

F-15 Eagle Prototypes



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The second twin-seat prototype, 71-0291, is probably the best-known of the Eagle prototypes. Following the test program at Edwards AFB, the aircraft was used by McDonnell Douglas as their dedicated test and development machine. It is seen here on 10 February 1976, carrying a load of Sparrow missiles and bombs. (all photos Mark Nankivil, Greater St Louis Air and Space Museum, unless credited otherwise)

With the roll-out of the first aircraft in 1972, the F-15 Eagle has now been in production for 40 years and with the recent Saudi order, it is set to remain in production for some time. Arguably one of the best air-to-air fighters of the world, the airframe later also became one of the most lethal air-to-ground fighters. In the following photo-article, we try to follow the origins of the program by showing photographs of each of the twelve prototypes. A short description of their individual history is also given, as well as their importance to the test and development effort.

In the mid-1960s, on 6 October 1965 to be precise, the USAF issued a requirement for a new fighter aircraft that was to replace the F-4 Phantom from about 1975 onwards. This requirement, originally named QOR 65-14F, was later renamed the F-X (Fighter Experimental), and a Request For Proposals (RFP), for a twin-engined multi-role aircraft with variable-geometry wings, was issued to the manufacturers on 8 December 1965. The aircraft's main role was air-to-air and it was to be capable of establishing air superiority. A secondary role of air-to-ground was also envisaged. However, none of the industry proposals was accepted by the USAF and it was not until the appearance of the MiG-25 in 1967 that a new RFP was issued on 11 August 1967, for a lighter, fixed-wing, air-to-air fighter. However, some rethinking by the USAF led to a final RFP for the Project Definition Phase on 30 September 1968; they now wanted a Mach 2.5 single-seat, twin-engined, air-to-air fighter with low wing loading and a high thrust-to-weight ratio with a high-performance Doppler radar. The emphasis was on air-to-air, as the USAF had experienced a less desirable air-to-air combat record over Vietnam. This time, Fairchild-Republic, McDonnell Douglas, North American, Boeing, General Dynamics, Lockheed, Grumman and LTV all issued proposals, but only the first three manufacturers were chosen to proceed with their design work on 30 December 1968. After a design review, the McDonnell Douglas proposal was chosen as the winner of the F-X program on 23 December 1969. For a more detailed description of the aircraft's design origins and a thorough technical description of the aircraft,

we advise you to read one of several books that cover the subject in exhaustive detail.

Work on the final design started and the roll-out of the first Eagle occurred on 26 June 1972, with the first flight being achieved at Edwards AFB (CA) on 27 July. Edwards was chosen in order to get access to the unlimited airspace and good weather of Edwards. The F-15 Joint Test Force was established here, which consisted of a mix of McDD and USAF personnel. After some time, the force boasted eleven McDD and ten USAF pilots; the latter were part of 6512th TS/6510th TW, otherwise known as the Air Force Flight Test Center. Ground personnel were a mix of McDD and USAF as well. The first prototype was quickly joined by nine other single-seaters and a pair of twin-seaters with the last one, 71-0289, joining the test force on 16 January 1974. Flight testing was divided in three categories: Category I, the initial testing, was carried out by the McDD test pilots and the original twelve FY71 machines. Category II, advanced flight testing, was carried out by USAF test pilots and the FY72 machines from the initial pre-production batch, while Category III, operational tests and evaluations, was carried out in the field by operational units, like the 57th FWW at Nellis AFB. Apart from F100 engine reliability problems, the test and evaluation effort went ahead very smoothly and very few major problems were encountered. On 30 October 1973, the day the 1000th test flight was flown, a maximum speed of Mach 2.3 and an altitude of 60,000 ft had been reached by the prototypes.

Several of the twelve prototypes were eventually bailed to NASA for all kinds of programs and some remained in use until the early 1990s. McDonnell Douglas also kept a few for their own development work, with 71-0291 being their dedicated test machine. This aircraft, in a number of configurations, carried a variety of color schemes, but it was also retired in the early 1990s. The FY72 batch of 8 pre-production aircraft is not included in this article, as these were part of the Category II operational test program; these aircraft really were pre-production machines. Several of them were eventually sold to the Israeli AF.

