YAT-28E TURBO TROJAN

Combat operations conducted by the T-28Bs and T-28Ds assigned to the *Farm Gate* detachment in Vietnam had revealed a number of shortcomings in the T-28. These included; a lack of power in the hot/high environment of South Vietnam, a short loiter time over the target, and the need for additional underwing stores pylons. These shortcomings led the Air Force to approach North American with yet another proposed modification to the T-28 airframe that would make it a more potent counter-insurgency aircraft.

In September of 1962 the Air Force awarded North American a contract to modify a T-28A airframe with a 2,445 hp Lycoming YT-55L-9 turboprop engine under the designation RA-28 (Reconnaissance-Attack). Shortly after the contract was let, however, the Air Force changed the designation of the prototype to YAT-28E (NAA model 284).

To install the Lycoming engine on the T-28A airframe the entire nose section forward of the firewall was redesigned. The new streamlined nose was longer, tapered, and featured a large exhaust port on the port side of the fuselage just forward of the wing root. The propeller was replaced with an 11 foot 6 inch four blade Aero Products-Allison propeller which incorporated a large pointed propeller spinner to improve airflow to the engine. The redesigned nose section increased fuselage length to 36 feet, over three feet longer than a standard T-28.

Other modifications included a strengthened wing structure to accommodate twelve under wing pylons, larger wing flaps, increased aileron and rudder travel, improved brakes, and lengthened horizontal stabilizers. The YAT-28E carried 250 gallons of internal fuel and had provisions for carrying two 110 gallon drop tanks on the inboard wing pylons. The maximum gross takeoff weight for the YAT-28E prototype was 15,530 pounds, some 7,000 pounds more than a fully loaded T-28D.

The YAT-28E was armed with two .50 caliber M-3 Browning machine guns in permanent underwing blisters with internal wing ammunition bays. The twelve underwing pylons could carry a total of 6,000 pounds of ordnance. One feature that, although appearing on the mock up, was never flight tested was the provision for mounting an AIM-9 Sidewinder air-to-air missile on each wing tip. The instrument and armament control panels remained virtually unchanged from earlier T-28s, although the YAT-28E was fitted with an improved Mk-20 Mod 4 gunsight.

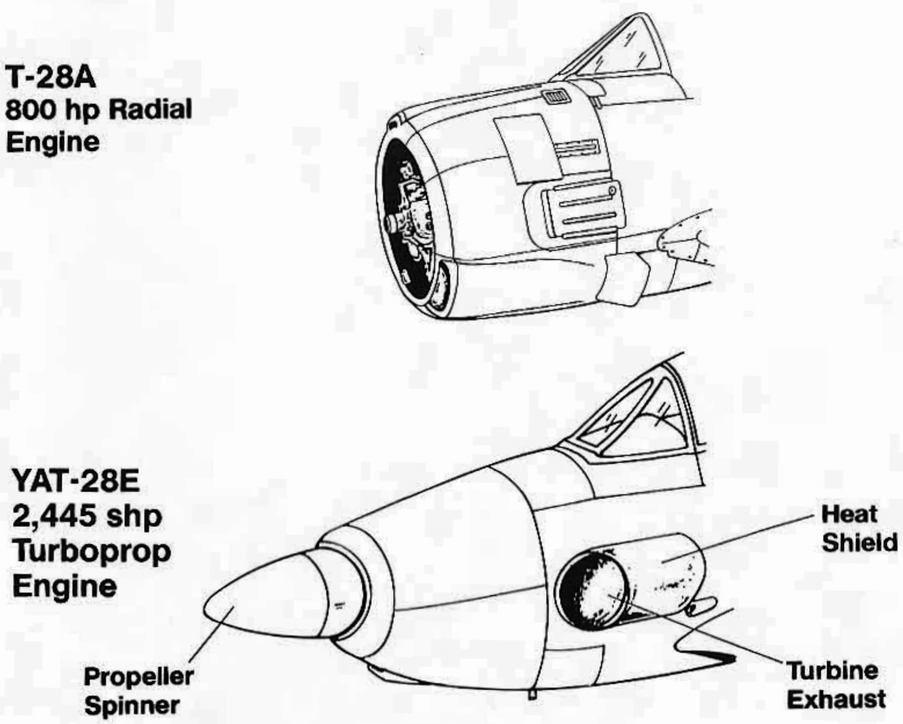
The YAT-28E prototype was first flown on 15 February 1963. Early flight tests revealed that the Turbo Trojan had a top speed of 360 mph, a cruising speed of 276 mph, a rate of climb of 5,130 feet per minute, and a range of 2,760 miles (with external tanks).

