A SHORT HISTORY OF THE BEECHCRAFT MENTOR

Frank Morris -- 6/1/2001

The Beechcraft Mentor was the brainchild of Walter Beech, who saw the need for a less expensive and easier-to-fly trainer than the North American Texan/SNJ/Harvard, which the Air Force, U.S. Navy and the United Kingdom used for primary training throughout the 1940s. In November of 1946 Beechcraft had received its Approved Type Certificate on the all new Model 35 Beechcraft Bonanza. By the end of 1977, Beechcraft had produced 10,000 of these popular, record setting, V-tailed civil aircraft.

Beech developed the Mentor as a private venture. During 1948, Beech completed three conceptual designs which were based on the Model 35 Bonanza and were designated Model 45 Mentor by the company. While Beech included a V-tail similar to the Bonanza in this group, the final design emerged with the more conventional tail for the benefit of a conservative military. The first test flight from the Beech field on 2 December 1948, by company test pilot Vern Carstens, was a complete success. During 1949, the Mentor was dispatched on a tour of military air bases throughout the United States, and was sent abroad to perform for the benefit of air officers of the Western European nations. A dramatic demonstration of aerobatic flight was also presented at Chicago's National Air Fair, at O'Hare International airport on the Independence Day weekend, before hundreds of thousands of spectators. Proving that brute strength was not required to put the Mentor through a breath-taking array of maneuvers standard in military combat operations, the pilot was pretty, petite, 100-lb. Betty Skelton – 22 year-old two-time holder of the women's international aerobatic championship. To cheering crowds, the stunts performed by the Mentor were a source of gasps and thrills. To sober-minded military observers, it was a reminder of the need for continued readiness to maintain air power for the defense of the free world. A reminder already accentuated by the Communist blockade of Berlin that was taking place at that time.

The USAF placed an order in March of 1950 for three Mentors for competitive evaluation, which were designate as the YT-34. Two of the aircraft were powered by (205-hp) Continental E-185-8 engines, and one with a (225-hp) Continental E-225-8 engine. These aircraft made their first flights in May, June and July of 1950 and were tested extensively during the competition period.

They were flown not only by evaluation pilots, but also in the primary training role with pupils and instructors. The T-34 eventually won a long competition to determine a new trainer but Walter Beech, who was the prime mover in the design of this aircraft, did not live to see its production. He died of a heart attack in 1950.

During 1953 the Air Force Phase VI flight tests of the Mentor at Edwards AFB in California, the test plane logged 434 hours of flight in only 32 days. It wrapped up this performance with a 'round-the-clock' run of 23 hours 20 minutes of flight in one 24-hour period, making seven quick landings during that interval to refuel and change pilots. This functional development phase of routine USAF testing did much to verify the stamina of the Mentor design and construction. A near accident associated with the testing program provided an even more dramatic demonstration of its in-built Beechcraft toughness. At full cruising speed of 189 mph, a YT-34 was inadvertently flown into contact with an aerial cable stretched across a canyon. The cable did not break, but almost stopped the Mentor and spun it around in mid-air, 350 feet above the canyon floor. Through skillful handling, the military pilot righted the airplane before it could touch ground, regained flying speed and flew back to the base, where he made a normal landing. Inspection showed that damage was confined to superficial contusions and abrasions of the right wing leading edge, which bore the imprint of the cable.

On 4 March 1953, the USAF selected the Model 45 as its new primary trainer under the designation T-34A Mentor. The Mentor was put in volume production in early 1954. Ultimately, there were 450 built for that service, 350 by Beech and 100 by the Canadian Car & Foundry Company in Montreal, Canada which was later licensed by Beech to build the Mentor.

In July 1951 one of the original prototypes was modified to mount two 7.62-mm (0.3-in) machine guns in the wings, with provision for underwing racks capable of accepting six rockets or two 68-kg (150-lb) bombs. The USAF evaluated this version as a potential close-support aircraft, but no orders ever materialized.

During 1953 the government of Chile placed an order for more than a million dollars worth of T-34As following competition of evaluation with other American, British and French airplanes. In October of 1953, the Republic of Colombia ordered a substantial quantity of Mentors.

