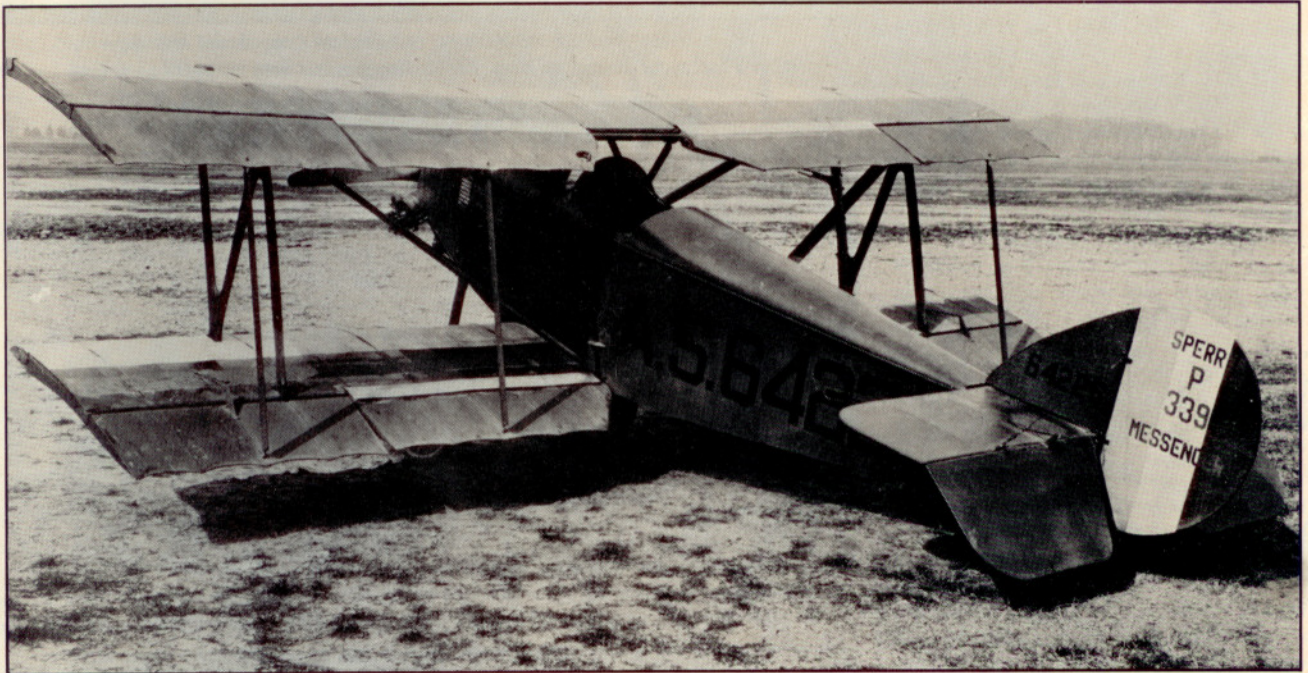


The Sperry Messenger



Designed to deliver

BY PETER M. BOWERS

The Sperry "Messenger" is the smallest, and some say the cutest, airplane that the U.S. Army has ever had. Designed in 1919 as the aerial equivalent of a military courier's motorcycle (hence the name Messenger), it also had a short and rather spectacular civil career.

Back in World War I, the Army Air Service established the Engineering Division at McCook Field, near Dayton, Ohio. This organization, often simply called "The Division," was concerned with the technical side of aviation. Much of its effort was directed toward improving existing military aircraft and equipment, but sometimes the work was extended to designing new airplanes. In some cases, experimental prototypes were built in the division's shops at McCook. If the new design proved to be desirable for production, a notice was circulated to the established aircraft industry, soliciting bids. In other cases, even the building of the prototypes was contracted out.

Such was the case with the Messenger, which was identified officially as the "Engineering Division M-1." The number stood

for the first (and only) model in a new and short-lived M-for-messenger class.

