

# Cessna T-37 Tweet

## T-37 Tweet



A T-37 Tweet from the 85th Flying Training Squadron, Laughlin Air Force Base, Texas, flies over Amistad Reservoir during a training mission.

<b>Role</b>	Military trainer aircraft
<b>Manufacturer</b>	Cessna
<b>First flight</b>	October 1954
<b>Introduction</b>	1957
<b>Primary users</b>	United States Air Force Brazilian Air Force Pakistan Air Force Portuguese Air Force
<b>Produced</b>	1955-1975
<b>Number built</b>	1,269
<b>Variants</b>	A-37 Dragonfly

The **Cessna T-37 Tweet** (designated **Model 318** by Cessna) is a small, economical twin-engine jet trainer-attack type aircraft which flew for decades as a primary trainer for the United States Air Force (USAF) and in the air forces of several other nations. The A-37 Dragonfly variant served in the light attack role during the Vietnam War and continues to serve in the air forces of several South American nations.

The T-37 served as the U.S. Air Force's primary pilot training vehicle for over 52 years after its first flight. After completing

Primary in the Tweet, students moved on to other advanced Navy, Marine Corps or Allied trainers. 1,269 Cessna T-37s were built, with 419 still serving in the United States Air Force in 2006. Between 2001 and 31 July 2009 the USAF phased out the T-37 in favor of the T-6 Texan II.

## **Development**

The Cessna Aircraft Company of Wichita, Kansas provided the United States Army during World War II and the Korean War with utility, light transport, and observation aircraft, particularly the "O-1 Bird Dog" series.

In the spring of 1952 the United States Air Force (USAF) issued a request for proposals for a "Trainer Experimental (TX)" program, specifying a lightweight two-seat basic trainer for introducing USAF cadets to jet aircraft.

Cessna responded to the TX request with a twin-jet design with side-by-side seating. The USAF liked the Cessna design, which was given the company designation of "Model 318", and the side-by-side seating since it let the student and instructor interact more closely than with tandem seating. In the spring of 1954, the USAF awarded Cessna a contract for three prototypes of the Model 318, and a contract for a single static test aircraft. The Air Force designated the type as **XT-37**.

The XT-37 had a low straight wing, with the engines buried in the wing roots, a clamshell-type canopy hinged to open vertically to the rear, a control layout similar to that of contemporary operational USAF aircraft, ejection seats, and tricycle landing gear with a wide track of 4.3 m (14 ft). It first flew on October 12, 1954.

The wide track and a steerable nose wheel made the aircraft easy to handle on the ground, and the short landing gear avoided the need for access ladders and service stands. The aircraft was

designed to be simple to maintain, with more than a hundred access panels and doors. An experienced ground crew could change an engine in about a half hour.

The XT-37 was aerodynamically clean, so much so that an air brake was fitted behind the nose wheel door to help reduce speed for landing. Since the short landing gear placed the engine air intakes close to the ground, screens pivoted over the intakes from underneath when the landing gear was extended, to prevent foreign object damage.

The XT-37 was fitted with two Continental-Teledyne J69-T-9 turbojet engines, French Turbomeca Marboré engines built under license, with 920 lbf (4.1 kN) thrust each. The engines had thrust deflectors to allow them to remain spooled-up (i.e. rotating at speeds above idle) during landing approach, permitting shorter landings while still allowing the aircraft to easily make another "go-round" in case something went wrong. Empty weight of the XT-37 was 2.27 tonnes (5,000 lb).

Tests showed the XT-37 had a maximum speed of 628 km/h (390 mph) at altitude, with a range of 1,505 km (935 mi). The aircraft was unpressurized, and so limited to a ceiling of 7.6 km (25,000 ft) by USAF regulations.

The initial prototype crashed during spin tests. Later prototypes had new features to improve handling, including long 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**. Production aircraft remained tricky in recovering from a spin; the recovery procedure was complex compared with most aircraft.

## **Production**

The production T-37A was similar to the XT-37 prototypes, except for minor changes to fix problems revealed by the flight

test program. The first T-37A was completed in September 1955 and flew later that year.

The T-37A was very noisy, even by the standards of a jet aircraft. The intake of air into its small 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" or "Converter" (converts fuel and air into noise and smoke). The piercing whistle quickly gave the T-37 its name: "Tweety Bird", or just "Tweet". The Air Force spent a lot of time and money sound-proofing buildings at bases where the T-37 was stationed, and ear protection remains mandatory for all personnel when near an operating aircraft.

The Air Force ordered 444 T-37As, with the last produced in 1959. During 1957, the US Army evaluated three T-37As for battlefield observation and other combat support roles, but eventually procured the Grumman OV-1 Mohawk instead.