The Navy Bureau of Aeronautics ran its own series of extensive tests on the T-34A Mentor at Pensacola, Florida, from 28 September to 4 December of 1953. The principal airplane tested was serial No. G-3, one of the first Mentors produced; and in spite of its age, it came through without ever being out of service due to a mechanical failure. Navy requirements for a training plane were in some ways more stringent than the Air Force. The Navy schooled its pilots from the

outset in landing techniques necessary for aircraft carrier operations, which called for abrupt stall-outs just above ground level and heavy "drop-in" landings that imposed great strains on the landing gear. Many well-built airplanes had faltered and "washed out" their landing gears under the severe stresses; but the Mentor gear did not fail. One Navy Commander said he could not "wash out" the Mentor gear in testing.

Other nations of the Free World had been watching the Mentor military test programs with keen interest. In November of 1953, an agreement was reached with the National Safety Forces of Japan for eventual production of Mentors in that country under license to the firm of Fuji Heavy Industries of Tokyo. Beech contracted to furnish initial completed Mentors, followed by parts and manufacturing information necessary to enable its licensee to build the airplane in its own plants. Preliminary phases of a similar agreement were also concluded with the Canadian government to produce the Mentor for Royal Canadian Air Force (RCAF) training in Canada.

On June 17, 1954 the Navy announced that the Mentor had been chosen as its first-step student trainer for use by the Naval Air Training Command with an initial order for several hundred planes. Beechcraft had won over two other airplanes, described by the Navy as "excellent" in evaluation tests conducted at Pensacola, Florida. The Navy trainers would be almost identical externally with the Air Force T-34A, except for removal of a triangular fillet under the rudder, giving it a notched look. Other differences included differential braking for on-ground steering (the 'A' had a steerable nosewheel), an additional degree of wing dihedral, and adjustable rudder pedals as opposed to a moveable seat. The most obvious difference was the high-visibility bright yellow paint, which the Navy considered useful in avoiding collisions around crowded training fields. . Performance of the USAF T-34A and the Navy T-34B would be identical, through expressed in different terms: High Speed 189 mph (164 knots); cruising speed at 60% of rated 225 hp at 10,000 feet, 173 mph (150 knots); maximum permissible diving speed, 280 mph (243 knots). Both versions would afford an extremely high flight safety factor of 10 permitting unrestricted aerobatic maneuvers. Both aircraft weighed in at 2,900 pounds gross, and

approximately 2,170 pounds empty. Both used a 225 hp Continental engine powering an 88-inch diameter Beech constant speed propeller, affording a rate of climb of 1,230 fpm at sea level, a sea level takeoff run of 780 feet, and a landing run at seal level of 330 feet. Wing span was 32 feet 10 inches with a length 25 feet 11 inches, a height 9 feet 7 inches; and total wing area including ailerons, of 177.6 square feet. In December of 1954 Beech delivered on the first T-34B trainer, just six months to the day from the date the contract was signed.

Beech began an experiment in a jet aircraft in 1955 with a two-place jet trainer based on the Mentor design, designated the Model 73 "Jet Mentor", and using many of the same Mentor components. It was described as "the most economical jet trainer in the world." It logged many successful test and demonstration flights; but in the meantime, the Air Force settled on a competitive jet trainer with twin engines and unconventional, for a training plane, side-by-side seating built by Cessna and designated the T-37A. The project was shelved, but to the pilots who saw and flew the swift, maneuverable little ship, it was proclaimed, "The airplane I'd like most to own – just for fun!"

May of 1956-marked the "on schedule" completion of a 40-month program which produced 350 T-34A Mentors for the Air Force. All Air Force aviation cadets were then receiving their primary pilot training in Mentors operated by the nine USAF contract schools. The Mentor was also serving the military forces of Chile, Colombia, El Salvador and Turkey; and was being produced under license from Beech in Japan and Canada to serve the in training Japanese and RCAF pilots.

A $4 million production agreement, executed with the government of Argentina on December 29, 1956, enlarged the scale of Mentor production concurrent with the Navy T-34B program. In addition to providing 15 Beech-built Mentors for flyway delivery to Argentina, the agreement called for 75 more planes to be assembled there. Argentina thus joined Japan and Canada in gaining rights to build Mentors for its own use.

