

Seaplane version of the Thomas-Morse S-4B used by the U.S. Navy in 1918 was known as the S-5. The three-pontoon arrangement was common in WW I, but has not been used since.
Photo by U.S. Navy



■ ■ The Thomas-Morse S-4 is an airplane design that has been remembered through history by a nickname rather than by its full manufacturer's name and model number. Although produced in relatively large numbers for the Army Air Service in World War I, the *Tommy* did not earn a reputation as a military airplane. Its place in the American aviation scene was earned entirely in the postwar years at the hands of civil pilots.

The Thomas-Morse Aircraft Corporation of Ithaca, N. Y., was the result of a merger similar to many taking place today but new to the industry at the time, where companies with nonrelated products get together. Shortly after the Thomas Brothers Aeroplane Company, with its affiliates the Thomas School of Aviation and the Thomas Aeromotor Corporation, was invited to move from Bath, N. Y., to Ithaca, the Thomas organizations merged with the long-established Morse Chain Company of Ithaca. This merger lasted from 1914 until 1929, when Consolidated Aircraft took over the aircraft side of the company and moved it to Buffalo. Morse Chain regained its own identity and is still in business in Ithaca.

The S-4 was designed just before America's entry into World War I as part of the preparedness program. Since it was a neutral, the United States had fallen way behind Europe in the development of high performance combat aircraft. American manufacturers had sold quantities of lower performance flying boats and training types to England, and Thomas-Morse was among these suppliers, but by the beginning of 1917 this country had not yet developed a single-seat "scout," as the military single-seaters of the time were called, much less equipped one with a machine gun. The S-4 was not intended to close the design gap in one jump. It was recognized that there would be a need for combat-type trainers, and the S-4 was aimed at this market. As an airplane, therefore, it proved to be just about the equivalent of the 1914 British *Bristol Scout*.

The foresight of Thomas-Morse's chief designer, B. Douglas Thomas (no relation) paid off, for some 1,150 were ordered. Cancellations at the Armistice reduced the total to 497 for the Army and 14, plus six seaplane variants, for the Navy. The design gap never was closed in the war years, and not a single combat worthy American scout or pursuit plane flew by the end of 1918. The *Tommy*, however, along with the similar Standard Model E-1, took its place in the vast training program that was developed. The cadets took their primary training in 90 h.p. Curtiss *Jennies*, did

Typical of postwar *Tommy* modifications is this S-4C fitted with a water-cooled Curtiss OX-5 engine. This one, complete with advertising, was used by "Speed" Holman in the 1924 National Air Races.
Photo by U.S. Air Force

Yesterday's Wings:

The Tommy

Thomas-Morse S-4 was produced as warplane—World War I—but gained fame as civilian

by PETER M. BOWERS / AOPA 54408

more advanced work in 150 h.p. *Jennies*, and then those selected for pursuit training used the *Tommys* and E-1's. These could be equipped with a single American Marlin machine gun for actual gunnery or with a camera gun for checking the pilots' proficiency in simulated plane-to-plane combat.

There were two production models of the S-4, the S-4B and the S-4C. Like the prototype, these were conventional stick-and-wire designs. The S-4B's used the American-built version of the famous French 10 h.p. *Gnome* rotary engine. The first 50 S-4C's were also delivered with this engine, but it proved so troublesome that the Army ordered subsequent models to be fitted with the American-built version of the French *Le Rhone* rotary. This was a relatively reliable powerplant by rotary standards and more than justified the 20 h.p. handicap. However, being some 44 pounds lighter, the *Le Rhone* contributed to an already acute tail heaviness problem that plagued the *Tommy*.

