.

Soon Bikle's sailplane was ascending at 1,000 to 2,000 feet per minute from the lower end of California's Owens Valley, and the higher it climbed, the lower the temperature became. Bikle had dressed for sub-zero conditions as best he could: fur-lined gloves from a hardware store and two shirts and two pairs of pants, as well as a light flight suit. He even wore electrically heated socks. But the efforts were to no avail. By 36,000 feet altitude, the outside air temperature was -65 degrees F and since there was no way to close the cockpit air vents, the temperature inside was the same. Despite the frigid conditions, Bikle and his sailplane continued to rise steadily until they crested 40,000 feet altitude.

Supplemental oxygen is needed in order to climb to such an altitude, and he had that in a large tank behind his head. The tank, however, dated to World War II and was never intended for use at that altitude. Still, it functioned. But because he'd loosened the oxygen mask earlier, while descending to 2,500 feet altitude in anticipation of landing, Bikle soon found during the sudden and non-stop ascent that he had to hold the oxygen mask to his face with his left hand while steering the sailplane with his right. Before long, the moisture produced by his body and exhaled air caused the inside of the aircraft's canopy to ice over completely, and Bikle had no outside vision. He could fly only on his instruments, and draw on an extraordinary font of experience to keep him in the ascending wave of air.

At just over 40,000 feet the climb rate dropped off to 500 feet per minute. Since he'd allowed himself only so much time for the attempt, and that window was slipping away as his climb slowed, Bikle feared he would not reach his goal. He thought about abandoning the effort; he'd already bested his own earlier record of some 36,000 feet. But then the climb rate picked back up to 1,000 feet per minute so he stayed with the wave, finally cresting at 46,267 feet, a new world altitude record for a sailplane.

He was back on the ground at Fox Field not much more than two hours after the adventure began. His son recalled that Bikle had radioed ahead to ask John to start the car and turn on the heater so he could warm himself on his return. While John tied down the Schweizer and took out the barograph for examination by officials, Paul Bikle huddled and shivered in the car, heater blasting on high.

The remarkable record would stand for 25 years. Seeing the aircraft in which Bikle's record was achieved and comparing it to more current, high-performance sailplanes, the record is all the more remarkable. The accomplishment is a testament to the perseverance of a determined man with a deep well of experience and knowledge to call upon, as well as to the tireless support of family and friends.

Crippen scheduled to attend April event celebrating STS-1

On April 12, 1981, the launch of Space Shuttle Columbia from Kennedy Space Center in Florida marked the first shuttle mission, STS-1. Two astronauts, Commander John Young and pilot Bob Crippen, were on board for one of the most extreme test flights of the early shuttle era, and the mission ended with an April 14 landing at Edwards. This year marks the 30th anniversary of the historic event.

To commemorate the milestone, the Antelope Valley Board of Trade in partnership with Dryden will host a dinner event with Crippen on April 15. The event will be held in the Grand Ballroom of the University of Antelope Valley (formerly the Antelope Valley Inn), 44055 Sierra Highway, Lancaster.

A reception with no-host bar will begin at 5:30 p.m., with the dinner and program following from 6:30 to 8:30 pm. Dryden Center Director David McBride will be among featured speakers.

Lakebed Legacies

March 4, 1948 – NACA research pilot Herbert H. Hoover became the first civilian to break the sound barrier when he flew X-1 (46-063) to Mach 1.029 at 40,000 feet.

March 2, 1977 – Final captive-inert flight-test of space shuttle orbiter Enterprise atop 747 SCA (N905NA).

ED11 0069-12 NASA Photo by Tom Tschida

PA-1 team members honored

Dryden contributions to the successful Pad Abort 1 flight on May 6, 2010, were acknowledged March 8 at a Constellation Recognition Awards ceremony at Dryden. Program manager commendations were awarded to Ricardo Arteaga, Bob Clarke, David Dowdell, Mauricio Rivas and Davis Hackenberg. Space Flight Awareness Leadership Awards were presented to Laurie Grindle and David McAllister. Dale Thomas, Constellation program manager; Charlie Stegemoeller, Constellation deputy program manager; and Mark Geyer, Orion project manager, presented the awards. From left are Stegemoeller, Thomas, Arteaga, Rivas, Dowdell, Grindle, Clarke, McAllister and Geyer.

I3P initiatives are gearing up

By Jay Levine
X-Press Editor

A new initiative is under way to consolidate information technology services and infrastructure across the agency and improve services and security while streamlining costs.

NASA's Information Technology Infrastructure Integration Program, or I3P, will provide agency-wide management, integration and delivery of IT infrastructure services. The concept behind I3P is to unify services at the agency level for Web services, integrated network and communication services, enterprise applications and data centers, end-user services and a NASA-owned service desk.

For Dryden, it will also improve purchasing power when buying IT services through agency contracts that allow economies of scale and will result in better pricing, said Russell Leonardo, Dryden I3P integration lead. Service also is expected to improve as a result of more consistent IT service delivery and standards across the centers, he said.

Contract teams for each cluster of IT services designed the request for proposals at the agency level, with input from center representatives. A board reviews the proposals, which detail a group of services to be provided, and determines which company will be awarded the contracts for providing those services.

"The idea is, with so many more people on similar platforms, with so many more people within a single architecture, it becomes easier to communicate with other centers," Leonardo said. "It allows us to begin to take down network barriers between centers and increase collaboration.

