SOUTH AUSTRALIAN AVIATION MUSEUM

SIGNIFICANT AVIATION EVENTS

A BRIEF HISTORY OF THE AUSTRALIAN SABRE

This article is derived from a speech that Group Captain Robert (Bob) MacIntosh (Ret.) gave to the Civil Aviation Historical Society of South Australia on 13 June 2013. Bob kindly gave me permission to plagiarise his speech notes and he contributed the photographs. He has also confirmed that I have not inadvertently introduced any errors to my edited version - Mike Milln 24 June 2013

FLT SGT Bob MacIntosh in an Avon Sabre
Courtesy Bob MacIntosh

As early as 1949 the RAAF began planning a replacement jet fighter for the locally-built CAC (Commonwealth Aircraft Corporation) Mustang and de Havilland Vampire. A number of existing and proposed aircraft were considered but, in the event, Gloster Meteors were obtained in 1951 for service with No 77 Squadron in the Korean War. In May 1951, plans were finalised for CAC to build a locally-designed version of the North American F-86F Sabre swept-wing fighter.

Due in part to the technical investigations initiated by CAC Manager L.J. Wackett, the RAAF decided to substitute 7,500Lb thrust Rolls-Royce Avon RA.7 turbojets for the 6,100lb thrust General Electric J-47s. This required major modifications including a larger nose-intake and positioning the Avon further aft; plus other improvements such as increased fuel capacity, a revised cockpit layout and replacement of the six 0.5 inch machine guns with two 30mm Aden cannons. This all resulted in CAC having to redesign 50% of the airframe and an aircraft, sometimes called the Avon-Sabre, that became the best of the many Sabre variants built around the world.

The first production CAC CA-27 Sabre, A94-901, flew on 13 July 1954 after the prototype first flew on 3 August the year before. This was followed by a further 21 Mk 30s, A94-902/922, with imported Avons, and leading edge slats. The next 20 Sabre Mk 31s were produced from 1955 powered by CAC Avon Mk 20s. They had other improvements including an extended leading-edge, additional fuel cells and fitments for drop-tanks, bombs and rockets. The earlier Mk 30s were then modified to Mk 31s before 69 Mk 32s, the final CAC version, were built. These aircraft, A94-943 to 990 and A94-351 to 371, carried additional drop tanks and rockets and, from 1960, Sidewinder air-to-air missiles. All the previous Mks were similarly modified and retrospectively fitted with the CAC Avon Mk 26, the first of which was installed in A94-973. The last to be modified, A94-371, completed acceptance trials on 19 December 1961.

Specifications
CAC Sabre CA-27 Mk 32
Type: single-seat, swept-wing fighter
Crew: 1
Wing span: 11.3m (37 ft)
Length: 11.43m (37 ft 6 in)
Ceiling: 52,000 ft
Weight (loaded): 8,038 kg
Speed: Cruise 885 kmh (478 kts); Max 1,126 kmh (608 kts or approx Mach .93)

The first production aircraft went to ARDU (Aircraft Research and Development Unit) on 19 August 1954, some 13 months after the first prototype flight. A Sabre Trials Flight was established at No 2 (Fighter) Operational Training Unit, RAAF Williamtown, on 1 November 1954 and the aircraft was subsequently introduced across operational squadrons including No 3 Squadron on 1 March 1956 and No 77 Squadron on 19 November 1956.[i] No 3 Sqn and No 77 Sqn were deployed to RAAF Butterworth in November 1958 and February 1959 respectively, and both used Sabres against the Malayan communist insurgency as No 78 (Fighter) Wing until July 1960.

In June 1962, eight Sabres were deployed from Butterworth to Ubon, Thailand, to counter communist activity, and this detachment became No 79 Squadron until it was disbanded in August 1968.

Bob was part of Sabre Trials Flight, which was formed in August 1954 as part of No 2 OTU. WGCDR Dick Cresswell DFC was CO of the OTU and CAPT James Marshal of the USAF was appointed as Flight Commander of the STF. Bob, then a Flight Sergeant, was the youngest of four other pilots in the STF. They didn't get any Sabres until January 1955 so continued flying Vampires while undergoing ground training on the many new features of the Sabre. These included the need to wear 'G' suits to prevent blackouts in manoeuvres up to 8 G and a high pressure oxygen supply system to force oxygen into the lungs in the event of high altitude depressurisation. The Sabre was also the first RAAF aircraft with powered controls – hydraulic-boosted to overcome high speed control forces. For all this innovation, however, Bob noted that the leading edge slats and the spring-actuated trim system harked back to the Tiger Moth. As for Pilot's Notes, all they got were some excerpts from the F86 Sabre manual and a few pages of notes by the ARDU test pilots – and their first flight was solo since there was no dual-control version of the aircraft.

Mk30 Avon Sabre A94-907
Courtesy Bob MacIntosh

All STF pilots had jet experience but flying the Sabre was still a shock. It had much greater take-off acceleration and rate of climb, and the controls were so sensitive that the pilots initially found themselves over controlling and causing 'pilot induced oscillation' or porpoising. They spent their first two months on conversion flying: stalls, spins, circuits and bumps, gunnery and dive bombing and formation flying. They also continued their normal 2OTU staff flying and Bob often flew the Wirraway, Vampire and Sabre in a single week. The trials program followed, when they had to measure everything – stall speeds, landing distances, range, max speeds and max altitude. The max altitude tests were the most interesting, which basically consisted of climbing until the engine quit at 52,000-53,000 feet and the aircraft depressurised. This required the pilot, breathing oxygen at high pressure, to roll the aircraft over and dive to 25,000 where there was sufficient air density to re-light the engine. That worked for all but one of the 50 to 60 times they tried it, with only one dead-stick

forced landing on the airfield required – fortunately, perfectly executed by F/O Tom Stoney. This interesting process established the ceiling for the Avon Sabre at 52,000 feet, which was significantly better than the 47,000 feet of the US versions of the aircraft.

These pilots were the glamour boys of the RAAF. The trials were secret and they and their families were checked out by ASIO. They had to use their own secret dedicated radio frequency during the trials. They were fed a special diet to ensure their flying fitness. And they were asked to break the sound barrier wherever they went. Imagine that today – they'd probably be court martialled!

An interesting question is whether the Avon Sabre modifications were ultimately worth it. The aircraft was acknowledged to be the best Sabre variant produced and it would have been a good match for the Mig15 in Korea. The problem was that the design and modifications took so long that the aircraft was obsolete by the time it entered service. The USAF F86 Sabre had been superseded by the F100 and F101 and the Russian and Chinese Mig15s by the M19 with the Mig21 soon to follow. Probably the fact that the Avon Sabre was the last fighter manufactured in Australia and was replaced by the French Mirage answers the question.

Bob doesn't regret it. He was commissioned as a Pilot Officer on 1 January 1956 and posted to No 3 Squadron as Adjutant and Squadron Pilot then later that year to CFS to do an instructors course. He went on to make the rare transition to rotary wing and flew the Iroquois in Vietnam and retired in December 1978 as a Group Captain. He is now President of the Mitcham Branch of the RAAF Association and State Vice President of the Association. He is also a United Church Minister.

Mike Milln
History Group Member
South Australian Aviation Museum
June 2013

[i] This paragraph was amended in August 2025 on advice that Bob's information that No 75 Sqn was first to receive the aircraft in the original document is incorrect. Sadly, Bob has since died so I am unable to refer the document back to him for his concurrence. Mike Milln – SAAM History Group