



McDonnell Douglas F-15A Streak Eagle

By: Dennis R. Jenkins



Paths to the Present
FLASHBACK

For two weeks beginning on 16 January 1975, three Air Force pilots and a modified McDonnell Douglas Aircraft Division (McAir) F-15A-6-MC (72-119) made an assault on the world class time-to-climb for aircraft powered by jet engines. The three pilots, Maj. Roger Smith, Maj. W. R. 'Mac' Macfarlane, and Maj. Dave Peterson were all members of the F-15 Joint Test Force at Edwards. Pete Garrison, a McAir pilot, was instrumental in the development of the flight profiles used for the records. Project Streak Eagle had three major objectives:



F-15A 72-119 'Streak Eagle' is shown flying over St. Louis, MO, during an early check flight. 'Streak Eagle' remained unpainted for most of its career.

- To enhance Air Force esprit de corps and morale, and to foster the attractiveness of an Air Force career in support of recruiting objectives,
- To help establish the credibility of Air Force general purpose forces as an integral element of the United States' overall military posture,
- To provide data on the F-15's capabilities at the extremes of altitudes and performance under controlled test conditions.

The Air Force awarded McAir a \$2.1 million dollar contract on 1 April 1974 for aircraft modifications and general support, with configuration approval on 18 May 1974. All test aircraft then in inventory were evaluated, and the choice narrowed between F5 (71-284) and F17 (72-119). Several items led the choice of 72-119: it was 800 pounds lighter than F5; it was an Air Force (Cat II) aircraft as opposed to a contractor (Cat I) aircraft and its absence would have less of an impact on the test program (in fact, it was an unneeded attrition aircraft); and since F17 was just rolling down the production line fewer things would have to be 'undone'. The aircraft was modified by McAir between 27 April and 11 June 1974 for the tests by deleting all non-mission critical systems including: the flap and speed brake actuators; internal armament; the radar and fire-control system; non-critical cockpit displays and radios; one of the generators; the utility hydraulic system; and, of course, the 50 pounds of paint (hence its name). Additions included: a revised oxygen system; support equipment for the full pressure suit worn by the pilots; extra batteries; a long pitot boom with alpha and beta vanes; an over-the-shoulder video camera; a battery powered radio; sensitive g meters; a standby attitude gyro; a large VHF antenna under the canopy behind the pilot; and a special 'hold-down' device in place of the tail hook. The final result was an aircraft that weighed 1,800 pounds less than the other block-6 aircraft. When weighed, in preparation for a 30,000 meter run (on test flight #37), 72-119 weighed 36,799 pounds.



Simulations, primarily of the high-altitude profiles, were run between 3 May - 30 September and the application to the Federation Aeronautique Internationale (FAI) was made on 15 September 1974. The flight profile for the 30,000 meter (98,425 feet) record was as follows:

- Release from the hold-down cable at full afterburner with 7,000 pounds of fuel
- Gear up and rotate at 70 knots (3 seconds after release)
- At 420 knots, rotate vertically into an Immelman and hold 2.65 g
- Expect to arrive level, upside down, at 32,000 feet and 1.1 Mach
- Rotate to right side up, accelerate to 600 knots while climbing to 36,000 feet
- Accelerate to 2.25 Mach and pull 4.0 g to a 60 degree climb angle
- Hold 60 degree climb
- Shut down the afterburners when they quit
- Shut down the engines when they flame-out
- Ride ballistically over the top at 55 knots and 103,000 feet
- Descend at a 55 degree dive angle
- When below 55,000 feet, try to start the engines
- Go Home.

The record runs were accomplished at Grand Forks AFB, North Dakota, where the cold atmospheric conditions were ideal. Six different record flights were flown (there were several unsuccessful ones in between), and margins of between 15 and 33 percent were achieved over the previous records. For the record attempts, the aircraft was physically held-down to the runway while full power was applied. The actual records set by Streak Eagle were:



'Streak Eagle' in the hangar at Grand Forks AFB, North Dakota during the record flight attempts. Note the small balancers on top of each vertical stabilizer.



The 'Streak Eagle' test team chose Grand Forks AFB, ND, for the record flight attempts due to its ideal atmospheric conditions during wintertime.