On 27 March 1963, after making twelve successful test flights, the prototype was lost when it entered a flat spin during high G maneuvers and crashed, killing North American's chief test pilot George Hoskins. The Air Force, however, had been impressed with the YAT-28E's potential and ordered two additional prototypes. The second prototype featured further refinements of the airframe including a higher vertical stabilizer, a modified canopy to allow the use of North American LW-2C ejection seats, and structural strengthening of the entire fuselage. The second prototype joined the test program on 15 November 1963.

The third prototype was refined still further, featuring a reshaped canopy and a further increase in the height of the vertical stabilizer. With these changes, the third prototype most closely approximated the proposed production configuration of the Turbo Trojan and was the only prototype that was fully equipped for control from either cockpit.

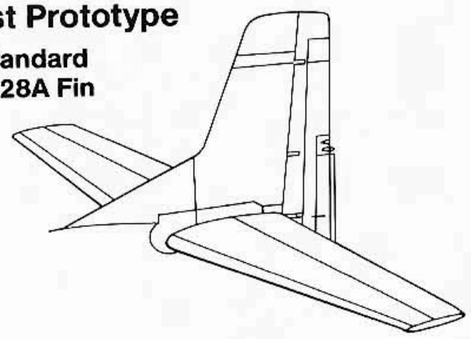
The YAT-28E prototype was developed to replace the T-28D in the COIN role and made its first flight on 15 February 1963 with North American test pilot George Hoskins at the controls. The YAT-28E was powered by a 2,445 shp turboprop engine and had a projected top speed of almost 400 mph. (Norman Taylor)