71-0280

F-15A-1-MC - The first prototype of the F-15 Eagle was 71-0280. This aircraft was rolled out at McDonnell Douglas's factory in St Louis during a ceremony on 26jun72, when this photograph was taken. Following the aircraft's roll-out, it was dismantled, loaded aboard a C-5 and flown to Edwards AFB on 11jul72, where the 50-minute first flight was made by McDD test pilot Irving Burrows on 27jul72. (Robert Burgess)



71-0280 was the trials aircraft for flight envelope exploration, general handling and external stores carriage tests. Although it had been rolled out in a grey color scheme, for the first flight the aircraft had received day-glo tail and wing markings. Within a week, the aircraft had reached Mach 1.5 and 45,000 ft! It was used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB between jul72 and nov75, and this photograph was taken there 28 July 1973; it shows seven of the Eagle prototypes.



The photograph on the left shows 71-0280 at the end of the aircraft's first flight. Note the change in markings compared with the aircraft in the photograph on top of the page. Following its testing career, 71-0280 was retired and used by the Air Force Orientation Group at Gentile AFS (OH) between 1979 and jun91 (marked '85-114/EG' on the latter date). It was later preserved at the History and Traditions Museum at Lackland AFB (TX) from aug93 until apr09 (and was still marked as '85-114/EG' all that time) (USAF photo)

71-0281

F-15A-1-MC – 71-0281 made its first flight on 26sep72 and was the F100 engine test aircraft. Like the other prototypes, 71-0281 was used by the F-15 Joint Test Force at Edwards AFB, and was noted with them in dec74. The photograph on the left shows the aircraft at Edwards AFB during the initial testing period. The aircraft was officially transferred to NASA on 17 December 1975, but it was seen with a NASA logo on the fuselage as early as November 1975. It retained its USAF tail number throughout its time with NASA, as seen on the photograph below. 71-0281 was used to test thermal protection tiles for the Space Shuttle, and was returned to the USAF in 1983; officially on 28 October 1983, but the aircraft was put on display at Langley AFB (VA), a few weeks earlier, on 12 August 1983. Last noted at Langley in may09. (Left: Mark Aldrich collection, below: NASA photo)



71-0282



F-15A-2-MC – 71-0282 made its first flight on 4 November 1972 and was the test aircraft for the Eagle's APG-63 radar and avionics; it was also used for air speed trials. Used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB between July 1973 and November 1977 (coded '3' in jul73). The photograph above was made at the McDonnell Douglas flight line at Edwards AFB (CA) on 31 July 73 with prototypes 4, 5 and 6 in the background, as well as a US Navy B-47. The photograph on the left shows the aircraft during an early test flight from St Louis, on 7 December 1972. It has day-glo patches on the tail, wingtips and the inlet.



71-0282 was also used by the AFFSL (Air Force Flight Systems Laboratory) for a short time between August and December 1977. The AFFSL adorned the aircraft with a sharkmouth - see above, but their association with the aircraft was short; it was placed in storage at MASDC (FH002) on 16 December 1977. The aircraft departed storage again on 14 August 1979 and was transferred to the 2955th CLSS at Robins AFB. It was noted in a WFU condition (possibly used for some kind of instructional purpose) at Robins AFB (GA) in January 1986, and was reportedly preserved at Robins at a later date, but it has not been seen since 1986. (Edwards AFB, August 1977, Mick Roth via Stephen Miller)

71-0283



F-15A-2-MC - 71-0283 made its first flight on 13 January 1973, and was used as the structural test aircraft. This was the first F-15 with the slightly smaller wingtips which had been redesigned to counter a severe buffet problem encountered during the test program. The photograph shows the aircraft early in 1973, when it was still flying from St Louis. It is hard to see in the B&W photograph, but the aircraft carries the dayglo patches worn by all the F-15s during this early testing period. The aircraft was used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB from May 1973 (coded '4'). (Mark Aldrich collection)



By 1978, 71-0283 had become a McDD (and Boeing from 1997) test aircraft, and on 12 November 1979 it was noted in the red and white color scheme on the photograph above. Note the original smaller-sized air brake on the spine. It was noted with an F-4E-type cannon nose fairing in October 1985, and was noted at the Warner Robins ALC in January 1986. 71-0283 was finally retired in 1998. It was noted undergoing restoration at Wright-Patterson AFB (OH) in July 1999, and ended up preserved at the Defense Supply Center, Richmond (VA) by October 2000; last noted there in September 2011. Carried code 'FF' while on display there. (Robert Burgess)

