

Dryden Flight Research Center

Dryden Flight Research Center

About Dryden

News

News

Fact Sheets

News Photos

News Releases

X-Press Newspaper

X-Press Archives

X-Press Special Editions

Biographies

Media Contacts

Multimedia

Aircraft

Research

Education

Capabilities and Facilities

Aircraft Operations Facility

Doing Business

History

Site Map

Search Dryden

Go

Text Size

A long-overdue tribute

Oct 21, 2005

It's not only angels who must work hard to earn their wings.

An elite group of Dryden research pilots who have met the requirements for receiving astronaut wings has been awarded the honor nearly four decades after they flew the missions that took them above the edge of space.

Image Right: From left are four of the five surviving X-15 pilots, Robert White, Bill Dana, Neil Armstrong and Joe Engle. They attended the astronaut wings ceremony, where Dana, Joe Walker and Jack McKay, who flew the X-15 rocket plane into space in the 1960s, received long-overdue recognition for their achievement. Walker and McKay were honored posthumously. NASA Photo by Tony Landis



In an era of Cold War confrontations, the moon race and war in Southeast Asia, these test pilots were among those who flew the three radical X-15 rocket planes for 199 missions between 1959 and 1968. However, until an Aug. 23 ceremony held at Dryden, three of those pioneering test pilots never received official recognition of their membership in the exclusive fraternity of American astronauts.

Fittingly, retired NASA pilot William H. Dana and family members representing deceased pilots John B. McKay and Joseph A. Walker received civilian astronaut wings during the event to acknowledge their flights at Dryden, which was the site of their pioneering achievements.

U.S. Air Force pilots in the X-15 program received their astronaut wings after the qualifying flights were complete. No such honor existed, however, for NASA X-15 pilots and only recently was the decades-old controversy surrounding the definition of the boundary of space – above 50 miles, according to the Air Force – resolved (see sidebar); with that issue settled, efforts finally moved forward to allow the three NASA pilots to get their due for their historic flights.

What they did

Together, the three account for 70 of the 199 flights in the X-15 program. Walker flew the aircraft for more than three years and on his third mission into space claimed the unofficial world altitude record of 354,200 feet, or 67.08 miles, on Aug. 22, 1963. Walker's unofficial record also marked the highest altitude to which the X-15 was ever flown.

Retired Dryden engineer John McTigue, who was an operations engineer on the X-15 program, recalled a laugh at Walker's expense.

"Joe was particular on his instruments placement. I told him we had it ready to go and he should 'come look at the cockpit to see if it's set up the way you want it.' I will never forget the look on face and his shock. We had painted it (the cockpit) pink. He started laughing," McTigue related in remarks at the Aug. 23 event.

Dana's first of two flights into space took him to 306,900 feet, or 58.13 miles above the Mojave Desert on Nov. 1, 1966, on a mission to collect micrometeorite samples while also gathering data about the sky's brightness at that altitude. The second space flight, which marked the last time the X-15 program had a flight over 50 miles, was Aug. 21, 1968, when Dana flew to an altitude of 267,500 feet, or 50.66 miles.

Image Left: Bill Dana is pictured in his flight suit alongside the legendary rocket plane in which flew to the edge of space. NASA Photo

NASA - A long-overdue tribute



Several speakers recalled Dana's radio conversation following two memorable flights. Radioed with the news that he had hit 280,000 feet, Dana's response was, "How about that?" And upon reaching 310,000 feet on another flight, Dana radioed, "Is Jack McKay sending his congratulations?"

McKay attained 295,600 feet altitude, or 55.98 miles, on Sept. 28, 1965, during a flight carrying several research experiments. He was second in the number of rocket flights he piloted only to A. Scott Crossfield, another of the X-15 pilots.

"McKay was one of the smoothest pilots. I remember a landing that was so smooth that I didn't know when the landing gear hit," McTigue said.