Outwardly, the S-4B's and the S-4C's were easy to tell apart. The S-4B had swept-back trailing edges on the ailerons, which were operated by wires. The S-4C had the trailing edges of the ailerons in line with the trailing edge of the rest of the upper wing, and the ailerons were controlled by a push rod and torque tube system. The push rods running from the rocking shaft in the cockpit to the ends of the torque tube

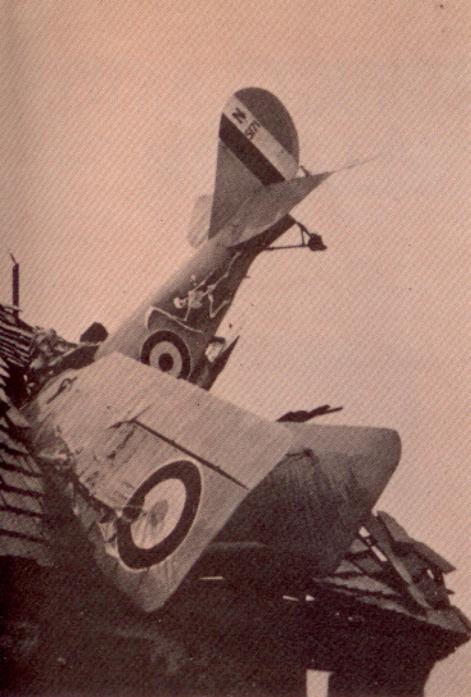
cranks in the wing were quite noticeable. This system was adapted from the French *Nieuport 17*, an example of which had been sent to Thomas-Morse after the United States got into the war and began to receive examples of current European combat types for study. The Navy's seaplane versions of the *Tommy* designated S-5, were simply S-4B's fitted with sea-sled type pontoons, two forward and one under the tail.

Like all tailskid airplanes of the day, the *Tommys* had no brakes. The wheels were located well forward to put plenty of weight on the tailskid when the plane was on the ground so the skid could provide good braking. However, the wheels were a little too far ahead on the *Tommy* and their position, relative to the center of gravity, created serious ground-looping problems during the landing roll. The Army recognized this problem and tested one S-4 with the wheels moved aft several inches. This improved matters, but not enough to justify the cost or effort of modifying the whole fleet. The in-flight tail heavi-

THOMAS-MORSE S-4C SPECIFICATIONS

Length	19 ft. 10 in.
Wing Area	234 sq. ft.
Empty Weight	940 lbs.
Gross Weight	1,330 lbs.
High Speed	97 m.p.h.
Span	27 ft. 6 in.
Landing Speed	45 m.p.h.
Climb	7,000 ft. in 10 min.





To the anguish of present-day antique airplane buffs, quite a few Tommies met this kind of fate at the hands of Hollywood stunt pilots and crash engineers. This one was in "Lost Squadron," starring Richard Dix, circa 1931.

Photo Peter M. Bowers collection

troubles of all rotary engines and the inherent Tommy tail heaviness problems simultaneously by installing a 90 h.p. Curtiss OX-5, a considerably heavier water-cooled V-8 engine that greatly improved reliability and balance. The OX-5 conversion was so satisfactory, in fact, that at least two small aircraft firms, Yackey Aircraft Company of Forest Park, Ill., and Charles F. Dycer in Los Angeles, marketed standardized conversions with the OX-5 engine and an extra cockpit. The two-seat arrangement (somewhat three, with the passengers jammed side-by-side in the new front cockpit) was possible on the OX-5 conversion through elimination of the rotary engine induction system, which projected aft through the firewall and almost into the pilot's lap.

The Tommies enjoyed an unrestricted life until the adoption of Federal licensing requirements in 1927. Unable to qualify for standard licenses, they operated in diminishing numbers as "registered" aircraft in those states that still allowed unlicensed aircraft to be flown. One by one, the states fell in line with the Federal regulations and the horizons of the Tommy narrowed. Even so, a few were flown in strictly bootleg operations by various rugged individuals. It should be pointed out that one pretty much had to be a rugged individual or at least an extremely dedicated one to even try to fly a worn-out rotary-engined World War I surplus plane for recreation in the early 1930's.