71-0284

F-15A-2-MC – First flight was made on 7 March 1973, and 71-0284 was used as the trials aircraft for armament development, and was the first aircraft with the internal M61 cannon fitted. It was also used for external fuel tank jettison testing. Used by the combined McDD/USAF F-15 Joint Test Force at Edwards between 1973 and nov75 (noted with code '5' on latter date). Early in 1974 the Air Force initiated Operation 'Streak Eagle', the time to climb record. One aircraft would have had to be modified, and the choice was between 71-0284 and 72-0119. The latter was chosen and 71-0284 continued its testing career. Photo on right shows it on 13 April 1973, fitted with brake chute.



The photograph above was taken at Edwards AFB on 8 October 1975; it shows off its testing colors with dayglo patches on fin and wings. 71-0284 was retired and redesignated a GF-15A; it became an instructional aircraft at the Sheppard TTC by April 1977. Remained in use until October 1991 at least; and although it arrived in its former test colors, it later was repainted in grey camo and carried an 'HO' code on one side of the aircraft and 'FF' on the other. Last noted as instructional aircraft in October 1990, it was noted with the name 'City of Iowa Park' during much of this instructional period. 71-0284 was noted on the dump at Sheppard in July 1992, but ended up as an instructional airframe at Goodfellow AFB (TX). First noted there in April 1995, last in May 2008, the aircraft carried the 'GD' tail code during this entire period. (Robert Burgess)

71-0285



F-15A-3-MC – First flight was made on 23may73, 71-0285 was used as the trials aircraft for the avionics and missile firing control system. Was also used for fighter control evaluation purposes. Used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB between 1973 and September 1981; was noted with the code '6' on several occasions. The photograph above shows the aircraft in the markings worn when it was a McDonnell Douglas test aircraft; white with blue spine and leading edges. (11 July 1982, Charles Mayer via Stephen Miller)



Although still a test aircraft, the aircraft was named 'Killer' and carried seven F-102 and twelve Firebee kills below the cockpit at the Edwards AFB open house in October 1976. It was noted flying with the ADTC in September 1977, but this may be incorrect as the aircraft was just flying a number of test missions from Eglin AFB at the time. It was used as a dedicated McDonnell Douglas test aircraft between August 1984 and August 1991 (see photo previous page). 71-0285 was noted preserved at St Louis – Lambert Field in May 1999, but was on display at USAF Personnel Recruiting Office, St Louis (MO) in 2007. By April 2010 the aircraft was pole-mounted as a radar target at the Boeing/McDonnell Douglas Research Facility at Smartt Field, St Charles County AP (MO) - see photo on the left. This facility also had custody of one of the F/A-18E prototypes. (October 2011, Carmelo Turdo via Mark Nankivil)

71-0286

F-15A-3-MC – First flight 14jun73, was used for armament trials and external fuel stores tests. The photo on the right shows the aircraft a few days after its first flight, on 19 June. Used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB between September 1973 and November 1980. The photo on the bottom was taken at Edwards on 12 September 1976; note the day-glo patches. Redesignated as a GF-15A and became an instructional aircraft at the Chanute TTC between March 1982 and August 1990. The aircraft was used in both the Jet Engine Training Division as well as the Fuel Specialist School at Chanute. It was preserved in the Octave Chanute Aerospace Museum (IL) from April 94; last noted there in July 2006. (bottom, Robert Burns via Stephen Miller)



71-0287



F-15A-4-MC – 71-0287 made its first Flight on 25 August 1973; it was used as the test aircraft for spin recovery and angle of attack trials and fuel systems tests. For spin recovery purposes, the aircraft had a small box-like structure attached to the rear fuselage which housed the anti-spin recovery parachute; this can be seen on this photograph, taken at Edwards on 25 November 1975 (Thomas Brewer via Stephen Miller).



During its testing years, 71-0287 was used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB (CA) between 1973 and November 1975 (it was noted coded '8' in February 1974). The photograph on the left shows the aircraft in late 1973, fresh from the McDonnell Douglas production line. It has a white color scheme with day-glo fin and intakes, but the patches on the wingtip have been deleted - see also the photograph of 71-0284.



