National Aeronautics and Space Administration

The Dryden X-PRESS

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Global Hawks to fly HS3

By Beth Hagenauer
Dryden Public Affairs

NASA's Hurricane and Severe Storm Sentinel, or HS3, mission will be a complex one for the pilots flying NASA's Global Hawk aircraft from the ground. The mission, set to begin this month, will be the first deployment for the unmanned aircraft away from their regular base of operations at Dryden. In addition, the pilots will be operating the aircraft from two locations on opposite coasts.

After the upload of specialized science equipment is complete, the two Global Hawks will fly from one coast of the United States to another over sparsely populated areas and open water to reach NASA's Wallops Flight Facility in Virginia.

NASA Wallops was selected as a deployment site because the area of scientific interest is the Atlantic Ocean, especially the eastern Atlantic where hurricanes begin to form. Flights from the U.S. East Coast take less transit time to the target than those from NASA Dryden and allow the aircraft to travel further out over the Atlantic and collect data for a longer period of time.

NASA/Tony Landis photo

Mission manager Matt Graham, left, and pilots Tom Miller, center, and Phil Hall of NOAA monitor the Global Hawk prior to take off.

Waiting at Wallops will be a mobile ground control center, mobile payload operations center and Ku-band satellite dish – all necessary for operation of the high-altitude and long-endurance aircraft. Scientists, maintenance personnel and three pilots will support flights from Wallops.

During take off and landing of the Global Hawk, the aircraft must be in line-of-sight communications with the pilot. The pilots deployed to Wallops will manage this activity from the Global Hawk Mobile Operations Facility, handing off operation of the aircraft to Dryden after reaching an altitude of approximately 30,000 feet.

Additional pilots sitting in Dryden's Global Hawk Operations

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X-48C makes first flight

By Gray Creech
Dryden Public Affairs

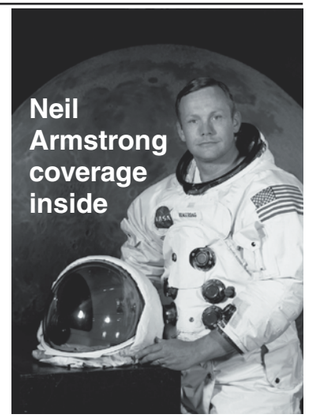
The remotely piloted X-48C aircraft successfully flew for the first time on Aug. 7, 2012.

The aircraft, designed by the Boeing Co. and built by Cranfield Aerospace Ltd. of the United Kingdom, is flying again in partnership with NASA. The new X-48C model, which was formerly the X-48B Blended Wing Body aircraft, was modified to evaluate the low-speed stability and control of a low-noise version of a notional, future Hybrid Wing

X-48C, page 7

ED12 0255-51 NASA/Carla Thomas photo

The X-48C concludes a successful first flight at Dryden.



Dryden receives NASA awards

The NASA Honor Awards Aug. 23 recognized 26 outstanding Dryden employees with medals and six project teams received group achievement awards.

Center Director David McBride and Robert M. Lightfoot Jr., acting NASA associate administrator, presented the medals and awards. The winners are listed below.

ED12 0286-07 NASA/Tom Tschida photo

Robert M. Lightfoot Jr., NASA acting associate administrator, right, congratulates retired Dryden engineer and manager Robert R. "Bob" Meyer and prepares to give him the NASA Distinguished Service Medal. Dryden center director David McBride prepares to give Meyer the framed certificate.

Distinguished Service Medal

Robert R. Meyer was recognized for meritorious service to the agency and the nation through significant contributions in the advancement of aeronautics and science.

Outstanding Leadership Medal

• **Glenn A. Bever** received his medal for outstanding technical and managerial leadership as the deputy director of Research and Engineering at NASA Dryden.

• **Thomas J. Horn** was recognized for exceptional leadership of the Critical Change Project Management core team resulting in new project management methods using the Theory of Constraints principles.

• **Stephen C. Jensen** received his medal for exceptional leadership as the Stratospheric Observatory for Infrared Astronomy, or SOFIA, Program chief engineer.

• **John W. Kelly** was recognized for outstanding leadership in the formulation and execution of NASA's Flight Opportunities Program.

