A GRAND ILLUSION?

THE RAF & THE SPEY MIRAGE IV, 1965

With the cancellation of BAC's state-of-the-art TSR.2 strike bomber in 1965, the RAF was left with a hole in its plans for a replacement for its ageing Canberra force. Might France's Dassault Mirage IV nuclear bomber, fitted with a British engine, fill the gap? Technology, politics and economics conspired against it, as **THOMAS WITHINGTON** explains

IN APRIL 1965, in the blink of an eye, what was then one of the world's most advanced combat aircraft became an instant museum piece, when the state-of-the-art TSR.2 strike/reconnaissance aircraft was cancelled by the recently elected Labour government, led by Harold Wilson. Cost overruns during the aircraft's development had sealed its fate. Yet scrapping the TSR.2 did not scrap the need for a medium bomber to equip the RAF as a replacement for its English Electric Canberra series: "The RAF requires an aircraft which will drop conventional weapons with great accuracy at low level, operating if necessary from poor-quality forward airstrips", noted an August 1965 Ministry of Defence (MoD) draft press release, announcing the decision to consider France's Dassault Mirage IV medium bomber as a Canberra-replacement contender.

British power for France's big delta

The Mirage IV had entered service with the *Armée de l'Air* (AdA — French Air Force) on October 1, 1964, and was in the running to replace the RAF's Canberras alongside the USA's General Dynamics F-111K and the homegrown Blackburn/Hawker Siddeley Buccaneer S.2. A joint BAC/Dassault proposal suggested the Mirage IV be equipped with Rolls-Royce RB.168-25R Spey turbofan engines in place of the aircraft's standard Snecma Atar 9K-50 turbojets. As with the Anglo-French Concorde supersonic airliner project, construction

BELOW ***Mirage IVA 03 — the third pre-production prototype of the standard nuclear bomber — roars away at the Paris Air Salon under the full power of its pair of Snecma Atar 9K turbojet engines in June 1967. The prospective British plan was to re-engine the majestic delta bomber with a pair of Rolls-Royce RB.168-25R Spey turbofans.***

MIKE HOOKS

Mirage (mira'ʒ') *n.*; an optical illusion caused by unusual atmospheric conditions . . .

DASSAULT VIA JEAN-CHRISTOPHE CARBONEL

ABOVE ***The first Mirage IV prototype, 01, was essentially a scaled-up two-seat version of the Mirage III fighter, but smaller than the later production-standard Mirage IVA. The prototype made its first flight on June 17, 1959, reaching Mach 1·9 the following month. Note the original fin; the chord was increased on subsequent prototypes.***

of which began in 1966, it was proposed that one production line in each country would assemble the RAF's Mirage IVs.

It was clear from the outset that the baseline Mirage IV would require significant modifications if it was to meet RAF requirements. A letter from Air Vice-Marshal (AVM) Reginald Emson, Assistant Chief of the Air Staff for Operational Requirements (ORs), to Air Chief Marshal (ACM) Sir Charles Elworthy, Chief of the Air Staff, dated June 18, 1965, highlights some of the concerns regarding the Mirage IV in its then-current form. The most significant of these was that the RAF wanted a low-level bomber, a flight profile the Mirage IV was not at that time configured to support. The latter was equipped with a Plan Position Indicator (PPI) radar, which scanned directly downwards, as opposed to the forward-scanning radar the RAF needed to perform low-level flight at high speed safely.

Emson stated that at low altitude the Mirage IV could achieve a 570-nautical mile (1,050km) radius of action when travelling at 400kt, with a single 100-mile (180km) dash at 566kt, with droptanks. At high altitude, with a one-way dash of 200 miles (370km) at 1,133kt and the rest of the sortie being flown at 600kt, the aircraft would have a 1,180-mile (2,180km) radius of action when using droptanks. He stated that "our present advice is that the Mirage IV would have to be strengthened for low-level work", adding that "it has not met our radius of action requirements, nor would [it] appear to have a satisfactory equipment fit".

Further shortcomings were raised by Emson following a presentation on the aircraft's suitability for the RAF given by Dassault and BAC on July 16, 1965. The good news was that equipping the aircraft with the Spey was considered feasible, albeit with a weight increase of some 1,800lb (820kg). The bad news was that Emson and his team felt that, unmodified, the Mirage IV could not meet the RAF's need for a 1,000-mile (1,850km) combat radius when carrying a 2,000lb (900kg) weapon without droptanks or inflight refuelling. The aircraft also fell short of a second requirement, which was to fly for 750 miles (870km) entirely at low level at speeds of 600kt unrefuelled. Another bit of good news, however, was the claim made by Dassault and BAC that the aircraft could in fact achieve a continuous minimum altitude of 500ft (150m) above ground level (agl) at high speed without the need for additional strengthening.

Radar requirements

One potential solution to the radar problem was to employ the French CSF Cyrano II dual-mode air/ground radar suite fitted to the Mirage III series of combat aircraft on the RAF Mirage IV. However, the British evaluation team stressed that the radar had no all-weather capability when used below 500ft, and that it could not perform simultaneous terrain-following and target-fixing. This was an obvious problem when the aircraft would need to fly a nap-of-the-earth (NOE) flight profile when approaching its target. Target