LOG ENTRIES
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CHARLIE MENTOR

FOR THE FIRST TIME IN MANY YEARS, THE GOVERNMENT IS ALLOWING THE SALE OF EX-MILITARY TRAINING AIRCRAFT

A T-34C operated by the Marine Corps.

The Beechcraft T-34C Turbo Mentor was designed and built as a fully aerobatic military trainer fitted with the latest in solid state electronics the mid-1970s offered for instrument flying. The turbine engine offered 5000 hours between overhauls. With more than 500 hours of test and evaluation flown, prototypes demonstrated excellent speed, reliability, economy of operation, and outstanding ground handling characteristics, which includes a very short turn radius. Capable of cruising at 240 knots at 24,000 feet, it required only 30 gallons of fuel per hour to operate.

During WWII, the USN and the USAAF used the same types training aircraft. This practice continued into the 1950s and both the Navy and the USAF selected the Beechcraft T-34 Mentor as their main training aircraft. The T-34A was based on the Beechcraft Model 45, a variant of the popular Beechcraft Bonanza, which first flew in December 1948. The YT-34 prototype made its first flight in May 1950. In early 1953, the Air Force ordered the Mentor after extensive trials. The first T-34A was delivered to Edwards AFB for testing in October 1953 while deliveries to the Air Training Command started in 1954. The T-34A was powered by a Continental O-470-13 engine, producing 225-hp. The USAF operated 450 T-34A Mentors until they were replaced by the Cessna T-37 jet trainer, which was introduced in the late 1950s.

Government agencies such as NASA have been able to obtain surplus Turbo Mentors.

The Navy began flying the T-34B, which had now been given seldom-used name of Mentor, in 1954. A total of 423 T-34Bs were built for the Navy from 1954 to October 1957. The Navy would operate the T-34Bs for over 20 years.

Work on the T-34C began in March 1973 after Beech was awarded a Navy contract to produce a new turboprop aircraft to be used for training that service's pilots. The contract required Beechcraft to demonstrate the feasibility of retaining the best features of previous trainers and to combine them with the latest technology from the company's commercial airplanes.

Two used T-34B fuselages were obtained from the Navy. Following a modification and production period of only five months, the first prototype aircraft was completed, vibration tested, and rolled out of the factory. The incredibly short design schedule was made possible by utilizing parts from current production airplanes — wings from the Baron, landing gear from the Duke, and a Pratt & Whitney PT6A-25 engine from the famous King Air. Although the engine is capable of 715-shp, the Navy restricted maximum power to 400-shp by incorporating a torque limiter. Differences between the new and the old version of the T-34 aircraft were readily apparent.

On 21 September 1973, less than six months from the day the contract was signed, the YT-34C prototype took its first test flight. Olive Ann Beech (Walter's widow), other Beechcraft officials, and Navy dignitaries, along with many interested factory personnel observed the first flight. Landings with the tricycle gear were gentle and with the capability of reverse beta propeller control, rollouts were short.

There were notable differences between the two YT-34C prototypes and production T-34Cs. Additional rivets were added to the ailerons to prevent the skins from separating at high speeds. An additional spar and rivets were added to the horizontal stabilizer to prevent the tail from being pulled off (which actually occurred with the first production aircraft, killing the test pilot). The nose gear doors on the prototypes were susceptible to being torn off at high speeds, so a nose gear spade was added in front of the gear doors to divert adverse air flow around the doors. The cowling around the PT-6 engine was modified to improve ease of access.

One of the YT-34Cs ended up as a gate guard at NAS Whiting Field near Pensacola, Florida. The remaining YT-34C prototype, BuNo 140784, was purchased from the Navy at Whiting Field, whereafter it was de-mated and completely disassembled and went through extensive inspections with original Beechcraft engineers. This is when the decision was made to add an additional spar with rivets in the horizontal stabilizer and additional rivets were added to the ailerons. Upon reassembly, a new Navy paint scheme was applied while a Pratt & Whitney PT6-28 of 700-shp was installed. Flight showed that the PT6-28 performed exceptionally and that the modifications were satisfactory. That aircraft is now civilian-owned and actively flown in Colorado as NX190AC.

After Navy acceptance of the YT-34C, Beechcraft initiated additional changes in the first T-34C production models. A heavier main wing spar was fitted and the nose gear spade was installed. Robert Stone, the test pilot on the first T-34C, was directed to

Some T-34Cs have been flown over 20,000 hours.

T-34Cs have been operated by nations such as the Republic of China.

conduct a high-speed tuck with the first production aircraft on 15 July 1977 near El Dorado, Kansas. At 320-kts, the aileron skins separated, the tail experienced catastrophic failure, and Stone was killed. The second production model also experienced problems with a tail flutter. Changes were immediately made in the production aircraft, resulting in three-hinge ailerons, instead of the two-hinge ailerons on the YT-34C, and the horizontal stabilizer was strengthened with an additional spar. The T-34C program was accepted by the Navy and formal production line construction commenced. The Department of Transportation issued a type certificate for the T-34C in 1976.

Since the T-34C was to be used to train student pilots, a careful investigation of spins was an important segment of the test program. Extensive telemetry sensors were added to the prototype, which was first subjected to a static tail strain test. An anti-spin chute was also fitted and tested for deployment on the ground and again in the air. In addition to the spin flight and chute tests, a model of T-34C was flown in the spin tunnel at Langley Field in Virginia. Important data on spin and spin recovery characteristics was acquired, and the test aircraft were fitted with larger tail strakes to facilitate spin recovery. With all preliminary work accomplished, the actual spin tests commenced. Visual documentation was provided by the use of motion picture cameras mounted on the wingtip and in the cockpit. Additionally, a manned camera was used to document the tests from a chase plane. Within the test aircraft, the vibration sensors recorded data from spin after spin. Inverted and upright, more than 1200 spins were recorded to sample every conceivable loading and control manipulation.