• **Timothy R. Moes** received his medal for exemplary leadership of the G-III UAVSAR Project, which has resulted in extraordinary scientific progress with new uses for synthetic aperture radar for national benefit.

Exceptional Service Medal

• **Dr. Trong T. Bui** was recognized for exceptional engineering and technical leadership, unwavering dedication to mentorship, research and skill development, and for serving as a role model.

• **Gary B. Cosentino** received his medal for exceptional performance, dedication, and teamwork in supporting Operations Engineering and leading special category programs including X-45A, X-48, Phantom Ray and DROID.

• **Dennis M. DaCruz** was recognized for exceptional success in creating innovative IT solutions at NASA Dryden, the Dryden Aircraft Operations Facility, and the AERO Institute.

• **George H. Grimshaw** received his medal for outstanding sustained support and significant contributions to NASA's Space Shuttle Program.

• **Joseph S. Lopko** was recognized for exceptional work as a master craftsman in the field of strain gage and thermal sensor application.

• **Hernan D. Posada** received his medal for exceptional service in developing and implementing unmanned aircraft systems at NASA Dryden, setting the example for other agencies and industry to follow.

• **Rosalia Toberman** was recognized for outstanding contributions in enabling Dryden's projects and programs to advance science and technology through flight.

Exceptional Public Service Medal

• **Dr. Eric E. Becklin** received his medal for excellence as a pioneer in the infrared astronomy field and providing key leadership for the scientific success of the Stratospheric Observatory for Infrared Astronomy.

• **William R. Werner** was recognized for exceptional leadership, dedication, and responsiveness in operating and developing Dryden's facility systems over 19 years, enabling extraordinary mission success.

Exceptional Engineering Achievement

• **Robert Downing** received his medal for exceptional system design and management of the development and implementation of Dryden's mission control centers data acquisition and processing system called WINGS.

• **Michael E. Yettaw** was recognized for exceptional technology innovation in the field of ground-based space communications and flight termination systems.

Exceptional Achievement Medal

• **Russell R. Leonardo** received his medal for outstanding achievements as Dryden center integration lead for the NASA IT Infrastructure Integration Program.

• **Bradley Flick** was recognized for outstanding service to NASA through his leadership of the GLORY Mishap Investigation Board.

Exceptional Administrative Achievement Medal

• **Sirell D. Lane** received her medal for exceptional administrative mission support and initiative in foreign travel coordination, small acquisition, IT coordination, and mission logistics support.

• **Afreekia S. Stillwater** was recognized for exceptional support to the SOFIA Program in establishing new office procedures and other process improvements that contributed to program success.

Early Career Achievement Medal

•**Larry J. Cliatt II** received his medal for exceptional initiative and commitment to exploring the barriers of supersonic flight over land, and enthusiastic dedication to NASA's mission.

• **Michael A. Hill** was recognized for outstanding innovative contributions to NASA Dryden simulation capability resulting in significant cost savings and substantial improvements of key simulation equipment.

• **Loyd R. Hook** received his medal for outstanding achievement in advancing digital terrain mapping

NASA Awards, page 8

E-85 fuel now available

New E-85 fuel dispensers needed to fill the gas tanks of Dryden's fleet of flexible fuel vehicles are now available at the Dryden Fuel Station.

E-85 is a gasoline-ethanol blend containing 51 percent to 83 percent ethanol, depending on geography and the season.

The E-85 fuel dispensers are used just like those of diesel or unleaded fuel. Instructions are posted on the pedestal of the Fuel Force keypad.

To begin the program, Kay & Associates employees have placed an E-85 decal on the gas tank door of all NASA leased E-85-compatible vehicles. The decal, which may be removed in the future, is a temporary reminder that people can pump E-85 and/or unleaded fuel into the vehicle. The fuels are compatible and can be mixed in the tank. Kay & Associates encourages the use of E-85 whenever possible.

E-85 fuel should only be pumped into vehicles equipped for it. Engine and fuel system components must be designed to handle the properties of ethanol. The fuel management system will help prevent this mix up, but it is important for people to know when they are offsite.

Photo courtesy of Jay Levine

E-85 fuel is now available. Cars able to use it are marked with yellow stickers.

Flexible fuel vehicles, or FFVs, have an internal combustion engine and are capable of operating on gasoline, E-85, or a mixture of the two.