The Air Force liked the T-37A, but considered it to be underpowered; consequently they ordered an improved version, the **T-37B**, with uprated J-69-T-25 engines. The new engines provided about 10% more thrust and were more reliable. Improved avionics were also specified for the new variant.

A total of 552 newly-built T-37Bs were constructed through 1973. All surviving T-37As were eventually upgraded to the T-37B standard as well.

Due to a series of accidents caused by bird strikes between 1965 and 1970, all T-37s were later retrofitted with a new windscreen made of Lexan polycarbonate plastic 12.5 mm (½in) thick, which could tolerate the impact of a 1.8 kg (4 lb) bird at a relative speed of 460 km/h (288 mph).

In 1962 Cessna suggested the T-37B as a replacement for the North American F-100 Super Sabre as the primary aircraft for

the USAF aerobatic demonstration team, the Thunderbirds, but the USAF was satisfied with the F-100.

The T-37A and T-37B had no built-in armament and no stores pylons for external armament. In 1961 Cessna began developing a modest enhancement of the T-37 for use as a weapons trainer. The new variant, the **T-37C**, was intended for export and could be used for light attack duties if required.

The prototype T-37C was a modified T-37B. The primary changes included stronger wings, with a stores pylon under each wing outboard of the main landing gear well. The T-37C could also be fitted with wingtip fuel tanks, each with a capacity of 245 l (65 US gallons), that could be dropped in an emergency.

A computing gun sight and gun camera were added. The T-37C could also be fitted with a reconnaissance camera mounted inside the fuselage.

The primary armament of the T-37C was the General Electric "multi-purpose pod" with a 12.7 mm (0.50 caliber) machine gun with 200 rounds, two 70 mm (2.75 in) folding-fin rockets, and four practice bombs. Other stores, such as folding-fin rocket pods or Sidewinder air-to-air missiles, could be carried.

The changes increased the weight of the T-37C by 650 kg (1,430 lb). As the engines were not upgraded, this reduced top speed to 595 km/h (370 mph), though the wingtip tanks increased maximum range to 1,770 km (1,100 mi). T-37 production ended in 1975. The list of exports above amounts to 273 T-37Cs. Adding this number to the 444 T-37As and 552 T-37Bs gives a total of 1,269 aircraft built.

Cessna proposed a number of innovative variants of the Tweet that never went into production. In 1959, Cessna built a prototype of a light jet transport version of the T-37, designated the Cessna **Model 407**, which was stretched 61 cm (2 ft) to

accommodate a four-place pressurized cockpit with an automobile-type configuration. Only a wooden mockup of the "Model 407" was constructed. The project was canceled due to insufficient customer interest.

The company also proposed a similar four-place military light transport, the "Model 405", with a big clamshell canopy, but it was never built.

In response to a United States Navy "Tandem Navy Trainer" (TNT) requirement, Cessna proposed a T-37 with a modified fuselage featuring a tandem cockpit. The Navy selected the North American T-2 Buckeye instead.

Cessna proposed various other trainer derivatives for the US Navy and Air Force, including a vertical takeoff version based on the TNT configuration and incorporating lift-jet pods in the wings, but none of them got to the prototype stage.

## **Operational history**

The T-37A was delivered to the U.S. Air Force beginning in June 1956. The USAF began cadet training in the T-37A during 1957. The first T-37B was delivered in 1959. Instructors and students considered the T-37A a pleasant aircraft to fly. It handled well and was agile and responsive, though it was definitely not overpowered. It was capable of all traditional aerobatic maneuvers. Students intentionally placed the aircraft into a spin as part of their pilot training.

The Air Force made several attempts to replace the T-37 (including the T-46), but it remained in service with the USAF until it was phased out in favor of the Beechcraft T-6A Texan II between 2001 and 2009. The T-6 is a turboprop aircraft with more power, better fuel efficiency and more modern avionics than the Tweet.

The final USAF student training sortie by a T-37B aircraft in the Air Education and Training Command (AETC) took place on 17 June 2009. The last USAF operator of the T-37B, the 80th Flying Training Wing (80 FTW), flew the sortie from its home station at Sheppard AFB, Texas. The last T-37B was officially retired from active USAF service on 31 July 2009.



## **MAPS T-37B, Serial Number 54-2732**

One of the two T-37A's located at the MAPS Air Museum (serial #54-2732) was manufactured by Cessna Aircraft Corporation in Wichita, Kansas and delivered to the United States Air Force in April 30, 1956. It was initially retained by the manufacturer as a JT-37A for test and evaluation.

In December 1958 the aircraft was assigned to the 3306<sup>th</sup> Pilot Training Group, Air Training Command (ATC) at Bainbridge Air Force Base in Georgia. During this assignment, the aircraft was converted to the "B" configuration. In January of 1961, it was re-assigned to the 3525<sup>th</sup> Pilot Training Wing (ATC) stationed at Williams Air Force Base located near Mesa, Arizona.

