

Yesterday's Wings **The Travel Air Mystery Ships**

by PETER M. BOWERS / AOPA 54408

■ ■ One of the major and continuing arguments in aviation is whether air racing is beneficial or detrimental.

In the long view, it is evident that the adoption of many technical improvements, which otherwise would have developed slowly, underwent accelerated testing and entered service sooner as the direct result of being used on racing planes. To cite an outstanding example, the famous British Spitfire of World War II and its superior Rolls-Royce Merlin engine both evolved from the line of Supermarine racers built for the Schneider Trophy Races of 1925 through 1931.

A significant domestic example is the Travel Air Mystery Ship of 1929, which was a major aeronautical revolution all by itself.

The major U.S. landplane race of the 1920s was the Pulitzer, which was the main event of the National Air Races from 1920 through 1925. This was always won by the military, which entered hopped-up fighters and specially designed racers that were actually high-speed research vehicles. There was no significant civil competition. The main "Unlimited" events of the 1926 through 1928 races were no longer sponsored by Pulitzer but were still military walk-aways.

A manufacturer of exclusively civil airplanes decided in 1928 to enter the 1929 unlimited event. This has since been generally regarded as the first of the famous Thompson Trophy races, but was not actually designated as such. The firm was the Travel Air Manufacturing Co. of Wichita, Kan. President Walter Beech was an adamant biplane man, but conceded the speed advantages of the monoplane and authorized the building of two monoplane racers to be known as Travel Air Model R.

This was a closely guarded project, both to outsiders and most Travel Air employees, hence the unofficial name "Mystery Ship". The actual design work was carried out by engineers Herb Rawdon and Walter Burnham, at home, and the construction was done in a screened-off section of the plant.

The Mystery Ship, sometimes identified erroneously as Model S, was conventional in layout and structure but had noteworthy refinements. While all but one of the previous Pulitzer races had been won by biplanes, the Schneider Cup races of 1926 and 1927 clearly showed the superiority of the low-wing

monoplane as speeds got higher and structural drag and wetted area became more critical. The Travel Airs went this route.

The major break with racing plane tradition was the use of an air-cooled radial engine instead of a liquid-cooled in-line. The engine was the new 300-hp Wright J-6-9 Whirlwind that had just replaced the 220-hp J-5, of Lindbergh fame, on the Wright production line. For racing, this was hopped up to 400 hp by additional supercharging and a higher compression ratio.

The traditional drag disadvantage of the big, round radial over the more compact in-line was reduced, if not entirely overcome, by the use of the then-new NACA cowling around the entire engine. This gave the Mystery Ship the appearance of some World War I designs, which used similar-looking cowlings around the small-diameter rotary engines of the time, primarily as oil shields.

On the racers and subsequent designs, the NACA cowling not only reduced drag by smoothing out the flow of air through the engine and past the nose, it actually increased thrust by acting as a circular airfoil that produced a forward lift component. Some designers, who thought that the airstream pushed against the cowling and therefore didn't design properly stressed fasteners, were surprised to find that the cowlings tended to pull forward and contact the propeller from behind.

At the last minute, it was decided to enter one of the racers, registered R613K, in limited engine displacement events, so it was fitted with a much smaller engine, the 165-hp Chevrolair inverted, air-cooled, in-line six. Otherwise, the two airframes were identical.

Another innovation was the use of large fairings that came to be called pants to enclose and streamline the wheels. Similar enclosures had been used occasionally clear back to World War I and even before, but they were primarily mud guards. The Travel Airs were the first to capitalize on their drag-reducing capability.

The airframes themselves were thoroughly traditional, but also incorporated a few new gimmicks. The fuselages and tails were welded steel tubing. The tails were fabric-covered, but the fuselages had wooden superstructures attached to the steel frames which were then skinned with plywood. The wings

