

Pushing the limits: The Experimental Aircraft Program

In the 1970s and 1980s, the future air defence of Britain was mostly down to Phantom, Harrier, Tornado and Jaguar aircraft. The manufacture of post-war combat and strike aircraft had been drastically altered by politicians of various stripes. Modern jet fighters of the time were the result of collaboration between European aircraft companies. Ultimately the Eurofighter Typhoon would be developed in this way.

One of the test-beds for Eurofighter technology was developed in the late 1970s and into the eighties: a sleek, delta-winged fighter known as the Experimental Aircraft Programme or EAP.

The EAP design concept was revolutionary for its time. It was a twin engine aircraft with delta wings, a single tailfin and swept back canards.

German aerospace company Messerschmitt-Bolkow-Blohm was investigating similar ideas. The two companies had worked together on the Tornado, and now MBB and British Aerospace proposed a new aircraft with the title of European Combat Fighter. The response from both Governments was to find more partners for the project.

An obvious choice for an additional partner was the French who has been producing exceptional aircraft for many years. Dassault-Breguet were met in 1980 and a slightly modified design was circulated with the name European Combat Aircraft. It was discussed.

With three collaborating nations there were always going to be differences in requirements. French demands for a lighter aircraft that could be operated from aircraft carriers were problematic for the other nations. Talks were soon to break down and the concept would fail. This would also end French involvement in the project.

As the multi-national idea failed, in 1981 British Aerospace produced a design known as the P.110. Accompanying the design was a working group to look into advanced systems. Unsurprisingly MBB produced a similar aircraft design at the same time.

Far away from both British Aerospace and MBB the Italian company of Aeritalia were studying a similar design in depth. By April 1982 Britain, Germany and Italy were back together with a joint proposal entitled Agile Combat Aircraft. A mock up of the design was built and displayed at the 1982 Farnborough Air Show where a press announcement told everyone that Government funding would support the two prototype aircraft which would be known as Experimental Aircraft Program and fly in 1986. One was to be built in the UK and another in Germany.

In the event only one EAP was built. Whilst the British Government had agreed to funding both the German and Italian Governments pulled out of the project and did not give funding.

With the aircraft building having already been divided between the three companies some major design changes were required. To their credit neither MBB or Aeritalia pulled out of the project entirely, though their contributions were much reduced due to having to fund the work themselves. Germany was to produce several smaller parts whilst Aeritalia was to build one of the wings.

The majority of the work though took place at Warton, Lancashire where British Aerospace was building and assembling the aircraft. Trials with computer control fly-by-wire systems had been taking place with a modified SEPECAT Jaguar since the early 1980s and this proved system would be applied to the Experimental Aircraft Program aircraft, or EAP.

The Jaguar XX765 which was used for this work is on display at the Museum's Cosford site, in the Test Flight gallery.

The EAP was to be a test bed for several new systems and features. Its design was a delta wing with leading canards which would be incredibly unstable during flight. The aircraft would be stabilised by computer control which made it highly manoeuvrable.

The all new cockpit design was revolutionary for the time: the pilot would be able to operate the aircraft without taking his hands from the controls. Computer screens, a heads up display and a voice system kept the pilot easily up to date with what was happening across the aircraft. There were few old fashioned dials.

Whilst the main fuselage employed conventional techniques it was an area of compromise, both the engines were standard to the Tornado as was the entire rear section and fin. This was well disguised however by shaping the fin into more of a curve.

On the 16th April 1986 the aircraft was officially rolled out at Warton. It was finished in a highly attractive off-white and deep blue colour scheme with the letters EAP and a blue flash on the tail above its military serial of ZF534. Not only was the aircraft on time, it was also on budget.

Following taxi trials and assessments the aircraft took to the air on the 8th August 1986 with David Eagle, Director of Flight Operations, at the controls. It easily passed the sound barrier on this flight achieving Mach 1.1 during the 1 hour and 7 minute flight. In September 1986 it was displayed at the Farnborough Air Show.

In less than a year the aircraft had been flown over 115 times. The technology had been proven, and could easily be applied to another design, the European Fighter Aircraft.

Throughout its flying career the aircraft was to test several aspects of the Eurofighter Typhoon. By the first of May 1991 the aircraft had completed its useful life and was stored at Warton.

Although its development was complex and its flying life seemingly short the aircraft had achieved what had previously thought to be impossible. It easily exceeded Mach.2 and could achieve angles of over 35 degree in flight.

The Experimental Aircraft Program was the start of a new generation of aircraft. Reliable computer technology became available allowing a huge advance in concepts and designs for today's fighter aircraft. Well into the 21st Century the lessons learnt from the Experimental Aircraft Program are still very relevant and its direct descendant, the Eurofighter Typhoon, is in service across Europe.