In March of 1967, 54-2732 was returned to Cessna Aircraft Company in Wichita and in August of 1968 it was dropped from the Air Force inventory by transfer to museum status. It was placed on loan to the Florida Military Aviation Museum in Clearwater, Florida. When the museum closed, the aircraft were removed from the facility and placed in outside storage.

The Cessna T-37B Tweet (Serial # 54-2732) along with a North American F-86L Sabre (Serial # 53-0658) were recovered from Florida and arrived at MAPS in March of 2007. Officially a part of the U.S. Air Force Museum, Wright Patterson AFB collection, it has been placed on indefinite loan to MAPS Air Museum for restoration and display.



## **MAPS T-37B, Serial Number 60-0188**

The second T-37's located at the MAPS Air Museum (serial #60-0188) was manufactured by Cessna Aircraft Corporation in Wichita, Kansas and delivered to the United States Air Force on December 29, 1961. In January of 1962, it was assigned to the 3575<sup>th</sup> Pilot Training Wing of the Air Forces Air Training Command (ATC) located at Vance Airforce Base (AFB) which was located northwest of Oklahoma City, Oklahoma.

In November of 1969, the aircraft was assigned to the 3560<sup>th</sup> Pilot Training Wing, ATC at Webb AFB, Texas. In November of 1973, 60-0188 was re-assigned to the 78<sup>th</sup> Flying Training Wing, ATC also located at Webb AFB.

In August of 1977, the Cessna was moved to Randolph AFB in Texas and assigned to the 12<sup>th</sup> Flying Training Wing, ATC. Less than a year later (June 1978) the aircraft was moved to Columbus AFB in Mississippi and assigned to the 14<sup>th</sup> Flying Training Wing. During this assignment, the aircraft was deployed back to Randolph.

January of 1982 saw 60-0188 moved to Sheppard AFB, Texas with assignment to the 88<sup>th</sup> Flying Training Squadron, ATC. In April of 1985, the aircraft was assigned to the 80<sup>th</sup> Flying Training Squadron at Sheppard. The last record shows 60-0188 assigned as a ground instructional airframe at Sheppard AFB, TX in March of 2004

Dropped from the Air Force inventory in November of 2007, the aircraft was purchased by a private collector from Mansfield, Ohio and arrived here at MAPS in November of 2012.



## Variants

### XT-37A

Two-seat jet trainer prototype aircraft, powered by two Continental YJ69-T-9 turbojet engines; two built.



The XT-37, circa 1954.

### T-37A

Two-seat basic jet trainer aircraft, powered by two Continental J69-T-9 turbojet engines; 534 built.

### T-37B

Two-seat basic jet trainer aircraft, powered by two Continental J69-T-25 turbojet engines, fitted with improved navigation and communications equipment.



T-37B Tweet in the 1980s

### T-37C

Two-seat basic jet trainer, light-attack aircraft, fitted with two weapons pylons, one under each wing; 269 built.

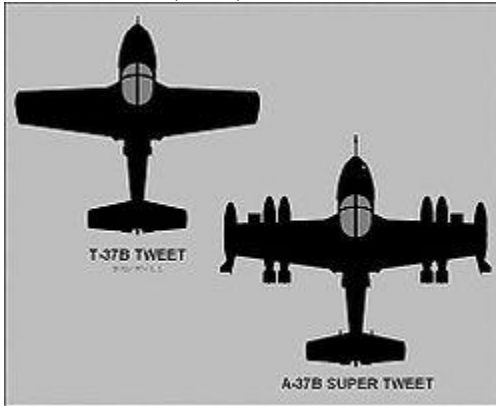
## XAT-37D

Two-seat counter-insurgency, light-attack prototype aircraft; two built.

## YT-48A

Proposed development with two Garrett F109-GA-100 engines; none built.

## General characteristics (T-38)



- **Crew:** 2
- **Length:** 29 ft. 3 in (9 m)
- **Wingspan:** 33 ft. 9 1/3 in (10.1 m)
- **Height:** 9 ft. 2 in (2.8 m)
- **Empty weight:** 4,056 lb. (1,840 kg)
- **Max takeoff weight:** 6,569 lb. (2,980 kg)
- **Power plant:** 2 × Continental-Teledyne J69-T-25 turbojets, 1,025 lbf (4.56 kN) each

## Performance

- **Maximum speed:** 425 mph (369 knots, 684 km/h)
- **Range:** 810 NM (932 mi, 1,500 km)
- **Service ceiling:** 25,000 ft. (7,620 m)

## Armament

- **Total stores stations:** None (T-37A/B), 2 under wing for stores up to 500 lb. (227 kg) (T-37C)