McKay also was responsible for coining a Dryden phrase that he uttered on a day when the weather was not good. His droll assessment, which has lived on in Center lore, was, "Any improvement will be for the better."

Astronaut Neil A. Armstrong, who flew the X-15 before going on to fame as the first man to walk on the moon, spoke eloquently at the ceremony about his former colleagues.

"In much of society, research means to investigate something you do not know or do not understand. But research here in this building at Dryden or at the Air Force Flight Test Center is quite a different thing," Armstrong said. "Research here is exploration and discovery. It's investigating (something that) no one knows or understands. Research here is creating new knowledge. Today we honor three men who did research here.

"They were not involved in such exploits for adventure, or to enjoy the view – although those flights were adventurous and the view was spectacular. They rocketed to these extreme altitudes to conduct research and to learn about and advance the world of flight," he said.

"I cherish my memories of working with each of those three gentlemen and am so pleased to be here for this recognition of their remarkable achievements."

The X-15 program

The North American Aviation (now a division of The Boeing Company) research aircraft was a joint program of the U.S. Air Force, NASA and the U.S. Navy. The nine-year program reaped mountains of information about hypersonic stability and control, flight loads and heating rates.

Three major aerospace concepts were proven in the X-15 program. The first was that a winged vehicle could transition in flight from the 57,000 pounds of thrust provided by the aircraft's XLR99 engines to an unpowered state, in which it became a gliding re-entry vehicle. Second, program research proved that reaction controls – tiny hydrogen peroxide jet thrusters on the X-15 that controlled pitch, yaw and roll – provided control at the edge of space, where conventional control surfaces were ineffective. Third, the program helped develop energy management techniques that allowed an unpowered spacecraft to make a precision landing on a designated runway following return from space.

In later phases of the program, according to a video presentation compiled by Jim Young, chief historian of the Air Force Flight Test Center at Edwards Air Force Base, the experimental vehicle also was used as a testbed for several additional experiments.

Image Right: McKay, who died in 1975, is pictured in his flying suit. NASA Photo

It took tremendous mental and physical strength to fly the approximately 10-minute flights, which slammed X-15 pilots into their seat with an instantaneous 2g acceleration that quickly pushed the ship past Mach 3. The pilot then continued to accelerate to 4g-force conditions until reaching space, where he experienced three minutes of weightless before re-entering Earth's atmosphere at Mach 5. Precise control was critical for reaching 80,000 feet, where the aircraft would level out. It required technique and skill to make a lakebed landing and not fall short or overshoot the base, Young said.

Johnny Armstrong, the Air Force Flight Test Center planner for X-15 flights, explained that most X-15 flights were air-launched at 45,000 feet from the NB-52B at .82 Mach. The first 40 seconds after launch were critical to establishing the aircraft's heading and the engine would fire for a maximum of 85 seconds. One second of burn less would mean the altitude goal would be missed. If the X-15's angle of attack were off by even one degree, it would result in missing the target altitude by 7,500 feet, Armstrong recalled.

Center Director Kevin L. Petersen spoke about what it took to fly the X-15, reading from pilot Milton O. Thompson's 1992



NASA - A long-overdue tribute

book "At the Edge of Space" about Thompson's first experiences flying the "Black Bull" in October 1963 on the first of 14 missions. Thompson dubbed the X-15 the Black Bull for its power and unpredictability.

"The launch was like being shot downward out of a cannon," Petersen read. "It was a real jolt. No one warned me about the severity of the launch. I guess that the more seasoned pilots had become used to it and began to think of it as routine so they never mentioned it to me..."

The next passage Petersen read focused on the firing of the rocket engine:

"It lit off successfully and then I received my second surprise. The force of the engine forced my body back hard into the seat and headrest and effectively pinned me there for the rest of the powered flight."

