



GO-ROUND

ALDINGA AERO CLUB MONTHLY NEWSLETTER

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AVRO Vulcan, first delivered in 1956.....67 years on

The **Avro Vulcan** (later **Hawker Siddeley Vulcan** from July 1963) is a [jet-powered](#), [tailless](#), [delta-wing](#), high-altitude, [strategic bomber](#), which was operated by the [Royal Air Force](#) (RAF) from 1956 until 1984. Aircraft manufacturer A.V. Roe and Company ([Avro](#)) designed the Vulcan in response to [Specification B.35/46](#). Of the three [V bombers](#) produced, the Vulcan was considered the most technically advanced, hence the riskiest option. Several reduced-scale aircraft, designated [Avro 707s](#), were produced to test and refine the delta-wing design principles.

The Vulcan B.1 was first delivered to the RAF in 1956; deliveries of the improved Vulcan B.2 started in 1960. The B.2 featured more powerful engines, a larger wing, an improved electrical system, and [electronic countermeasures](#), and many were modified to accept the [Blue](#)

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[Steel](#) missile. As a part of the [V-force](#), the Vulcan was the backbone of the United Kingdom's airborne nuclear deterrent during much of the [Cold War](#). Although the Vulcan was typically armed with [nuclear weapons](#), it could also carry out conventional bombing missions, which it did in [Operation Black Buck](#) during the [Falklands War](#) between the United Kingdom and Argentina in 1982.

The Vulcan had no defensive weaponry, initially relying upon high-speed, high-altitude flight to evade interception. Electronic countermeasures were employed by the B.1 (designated B.1A) and B.2 from around 1960. A change to low-level tactics was made in the mid-1960s. In the mid-1970s, nine Vulcans were adapted for maritime radar reconnaissance operations, [redesignated](#) as B.2 (MRR). In the final years of service, six Vulcans were converted to the K.2 tanker configuration for [aerial refuelling](#).

After retirement by the RAF, one example, B.2 [XH558](#), named *The Spirit of Great Britain*, was restored for use in display flights and air shows, whilst two other B.2s, [XL426](#) and [XM655](#), have been kept in taxi-able condition for ground runs and demonstrations. B.2 [XH558](#) flew for the last time in October 2015 and is also being kept in taxi-able condition.

The origin of the Vulcan and the other V bombers is linked with early [British atomic weapon programme](#) and [nuclear deterrent](#) policies. Britain's atom bomb programme began with Air Staff Operational Requirement OR.1001 issued in August 1946. This anticipated a government decision in January 1947 to authorise research and development work on atomic weapons, the U.S. [Atomic Energy Act of 1946](#) (McMahon Act) having prohibited exporting atomic knowledge, even to countries that had collaborated on the [Manhattan Project](#). OR.1001 envisaged a weapon not to exceed 24 ft 2 in (7.37 m) in length, 5 ft (1.5 m) in diameter and 10,000 lb (4,500 kg) in weight. The weapon had to be suitable for release from 20,000 to 50,000 ft (6,100 to 15,200 m)

The first 15 production B.1s were powered by the Olympus 101. Many of these early examples in a metallic finish remained the property of the Ministry of Supply, being retained for trials and development purposes. Those entering RAF service were delivered to [No 230 Operational Conversion Unit](#) (OCU), the first in July 1956. Later aircraft, painted in [anti-flash white](#) and powered by the Olympus 102 with 12,000 lbf (53 kN) thrust, began to enter squadron service in July 1957. ^[36] The Olympus 102s were modified during overhaul to the Olympus 104 standard, ultimately rated at 13,500 lbf (60 kN) thrust.

Rebuilding B.1s as B.2s was considered but rejected over cost. Nevertheless, to extend the B.1's service life, 28 (the surviving B1 aircraft fitted with Olympus 102/104 engines) were upgraded by [Armstrong Whitworth](#) between 1959 and 1963 to the B.1A standard, including features of the B.2 such as ECM equipment, in-flight refuelling receiving equipment, and UHF radio. However, the B.1As were not strengthened for low-level operations and all were withdrawn by 1968

Australia

As early as 1954, the [Royal Australian Air Force](#) (RAAF) recognised that the [English Electric Canberra](#) might soon become outdated. Potential replacements, such as the [Boeing B-47E](#), [Handley-Page Victor](#) and Vulcan were considered.

Political pressure for a Canberra replacement came to a head in 1962, by which time agile, supersonic bombers/strategic [strike aircraft](#), such as the [North American A-5 Vigilante](#), [BAC TSR-2](#), [General Dynamics F-111](#), had become available. Had the Australian government pre-ordered the TSR-2, several V-bombers, including Vulcans, would have been made available, for interim use by the RAAF; however, the F-111C was ordered. (The UK government almost followed that decision – after the cancellation of the TSR-2 – it was offered the similar [F-111K](#).)

Argentina

In the early 1980s, Argentina approached the UK with a proposal to buy a number of Vulcans. An application, made in September 1981, requested the 'early availability' of a 'suitable aircraft'. With some reluctance, British ministers approved the export of a single aircraft but emphasised that clearance had not been given for the sale of a larger number. A letter from the British [Foreign and Commonwealth Office](#) to the [Ministry of Defence](#) in January 1982 stated that little prospect was seen of this happening without ascertaining the Argentine interest and whether such interest was genuine: 'On the face of it, a strike aircraft would be entirely suitable for an attack on the Falklands.' [Argentina invaded the Falkland Islands](#) less than three months later, after which a British [embargo](#) on the sale of any military equipment was quickly imposed.