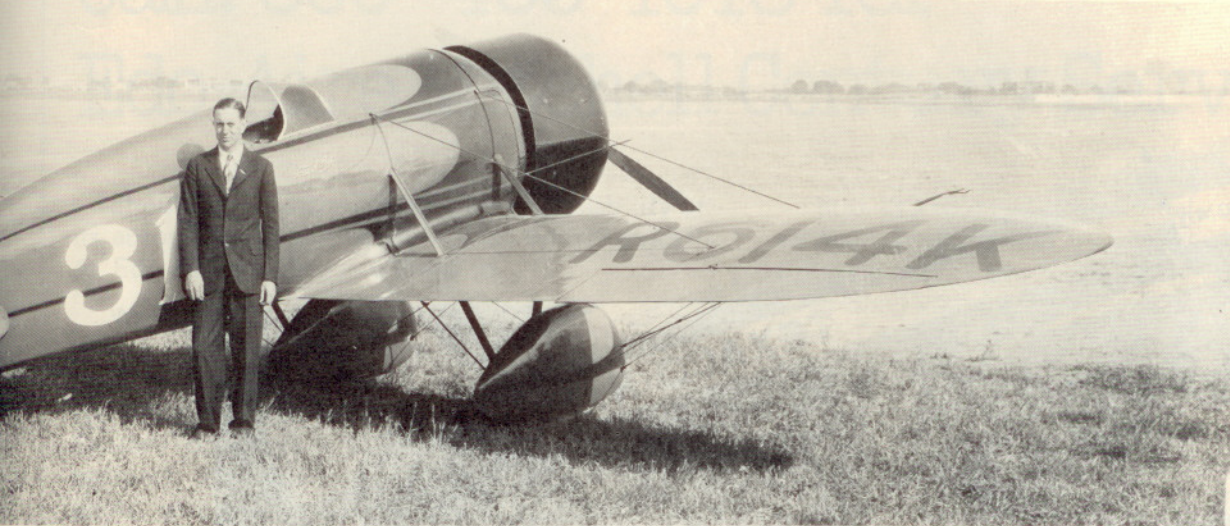
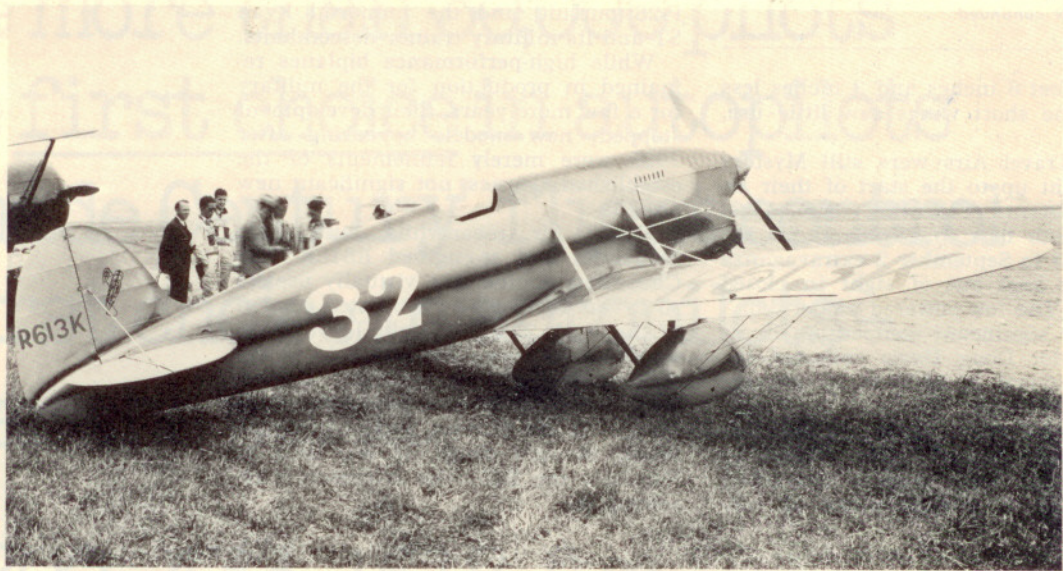


were wood frame, also covered with plywood for aerodynamic smoothness. The wingtips that faired out the RAF-34 airfoil were works of art that were carried on in the later line of Beechcraft biplanes. A clever gimmick was to use the corrugated metal oil cooler as a walkway on the stub center section.

For low weight and minimum drag, the wing was thin. This required external bracing that added drag, but not as much as a thicker cantilever wing would have added. Wire was used to brace both the wing and the landing gear and the two components were inter-dependent; the wings were not stable without the landing gear in place and the landing gear was not stable without the wings in place to complete the closed loop of the bracing system.