According to the U.S. Energy Information Administration, there are more than 8 million FFVs on U.S. roads. However, many flex fuel vehicle owners don't realize their car is an FFV and that they have a choice of fuels.

Other than employing an ethanol-compatible fuel system and powertrain calibration, FFVs are similar to their conventional gasoline counterparts. The only difference is that the fuel economy is lower when FFVs run on ethanol. Their power, acceleration, payload, and cruise speed are comparable whether running on ethanol or gasoline.

Federal regulations require that agencies obtain alternative fueled vehicles and use alternative fuel when it becomes available.

NSSC can help prep for retirement

A recent survey from the U.S. Office of Personnel Management showed eight out of ten government workers wanted to receive additional retirement information. From fiscal year 2008 through 2012, 240,000 federal employees expected to retire from government service.

The NASA Shared Services Center offers several ways for people to learn more about retirement processes and planning. People can go to the nssc.nasa.gov website and enter retirement application processing on the website's search engine to find retirement information. For those who prefer, the NSSC Customer Contact Center is available at 877-677-2123. Help desk agents can provide retirement information, or connect people to a retirement counselor. The NSSC also provides face-to-face information from human resource specialists during center visits.

People looking to retire should first review their work history, including military service or temporary service and refunds of retirement contributions. A review of work history could include useful credits for retirement.

The NSSC Retirement Application or Estimate Request webpage also could provide a solid start toward retirement. On the retirement information page is a "Type of Request" dropdown menu that provides the option for people to make requests such as: Retirement Estimates Only, Begin My Application for Retirement Processing, Military Deposits and Civilian Deposit/Redeposit Calculation Requests. Once a NASA employee completes the Retirement Estimate Request form, the NSSC starts the retirement information/application process.

The following priorities apply to your request for retirement estimate:

• Priority high – within one year of expected retirement date, people will receive an estimate within 10 business days.

• Priority medium – within one to three years of expected retirement date, people will receive an estimate within 30 business days.

• Priority low – within three to

See NSSC, page 6

News at NASA

Space voice

NASA's Mars Curiosity has debuted the first recorded human voice that traveled from Earth to another planet and back.

NASA Administrator Charles Bolden noted the difficulty of landing a rover on Mars, congratulated NASA employees and the agency's commercial and government partners, and said curiosity is what drives humans to explore in a message radioed to the rover on Mars and back to NASA's Deep Space Network on Earth.

"Curiosity will bring benefits to Earth and inspire a new generation of scientists and explorers, as it prepares the way for a human mission in the not too distant future," Bolden said in the recorded message.

The full text of the message, and a video clip and audio clip, are available at: http://www.nasa.gov/mission_pages/msl/news/bolden20120827.html