Another excerpt from Thompson's book gave details about landing the rocket plane. At 173,000 feet, just 122 seconds after launch, he shut off the X-15's engine and began to glide toward Edwards:

"I had make it to Edwards in reasonably good shape, but now I was going to have to make that honest-to-God deadstick (unpowered) landing. I only had one chance. If I screwed up, I lost the airplane and maybe more. The initial touchdown was very smooth until the nose came down. The nose came down with a vengeance. For a moment I thought the nose gear had failed as the nose slammed down on the runway. I did not realize how close the cockpit was to the ground in the landing attitude. I thought my butt would scrape the lakebed. It was a real jolt. It was about 8 g's in the cockpit."

Of his experiences flying the X-15, Thompson wrote: "The one thing that impressed me on this flight was the amount of physical effort required to fly this airplane. I was really exhausted after the flight. Some of the exhaustion was obviously due to mental stress, but much of it was due to the muscular exertion required to manipulate all the controls and fly the aircraft while fighting the g forces and resistance of the pressure suit...flying the X-15 was definitely not a piece of cake. After that flight I felt like I had put in a 12-hour day digging ditches."

Three piloted hypersonic rocket planes were used in the course of the X-15 program to fly as high as 67 miles and as fast as almost seven times the speed of sound. Volumes of test data gleaned from missions helped shape the successful Mercury, Gemini, Apollo and space shuttle human spaceflight programs. The two surviving X-15s are now on public display, one at the Smithsonian National Air & Space Museum, Washington, D.C., and another at the National Museum of the U.S. Air Force (formerly the U.S. Air Force Museum) at Wright-Patterson Air Force Base, Dayton, Ohio.

The ceremony

Steve Schmidt, Dryden's deputy center director and master of ceremonies for the astronaut wings ceremony, acknowledged aerospace author Dennis R. Jenkins and Dryden photographer Tony Landis for their efforts in making the case for the three X-15 pilots to be recognized (see related story) and making the ceremony a reality. William F. Readdy, former NASA associate administrator in the Space Operations mission directorate, also was instrumental in making the event happen.

Capt. Kent Rominger, chief of NASA's Astronaut Office at Johnson Space Center in Houston and Vance Brand, a former astronaut and Dryden's current deputy associate center director for programs, presented the astronaut wings to Joe Walker's wife, Grace Wiesmann, and son Jim Walker. Rominger said the X-15 pilots had inspired him, and that he had originally wanted to be a pilot rather than an astronaut.

"It truly is an honor as chief of the Astronaut Office to make this presentation," Rominger said in his remarks. "When Dennis Jenkins and Bill Readdy came to me, I jumped at the opportunity to be a part of this."

Brand said he was equally proud to participate in the event.

"I was a beneficiary of the (X-15) program in the 1960s, when we were in awe of the program," said Brand, command module pilot on the 1975 Apollo-Soyuz mission. "We still are today."

Schmidt also called the X-15 pilots his heroes and cited them as a reason he chose the career path he did.

"Growing up, I remember the sounds of sonic booms and windows rattling," Schmidt reflected. "I would lie in the tall, dark grass and look up at the bright blue sky to see the contrails left behind. It left me with dreams of becoming a pilot, a space cowboy and an astronaut. A pivotal point came when I was given a personally signed X-15 model by Maj. Robert A. Rushworth."



Image Left: Joe Walker is pictured next to the famed rocket plane. NASA Photo

Distinguished guests who attended the ceremony included a who's who of historic flight research projects, including X-15 pilots Joe Engle, Robert White and Neil Armstrong. Pilots Stan Butchart, Fitz Fulton and Don Mallick were on hand, as

NASA - A long-overdue tribute



were former Dryden Deputy Director Ted Ayers and former Dryden center directors John Manke and Ken Szalai.

Also at the event were former NASA engineers Gene Matranga, Byron Gibbs and Vince Capasso as well as Andrew Mercy, representing state Sen. George Runner. North American Aviation was represented by Steve Oswald, Boeing vice president and program director for the space shuttle, an astronaut and former U.S. Navy rear admiral.

Tough times

The most successful flight research program in history did not come without cost.