The Army needed a light and structurally simple single-seater that could land on roads and in small clearings near forward positions to deliver and pick up messages.

The principal designer was Alfred W. Verville, a prominent aeronautical engineer in the industry since 1914, who came to the division in 1918. The Messenger turned out to be a minor aeronautical masterpiece. It was all wood, with squared-off wings similar to many of the simplified designs of the time. But the particular angle of the wing stagger, the use of single-unit N struts and of lift struts instead of wires, and the rounded fin and rudder combined with nice fuselage lines to give an over-all appearance that is pleasing even today.

By far, the smartest decision was the choice of engine. Where other small single-seaters tried to get along on small-displacement engines down in the motorcycle power range, the Messenger used a husky, three-cylinder Lawrence L-4 air-cooled radial.

Without the L-4, the Messenger would not have been a success. A 1918 design, the L-4 delivered between 55 and 65 horsepower. This does not sound like much by today's specifications, but horsepower ratings then were not the same as they are now. The L-4 was a long-stroke engine,

with a bore of 4.25 inches and a stroke of 5.25, which resulted in a displacement of 223 cubic inches. The 78-inch propeller turned at only 1,600 rpm, a much more efficient speed than today's high-rpm snarlers, so that the so-called 55-hp L-4 delivered about the equivalent thrust of a 108-hp Lycoming O-235 today, plus it weighed 71 pounds less than the O-235.

When the design was finalized, the division invited bids for a flying prototype and one static test article. The winning bid came from a new firm, the Lawrence Sperry Aircraft Company of Farmingdale, Long Island. Lawrence Sperry had excellent qualifications as a pilot and engineer; he was the son of Elmer A. Sperry of gyroscope and early autopilot fame. Actually, Sperry did not have a proper factory at the time he was awarded the contract in April 1920 and borrowed a shop for experimental work.

After the test articles were delivered to McCook Field, the division decided that it wanted production models, so invitations to bid were sent out again. With the advantage of having built two already, Sperry won a contract for five more Messengers. Deliveries began in 1921. These were followed by four other small contracts, with the last 20 airplanes, out of a total of 42, being slightly improved M-1As.

The airplanes were, of course, Engineer-

Intrigued by airplanes long before his first ride in a Travel Air at age 10, Peter Bowers, AOPA 55408, has since logged more than 4,200 hours.

continued

ing Division M-1s. But the airplanes popularly were called Sperry Messengers, most probably because the incorrect designation was painted on the rudders. This bothered the Army to the point that a technical order was issued in May 1924 to remove the Sperry identification and apply the correct Army designation and model number.

No records are available for Sperry's non-military production of the Messenger, but photos show enough configuration variations to verify that several airplanes did exist. Sperry owned some of them himself, his first personal Messenger being the Army's static-test unit. When the model had passed seven Gs without breaking, the Army figured there was no point in testing it further and sold it to Sperry in October 1921. And he went on to receive quite a bit of publicity through his Messenger escapades.

Old news photos show him getting a ticket from a motorcycle policeman after landing in the street in front of his home. There were no civil air regulations then, or airplane and pilot licenses until 1927; so he was not cited for violations of the CARs or even for flying without a pilot's license. He was speeding.