On October 31, 1957, Beech completed its 40-month production program on U.S. Navy T-34Bs, delivering the 423rd and final unit. The Mentor's record in the primary training programs directed from the Naval Training Center at Pensacola, Florida, found that its syllabus could be shortened, and primary flight time cut from 74 to 36 hours – a better than 50% reduction – since students could attain a higher level of proficiency more quickly in the Mentor. The time required to solo was cut by more than half; and the accident rate was notably improved. In brief, the Mentor was a much better teacher than its bigger, heavier and higher-powered predecessor, and vastly more economical to fly and maintain in the bargain.

Completion of the Navy contract brought to 773 the total number of T-34s delivered to U.S. military flying services, 350 of the T-34A types having been built for the USAF. Production continued for Mentor aircraft and assemblies for export customers.

In mid-January of 1958 there was a flyaway delivery of the first Beechcraft Mentors sold for civil use. Four Mentors were flown from Wichita by officials and staff members of the International Training Center for Civil Aviation (ITCCA), a unique aviation school sponsored by the Government of Mexico and the United Nations to train pilots, mechanics, air controllers and other civil aviation jobs in Central and South America. Deriving some 75% of its support from the Mexican government, the school provided students from throughout Latin America in the highest standard procedures established by the UN's International Civil Aviation Organization, thus helping to advance the progress of aviation and flight safety in the lands "south of the border." The ITCCA Mentors were soon to be joined in Mexico by another group of T-34s ordered by the Mexican Navy.

Shortly after dawn on 24 April 1959, the first units of a group of 20 new Mentors, ordered some time before by the government of Chile, took off from the Beech Field on the start of a 6,000-mile ferry flight to El Bosque, Chile's military flying base near Santiago. Flown from Wichita by a party of 30 Chilean Air Force officers and airmen, the Beech trainers enlarged a force of 45 T-34A Mentors previously purchased by Chile.

During 1959, the second of the nation's good neighbors in South America to acquire new fleets of Beechcraft Mentors during the year completed flyaway deliveries from Wichita in September. Officers and personnel of the Venezuelan Air Force and the Venezuelan government's Ministry of Communications headed home with the last of 41 Mentors build during 1959 for their respective services – 34 for Air Force training use, 7 for the Ministry's civilian flying school.

Word came in late 1961 from the Pensacola Naval Air Station of notable service marks established by the T-34Bs in use there since 1956. Shortly after mid-year, the 9,000 Naval Air cadet successfully completed primary flight training in the Mentor; and the 1,000th inverted spin was performed for the Flight Instruction Indoctrination Group at Pensacola. Restricted to only a few types of Navy aircraft, the inverted spin – an essential item in the instructor-training syllabus – often imposed severe stresses that harshly tested the structural integrity of the plane. Pensacola's Mentors had been flown more than 445,000 hours, and had compiled a safety record calculated at five times that of previous Navy trainers over a comparable period. Later at Saufley Field, Pensacola VT-1 Mentor-equipped squadron reported a new safety record of 75,000 consecutive accident-free flight hours; and the second-stage VT-3 squadron an all time Navy mark of 80,000 consecutive accident-free hours.

A Navy Mentor passed a notable service milestone early in the year 1963. At Saufley Field at the Naval Air Station, Pensacola, Florida, Training Squadron one of the Naval Air Basic Training Command awarded a "gold seal of approval" to Buno 140705, a T-34B Mentor on its completion of more than 5,000 hours of flight. First of the Navy's Mentors known to have reached this mark, the durable Beechcraft had been the 39th T-34B to come off the Beech production line. Since its manufacture in September, 1955 Buno 140705 had trained 114 Navy and Marine student aviators; had flown 5,115 hours, made 16,459 landings and performed 4,604 loops, 3,401 spins and 17,904 stalls. In 700,000 miles of flight, it was refueled 3,325 times. "Beech Aircraft is certainly to be commended for providing us with equipment like the T-34B Mentor," was the comment of Commander H.E. Kendrick, Squadron One commanding officer. Beechcraft was delighted that the Mentors they had built had earned this praise; for it was almost an axiom in aviation that the only type of airplane that led a harder life than a basic trainer was a target drone.

The USAF phased their Mentors out of service in the early 1960's, in favor of all-jet trainers. The Navy used their initial batch of Mentors until the middle of the 1970's. They were retired when the Navy bought the T-34C Turbo-Mentor, a heavier version of the Mentor which is powered by the Pratt & Whitney Aircraft of Canada PT-6A-25 turboprop engine. In this particular application, it is provided with a torque limiter that restricts power output to some 56 percent of maximum, ensuring constant performance over a wide range of altitude/temperature conditions, and also offering long engine life. The first aircraft was flown on 21 September 1973.