Passings

Frederick B. Sheehy

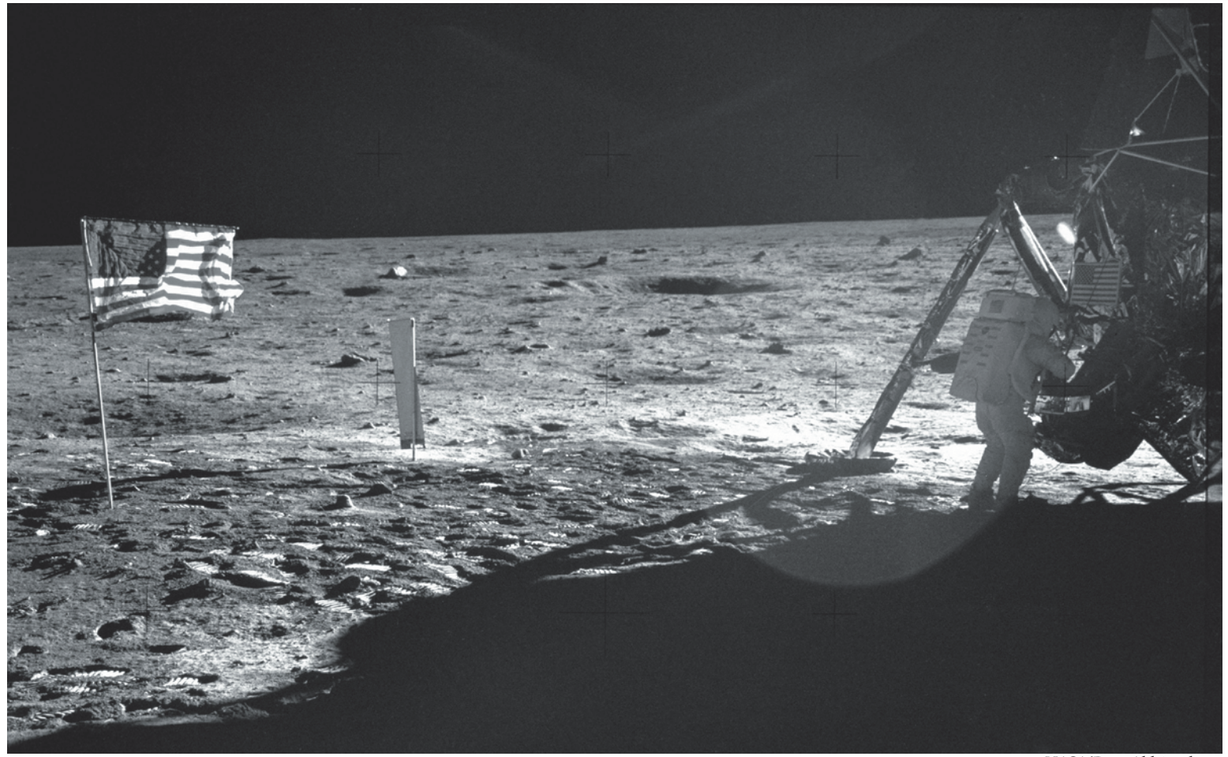
Frederick B. Sheehy, a former National Advisory Committee for Aeronautics instrumentation specialist who worked on X-Planes, died July 29. He was 86.

Phillip J. Kerschner

Phillip J. Kerschner, a Computer Sciences Corporation employee at Dryden, died July 12.

Kerschner was a mechanic who worked on projects like the Orion Pad Abort-1 abort flight test vehicle and most recently on the Global Hawks.

A memorial fund has been set up at Wells Fargo bank under Philip J. Kerschner Memorial Fund, account number 6096841686.



NASA/Buzz Aldrin photo

Armstrong's achievements will continue to inspire

The legend lives on

Neil Armstrong, the first man to walk on the moon during the 1969 Apollo 11 mission, died Aug. 25, following complications resulting from cardiovascular procedures. He was 82.

Armstrong's words "That is one small step for (a) man, one giant leap for mankind," spoken on July 20, 1969, as he became the first person ever to step onto another planetary body, instantly became a part of history.

Those few words from the Sea of Tranquillity were the climactic fulfillment of the efforts and hopes of millions of people and the expenditure of billions of dollars. A plaque on one of the lander's legs that concluded "We came in peace for all mankind," further emphasized that Armstrong and fellow astronaut Edwin "Buzz" Aldrin were there as representatives of all humans.

In a 2001 oral history interview, Armstrong credited those behind the scenes for the mission's success: "when you have hundreds of thousands of people all doing their job a little better than they have to, you get an improvement in performance. And that's the only reason we could have pulled this whole thing off."

"Neil Armstrong was a hero not just of his time, but of all time," President Barack Obama said via Twitter. "Thank you, Neil, for showing us the power of one small step."

Armstrong's family released the following statement on Aug. 25:

"Neil Armstrong was also a reluctant American hero who always believed he was just doing his job. He served his Nation proudly, as a navy fighter pilot, test pilot, and astronaut. He also found success back home in his native Ohio in business and academia, and became a community leader in Cincinnati.

"While we mourn the loss of a very good man, we also celebrate his remarkable life and hope that it serves as an example to young people around the world to work hard to make their dreams come true, to be willing to explore and push the limits, and to selflessly serve a cause greater than themselves."

The family will be providing further updates at www.neilarmstronginfo.com

"As long as there are history books, Neil Armstrong will be included in them, remembered for taking humankind's first small step on a world beyond our own," said NASA Administrator Charles Bolden.

"Besides being one of America's greatest explorers," Bolden added, "Neil carried himself with a grace and humility that was an example to us all."