Nose Development

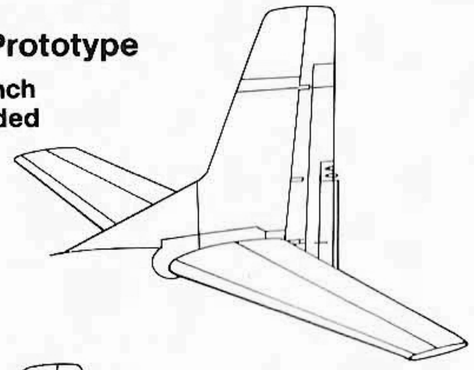


YAT-28E Fin Development

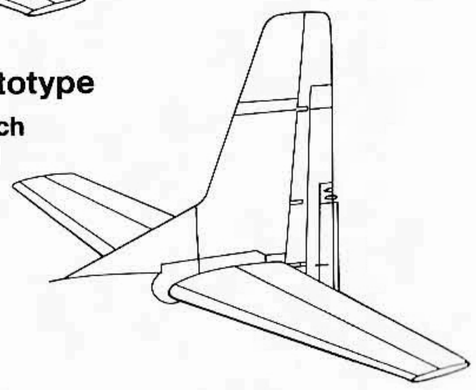
1st Prototype
Standard
T-28A Fin



2nd Prototype
Nine Inch
Extended
Fin

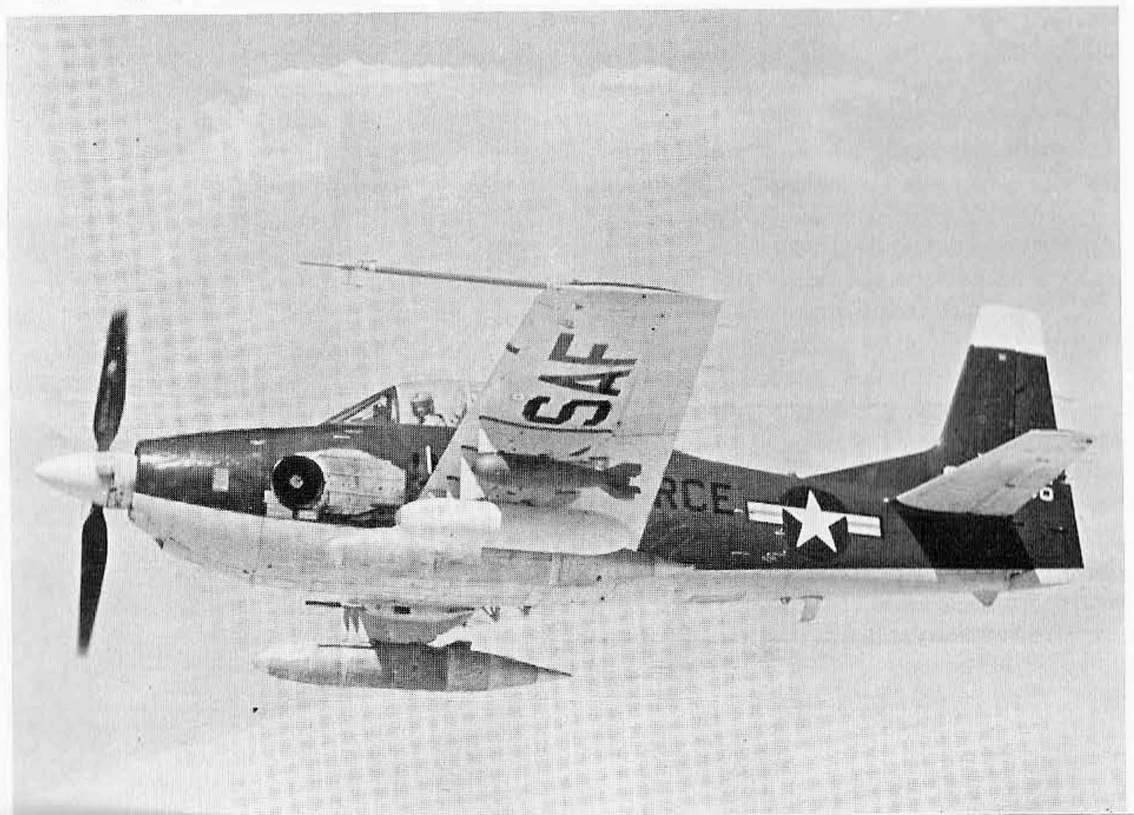


3rd Prototype
Twelve Inch
Extended
Fin



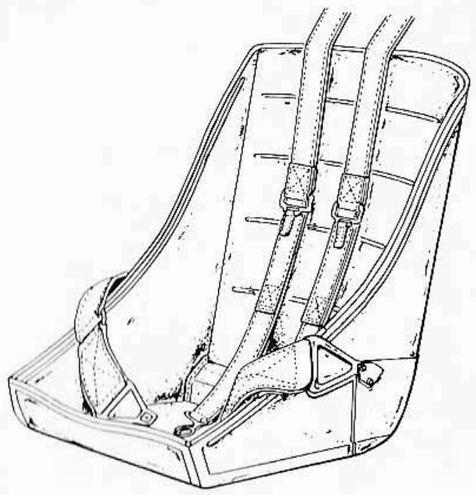
The third YAT-28E prototype was the most extensively modified and closely approximated the proposed final production standard. The flat topped canopy allowed clearance for the ejection seats and improved rudder control. (SH. H. Miller via D. Menard)

After the crash of the first prototype, the USAF ordered two additional YAT-28E prototypes for further evaluation. The second prototype (51-3786) featured a strengthened rear fuselage and heightened vertical stabilizer to increase rudder effectiveness. (USAF via Hugh Morgan)