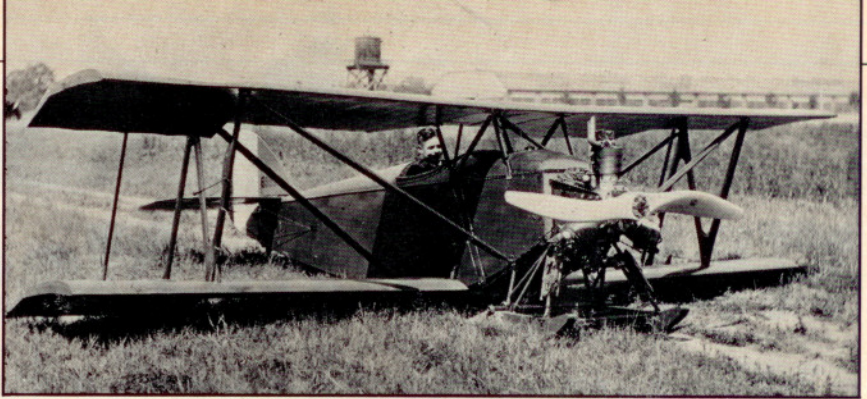
Another escapade covered by the news media was his landing a Messenger on the plaza in front of the U.S. Capitol. With no brakes and a tail skid that could not dig into the pavement, the little craft swerved on the landing roll and started to climb the Capitol steps. It slid back down and, fortunately, no one was hurt and the craft was not damaged. Sperry then took off and landed in front of the Lincoln Memorial, where he was photographed with Charles Lawrance, builder of the little craft's engine.

The Messenger did well for Sperry personally; as a flying motorcycle for the Army, it did not fare so well. But the low cost (a complete airplane cost between \$4,000 and \$6,000) and simplicity of the design, plus viceless flying characteristics, made it a good trainer and time-builder.

It also became a valuable research tool. The division undertook the design of experimental wings—different sizes, shapes and airfoil sections—and construction was contracted to the industry. One of the most interesting was a set of variable-camber wings built by Aeromarine Aeroplane and Motor Company using the same wing span, chord and shape for direct comparison.

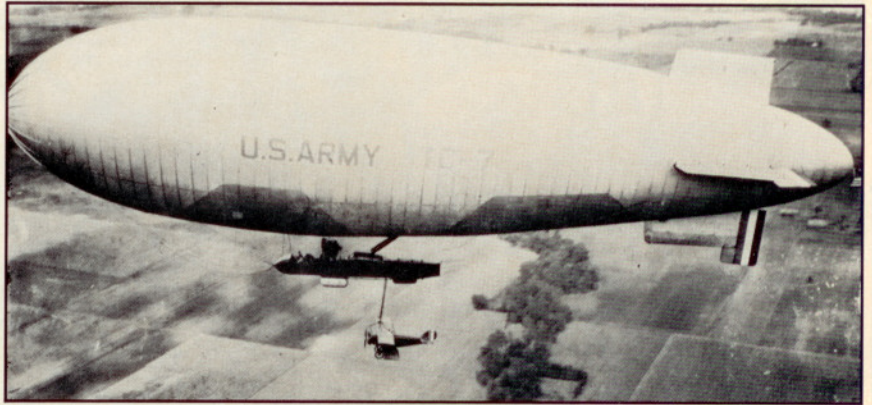
On these, the leading edge could be made to droop for the full span by pulling a lever, similar to an automobile hand brake; the flexible mid-section could vary in thickness, while the trailing edge portion inboard of the ailerons was fitted with flaps having the same chord as the ailerons. The operation of these trailing-edge sections was a very challenging exercise.

There was a hand-hold on the inside, upper-left flap. Pulling down on this lowered all four connected sections. To keep them down, it was necessary for the pilot to insert a locking pin with his other hand, presum-

