

X-15

Biographies

Michael J. Adams



Michael Adams was born in Sacramento, California on 5 May 1930. He enlisted in the U.S. Air Force in 1950 after graduation from Sacramento Junior College and earned his pilot wings and commission in 1952 at Webb AFB, Texas. Adams served as a fighter-bomber pilot during the Korean conflict, followed by 30 months with the 613th Fighter-Bomber Squadron at England AFB, Louisiana and six months rotational duty at Chaumont Air Base in France.

In 1958, Adams received an aeronautical engineering degree from Oklahoma University and, after 18 months of astronautics study at Massachusetts Institute of Technology, was selected in 1962 for the Experimental Test Pilot School at Edwards AFB, California. Here, he won the Honts Trophy as the best scholar and pilot in his class. Adams subsequently attended the Aerospace Research Pilot School (ARPS), graduating with honors in December 1963. He was one of four Edwards aerospace research pilots to participate in a five-month series of NASA moon landing practice tests at the Martin Company in Baltimore, Maryland.

In July 1966, Major Adams came to the X-15 program, a joint USAF/NASA project. He made his first X-15 flight on 6 October 1966 in the number one aircraft. Adams' seventh X-15 flight took place on 15 November 1967 in the number three aircraft. The X-15-3 would also make the most tragic flight of the program. At 10:30 in the morning on 15 November 1967, the X-15-3 dropped away from the NB-52B at 45,000 feet over Delamar Dry Lake. At the controls was Major Michael J. Adams, making his seventh X-15 flight. Starting his climb under full power, he was soon passing through 85,000 feet. Then an electrical disturbance distracted him and slightly degraded the control of the aircraft; having adequate backup controls, Adams continued on. At 10:33 he reached a peak altitude of 266,000 feet. In the NASA 1 control room, mission controller Pete Knight monitored the mission with a team of engineers. As the X-15 climbed, Adams started a planned wing-rocking maneuver so an on-board camera could scan the horizon. The wing rocking quickly became excessive, by a factor of two or three. At the conclusion of the wing-rocking portion of the climb, the X-15 began a slow drift in heading; 40 seconds later, when the aircraft reached its maximum altitude, it was off heading by 15 degrees. As Adams came over the top, the drift briefly halted, with the airplane yawed 15 degrees to the right. Then the drift began again; within 30 seconds, Adams was descending at right angles to the flight path. At 230,000 feet, encountering rapidly increasing dynamic pressures, the X-15 entered a Mach 5 spin.

In the NASA 1 control room there was no way to monitor heading, so nobody suspected the true situation that Adams now faced. The controllers did not know that the airplane was yawing, eventually turning completely around. In fact, Knight advised Adams that he was "a little bit high," but in "real good

shape." Just 15 seconds later, Adams radioed that the aircraft "seems squirrely." At 10:34 came a shattering call: "I'm in a spin, Pete." Plagued by lack of heading information, the control room staff saw only large and very slow pitching and rolling motions. One reaction was "disbelief; the feeling that possibly he was overstating the case." But Adams again called out, "I'm in a spin." As best they could, the ground controllers sought to get the X-15 straightened out. There was no recommended spin recovery technique for the X-15, and engineers knew nothing about the aircraft's supersonic spin tendencies. The chase pilots, realizing that the X-15 would never make Rogers Dry Lake, went into afterburner and raced for the emergency lakes; Ballarat and Cuddeback. Adams held the X-15's controls against the spin, using both the aerodynamic control surfaces and the reaction controls. Through some combination of pilot technique and basic aerodynamic stability, the airplane recovered from the spin at 118,000 feet and went into an inverted Mach 4.7 dive at an angle between 40 and 45 degrees. Adams was in a relatively high altitude dive and had a good chance of rolling upright, pulling out, and setting up a landing. But now came a technical problem; the MH-96 began a limit-cycle oscillation just as the airplane came out of the spin, preventing the gain changer from reducing pitch as dynamic pressure increased. The X-15 began a rapid pitching motion of increasing severity, still in a dive at 160,000 feet per minute, dynamic pressure increasing intolerably. As the X-15 neared 65,000 feet, it was diving at Mach 3.93 and experiencing over 15-g vertically, both positive and negative, and 8-g laterally. The aircraft broke up northeast of the town of Johannesburg 10 minutes and 35 seconds after launch. A chase pilot spotted dust on Cuddeback, but it was not the X-15. Then an Air Force pilot, who had been up on a delayed chase mission and had tagged along on the X-15 flight to see if he could fill in for an errant chase plane, spotted the main wreckage northwest of Cuddeback. Mike Adams was dead; the X-15-3 destroyed.

NASA and the Air Force convened an accident board. Chaired by NASA's Donald R. Bellman, the board took two months to prepare its report. Ground parties scoured the countryside looking for wreckage; critical to the investigation was the film from the cockpit camera. The weekend after the accident, an unofficial FRC search party found the camera; disappointingly, the film cartridge was nowhere in sight. Engineers theorized that the film cassette, being lighter than the camera, might be further away, blown north by winds at altitude. FRC engineer Victor Horton organized a search and on 29 November, during the first pass over the area, Willard E. Dives found the cassette. Most puzzling was Adams' complete lack of awareness of major heading deviations in spite of accurately functioning cockpit instrumentation. The accident board concluded that he had allowed the aircraft to deviate as the result of a combination of distraction, misinterpretation of his instrumentation display, and possible vertigo. The electrical disturbance early in the flight degraded the overall effectiveness of the aircraft's control system and further added to pilot workload. The MH-96 adaptive control system then caused the airplane to break up during reentry. The board made two major recommendations: install a telemetered heading indicator in the control room, visible to the flight controller; and medically screen X-15 pilot candidates for labyrinth (vertigo) sensitivity. As a result of the X-15's crash, the

FRC added a ground-based "8 ball" attitude indicator in the control room to furnish mission controllers with real time pitch, roll, heading, angle of attack, and sideslip information.

Mike Adams was posthumously awarded Astronaut Wings for his last flight in the X-15-3, which had attained an altitude of 266,000 feet - 50.38 miles. In 1991 Adams' name was added to the Astronaut Memorial at the Kennedy Space Center in Florida.

[back](#)