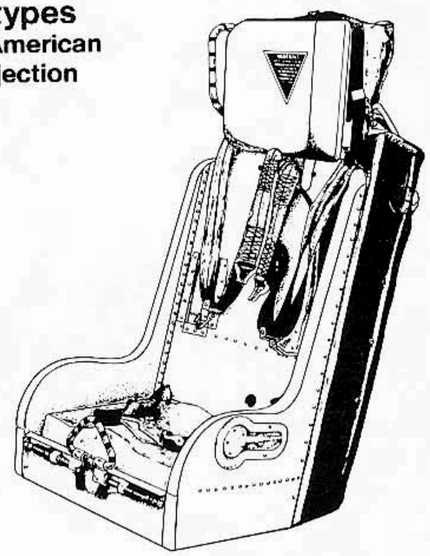


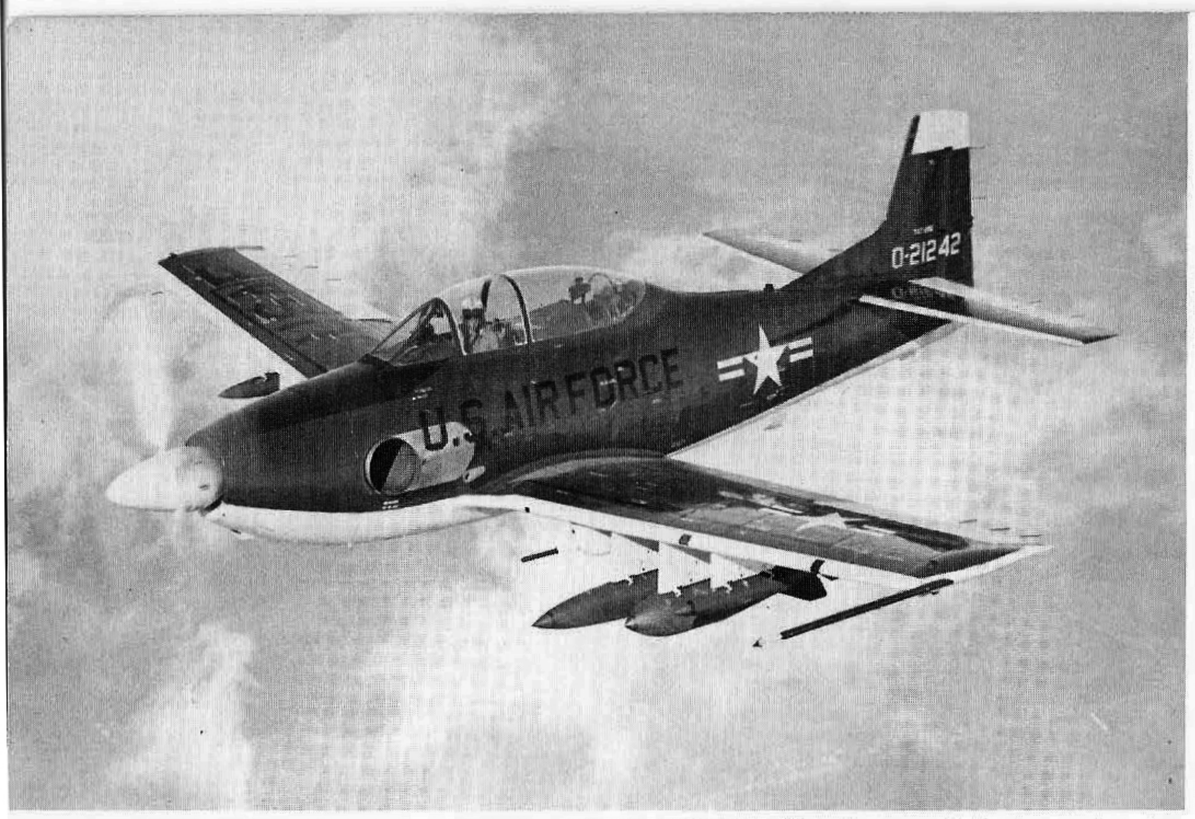
Seats

1st Prototype
Standard
T-28 Seat



2nd and 3rd Prototypes
North American
LW-2 Ejection
Seat





The YAT-28E prototype could be armed with rockets and bombs on up to twelve underwing pylons in addition to the fixed .50 caliber machine gun pods. The ammunition for these streamlined gun gondolas was carried in the wings. The bright metal panel on the fuselage behind the exhaust is a heat shield which protected the fuselage from the engine exhaust. (Norman Taylor)