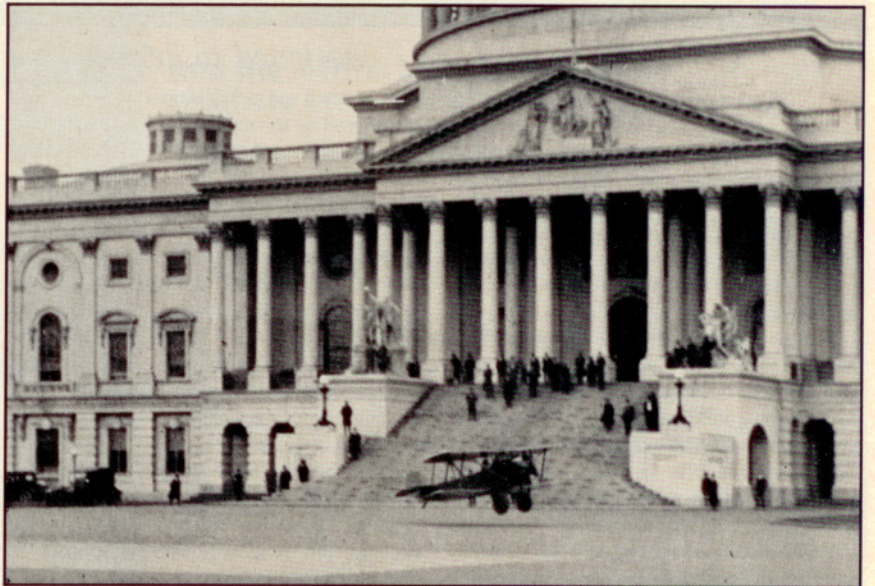


The pose: Lawrence Sperry sits in the cockpit of an Army-owned Messenger after a successful landing on skids. The landing gear had been jettisoned on takeoff.

YESTERDAYS • WINGS



A Messenger is carried aloft by a blimp (above) for release; the engine was started during the glide. (Below) Sperry takes off from the Capitol Plaza after a nearly disastrous landing.



ably while keeping the airplane level by holding the stick between his knees. Why not? Simple airplane; simple procedures.

The wing was supposed to lower the minimum speed and increase top speed; however, it nearly doubled the minimum required by the contract and significantly decreased top speed. All the gaps and external gadgetry added so much drag that the expected gains were more than nullified.

The little Messenger was cheap enough to be expendable, and several were converted

by Sperry to radio-controlled pilotless drones (used as missiles), designated Messenger Aerial Torpedos, or MATs. This was an idea many years ahead of its time.

Sperry also was involved in division-sponsored tests. One called for dropping the standard landing gear after takeoff and then landing on a pair of shock-absorbing skids. Sperry developed a cable-and-ratchet device to pull the propeller to a level position after the engine was stopped to protect it during the landing. The tests were successful, but

there has been no application of the concept except by a few pilots on long-distance trips who jettisoned their landing gear to reduce drag and increase range.

The most interesting experiment, which was entirely Sperry's doing, was the "Sky-hook." Late in World War I, both Germany and the Allies had carried single-seat fighters aloft under large rigid airships and then released them. In December 1918, a U.S. Navy C-1 blimp carried an Army Curtiss JN-4 trainer aloft and released it successfully. None of the airplanes, however, hooked back on to their mother ships from free flight. Sperry sought to change that. After a meeting at McCook in January 1922, he received a research contract.

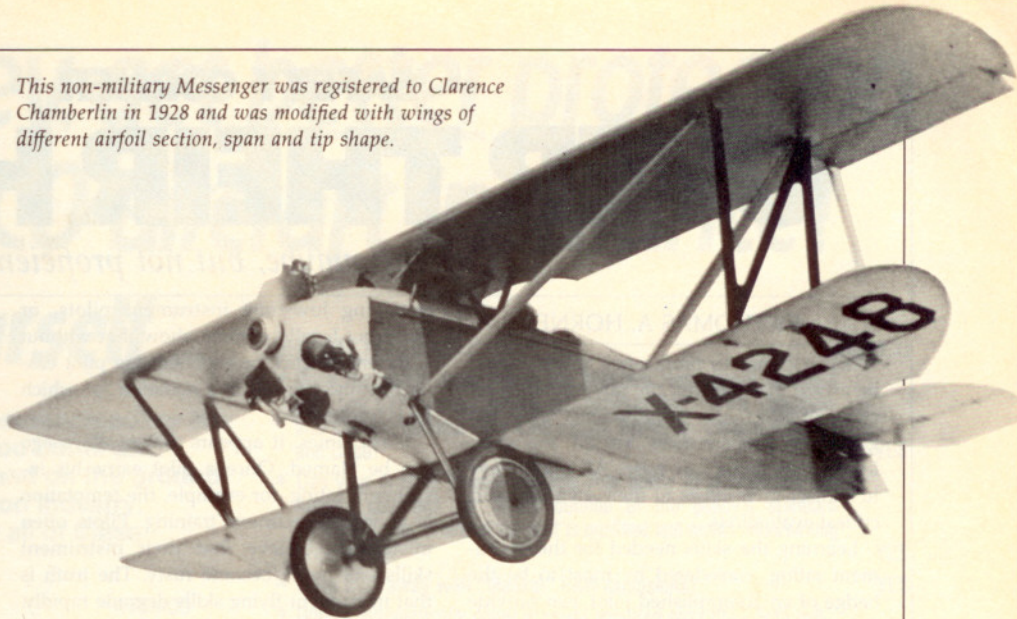
First, to determine that the hook-on craft could hold steady formation beneath a larger craft, he installed a vertical rod above the center section of a Messenger, which he then flew close under an Army de Havilland 4 observation airplane from which a rope ladder had been lowered. The bottom rung of the ladder had been smeared with a mixture of lampblack and grease; the area of the rod over which grease marks were found was an indication of how well he had been able to hold the formation.

