

## THE HISTORY OF CESSNA'S T-37 TRAINER



In the early 1950s the US Air Force was looking for a turbojet-powered trainer, and in 1953 Cessna was announced winner of this design competition, two prototypes being ordered under the designation XT-37. The company identified the type as the Cessna Model 318, and the first of these made its initial flight on 12 October 1954. It was a perfectly straightforward monoplane of all-metal construction, with pupil and instructor seated in what had long been considered to be an ideal side-by-side arrangement (contrary to the normal US tandem practice). Powerplant consisted of two Continental turbojets (Americanized versions of the French Turbomeca Marbore) with 920 pounds (417Kg) of thrust each mounted within the wing roots on each side of the fuselage. The tail-plane was mounted above the fuselage about one-third of the way up the fin to ensure that the airstream flowing past it was unaffected by the jet exhaust.

The initial prototype crashed during spin tests. The later prototypes incorporated new features to improve handling, including long spin strakes along the nose, and an extensively redesigned and enlarged tail. After these modifications, the USAF found the aircraft acceptable to their needs, and ordered it into production as the "T-37A".

The first production batch of 11 aircraft, which had the designation T-37A, was ordered during 1954, and the first of these flew on 27 September 1955. The T-37As, of which 534 were built under successive contracts, were slow in entering service as a result of the need for a number of changes and modifications before they were considered acceptable for training purposes. When introduced into service, in 1957, the T-37s were used initially as follow on primary trainers, the pupils transferring to these aircraft only after completing their primary training on Beech T-34 Mentors.

The T-37B with more powerful J-69-T-25 engines with 1025 pounds (456kg) thrust, and improved nav/com systems, was introduced into service in November 1959, and all surviving T-37 As were converted retrospectively to this standard. Final version was the T-37 with provision for armament

and wingtip fuel tanks.

In April 1961 all-through jet training was initiated, the pupil flying from the very beginning of his training on T-37 aircraft which had a speed range of 82-410 mph (138-684km/h) (mach .4).

Instructors and students found the T-37A extremely pleasant to fly. It handled well and was agile and responsive, though it was definitely not overpowered. It was capable of all traditional aerobatic maneuvers. The T-37A had one very noticeable and unpleasant characteristic: it was very noisy, even by the standards of a jet aircraft. Its' little turbojets emitted a high-pitched shriek that led some to describe the trainer as a "Screaming Mimi", and it was referred to as the "6,000 pound dog whistle". The piercing whistle quickly gave the T-37 its name: "Tweety Bird", or just "Tweet".

No catastrophic accident rate resulted, as had been feared by many, but one point which had not been fully considered was the much higher training cost using jet aircraft. There is inevitably a varying pupil rejection rate at the end of primary training, and it was decided in 1964 to revert to light piston-engine trainers, which are much cheaper to operate, for this primary phase, so that T-37 pupils were those left after the first weeding-out.

In 1962, Cessna suggested the T-37B as a replacement for the North American F-100 Super Sabre as the mount for the USAF aerobatic demonstration team, the Thunderbirds. The T-37B was an excellent aerobatic aircraft, was economical to operate and support, and could be flown from small airports. However, the Air Force was happy with the thunderous F-100 and was not interested in trading it in for the shrill Tweet.

#### THE TWEET GOES TO WAR

Also during 1962 two Cessna T-37B trainers were evaluated by the USAF's Special Air Warfare Center to consider their suitability for deployment in the counter-insurgency (COIN) role. These were first tested with their original powerplant of two 1025 pound (465kg) thrust Continental J69-T-25 turbojets, at a take-off weight of 8700 pounds (3946kg), well above the normal maximum take-off weight (that's 33% above normal takeoff weight).

Subsequently the airframes were modified to accept two 2400 pound (1089kg) thrust General Electric J85-GE-5 turbojets. This vast increase in power made it possible for the aircraft, then designated YAT-37D, to be flown at steadily increasing take-off weights until a safe upper limit of 14,000 pounds (6350kg) was reached.

There was, clearly, plenty of scope for the carriage of a worthwhile load of weapons.

This exercise was academic, until the need of the war in Vietnam made the USAF take a closer look at this armed version of what had proved to be an excellent trainer. During this period, Cessna had built the Model 318E prototype of a purpose-designated light-strike aircraft based on the T-37. Little time was lost in evaluation and the initial production batch of this A-37B was started quickly enough for the first deliveries to begin in May 1967. Accordingly, Cessna was requested to convert 39 T-37B trainers to a light-strike configuration. The new model was based on the earlier experiments with the two YAT-37Ds, and was equipped with eight underwing hard-points, provided with wingtip tanks to increase fuel capacity and powered by derated General Electric J85-GE-5 turbojets.

Delivery to the USAF began on 2 May 1967, and during the latter half of that year a squadron numbering 25 of these aircraft, designated A-37A and named Dragonfly, underwent a four-month operational evaluation in South Vietnam. Following this investigation they were transferred for operational duty with the 604th Air Commando Squadron at Bien Hoa; in 1970 they were assigned to the South Vietnamese air force.

The A-37B differed in construction from the prototype YAT-37D, its air-frame stressed for 6g loading, maximum internal fuel capacity increased to 508 gal (1920 litres) with the ability to carry four auxiliary tanks having a combined capacity of 400 gal. (1516 litres), and with provision for flight-refuelling.

Powerplant was changed to two General Electric J85-GE-17A turbojets. A GAU-2B/A 7.62mm Minigun was installed, and the eight underwing hardpoints could carry in excess of 5,000 pounds (2268kg) of mixed stores. For the assessment of results both gun and strike cameras were carried, and some armour protection for the crew of two was provided by the inclusion of layered nylon flak-curtains installed around the cockpit. The A-37A was formally named the "Dragonfly", but most pilots called it the "Super Tweet". It is an interesting question if that meant the A-37A was even noisier than the T-37.

By the time that production ended in the 1960's, a total of 552 T-37Bs were built, and in addition to serving with the USAF, the type was supplied in small numbers to friendly nations. Many were transferred to the US Air National Guard and to the South Vietnam air force. Exports to allied countries amounted to 273 T-37Cs. Adding this to the 444 T-37As and 552 T-37Bs gives a total of 1,269 aircraft built. Some may still be flying.

The last T-37B was officially retired from active USAF service on 31 July 2009.



The T-37 was a symbol of Air Force pilot training for half a century.

Any trainer/warbird that can be used for over 50 years has earned it's place in the "Aircraft Hall of Fame".

At least two airworthy T-37s and six A-37s are currently registered under private ownership with the FAA and are currently flying.