A specialized hold back explosive bolt attached to a steel cable replaced the tailhook for the record attempts. With engines at full power, the pilot released the aircraft and reached rotation speed in approximately 3 seconds.



With its two Pratt & Whitney F100 engines at full thrust, F-15A 72-119, 'Streak Eagle' departs the runway at Grand Forks AFB, ND, during the record setting flights in January and February 1975.

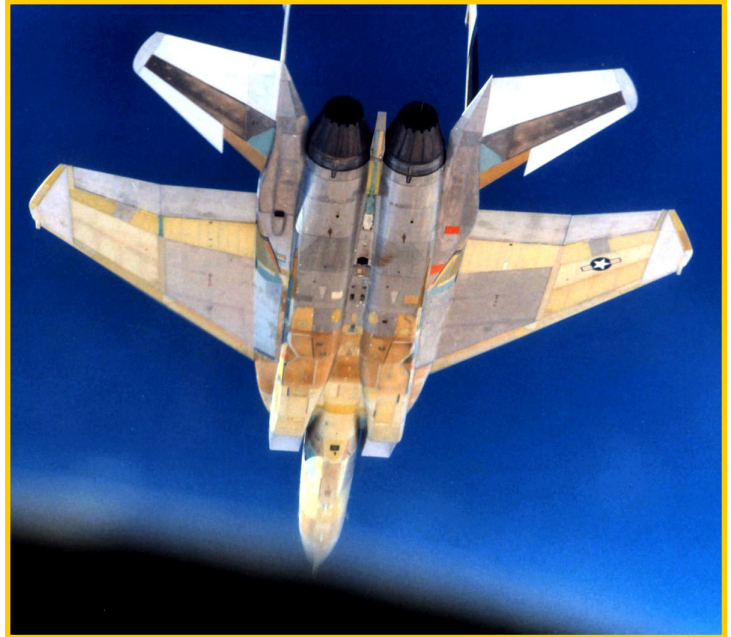
Altitude (meters)	Date	Pilot	Old Record (seconds)	Goal (seconds)	Actual (seconds)
3,000	16 January 1975	Smith	34.50	27.00	27.57
6,000	16 January 1975	Macfarlane	48.80	38.60	39.33
9,000	16 January 1975	Macfarlane	61.70	47.90	48.86
12,000	16 January 1975	Macfarlane	77.10	58.00	59.38
15,000	16 January 1975	Peterson	114.50	73.70	77.02
20,000	19 January 1975	Smith	169.80	126.10	122.94
25,000	26 January 1975	Peterson	192.60	163.70	161.02
30,000	1 February 1975	Smith	243.90	206.90	207.80

A highly modified MiG-25 (E-266) has since retaken several of the higher altitude records, and also set one to 35,000 meters, although it is still a matter of some controversy over whether it was rocket assisted. There was consideration given to further modifying Streak Eagle, including using more powerful production engines, and making another attempt, but this never materialized. Like the other Category II test aircraft, 72-119 was to have been brought up to production standards and sent to an operational squadron, however the sale of four of the eight aircraft to Israel, and the amount of work needed on F17, made



F-15 Streak Eagle pilots (from left) Maj. W.R. Macfarlane, Maj. Roger Smith and Maj. Dave Peterson. (U.S. Air Force photo)

this impractical, and the plan was abandoned. Streak Eagle was turned over to the National Museum of the United States Air Force (NMUSAF) in December 1980 where, to protect it from corrosion, it was painted in a Compass Ghost scheme by McDonnell Douglas utilizing two-tones of blue instead of the normal grey. Beginning in January 2021, the aircraft began a full restoration into to the record flights configuration and is expected to be on placed display at the NMUSAF in 2023.



Certificate flown aboard ‘Streak Eagle’ during the record flights in 1975 (above). This unique view of the underside of ‘Streak Eagle’ shows the color variations of the different materials used in constructing the F-15. (right)



‘Streak Eagle’ in flight showing the Aquila Maxima logo applied to both vertical stabilizers after the record flights (above, left). For corrosion protection, F-15A 72-119, was painted in a Compass Ghost scheme after its arrival to the National Museum of the United States Air Force in December 1980.

Further reading: Aerofax Datagraph 6: McDonnell Douglas F-15A/B/C/D/E Eagle/Strike Eagle; Dennis R. Jenkins; Aerofax Inc.; 1990



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