The first YAT-28E prototype was destroyed in a fatal crash after some fourteen hours of flight testing. The crash was caused by failure of the tail section during high G maneuvers. The second and third prototypes corrected this fault by strengthening the tail section. (Norman Taylor)

The Air Force and North American conducted a lengthy evaluation of the two YAT-28E prototypes over a period of some nine months. A number of problems were uncovered during testing and the Air Force concluded that further development of the YAT-28E would require extensive (and expensive) redesign. The engine needed further development, the exhaust system required a complete redesign, and there were other changes that, together, would require at least a year to complete. With the advent of the North American OV-10 Bronco and Cessna A-37 Dragonfly, the Air Force decided that further development of the YAT-28E was no longer cost effective and the project was terminated. Both YAT-28E prototypes were returned to North American during January of 1965 and placed in storage.

During early 1965 the Navy was searching for a new trainer to replace their fleet of T-28Bs and T-28C. One possibility being studied by the Navy was a turboprop version of the Trojan. Agreement was reached between Navy and Air Force officials under which the Navy was loaned the number three YAT-28E prototype for a period of one year to evaluate the aircraft for the training role.

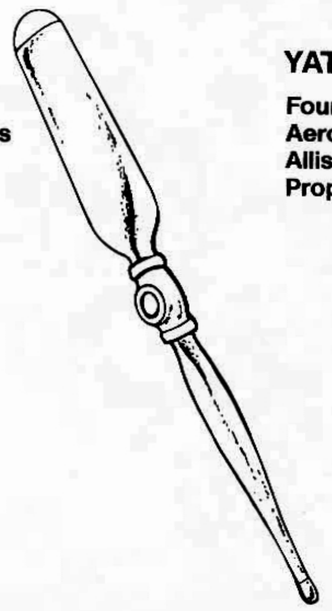
On 24 January 1966 a Navy team headed by LT Bob Sallada, began an evaluation of the prototype at North American's Columbus facility. A total of twenty-seven flights (40.1 hours) were conducted before the Navy ended the project. On 3 May 1966 the Navy issued its formal evaluation report which stated that the YAT-28 was unsuited for the training role for the following reasons: a restricted forward field of view while in a climb, an inadequate stall warning, overly heavy flight controls, visibility from the rear cockpit was restricted by the ejection seat, and the aircraft's performance was far in excess of training requirements even with a restricted throttle. Basically the Navy found that the YAT-28 was far too 'hot' an aircraft for students to fly. Once again the YAT-28Es were placed back into storage.

In the event, both aircraft were disposed of by North American to Mr. Merle Maine of Ontario, Oregon. Both airframes are reportedly in a state of disrepair and neither has an engine. The engine/gear box combination had been sold by North American to Piper for use in the Piper Enforcer, a turboprop conversion of the P-51 Mustang. It is therefore doubtful that either aircraft will ever fly again.

Propeller

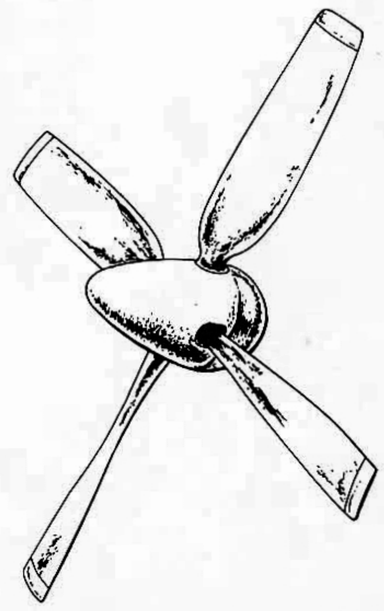
T-28A

Two Blade
Aero Products
Propeller



YAT-28E

Four Blade
Aero Products
Allison
Propeller



Hot Trojan: C&J's YAT-28E Project

United States Air Force combat operations in South East Asia under the auspices of *Operation Farm Gate* produced much feedback on the T-28 in a combat situation. For many combat pilots the type lacked in a number of departments including relatively poor performance due to lack of power in the climatic conditions of South East Asia, a drastic need for more underwing attack stores pylons and a very short loiter time over the target area.