Apollo 11 lunar module pilot and fellow moonwalker Buzz Aldrin on Armstrong's passing: "I am very saddened to learn of the passing of Neil Armstrong today. Neil and I trained together as technical partners but were also good friends who will always be connected through our participation in the Apollo 11 mission. Whenever I look at the moon it reminds me of the moment over four decades ago when I realized that even though we were farther away from earth than two humans had ever been, we were not alone."

Apollo 11 command module pilot Michael Collins said simply, "He was the best, and I will miss him terribly."

Many NASA officials offered thoughts on NASA's best-known representative:

"The passing of Neil Armstrong has shocked all of us at the Johnson Space Center," said Center Director Michael Coats. "The whole world knew Neil as the first man to step foot on the Moon, but to us he was a co-worker, a friend, and an outstanding spokesman for the Human Space Program. His quiet confidence and ability to perform under pressure set an example for all subsequent astronauts. Our role model will be missed."

NASA photo

Armstrong, right, and David R. Scott prepare to board Gemini-Titan VIII.

NASA photo

Before becoming an astronaut, Armstrong flew the rocket-powered X-15 as a research test pilot at the NACA High-Speed Flight Station, now Dryden.

ED11 0120-54 NASA/Tom Tschida photo

Gary Cosentino briefs Apollo 11 astronaut Neil Armstrong, left, on the X-48C engine during a National Research Council tour at Dryden.

NASA photo

Armstrong was honored in 1991 by the City of Lancaster, Calif., with an Aerospace Walk of Honor monument for his achievements as a pilot and astronaut.

"Neil Armstrong was a very personal inspiration to all of us within the astronaut office," said Bob Behnken, chief of NASA's Astronaut Office. "His historic step onto the Moon's surface was the foundation for many of our personal dreams to become astronauts. The only thing that outshone his accomplishments was his humility about those accomplishments. We will miss him as a friend, mentor, explorer and ambassador for the American spirit of ingenuity."

Armstrong's single sentence, though it was focused above the national divisions and quarrels of Earth, still signified unquestionably the U.S. victory in the desperate space race with the Soviet Union.

Neil A. Armstrong was born Aug. 5, 1930, in Wapakoneta, Ohio. He earned an aeronautical engineering degree from Purdue University and a master's in aerospace engineering from the University of Southern California.

He was a naval aviator from 1949 to 1952. During the Korean War he flew 78 combat missions.

In 1955 he joined the National Advisory Committee for Aeronautics, or the NACA, NASA's predecessor, as a research pilot at Lewis Laboratory in Cleveland.

Armstrong later transferred to NACA's High Speed Flight Research Station at Edwards Air Force Base, now Dryden. As a research project test pilot for seven years at the center from 1955 through 1962, he was in the forefront of the development of many high-speed aircraft. He was one of only 12 pilots to fly the hypersonic X-15 as well as the first of 12 men to later walk on the moon. In all, he flew more than 200 different types of aircraft.

Long-time Dryden employee Glenn Bever, who is deputy director of Research and Engineering, recalled that Armstrong last visited here in 2011 as part of the National Research Council committee that reviewed the flight content of Dryden's NASA Aeronautics portfolio. He also flew the X-48

American Hero, page 7

Employees recognized by peers

More than 50 Dryden civil service and contractor employees were honored Aug. 15 at the 2012 Dryden Peer Awards ceremonies.

Sponsored by the Dryden Employee Exchange Council, the awards are presented to Dryden staff members who in the eyes of their peers have demonstrated their dedication, perseverance and competence in performing their jobs. Valerie and John Zelmer hosted the Western-themed event.

Center director David McBride presented the top two awards to two long-time Dryden staff members – retired research pilot and former astronaut Gordon Fullerton and Advanced Planning and Partnerships Office director John Del Frate.

Fullerton was honored with the Milton O. Thompson Award in recognition "of a lifetime dedicated to the mastery, discovery and pioneering of atmospheric and space flight."

McBride presented Del Frate with the Dryden Center Director's Award, citing Del Frate's "tireless leadership, extraordinary personal dedication and commitment to Dryden Flight Research Center in maintaining and promoting a diverse and exciting flow of external flight activities for Dryden, NASA and the nation."

