RAAF
HISTORY AND HERITAGE

The RAAF's first experience of rotary wing

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The first helicopter operated by the Royal Australian Air Force (RAAF) and, in fact, the first in the Australian Defence Force (ADF), was the Sikorsky S.51 Dragonfly, so called because of its hovering ability and the buzzing noise from its rotors. The RAAF acquired three in 1947 and a further two in 1951. However, the Dragonfly was not the first experience the RAAF had had with rotary winged aircraft.

Cierva C.30 VH-USR at Laverton. Credit: Department of Defence

As part of a 1942 initiative, the RAAF evaluated a Cierva C.30A autogyro at Laverton with a view to using similar autogyros for military operations.

The interest in autogyros had much to do with their unique flying properties. While considered by some as the forerunner of the modern helicopter, an autogyro cannot hover, but can take off and land with very minimal ground run. They are able to fly at extremely low speeds and are not subject to the stall characteristics typical of fixed winged aircraft. In the event of an emergency, the autogyro could freefall down to earth, much like a falling sycamore seed. Importantly, at a time of great demand on Australia's limited industrial and military resources, autogyros were considered cheap to construct, easy to store and relatively easy to operate. With these characteristics, autogyros had certain military appeal with potential for reconnaissance, transportation and air-drop operations.

Although similar in looks to a helicopter, an autogyro has a freewheeling upper rotor which acts as an aerofoil to generate lift, and requires an engine-driven propeller for forward motion. While some early designs were tested with autogyro-like features, none were very successful until a Spanish engineer, Juan de la Cierva, developed the first practical aircraft in 1923.

After experimenting with various designs, in 1934 Cierva's C.30A autogyro went into production and sold well. The C.30A had three folding rotor blades and a reverse aerofoil section on the port tailplane to counter rotor torque. A 140 hp Genet Major engine gave the C.30A a cruise speed of 150 kph and a range of 460 km. The C.30A was evaluated by the Royal Air Force at their Boscombe Down test facility and 12 went into RAF service

between 1934 and 1945. Flown by No 529 Squadron, these aircraft were used to calibrate coastal radar stations during the Battle of Britain and thereafter.

Sikorsky S.51 helicopters in formation.
Credit: Department of Defence

Of the 100 built, only four Cierva autogyros were imported into Australia, between September 1934 and mid-1935. While one of these aircraft saw RAAF service for trials in 1942, it never received a military serial number. This particular C.30A was purchased by Andrew Thyne Reid, a wealthy businessman, who had learnt to fly autogyros at the Cierva School at Hanworth in England. Built at the A.V. Roe works in Manchester as Avro type 671, it was imported and registered in Australia as VH-USR. It was used by Reid and his wife to fly between Sydney and their property at Yass and for recreational flying around NSW. Reid offered the aircraft to the Department of Defence during the war.

Reid's unusual aircraft was believed to have first been used by the Royal Australian Navy to track torpedos during firing tests at Pittwater, but it came into RAAF hands at Laverton in 1942 for evaluation. The first autogyro trials on the Cierva C.30 were to evaluate its suitability for army troop transport and for airdropping supplies to troops in the jungle. *Project Skyward* was intended to develop a 'flying Jeep' or 'fleep' out of cannibalised autogyros (presumably what was left of the other three imports). The intention was to tow the autogyro behind a C-47 Dakota, but the flying speed of the Dakota at around 120 knots made the concept unworkable because of autogyro structural problems. Initial tow-tests were carried out behind a large Buick car to allow the civilian test pilot, Ken Frewin, to become accustomed to being towed without the problems of propeller backwash from the Dakota. These initial trials indicated that a range of handling and control problems would need to be resolved before the plan could have any practical application. Subsequently, the project was cancelled before the autogyro was tested behind an aircraft.

While still at Laverton, a bad landing in a crosswind resulted in structural damage and the autogyro was sent to Marshall Airways for repairs. In the end, these and other tests proved unsuccessful and the idea of using autogyros to drop supplies or transport troops over the jungle was abandoned. So was the idea of a 'fleep'.

After the war, VH-USR was returned to Reid and although he flew it on several occasions, when he died, his widow donated it to the Royal Aero Club at Bankstown. In 1979, it was purchased by the Powerhouse Museum where it now hangs from the ceiling on public display.

Despite disappointing results with the autogyro trials, interest in the potential for rotary wing operations remained strong. In

June 1943, the Air Board requested information from the United States (US) regarding autogyro and helicopter developments from the previous two years. By July, the Army was indicating a requirement for up to 25 helicopters, prompting further enquiries with the US. Any thoughts of an early acquisition soon faded when it was made known by Washington that there may be a delay of nine months after any initial order was made before helicopters might become available.

Undaunted, the Army and RAAF actively pursued options of local manufacture, but was soon dissuaded by the lack of adequate skilled manufacturing capacity in Australia. Despite the Army continuing to show interest, even their enthusiasm for the project waned, scaling back their requirement to a fleet of six Sikorsky Type R.5. helicopters. With the war clearly coming to an end and with other more pressing requirements, the need for helicopters lost urgency, until the proposal dropped altogether in October 1945.

By 1946, the Air Board had second thoughts and decided to acquire a Sikorsky S.51 for evaluation purposes. The aircraft was delivered in October 1947 and given the serial number A80-1. After test pilot Squadron Leader Ken Robertson of the RAAF's Aircraft Research and Development Unit tested the Sikorsky in 1948 and gave it a qualified acceptance, the RAAF ordered four more and so the RAAF entered the helicopter era.

By October 1962, the RAAF had received perhaps the best-known helicopter of a generation when the first batch of UH-1B Iroquois arrived. The Iroquois went on to serve the Navy, Army and Air Force in peace and war until finally being retired from the Army in 2007.

- *The RAAF's association with rotary wing aircraft dates back to the Second World War.*
- *While promising, the performance of Second World War-era autogyros was disappointing when evaluated against specific operational-based criteria.*
- *The emerging helicopters of the post-war era demonstrated significant potential for use across the joint environment.*

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