Two sets of wings were built for the high-powered ship, R614K—the standard set, with a span of 29 feet 2 inches, and a special racing set, with a span of

Mystery Ship R613K looked faster than R614K, but its smaller in-line Chevrolair engine delivered less than half the power of the big Wright radial.



Pilot Doug Davis and his winning Travel Air Mystery Ship at the 1929 National Air Races.



This view shows the new NACA cowling and wheel plants of the Travel Air Mystery Ship R614K as well as its unique wire bracing system.

TRAVEL AIR MYSTERY SHIP

Specifications

Powerplant	Special Wright J-6-9, 400 hp @ 2,300 rpm (normal 300 hp 2,000 rpm)
Span	29 ft 2 in
Length	20 ft 2 in
Height	7 ft 9 in
Area	125 sq ft
Empty weight	1,475 lb
Gross weight	1,940 lb

Performance

High speed	235 mph
Cruising speed	150 mph
Landing speed	74 mph
Initial climb	3,200 fpm
Service ceiling	30,000 ft
Range	525 mi

only 27 feet 8 inches and 3 inches less chord. The short wings saw little use, however.

Both Travel Airs were still Mystery Ships right up to the start of their respective events. Following factory test flights, both flew to Cleveland for the August 24 to September 2 extravaganza but were kept out of sight in closed hangars. The low-powered model didn't have any significant competition in its event; pilot Doug Davis collected the winner's purse of \$400 at an average speed of 113 mph.

The high-powered model, on the other hand, made history. Also piloted by Davis, it ran away from a cleaned-up Curtiss XP-3A pursuit plane of con-

P-26 pursuit, and the immortal Ryan ST and its military trainer descendants.

While high-performance biplanes remained in production for the military for a few more years, their development stopped; new models appearing after 1929 were merely refinements of the established classics, not significant new designs.

Travel Air, meanwhile, built more Model Rs and re-engined R613K. The Chevrolair engine was virtually useless so it was replaced by a boosted version of the stock 225-hp Wright J-6-7 Whirlwind and the airplane was sold to the well-known Florence "Pancho" Barnes. She later sold it to movie pilot Paul Mantz. In the famous auction that followed Mantz's death, it was sold to Pancho's son Bill, who is presently restoring it.



Frank Hawks' NR1313 featured a modified cockpit. After takeoff, he lowered his seat and then slid the windshield aft to form a drag-reducing roof. Side panels provided the necessary visibility.

siderably higher power. The winning time was 194.9 mph for a purse of \$750; the XP-34 was second at 186.8 mph.

This stunning victory by a relatively low-powered monoplane over traditional, hot biplanes had an immediate impact on the entire industry. The monoplane age had dawned for U.S. civil aviation shortly before Lindbergh, but the Mystery Ship turned a trend into a revolution. Even high-drag commercial monoplanes already built benefited from the new approach by being retrofitted with speed-boosting cowlings and wheel pants.

New designs, based on the Mystery Ship configuration, soon appeared, notably the Gee Bee sportplanes and racers, the Wedell-Williams racers, the Boeing

The big 1929 winner did not race in 1930. It was entered in the 1931 Thompson, but caught fire in the air in a pre-race test flight and was destroyed.

The third Model R was ordered by the Shell Oil Co. for its pilots, Jimmy Heaslip and Jimmy Doolittle, and was delivered in 1930. It was prepared for its first major race, the 1932 Thompson, by undergoing extensive modification under Doolittle's direction at the Parks Air College. Flutter developed on a test flight and Doolittle bailed out to become a race pilot without a plane just before the big race. A quirk of circumstance teamed him with an organization that had a hot new racer, the Gee Bee R-1, but no available pilot. Between them, they won the 1932 Thompson and also

set a new world's landplane speed record.

The best-known Travel Air R, at least to the American public and the world at large, was Number 4, which was registered NR1313. This was bought by Texaco for its pilot Frank Hawks. Using the short wing of R614K, Hawks entered the 1930 Thompson but pulled out on the third lap with fuel vent problems. He went on to lasting fame, however, with his hundreds of inter-city speed records all over the U.S. and Europe with the standard wings reinstalled. This airplane now hangs in the Museum of Science and Industry in Chicago.

The fifth and final Travel Air Model R was built for the Italian government; its subsequent history is unknown. □