71-0287 was loaned to NASA as 835 on 5 January 1976, and became N835NA in 1986. As part of an F100 engine improvement program, NASA used 71-0287 for research into the F100 EMD (Engine Model Derivative), which saw quite an improvement over the old engine. It was also used in HIDEDEC program (Highly Integrated Digital Engine Controls). Last noted in active use in May 1993, noted stored at Edwards AFB (CA) in October 2006. The photograph above was taken over Edwards AFB on 20 March 1980; the aircraft still carries its old testing colors with some NASA decals added. It later became white overall. The pitot tube is supposed to be bent like this! (NASA photo)

71-0288



F-15A-4-MC - 71-0288 made its first flight on 20 October 1973, and was the trials aircraft for integrated aircraft and engine performance. It was used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB between 1973 and November 1982; this is where the photograph on the left was taken. 71-0288 then went to McDonnell Douglas as a dedicated company test aircraft between January 1986 and January 1991, but may already have been grounded during this period, as it has never been noted flying, and moreover, it was never noted since. (Frank Nunez Jr via Craig Kaston)

71-0289



F-15A-4-MC – Made its first Flight on 16 January 1974 and was the trials aircraft for radar, avionics and tactical electronic warfare systems. Flew missions with the ADTC at Eglin AFB between October 1974 and September 1980, although it was noted with the AFFTC at Edwards once, in October 1975. Never physically noted since September 1980, but the aircraft was still in the books in January 1986 and was officially assigned to the McDD test force. 71-0289 was flying with 586th TSS at Holloman AFB, tail code 'HT' between October 1997 and August 2000, but the purpose of its mission there remains unconfirmed. Never noted since. (Eglin AFB, 2 November 1974, Ray Leader via Stephen Miller)

71-0290



F-15B-3-MC – 71-0290's first flight was made on 7 July 1973, and it was the first of two TF-15A two-seater prototypes; the TF-15A designation was changed to F-15B on 1 December 1977. The aircraft actually followed 71-0286 in the production order, and was used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB between July 1973 and June 1983. The photograph above was made on 24 August 1973, during the F-15 aerial refueling trials. The tanker in the photograph is KC-135A 63-8010 of 22nd BW from March AFB (CA).



On the left, another 1973 photograph of 71-0290, seen during an early test flight. Note the day-glo patches on the fins and the wing tips. Interestingly, the aircraft conducted flight tests without a canopy in order to evaluate the effects of windblasts on the crew in May 1977. At first, a dummy was placed in the backseat, but this was later replaced by a human volunteer! The aircraft became a dedicated McDD test aircraft from April 1984, and was used in various programs.

On 1 October 1984, McDD became involved in the 'Agile Eagle' program, which culminated in a STOL MTD (Short Take Off and Landing Maneuvering Technology Demonstrator) prototype. 71-0290 was fitted with canard wings, improved radar, LANTIRN and a strengthened landing gear. Following mods the aircraft was redesignated NF-15B, and first flew in this condition on 7 September 1988. At the end of the initial test program, thrust-vectoring nozzles were installed; the first flight with these was made from St Louis on 16 May 1989. 71-0290 moved to Edwards on 25 May. The program, and especially the thrust-vectoring part of it, was very successful and ended on 12 August 1991, when the aircraft was retired and stored at the McDonnell Douglas factory in St Louis, minus engines and the thrust-vectoring nozzles. The photograph above was taken at Edwards AFB in May 1980, prior to these modifications (Craig Kaston collection).



The photograph below shows the aircraft at Offutt AFB later in 1980, wearing the white & blue McDD house colors. (Jim Nugent)



In 1992, a program called ACTIVE (Advanced Control Technology for Integrated VEHICLES) was started: this was a NASA program which involved an advanced thrust-vectoring nozzle, which could be used at supersonic speeds. 71-0290 was pulled out of retirement and transferred to NASA control on 15 June 1993. The first flight for ACTIVE with axisymmetric nozzles was made in February 1996, and on 31 October thrust vectoring was used at a speed of Mach 1.95. The next program for the aircraft to be involved in was that of the F-15 IFCS (Intelligent Flight Control System), which lasted from 1999 to 2008. The IFCS allowed the aircraft to be safely controlled with various degrees of damage to the airframe; sensor input allowed the aircraft's computer to react to changing flight parameters. Various progressive updates of the system were tested over the years. The photograph above, taken on 27 August 2003, shows the aircraft in this configuration. In December 2006, the aircraft started flying with the 'Quiet Spike', and was fitted with a giant pitot tube. This was a study into the effects of supersonic shock waves. The aircraft had received NASA marks as 837 by July 1996, and officially became N837NA on 23 July 2001. The aircraft's last flight was made on 30 January 2009. However, the registration N837NA was not cancelled until 17 November 2011. The aircraft is still present at Edwards AFB as of now. (Jim Ross/NASA)