Sperry then designed a structure above the Messenger's center section that combined a support for the manually operated hook and a guard for the prop. But testing was delayed when Sperry set off on another of his escapades. It turned out to be his last.

He took one of his own Messengers to England where, since licensing was required, it was given the British registration G-EBJJ. On December 13, 1923, he started a cross-channel flight to France. But he never got there. Ditching in the channel, he apparently tried to swim to land but drowned; the airplane later drifted ashore intact.

It was a year before the Army began testing again. On October 3, 1924, the small, light Messenger was carried aloft by an Army blimp, TC-7, and released. The engine was started after release by a modification of Sperry's earlier propeller-leveling

This non-military Messenger was registered to Clarence Chamberlin in 1928 and was modified with wings of different airfoil section, span and tip shape.



device for the wheels-to-skids modification.

The first hookup test was conducted with the TC-3 blimp on December 13, 1924. It did not go so well; apparently the Army pilot did not have Sperry's skill for formation flying. He rammed the trapeze and broke his propeller. The test was conducted directly over the blimp's base in anticipation of just such an event, and the airplane landed safely.

Several successful hook-ups were made later that month. The system worked all right, but the Army did nothing more with it. It remained for the Navy to perfect the procedure from 1932 to 1935 and achieve worldwide fame with the little Curtiss F9C "Sparrowhawks" that were carried within the Akron and Macon rigid airships.

Except for the fact that three-cylinder radials are virtually impossible to come by these days, the Messenger is a natural for a homebuilt replica today. It has the right combination of size, weight, structural simplicity and plain old schmaltz to fit right in. Even with a modern flat-four, the nose would still look right if airscoops, such as the Piper J-3 Cub has, were used instead of

a closed cowl. Oddly enough, only one latter-day Messenger has been built, but it has so many modern details that it hardly qualifies for the name of Sperry Messenger.

Only one Messenger is known to exist today. It is the property of the National Air and Space Museum of the Smithsonian Institution and is on loan to the Air Force Museum at Wright Field, in Dayton, Ohio. □

**ENGINEERING DIVISION M-1
SPERRY MESSENGER**

Specifications

Powerplant	Lawrance L-4 (Wright Gale)
	56.5 hp @ 1,600 rpm
	64 hp @ 1,880 rpm
Wingspan	20 ft
Length	17 ft 9 in
Wing area	150 sq ft
Wing loading	5.75 lb/sq ft
Power loading	15.25 lb/hp
Empty weight	623 lb
Gross weight	862 lb

Performance

High speed	96.7 mph
Landing speed	45 mph
Initial climb	700 fpm

Lawrence Sperry and friends are shown with a two-seat version of the Messenger. The fuselage was lengthened, with the cockpit elongated enough to squeeze in a small passenger, and the engine was moved forward just enough to maintain balance.