"The real test of our success will be when the contracts are in place and we can tell how well the collaboration works."

IT security also is expected to improve. Leonardo likened the proposed changes to a house with 10 different doors with individual locks then switching to a house with a single door with several locks.

The first major contract is expected to be in the agency's Consolidated End-user Services, or ACES, contract, which has been

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News at NASA

Wanted: students

High school students in the United States are invited to participate in NASA's Interdisciplinary National Science Program Incorporating Research Experience, or INSPIRE, through an online learning community. INSPIRE is designed to encourage students in ninth through 12th grades to pursue careers in the science, technology, engineering and math disciplines.

Applications are being accepted through June 30. Selections for the program will be made in September. The students chosen, along with their parents, will participate in an online learning community with opportunities to interact with peers, NASA engineers and scientists. The online community also provides appropriate grade-level educational activities, discussion boards and chat rooms for participants to gain exposure to careers and opportunities available at NASA.

Students selected for the program also will have the option to compete for unique grade-appropriate experiences during the summer of 2012 at NASA facilities and participating universities. The summer experience will provide students with hands-on opportunities to investigate education and careers in the STEM disciplines.

INSPIRE is part of NASA's education strategy, aimed at attracting and retaining students in the STEM disciplines, which are critical to the agency's mission.

To apply for the program, go to https://inspire.okstate.edu/index.cfm?liftoff=login.LoginForm.

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in the planning for more than two years. The ACES contract will provide services across the agency, including the purchase and management of desktops, laptops, multi-function copiers, printers, personal digital assistants and cell phones. The contract also will cover e-mail, calendar services and office automation software.

Another contract in the works is the NASA Integrated Communication Services, or NICS, contract, which will consolidate NASA integrated services networks and center local area networks, such as Dryden's networks, and services. The contract also will cover management of wide-area networks. Currently, there are as many as 100 data centers of varying sizes across the agency and NASA's goal is to have one centralized data center per center. That is expected to result in savings of energy, time and space. In addition, employees are expected to spend less time with IT concerns.

"An engineer that is supposed to be solving the agency's complex engineering problems will not have to manage IT issues," Leonardo said.

Other elements of the plan to unify NASA services are in the works.

For example, the Enterprise Applications Service Technologies, or EAST, contract was recently awarded to Science Applications International Corp. at Marshall Space Flight Center, Huntsville, Ala. As the name implies, the contract is focused on enterprise application services through the NASA Enterprise Applications Competency Center. Those include services such as the NASA financial system, WebTADS time entry system, SATERN, and the human-capital information environment.

Users of those services will eventually have a single phone number to call where information about the request will be gathered and routed to the appropriate area for resolution, he said. To meet that goal, the Enterprise Service Desk will be established to provide I3P end users with a consolidated help desk, self-service website, enterprise notification service and I3P service-request processing. The Dryden Help Desk, which provides on-site support staff to answer calls, will continue to be available in addition to the Enterprise Service Desk.

The Web Enterprise Service Technologies, or WEST, contract will provide a consolidated, single-point-of-entry Web environment and integration of NASA's public Web content. Included are public Web hosting, Web content management and integration and search services.

Though there are a number of changes under way aimed at unifying and making better use of NASA resources, most employees will see a seamless transition that will not affect the way they do their job.

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with the ability and willingness of the NASA team to modify the flight plans and scheduled drop locations in real time."

Also aboard the Global Hawk was the High-Altitude Monolithic Microwave Integrated Circuit Sounding Radiometer, or HAMSR, an advanced water vapor sensor. Developed by NASA's Jet Propulsion Laboratory in Pasadena, Calif., HAMSR analyzes heat radiation emitted by oxygen and water molecules in the atmosphere to determine their density and temperature.

The HAMSR operates at microwave frequencies that can penetrate clouds, enabling the instrument to determine temperature, humidity and cloud structure under all weather conditions. This capability is critical for studying atmospheric processes associated with bad weather, such as the conditions present in atmospheric river events.

"HAMSR worked flawlessly during the WISPAR campaign and was essentially operating autonomously, with no intervention required during the flights," said HAMSR principal investigator Bjorn Lambrigtsen. "The real-time data-display capability provided situational awareness and was used to assist in executing the flights, as was also done previously in the GRIP hurricane mission. The HAMSR data will be used by NOAA and JPL scientists to investigate the atmospheric river phenomenon."

The unmanned Global Hawk took off from Dryden Feb. 11 on the first atmospheric rivers flight, landing 20 hours later. During the flight, made to investigate atmospheric rivers in the Pacific, 37 dropsondes were dispensed, the first use of a dropsonde system on the aircraft. During the three flights a total of 177 dropsondes were dispensed.

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FRRP team successfully proved the maturity of the technology and its readiness for transition to operational fighter aircraft. As a direct result of the ACAT/FRRP team's success, Auto GCAS is now being incorporated into the Air Force's F-16 and F-22 aircraft as well as the F-35 Joint Strike Fighter.

Auto GCAS offers unprecedented payoffs in terms of operator safety and aircraft retention, according to Air Force Research Laboratory officials. The ACAT/FRRP team is composed of the AFRL, Lockheed Martin, Dryden, the AFFTC, and the Office of the Secretary of Defense Personnel and Readiness.

The annual Aviation Week Laureate Awards recognize extraordinary individuals and teams for exploration, innovation and vision in the aerospace and defense industry.

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