Pilot Michael Adams perished piloting X-15 No. 3 on Nov. 15, 1967, when it broke apart on reentry. The flight was the 191st of the program and was Adams' first suborbital flight. The accident was the only one involving loss of life in the revolutionary program, but was not the only mishap.

McKay suffered the next-worst accident on Nov. 9, 1962. McKay lost power shortly after launch in X-15 No. 2 and was forced to land on Mud Lake, Nev., at 300 mph. The plane's left skid collapsed on landing and the aircraft tumbled violently with McKay trapped inside.

McKay survived the crash and the aircraft was rebuilt as the X-15 A-2. It was rebuilt with a larger tank, setting the stage for William J. "Pete" Knight to make his Oct. 3, 1967, record speed flight of 6.7 Mach, or 4,521 mph – twice the speed of a 50-caliber bullet. On that flight, aerodynamic heating in the area where a dummy scramjet engine had been attached resulted in damage to the plane's ventral fin due to burn-through of the aircraft's ablative heat-shield coating. It took exceptional piloting skills to bring the charred aircraft back for a landing, and it was never flown again. Knight's speed record stands.

In her remarks about her father, Sheri McKay Lowe marveled that not only did he survive the deadly crash but flew the X-15 22 more times and lived 13 years after the accident.

"He was not the same man (after the accident), but he never complained. 'It's those darn pain pills,' he said once. He has been called a steel-nerved test pilot; he certainly was that," she recalled.

Joe Engle said he admired McKay as he "came back into the program, and healed himself and the program. Doesn't that say enough about the man?"

As for all three of the pilots honored at the ceremony, Engle added, "They are among the very best that operated in this organization."

Families value wings

The recipients and their families said they were honored to be at the ceremony.

"My dad's an astronaut," said Jim Walker. "To our family it means a lot. We are grateful. As my brother mentioned, our father probably would be humble because he knows it was a group effort and it was all the people in the X-15 program and all the people down the line. These are the real heroes."

McKay's son John, a 29-year Dryden employee who retired as a branch chief, said he wanted his father's wings to be dedicated to engineers, mechanics, avionics and instrumentation personnel who worked on the program.

Sheri McKay Low also recalled the story of how her father became interested in aeronautics.

"Charles Lindberg was on a tour, and Jack and Jim (the X-15 pilot and his brother) met him at his seaplane. After they met Lindberg, they started making airplanes out of Popsicle sticks, then balsa wood, and the planes got bigger and bigger. It illustrates how interwoven aviation history is," McKay Lowe said, noting that Lindberg's Spirit of St. Louis and X-15 No. 1 are both prominently displayed in the Smithsonian National Air & Space Museum.

"We honor all NASA employees who keep the dream of space travel alive," McKay Low concluded.

Dana, who is retired from NASA but still works for Analytical Services & Materials Inc. as a contract employee, also said he values his latest honor.

"It is fitting that Judy," he said, referring to his wife, "who didn't get to give me my set of wings out of pilot training – because I didn't even know her then – I think it's fitting for her to place on me these wings that are so very special. I want to thank Capt. Rominger and Vance Brand for their gift to me," Dana said, as his wife removed the nametag on Dana's flight jacket and

5/18/2009

NASA - A long-overdue tribute

replaced it with the new one denoting official astronaut status.

It was a well-deserved honor that was a long time coming.

Jay Levine
X-Press Editor

[› Back To Top](#)

Page Last Updated: March 1, 2008
Page Editor: Marty Curry
NASA Official: Brian Dunbar

Budgets, Strategic Plans and
Accountability Reports
Equal Employment Opportunity Data
Posted Pursuant to the No Fear Act
Information-Dissemination Policies
and Inventories

Freedom of Information Act
Privacy Policy & Important Notices
NASA Advisory Council
Inspector General Hotline
Office of the Inspector General
NASA Communications Policy

Contact Dryden
Site Map
USA.gov
ExpectMore.gov
Help and Preferences