Although the Tommy, for all practical purposes, had vanished from the general aviation scene by the end of the 1920's, a small amount of legal activity continued in Hollywood. Air-war movies were then at the peak of their popularity. As the most readily available World War I single-seater, the Tommy became a mainstay of the Hollywood antique fleet. However, the fragile old crates soon reached a point where the cost of their upkeep exceeded their actual worth before the cameras. Many that were still barely flyable were expended in crash scenes while the non-flyable ones were relegated to the role of background props in the airdrome scenes. Three of these that were still intact were so used in the 1938 epic, "Men With Wings."

That movie marked the end of the Tommy's second career. A third opened

up after World War II when antique airplanes became a big hobby on a national scale. Nearly a dozen old Tommies, some relatively intact and others that were virtual basket cases, have been resurrected from obscure hiding places. Several have now gotten into the air and the others are undergoing painstaking restoration at the hands of new owners that will make the final efforts worth several times the \$4,000 that the Tommies originally cost the Government if the hobbyist's man-hours are paid for at the current rates for skilled aircraft mechanics.

Current interest in Tommies is so high, in fact, that some individuals who have been unable to obtain originals are starting to build replicas. Some of the restorations could qualify for "Amateur-Built" licenses since their owners actually build more than 51% of the airframe, FAA's criterion for defining an amateur production when parts of existing factory-built aircraft are used. Since they are factory built but do not qualify for "standard" licenses, the restored Tommies fly under "Experimental-Exhibition" licenses, "Exhibition" being one particular subcategory of the "Experimental" classification. Quite a few restrictions go with such a license, but they don't trouble the owners. The Tommies have so many operational problems compared to today's general aviation planes that no attempt is made to integrate them into the regular traffic. Tommies and other rotary-engine types fly only on special occasions, and then generally from low-traffic grass fields or from the grass alongside the paved runway at general aviation fields when an air show is under way and other operations are shut down while the old timers do their stuff. Since the rotary engines can't be throttled down, the wheels have no brakes, and the tailskid isn't steerable, ships like the Tommy are not taxied from the hangar to the takeoff point. They are towed, and takeoff is made from the spot where the engine is started.

One Tommy, an S-4B with a *Le Rhone*, was used in a crash scene in the 1956 movie "*Lafayette Escadrille*." However, since it was now in the category of a priceless antique rather than the expendable piece of junk it would have been 25 years before, the "crash" was actually a carefully-planned taxi run into a straw-filled pit. The Tommy flipped over onto its back convincingly but was actually unhurt. □

Among the Tommies put back into the air in recent years is this S-4C owned by Ed Carlson of Spokane, Wash. Distrustful of the old rotary engine, Carlson replaced it with a 1937 vintage 120 h.p. Ken Royce radial. This has a displacement of 372 cubic inches, turns a much smaller propeller at 2,225 r.p.m., and doesn't put out nearly the thrust of the slower-turning, larger-displacement rotary. In spite of having a throttleable engine, Carlson's Tommy still has taxi problems on modern airports because of non-steerable tailskid and no brakes. Towing is the preferred method of getting it from the hangar to the takeoff point.

Photo by Peter M. Bowers

ness condition was alleviated somewhat by raising the leading edge of the stabilizer an inch.

In spite of having ordered it into production, the Army was not well satisfied with the Tommy, and in 1918 plans were made to replace it with American-built versions of the 1914 British Bristol *Scout*. The war ended before the Bristol program got started and the existing Tommies were soon on the surplus market, a point from which they started a new career.

Since it was a single seater, the Tommy had little commercial potential. It couldn't be used for training, passenger-hopping, or cargo like the *Jennies* that gave their name to the postwar barnstorming era, nor was it as good at airshow aerobatics as the higher-powered French and British fighter models that were also on the surplus market. There were plenty of customers for the Tommy, however, and a few managed to reduce their flying expenses by carrying paid advertising on their wings. With no licensing regulations at the time or required registration numbers, the entire area of the airplane was available for art work.

Both the *Gnome*- and *LeRhône*-powered models were available, but like the military, the civil owners were dissatisfied with the *Gnome* and many made the relatively simple change to the *Le Rhone*. This practice has led some later aero-historians into believing that all the Tommies were *Le Rhone* powered. Other owners solved the chronic