In September 1962 the U.S. Department of Defense contracted North American Aviation to modify a number of T-28 airframes under the designation RA-28 in order to address the shortcomings and produce a more reliable and potent COIN aircraft. The contract was worth some $750,000, though shortly after it was awarded the U.S. Air Force changed the designation to YAT-28E. North American Aviation designated the type NAA model 284.

It was proposed to address the lack of power problem by replacing the Wright 1300 powerplant with a Lycoming T55 turboprop that generated 2450shp. This entailed a complete redesign firewall forward in order to accommodate the new engine. Few would disagree this turned the rugged trainer into a full-blown attack aircraft both in performance, capability and indeed in looks. An Aero Products-Allison unit replaced the standard propeller and a spinner was added to improve airflow to the engine. This also resulted in an overall increase in length of three feet to 35 feet 7 inches.

To improve weapon load carrying capability the design team decided on a twelve-pylon system which entailed the incorporation of a strengthened wing structure. Other major items detailed for work included the twelve underwing pylons, lengthened horizontal stabilisers, larger wings flaps and an increase in rudder and aileron travel. The new aircraft was to be significantly heavier than the standard Trojan - the YAT-28E's max gross take-off weight was 15,500lbs, some 7000lbs heavier than its forbear.

The twelve underwing stores could mount up to 6000lbs of ordnance and the aircraft was designed to carry a sidewinder missile on each wing tip for defensive purposes but they were never tested. 250 gallons of internal fuel and the provision for two 110 gallon wing tanks to be carried on the inboard wing pylons made up the fuel load. With external tanks the aircraft touted an impressive 2750 miles. The Turbo Trojan had a top speed of 360mph with a cruise speed of 276mph and a rate of climb of just over 5000 feet per minute.

After the initial modification work the prototype first flew on 15th February 1963. The Air Force immediately impressed with the potential being demonstrated by North American's 'new' baby quickly ordered the building of two more prototypes to advance the programme. Tragically, after some twelve successful test flights the prototype crashed after getting into a flat spin during test flying, killing test pilot George Hoskins on 27 March 1963. The second prototype incorporated a higher vertical fin and much modified canopies to allow the installation of North American built LW-2C ejection seats. Further strengthening of the fuselage was also carried out. The second prototype joined the Air Force test programme in November the same year.

As test flying progressed and the resultant data flowed work on the third prototype developed apace, with a further increase in the height of the tail fin, more cockpit canopy modifications and other more minor adjustments including dual controls. The following nine months saw the two YAT-28Es exhaustively flight tested. In the event, with the rapid development of the OV-10 and Cessna A-37 the Air Force decided to halt further development. Both remaining YAT-28Es were put into storage by North American Aviation for approximately a year until the U.S. Navy began an evaluation of the type as a trainer. Following some 27 flights the U.S. Navy declined to continue development of the project, largely due to the fact they believed the aircraft was 'too hot' for training students.

Following completion of trials with the U.S.N., which were completed on 3rd May 1966, No.2 YAT-28E serial 51-3786 went into storage and was destined for the scrap yard.

#OTD 28 Feb 1964 at Edwards - The first flight of an accelerated Category II test program of the North American YAT-28E took place. The aircraft was a T-28 Trojan heavily modified to a ground attack/trainer configuration for counter-insurgency warfare. (Edwards History Office file photo)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YAT-28E #1 READY FOR 1ST SHOWING IN COLUMBUS PLANT ~ NOTE WING TIP STORES - NOT USED


ORCE
0-137
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