In

September 1956, the RAF received its first Vulcan B.1, XA897, which immediately embarked upon a round-the-world tour. The tour was to be an important demonstration of the range and capabilities of the aircraft, but it also had other benefits in the form of conducting goodwill visits in various countries; during their service, Vulcans routinely visited various nations and distant parts of the [Commonwealth](#) as a show of support and military protection. This first tour, however, was struck by misfortune; on 1 October 1956, while landing in bad weather at [London Heathrow Airport](#) at the completion of the world tour, [XA897 was destroyed](#) in a fatal accident.

The first two aircraft were delivered to 230 OCU in January 1957 and the training of crews started on 21 February 1957. The first OCU course to qualify was No. 1 Course, on 21 May 1957, and they went on to form the first flight of [No. 83 Squadron](#). No. 83 Squadron was the first operational squadron to use the bomber, at first using borrowed Vulcans from the OCU, and on 11 July 1956 it received the first aircraft of its own. By September 1957, several Vulcans had been handed over to No. 83 Squadron. The second OCU course also formed a Flight of 83 Squadron, but subsequent trained crews were also used to form the second bomber squadron, [101 Squadron](#). The last aircraft from the first batch of 25 aircraft had been delivered by the end of 1957 to 101 Squadron

Vulcans flew some very long-range missions. In June 1961, one flew 18,507 km from RAF Scampton to Sydney in just over 20 hours, facilitated by three air refuellings. Vulcans frequently visited the United States during the 1960s and 1970s to participate in air shows and static displays, as well as to participate in the [Strategic Air Command's](#) (SAC) Annual Bombing and Navigation Competition at such locations as [Barksdale AFB](#), Louisiana, and the former [McCoy AFB](#), Florida. Vulcans also took part [Operation Skyshield](#) exercises in 1960, 1961, and 1962, in which [NORAD](#) defences were tested against possible Soviet air attack, the Vulcans simulating Soviet fighter/bomber attacks against New York, Chicago, and [Washington, DC](#). The results of the tests were classified until 1997. The Vulcan proved quite successful during the 1974 "Giant Voice" exercise, in which it managed to avoid USAF interceptors

Nuclear deterrent

As part of Britain's independent nuclear deterrent, the Vulcan initially carried Britain's first nuclear weapon, the [Blue Danube gravity bomb](#). *Blue Danube* was a low-kiloton yield fission bomb designed before the United States detonated the first [hydrogen bomb](#). These were supplemented by U.S.-owned [Mk 5](#) bombs (made available under the [Project E](#) programme) and later by the British [Red Beard](#) tactical nuclear weapon. The UK had already embarked on its own hydrogen bomb programme, and to bridge the gap until these were ready the V-bombers were equipped with an Interim Megaton Weapon based on the *Blue Danube* casing containing [Green Grass](#), a large pure-fission warhead of 400-kiloton-of-TNT (1.7 PJ) yield. This bomb was known as [Violet Club](#). Only five were deployed before the *Green Grass* warhead was incorporated into a developed weapon as [Yellow Sun Mk.1](#).

The later *Yellow Sun Mk 2*, was fitted with [Red Snow](#), a British-built variant of the U.S. [W28 warhead](#). *Yellow Sun Mk 2* was the first British thermonuclear weapon to be deployed, and was carried on both the Vulcan and [Handley Page Victor](#). The Valiant retained U.S. nuclear weapons assigned to [SACEUR](#) under the dual-key arrangements. *Red Beard* was positioned in [Singapore](#) for use by Vulcan and Victor bombers. From 1962, three squadrons of Vulcan B.2s and two squadrons of Victor B.2s were armed with the [Blue Steel](#) missile, a rocket-powered stand-off bomb, which was also fitted with the 1.1 Mt (4.6 PJ) yield *Red Snow* warhead.

Operationally, RAF Bomber Command and the SAC cooperated in the [Single Integrated Operational Plan](#) to ensure coverage of all major Soviet targets from 1958; 108 of the RAF's V-bombers were assigned targets under the plan by the end of 1959. From 1962 onwards, two jets in every RAF bomber base were armed with nuclear weapons and on standby permanently under the principle of [Quick Reaction Alert](#) (QRA). Vulcans on QRA were to be airborne within four minutes of receiving an alert, as this was identified as the amount of time between warning of a USSR nuclear strike being launched and it arriving in Britain. The closest the Vulcan came to taking part in potential nuclear conflict was during the [Cuban Missile Crisis](#) in October 1962, where Bomber Command was moved to Alert Condition 3, an increased state of preparedness from normal operations; however, it stood down in early November



What is this plane called?

Where is it registered?

Vale Tony Human



Gabriella, members of the Aldinga Aero Club would like to express our sincere condolences to you, and we, like you, feel a real loss with the passing of your mate, and ours, Tony.

Tony will always be remembered for his cheerful, thoughtful and willing nature.

Whenever there was a Club activity, Tony was always willing, if he was able, to be a part of it, whether a Sunday bbq, a flying skills activity, a flyaway, and especially a Charity day, where he willingly gave of his expertise and skills and used his aircraft to take children with sometimes life-limiting medical conditions, for a flying experience they may otherwise never have had.

He was a keen member of the Club Executive, where he made many contributions and provided some very thoughtful insights into, and solutions for problems that occasionally arose.

He was always willing to be involved in whatever way he could, whether at a working bee, or taking colleagues who were unable to fly, with him on Club day competition activities.

When he retired and experienced some health problems, and sold his aircraft, he often travelled away in his caravan, but always appreciated being included in invitations to Club social activities such as film nights at the Ingle Theatre, or AGM's, or Christmas lunches, where we first met you.

We think of you at this time as well, and hope that the emotional pain you no doubt are experiencing presently may lessen with time, but be assured that you will always have memories, as we do, that will be yours forever, and which will be more meaningful as time passes. **From the members and Executive of the Aldinga Aero Club**