The first Atlantic crossing of a Beechcraft Turbine T-34C-1 trainer on November 16, 1977, en route to a demonstration tour of Europe, was followed next day by the delivery to the U.S. Navy at Pensacola, Florida or the Navy's first T-34C Beechcraft trainers. The Navy aircraft went into immediate service as instructor familiarization units. Student pilot training with the T-34C's would follow early in 1978. Since then production has reached 353 units, with six being transferred to the U.S. Army.

Beech developed a T-34C-1 version for armaments system training, equipped with four underwing hardpoints having a total weapons capacity of 544-kg (1,200-lb). In addition to deployment in such a training role the T-34C-1 is suitable also for forward air control and tactical strike training missions.

The specifications for the T-34C are: maximum cruising speed 246-mph at 5,180-ft, service ceiling above 30,000 ft; maximum range at 20,000-ft 814-miles, weights empty 2,960; and maximum takeoff 4,300 feet. The dimensions are: span 33ft 4in, length 28 ft 8 1/2 in, height 9 ft 7 in, and wing area 179,6 sq ft.

The T-34Bs were sent to various recruiting commands to give potential new aviation cadets a taste of their flying future with the Navy. Many more were sent to Navy flying clubs, or sold to civilian owners.

As a sequel to the U.S. Navy deliveries, a group of pilots from Ecuador staged a flyaway from Beech Field of six of 14 T-34C-1 trainers ordered by that nation. Ecuador was one of five foreign nations that had placed orders for a total of 69 T-34C-1s and Turbine Mentor 34Cs. The jetprop trainer was on its way, with more than $83 million in U.S. and foreign orders on the books.

Blessings by a Catholic priest were a part of the activities at Beech field as the New Year of 1978 unfolded. The occasion was a formal ceremony honoring the deliver to the Peruvian Navy of a fleet of six T-34C-1s. It was a Peruvian tradition that every vessel and airplane entering the

Navy of Peru do so with the invocation of God's protection for the craft and its occupants. Accordingly, Father Ken Melaragno, associate pastor of Saint Margaret Mary Catholic Church in Wichita, invoked a blessing on each of Peru's six trainers as part of the acceptance proceedings. Peruvian Navy pilots carried through the flyaway to Peru without incident.

Moroccan Air Force, Ecuadorian Air Force and Peruvian Navy Beechcraft T-34C-1 trainers were delivered for those countries pilot training programs. Orders from the Argentine Navy and Indonesian Air Force quickly followed in 1978.

In 1978 a mass flyaway from Beech Field by the Argentine Navy pilots of 7 T-34C-1 trainers completed the delivery of a 15-plane fleet to Argentina.

In 1978 a $3.5 million contract from the government of Algeria initiated deliveries of Mentor T-34Cs to the national pilot training school at Oran.

When they were re-certified as civilian aircraft, the FAA mandated several changes to the T-34B. These included a stall strip on the right wing, addition of a stall warning system, removal of the nose gear doors, replacing the tail fillet that had been removed from the 'A' models, and generally reducing the performance restrictions. In addition, T-34Bs did not undergo spin testing as part of their re-certification. For this reason, civilian T-34B's registered as Beech D-45's (including those at PRNFC) are NOT certified for aerobatics, even though years of service demonstrated their capability in this regard.

During 1981 the delivery of three T-34C-1 trainers to the Navy of Uruguay brought to seven the number of countries which had purchased commercial T-34C-1 and Turbo Mentor 34C versions. In addition to Uruguay were Morocco, Ecuador, Peru, Argentina, Indonesia and Algeria.

In mid-December, the west African nation of Gabon became the eighth foreign nation to purchase international or commercial versions of the T-34C-1 or T-34C turboprop trainers. Gabon's initial order for four T-34C-1s was scheduled for use by the elite Presidential Guard of the nation's president, Omar Bongo.

Today the T-34A and T34B Mentors have become come very popular war birds because of their flying qualities and economy and are welcomed at air shows. They are owned by military and civilian flying clubs as well as many individuals. The number of T-34s in military flying clubs is not known. There are currently about 200 T-34s in civilian hands. Picture 5 is a the six member

civilian Lima-Lima precision formation flight team which has performed in air shows from border to border and coast to coast in their T-34s.

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