Others honored at the annual Peer Awards ceremonies included:

•2012 Pride in NASA Awards: Jack Sheldon, Arcata Associates; Leslie Williams, NASA

•Can-Do Attitude: Matthew Berry, NASA; John Tucker, Tybrin Corp.

•Engineer/Scientist/Pilot: Michael Marston, Tybrin Corp.

•Facilities Personnel: Brandon Werner, EMCOR

•Rising Star: Shedrick Bessent, NASA

•Safety: Donald Dennis, ISSI; Steve Fedor, MECX

•Mission Impossible: Sean Clarke, NASA

•Mentor: Paul Bean, NASA

•Student: Andrew Strongrich, NASA

•Supervisor/Manager/Leader: Jennifer Cole, NASA

•Technician/Mechanic: Robert Novy, NASA

•Mission Support – Administrative: Beverly Crooke, Media Fusion

•Mission Support – Administrative Professional: Andrea Basham, NASA; Robbin Kessler, NASA

•Mission Support – Financial/ Resources: Florence Norman, SAIC

•Mission Support – Information Technology: Craig Sayler, Arcata Associates

•Mission Support – Other Support Services: Carla Thomas, Arcata Associates

•Unsung Hero: Darlene Homiak, NASA; Mark Morgan, Tybrin Corp.; Michael Nesel, NASA

•Teamwork: Small Unmanned Aerial Vehicles Automatic Ground Collision Avoidance System (SUAV Auto GCAS) project team.

Co-workers and Dryden employees with knowledge of the nominees' contributions submitted nominees for the annual Peer Awards. Final selections of winners made by the 11-member 2012 Dryden Peer Awards Committee.

ED12 0270-8 **NASA/Tom Tschida photo**

Center Director David McBride presented retired Dryden research pilot and former NASA astronaut Gordon Fullerton with the Milton O. Thompson Award for his lifetime dedicated to atmospheric and space flight.

ED12 0270-4 **NASA/Tom Tschida photo**

John Del Frate, chief of Dryden's Advanced Planning and Partnerships Office, was honored by center director David McBride with the Director's Award.

NSSC... from page 3

five years of expected retirement date, people will receive an estimate within 45 business days.

People should begin planning several years before the date they have set for retirement so that they will know the requirements to continue certain benefits into retirement. Many factors are included in retirement planning and it is never too early to begin. For more information, visit OPM's frequently asked questions at: www.opm.gov/retire/faq/pre/faq9.asp

NSSC News is available

The NASA Shared Services Center quarterly publication, the NSSC News, is designed to provide updates on NSSC activities and contains information that NASA employees need to know.

It is available at www.nssc.nasa.gov/customerservice. Click on the newsletter icon for the latest issue.

American Hero... from page 5

simulator during a tour of Dryden.

"His love of flying never diminished, and I believe he was happier discussing flying as 'one of the boys' than he was in his role of the icon that first walked on the moon," Bever reflected. "We have lost a humble giant, but his legacy is forever."

Armstrong was selected as an astronaut in 1962.

His first space flight was Gemini 8, which he commanded. He was the first civilian to fly a U.S. spacecraft. With fellow astronaut David R. Scott, Armstrong performed the first docking in space, with an Agena target satellite.

Less than an hour later their spacecraft began an unplanned rolling motion. After undocking, it increased to one revolution per second. One of the Gemini's 16 thrusters had stuck open because of an electrical short circuit.

Armstrong used re-entry thrusters to control the capsule, and after a 30-minute struggle, it was stabilized. Flight rules required a return to Earth after use of the re-entry thrusters, so the crewmembers fired retrorockets that sent Gemini 8 to a contingency landing zone in the Western Pacific.

> **"We have lost a humble giant, but his legacy is forever."**
>
> **Glenn Bever**
> **Dryden deputy director of Research and Engineering**

The March 16, 1966, flight took about 10 hours, 41 minutes.

Apollo 11 lifted off on July 16, 1969, with Armstrong, Aldrin and Mike Collins aboard. Collins remained in lunar orbit in the command module while Armstrong and Aldrin descended in the lunar module they had named Eagle to their landing on the moon's surface.

"Houston, Tranquillity Base here. The Eagle has landed," Armstrong said, telling a tense and waiting Earth that men reached the lunar surface.

