## The Avon Sabre

Towards the end of the Second World War Germany had a significant lead on the rest of the Allies with regard to weapons and aircraft design. Two of these the Messerschmitt ME-262 and its primary armament the Mauser MG 213C 30mm cannon would go on to have a far reaching effect on the Sabre for RAAF service.

German engineers had a good understanding of the benefits of swept wings for high speed aircraft, they also knew of the low speed stability problems that it created, by wars end they were working on a swept wing for the ME-262 with drop out leading edge slats to combat the stability problem.

After the war teams of specialists scoured Germany for anything that might be of use, the swept wing design was taken up by the Americans and the Russians. The Americans refined the slats concept and went on to produce the F-86A, using an almost identical wing to that designed by the Germans. The Russians came up with the MiG 15, both these aircraft were to become mortal enemies in the skies over Korea.

The Mauser MG 213C was redeveloped by the British as the ADEN 30mm cannon, this gun was to become the main armament for most British fighters for many years. France produced the DEFA 552A, of similar design but less costly to manufacture. Used in the Mirage family of aircraft it was the main armament of Australia's Mirage IIIO/IIID.

Towards the end of 1949 the RAAF recognised that it's first jet aircraft, the Vampire, would need to be replaced by a more modern design. The American F-86 Sabre was an obvious choice but events in Korea meant that no Sabres could be spared for Australia. As a result Meteors were purchased from the UK and almost immediately went into service with 77Sqn in Korea.

The Government of the day had very strong leanings towards the UK, and wanted an aircraft design from there to be licence built by CAC in Australia, many proposals were put forward including the Hunter but development and lead times were far too long for the RAAF. Fortunately a visionary in CAC Lawrence Wackett could see great promise in marrying the F-86 airframe to the more powerful Rolls Royce Avon axial flow turbojet.

Finally in 1951 the Government relented and design and development got underway, the design was to be based on the F-86F with a slatted wing. The use of the shorter but larger diameter Avon meant that the fuselage needed deepening at the front to increase the intake airflow, and moving the engine mounting further aft to maintain centre of gravity. The final design had only a superficial resemblance to the original.

Experience gained in Korea proved that the six .50 machine guns in the F-86 were inadequate( the MiG 15 had one 37mm and two 23mm cannons ) The high closing rate of modern fighters meant that firing windows were very brief, one or two hits would have to be sufficient to knock out the opponent. The initial choice was four 20mm Hispano cannon (as per the Meteor) but two of the new 30mm ADENs with a rate of fire of 1200/1400 rounds per minute was the eventual choice.

The first prototype, designated CA-26, was delivered in August of 1953, Deliveries of production aircraft, designated CA-27 Mk-30, one year later. In all 22 Mk-30s were built.

The next version the Mk-31, started deliveries in July 1955 with 20 being delivered by September 1956. A significant change in this model was the replacement of the original wing with a new design. Called the 6/3 wing it deleted the drop out slats and increased the wing cord by 6 inches at the root and 3 inches at the tip. Again this was as a result of experience in Korea, the new wing giving better performance at high altitude/high mach numbers. Later

versions also having increased fuel capacity in the leading edge itself. The remaining Mk-30s were upgraded to Mk-31 as they became due for major servicing.

The last and definitive version was the Mk-32, with first deliveries in September 1956, they were produced in three separate batches totalling 69 aircraft, the final delivery by the end of 1961. These aircraft had an updated version of the 6/3 wing, having two hard points under each wing for stores carriage ( the original had only one ) This meant it could now carry a bomb load and long range tanks. They also had the redesigned Avon 26 engine with improvements in airflow to prevent surging when the guns were fired.

During test firing of early aircraft an inherent weakness of the Avon RA7 came to light, the muzzle blast of the guns interfered with engine airflow causing severe surging. An extensive test programme was undertaken both by CAC in Australia and Rolls Royce in UK. This testing resulted in a change to the design of the blast panels to incorporate baffles, redesign of the engine with better internal flow and, the fitting of a fuel dipper to reduce fuel supply to the engine during firing .

Although installation and flight tests had been performed in 1958/59 with the British designed Firestreak (Blue Jay) missile further development was not carried out. The installation required significant changes to the airframe and wiring and could not be justified. The American AIM 9B Sidewinder on the other hand was practically a bolt on installation, ARDU's A94-946 being the first sabre to be fitted with this missile in 1959. The two operational Sabre squadrons in Malaya, 3 and 77 were fitted out early in 1960.

The twin store wing of the Mk 32s meant that for ferry purposes two drop tanks could be fitted to each wing, 100 gallon inboard and 167 gallon outboard. I know of at least one aircraft being fitted up this way and test flown on two occasions, I think the duration was over three hours. Why this set up was not used for some of the longer ferry flights I don't know, perhaps some one has the answer.

As well as serving at various bases in Australia the Avon Sabre saw active service at Butterworth Malaysia during the "Emergency" and "Confrontation" and, Ubon Thailand, during the Vietnam War. A total of 18 ex RAAF Sabres were donated to the Royal Malaysian Air Force between 1969 and 1972 ,operating as No11 Sqn TUDM. From 1973 to 1975 a further 23 Sabres were donated to the Indonesian Air Force, five of these being ex Malaysian aircraft, they comprised No 14 Sqn TNI-AU. Of these five at least two A94-978 and A94-987 have served in all five theatres of operation. It is perhaps not often that the same aircraft serves on two different sides during its life.

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Information sources are. My own records Meteor, Sabre and Mirage in RAAF service Pictorial History of the RAAF Military Aircraft of Australia