F-15B-4-MC – 71-0291 made its first flight as a TF-15A on 18 October 1973; it was redesignated F-15B on 1 December 1977. It actually followed 71-0287 in the production sequence. Over the years, 71-0291 has become the most well-known and photographed of the Eagle prototypes, mainly because of its development work for McDonnell Douglas and the many color schemes it carried over the years. Initially, the aircraft was used by the combined McDD/USAF F-15 Joint Test Force at Edwards AFB between May 1974 and April 1975. The aircraft was used during the development of the FAST pack (conformal fuel tanks). The photograph above was taken during this period, and shows the FAST Pack to good effect. This equipment is fitted to current F-15Es 'as standard'. In September 1974, the aircraft came to Europe for a demonstration tour; it visited several US airbases, like Ramstein, but was also displayed at Farnborough. At that time, the aircraft was painted in a gray scheme, but also carried FAST packs. In February 1976, 71-0291 was bailed back to McDonnell Douglas as their dedicated test and demonstration aircraft. To celebrate that the USA existed for two centuries, 71-0291 was repainted in bicentennial marks by July 76 and was one of a large number of US military aircraft with special bicentennial markings. As such, it was involved in an extensive around-the-world sales tour, which included another display at the Farnborough air show. The photograph on the top left was made on Independence Day, 4 July 1976, the one in the middle shows the aircraft at Edwards on 16 July 1976 (Tom Brewer via Stephen Miller). The one on the bottom shows 71-0291 taking off for its display at Farnborough on 11 September 1976 (Patrick Roegies collection). The bicentennial 'pretzel' was replaced by a globe during 1977 and 1978; the red and white scheme was retained during these years.



The photograph on the left shows 71-0291 at Andrews AFB on 25 September 1974 upon return from its European sales tour. Interestingly, the aircraft gained a 526th TFS badge from the F-4 unit at Ramstein below the cockpit! (Jack Morris via Stephen Miller). In 1979, Hughes and McDD joined forces and, as a private venture, converted 71-0291 to the F-15E Strike Eagle prototype; a program that was initially known as the F-15DRF (Duel Role Fighter). The aircraft was to be equipped with an APG-63 ground mapping radar, a (partial) glass cockpit and FAST packs. The first flight as the Strike Eagle was made on 8 July 1980 and McDD and Hughes started testing the aircraft. It embarked on yet another demonstration tour to Europe, attending the Farnborough show in September 1980.



An official USAF program started in March 1981 and was known as the ETF (Enhanced Tactical Fighter), which was to replace the F-111. This competition ended in a fly-off between the Strike Eagle and the F-16XL. 71-0291 was deployed to Edwards AFB to join the evaluation program; testing was also conducted from Eglin AFB. On 24 February 1984, the Strike Eagle was declared the winner of the competition. The photograph above shows 71-0291 on the ramp at Offutt AFB on 6 February 1984; the FAST Pack can be seen clearly (Jim Nugent). The photo on the left shows the same aircraft with a huge load of bombs. The writing on the fin says 'AFC Demo' (Mark Aldrich collection). The bottom photograph shows the aircraft in the 'European One' camo which it never carried operationally (USAF photo). In the late 1980s, 71-0291 was involved in the integration of the LANTIRN pod and the F-15E weapons system. In May 1991 the aircraft was inscribed 'F-15RTD Peek Eagle'. This was a private McDD venture; the aircraft was fitted and tested with a centerline pod with reconnaissance equipment and a data link. It did not progress beyond this point. 71-0291 was last noted in active service in June 1992, although the aircraft still was on Boeing charge in May 1999. The airframe was noted in a compound on the corner of Marchbank Road and Macon, outside the Warner Robins ALC, Robins AFB (GA) in August 2001. Reported to be used as a BDRT airframe at Robins by 2005.