He and Aldrin spent about two hours exploring, gathering more than 50 pounds of moon rocks and setting up three experiments. The next day, after 21 hours and 37 minutes on the moon, they fired Eagle's engine to begin the return to Collins and the command module.

The crew returned to Earth, landing near the USS Hornet in the Pacific after a mission of about eight days. President Richard M. Nixon was there to welcome them.

"This is the greatest week in the history of the world since the creation," Nixon told the three.

After 16 days in quarantine to protect Earth from any returned moon germs, the crew went on U.S. and international tours. Millions greeted them as heroes.

Armstrong later served as deputy associate administrator for aeronautics in the Office of Advanced Research and Technology at NASA Headquarters. He resigned from the space agency in 1971. As a professor at the University of Cincinnati from 1971 to 1979, he was involved in teaching and research.

For 10 years he was chairman of Computing Technologies for Aviation Inc. of Charlottesville, Va., and then chairman of AIL Systems Inc., an electronic systems company based in Deer Park, N.Y.

Armstrong was a fellow of the Society of Experimental Test Pilots, the Royal Aeronautical Society, and an honorary fellow of the American Institute of Aeronautics and Astronautics and the International Astronautical Federation.

He was a member of the National Academy of Engineering. He served as a member of the National Commission on Space in 1985 and 1986, and was vice chairman of the Presidential Commission on the Space Shuttle Challenger Accident. He also was chairman of the Presidential Advisory Committee for the Peace Corps from 1971 to 1973.

Seventeen countries decorated Armstrong. His honors include the Presidential Medal of Freedom, the Congressional Gold Medal, the Congressional Space Medal of Honor, NASA's Ambassador of Exploration Award, the Explorers Club Medal, the Robert H. Goddard Memorial Trophy, the NASA Distinguished Service Medal, the Harmon International Aviation Trophy, the Royal Geographic Society's Gold Medal, the Federation Aeronautique Internationale's Gold Space Medal, the American Astronautical Society Flight Achievement Award, the Robert J. Collier Trophy, the AIAA Astronautics Award, the Octave Chanute Award, and the John J. Montgomery Award.

X-48C... from page 1

Body, or HWB, aircraft design. The HWB design stems from concept studies being conducted by NASA's Environmentally Responsible Aviation project of future potential aircraft designs 20 years from now.

"We are thrilled to get back in the air to start collecting data in this low-noise configuration," said Heather Maliska, Dryden X-48C project manager. "Our dedicated team has worked hard to get the X-48C off the ground for this first flight and we are excited to learn about the stability and control characteristics of this low-noise configuration of the Blended Wing Body."

Primary changes to the C-model from the B-model, which flew 92 flights at NASA Dryden between 2007 and 2010, were geared to transforming it to an airframe noise-shielding configuration. External modifications included relocating the wingtip winglets inboard next to the engines, effectively turning them into twin tails. The aft deck of the aircraft was also extended about two feet to the rear. Finally, the project team replaced the X-48B's three 50-pound-thrust jet engines with two 89-pound-thrust engines.

Because handling qualities of the X-48C will be different than those of the X-48B, the project team developed flight control system software modifications, including flight control limiters to keep the airplane flying within a safe flight envelope. This will enable a stronger and safer prototype flight control system suitable for future full-scale commercial hybrid or blended wing aircraft.

"We are very pleased to begin flight tests of the X-48C," said Mike Kisska, Boeing X-48C project manager. "Working with NASA, we've successfully passed another milestone in our work to explore and validate the aerodynamic characteristics and efficiencies of the blended wing body concept."

Additionally, the upcoming flight experiments with the X-48C will help researchers further develop methods to validate the design's aerodynamics and control laws, including a goal of reducing aerodynamic drag through engine yaw control tests.

During the planned second block of flight testing this fall, NASA will test engine yaw control software incorporated in the X-48C's flight computer. This research will use asymmetric engine thrust to create yaw, or nose left or right movements, for trim and for relatively slow maneuvers.

NASA's Aeronautics Research Mission Directorate and Boeing are funding the X-48 technology demonstration research effort, which supports NASA's goals of reduced fuel burn, emissions and noise.

