THE SELECTION AND CONSTRUCTION OF THE CAC SABRE FOR RAAF SERVICE

“...On one hand it is said that if we are to produce our own military planes in Australia then by the time we have produced enough we will have them out of date...on the other hand that if you don’t produce enough aircraft in Australia we will have no industry and will be deficient in any one of those isolations which may have to be faced in a great war...”

Prime Minister R.G. Menzies 30 August 1954.

In response to the global transition to the jet age, and the need for Australia to replace its obsolete fighter force of P-51 Mustangs and De Havilland Vampire aircraft, the Australian Government announced on 8 February 1950 the decision to purchase 72 Hawker P.1081 fighter aircraft, to be built under licence by the Commonwealth Aircraft Corporation (CAC). This announcement came as a surprise to the Board of the CAC. They knew the RAAF was seeking a replacement fighter aircraft, and had researched options for such an aircraft, including the design and manufacture of their own aircraft and the licensed manufacture of an existing aircraft from overseas. However, the decision to purchase the P.1081 was made without consulting the Board of the CAC. The ambitious acquisition schedule of only 18 months from the date of the announcement to expected introduction into RAAF service further compounded the challenges facing the CAC.

The head of the CAC, Lawrence Wackett (later Sir Lawrence), realised the proposed schedule was ambitious, if not completely unrealistic. The design specifications of the P.1081 were not finalised, the prototype was yet to fly and manufacturing infrastructure had yet to be completed. Wackett was aware, however, that the CAC needed the contract to continue to be financially viable. He sent a party of CAC engineers to the Hawker factory in the United Kingdom to complete the licensing arrangements. Although the prototype P.1081 made its first flight in June 1950, by August the CAC team in the UK was reporting the project was in difficulties. The development delays, combined with the lack of UK Government interest in the P.1081, made the Australian Government decide to cancel the P.1081 purchase.

In parallel to these events, the CAC had developed a business relationship with Rolls-Royce (RR). RR had bought shares in the CAC in 1948 and Wackett, considering this “a great compliment”, was keen to keep building their engines under licence. CAC was supplying the Nene for the Vampire and the licence eventually extended to the Avon engine for use in the newly ordered Canberra. With access to a modern jet engine secured, Wackett turned his attention to an aircraft suitable for licensing and meeting the RAAF’s requirements.

Hawker offered an alternative design, the F3, later named the Hunter, in place of the P.1081. However, Wackett argued that as Australian deliveries of the F3 could not be effected before mid to late 1954, an American aircraft design should be considered instead. The Australian Government remained firm on its requirement to purchase British equipment and with nothing available, additional Vampires and the Meteor were acquired to fill the RAAF’s needs, particularly to counter MiGs in Korea.

Dissatisfied with the state of affairs, Wackett continued to look at manufacturing a capable modern fighter for the RAAF. Wackett had experience in dealing with the North American Aviation company through licensed manufacture of Wirraway and Mustang aircraft. Wackett determined that the latest product from the company, the Sabre, had the proven design and performance best suited to filling the RAAF’s fighter requirements. With no
official backing from the Australian Government, Wackett travelled to the United States to meet with representatives from the Pentagon and the North American Aviation plant in California. Receiving strong encouragement for the Sabre deal, Wackett worked to convince the Australian Government of the Sabre’s benefits. On return to Australia Wackett, through the CAC, submitted a proposal to the Air Board for the licensed manufacture of the Sabre with the RR Avon engine. While the Air Board agreed in principle, it wasn’t until a phone call from Lord Hives of RR to the Minister for Air, Sir Thomas White, that the Government became committed to the Sabre aircraft, announcing the purchase decision on 22 February 1951.

The CAC Sabre was based on the F-86F model. With the substitution of the General Electric J47 power plant with the Avon engine, the CAC knew that the airframe design would require major modifications. It fell to CAC’s engineer Ian Ring and his team to make the amendments. A total of 268 engineering changes were made to the original F-86 design to create the Avon-Sabre prototype. The Avon engine was lighter and shorter, but with greater diameter than the J47. The engine needed to be moved rearwards, but still remain supported by the fuselage. By shortening the rear portion of the fuselage by 66cm and adding this amount to the front, the aircraft’s original centre of gravity and overall length was maintained. The Avon provided more thrust than the J47, necessitating the enlargement of the air intake. This was achieved by splitting the front fuselage horizontally and inserting a 9.47cm wedge into the space. The modification avoided having to make changes to the cockpit arrangements and had the added benefit of raising the nose during the take-off roll and improving the Sabre’s airfield performance.

Another significant change was to the armament. While the original F-86 carried six .50 inch machine guns, the CAC Sabre was intended to carry four 20mm Hispano cannons. This was subsequently amended to the newly developed Aden 30mm cannon. This change added three months to the development program, but the RAAF considered it worthwhile.

The first ground run was conducted on 20 July 1953 and by August that year the prototype was ready for its first flight. The CAC airfield at Fishermans Bend in Melbourne was too short for the Sabre’s flying trials, so the aircraft was dismantled and trucked to the Avalon airfield and reassembled. Allocated the number A94-101, the first CAC Sabre flew on 3 August 1953 with FLTLT William Scott at the controls and the flight lasted 30mins. On 14 August 1953, again with Scott as the pilot, the aircraft broke the sound barrier for the first time in Australia during a shallow dive.

As with any new project early tests uncovered unforeseen problems such as engine surges at high altitude and when the guns were fired. Innovative improvements ensured that the RAAF received a capable and locally made fighter comparable to similar equipment made overseas. Further modifications were eventually made to include the carriage of infrared air-to-air missiles. While consideration was given to equipping the Sabre with air-to-air missiles early in its design phase, it was not until 1956–57 that tests were carried out comparing the US made Sidewinder against the UK’s Firestreak missile. The Sidewinder was selected and issued to the squadrons from February 1960.

The first of an eventual 112 aircraft was handed over to the RAAF on 30 August 1954 and the last on 4 August 1961. The Sabre remained in RAAF service until official retirement on 30 July 1971, being replaced by the GAF built Mirage IIIO. The CAC Sabre proved itself to be an excellent aircraft if obsolete by the late 1960s and marked a major milestone of aircraft manufacture in Australia.

Key Points

- The CAC Sabre was Australia’s first swept-wing, second generation, jet aircraft. Capable of supersonic speed in a dive and armed with modern air-to-air missiles, it was considered to be one of the most capable variants of the F-86 aircraft.
- The modification and manufacture of the CAC Sabre in Australia represented a high-water mark for Australia's aviation industry.
- The relationship between CAC, RR and North American Aviation was a portent of the progressive globalisation of the civil Defence industry.