The X-48C retains most dimensions of the B-model, with a wingspan just longer than 20 feet, and a weight of about 500 pounds. The aircraft has an estimated top speed of about 140 mph, and a maximum altitude of 10,000 feet.

The Air Force Research Laboratory, Dayton, Ohio, is also a member of the project team.

HS3... from page 1

Center will receive the verbal hand-off via telephone, cross check data links with pilots at Wallops, and assume responsibility for the aircraft's operation until the mission is completed when the landing operation transfers back to Wallops. This close coordination alleviates the necessity to deploy a larger number of pilots.

When an unmanned aircraft is in the air, the ground-based pilots maintain continual contact with Federal Aviation Administration air traffic control specialists.

The interesting scenario for HS3 is that the pilots are in California's Mojave Desert, talking with East Coast controllers through a radio located on the aircraft. When flying in oceanic airspace, pilots talk with international controllers over telephone. This communication is vital as air traffic controllers provide the altitude and number of other aircraft sharing the same area of the U.S.'s National Airspace System and international air space as the NASA aircraft. When the Global Hawk reaches an altitude of between 60,000 and 65,000 feet, there are few aircraft competing for space.

Although the flight path of the Global Hawk is pre-programmed into the aircraft's flight control computers prior to a mission, pilots are able to override the flight plan to accommodate the scientists' requests. The scientists will observe flights from the mobile payload operations facility at Wallops where information will stream onto computer monitors from their instruments. The payload manager at Wallops will send the scientists' request for change in altitude or course to the mission director in the control room with the pilots at Dryden. The pilots operating the Global Hawk change the flight path by entering a new heading, airspeed or altitude on the primary flight display.

All Global Hawk pilots are rated to fly manned aircraft. The pilots commented that it is possible to become so engaged during a Global Hawk flight that it seems like a flying a manned aircraft. They add that much of the sensory information available to pilots of manned aircraft is missing for the unmanned aircraft pilots. It is not possible to smell the fuel, see the weather and terrain, hear the engine starting, or feel the movement from a ground control center. An unmanned aircraft pilot is dependent upon computers and their displays for updates on the health of the vehicle.

The Global Hawk pilots will have to deal with turbulence in the hurricane flights. Fortunately, the cruise altitude is above most of the unstable air associated with that weather phenomenon. In addition, an instrument measuring turbulence was adapted and will be installed with the science payload.

Global Hawk pilots will be well-prepared for the Hurricane and Severe Storm Sentinel mission. They spend hours planning missions, flying a simulator and have a support team in the "cockpit" consisting of a co-pilot, mission director and control room operator. Many are seasoned from flying this type aircraft for the military. Although their tools are a mouse, keyboard and computer displays, the NASA Global Hawk pilots find their work challenging and are proud of the job they do to support the U.S. science community.

NASA Awards ... from page 2

technology and aircraft ground collision avoidance systems.

• **Jeffrey W. King** was recognized for exceptional personal contributions to NASA in the fields of aerospace and aeronautics ground operations safety and system safety during the first 10 years of his career.

Silver Achievement Medal

Mary Kennedy received her medal for exceptional competency, enthusiasm, honesty, and passion as travel planning professional, ensuring the mission accomplishment of countless travelers.

Group Achievement Award

• **The Dryden Critical Chain Project Management Core Team** was recognized for exceptional team performance in the establishment of the Center's Critical Chain Project Management implementation approach.

• **Dryden Shuttle Communications and Outreach Team** was recognized for exceptional team performance in communicating Shuttle Program activities to the public and facilitating end of mission media coverage for shuttle landings at Dryden.

• **Mars Science Laboratory DFRC Team** was recognized for exemplary performance in the successful execution of challenging ground operations and flight maneuvers for the Mars Science Laboratory radar system.

• **Space Shuttle Operations, Landing, and Post-Flight Support Team** was recognized for exceptional shuttle support at DFRC leading to the successful completion of the Space Shuttle Program and major contributions to America's Human Space Flight Program.

• **Medical Staff of Dryden Flight Research Center Team** was recognized for outstanding medical support of the Dryden family of employees and the long-term care of the Space Shuttle program.

• **The Sonic Boom Team** was recognized for exceptional initiative, commitment to and support of the NASA ARMD Supersonics Program, and efficient and effective utilization of government resources.

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

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