

showstopper

The Stearman 450 is a king of the sky

BY RICK DURDEN

Once upon a time, in a land called Kansas, some years after L. Frank Baum wrote of Dorothy and Toto's abrupt departure and their finessed return via ruby slippers, Lloyd Stearman built biplanes. By 1927, the company bearing his name had acquired a reputation for tough equipment, resulting in the airmail companies purchasing his aircraft, including the barrel-chested M-2 "Speedmails," each equipped with a Pratt&Whitney engine developing a stunning 525 horsepower. That series was thereafter referred to as the Bull Stearman and let the world know that Stearman biplanes could handle whatever engine could be bolted to the front end.

Two months before the Great Depression began, Stearman shrewdly sold his company to the vast United Aircraft conglomerate. There, mergers spawned anti-trust litigation, which begat spin-offs, leading to Boeing's acquisition of Stearman Aircraft. By then, Stearman had repositioned to California where he became the president of Lockheed Aircraft, yet his surname would remain indelibly attached to a hugely successful military trainer created more than a year after he left the wide skies of Kansas.

PHOTOGRAPHY BY MIKE FIZER



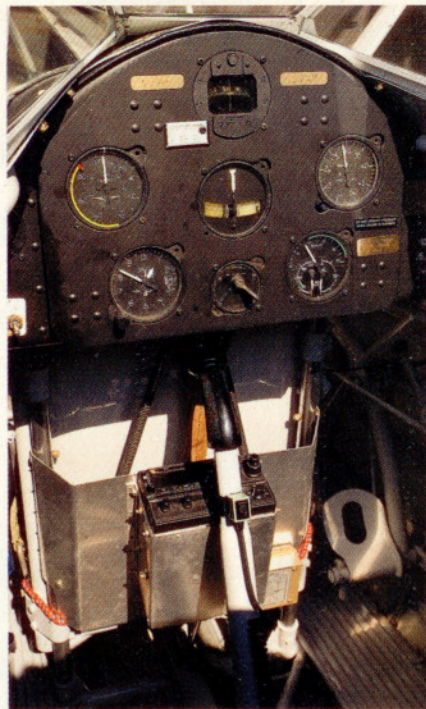


In late 1933, word came from on high that the Army and Navy would look favorably upon a new primary trainer for their aviation cadets. In a mere 60 days, engineers at Boeing completely reworked a previous attempt at a military trainer, the "Cloudboy" to create a strikingly clean, straight-legged biplane. Capable of withstanding a whopping 10 Gs, the model 70 was subjected to Navy testing in early 1934.

The Model 70 was upgraded and both the Navy and Army bought many of them, with some 8,585 eventually being built. In 1941, a naming competition caused the hopelessly incongruous sobriquet of "Kaydet" to be applied to the incredibly robust airframe. Fortunately, the name never stuck, and to this day the Boeing Models 70, 73, 75, and 76 are known with deep affection simply as "Stearmans."

Thousands of World War II military pilots trained in Stearmans. They praised its friendly manners when aloft but uttered dark imprecations against its behavior when the tall, skinny landing gear was in contact with the ground, especially in the presence of a crosswind.

Following World War II, Stearmans were sold as surplus. Its great structural strength caused it to be amenable to installation of larger engines, to the great



joy and profit of the cropdusting community. It was soon discovered that the Pratt & Whitney R-985, with its 450 horsepower more than twice that of the stock Stearman powerplant, was almost ideal. About that time the aerobatic set also found the 450 Stearman, as it came to be known, provided performance

never before seen on the airshow circuit because the power allowed a high drag biplane to perform vertical maneuvers. The combination has proven enduring; 450-horsepower Stearmans have been wowing airshow audiences for more than 60 years.

Let's go flying

And now, after years of seeing and hearing 450 Stearmans do heart-stopping airshow routines, it's time for you to fly one. You've been introduced to Bob Matthews, a quiet-spoken airline captain who harbored a passion for Stearmans from his youth, perhaps because his father had instructed in them in World War II. Matthews first purchased a stock 220-horsepower machine. After a year flying a big boxkite with only just adequate power, he made the decision to step up to the stud brute of the herd, buying N75697, and slowly brought it to its current, glittering condition. As you do the walkaround, Matthews tells you

There are minimal gauges in the rear cockpit (above). Soloing over a pristine lake near Poplar Grove, Illinois (below). Control response is light in the Stearman and things don't move too fast so a maneuver such as a loop are easy—and a joy. Note Bob Matthews smile (right).





that 450 Stearman conversions are a little like snowflakes, few are identical. All have shorter engine mounts, to move the heavier engine aft for balance. From there the differences are rampant; Matthew's airplane has a cowling from a Beech 18, improving engine cooling and reducing drag, while adding nice lines. The engine oil tank is

oversize and was moved to the baggage area behind the cockpits.

Climbing into the rear cockpit, from which the Stearman is soloed, you find that the seat adjusts only vertically, while the rudder pedals adjust fore and aft, so quite a range of pilot physiques can be accommodated. Nonetheless, you also discover it is utterly blind forward.

There are not a lot of gauges in the cockpit; this was developed as a basic, VFR airplane. To your left, the throttle quadrant sprouts a mixture lever, a brand new propeller rpm control and a monstrous throttle that is of the sort to be seized within a fist. It is a no-nonsense, sizable hunk of wood, which effectively serves notice that there is a

boatload of power up front and that this airplane is not going to be like anything you've ever flown.

Starting is classic radial. Mixture too rich, then give it three full shots of prime. Activate the preoiler for several seconds to smooth the path of the pistons when they start to move. Holler "clear" loud and strong because there could be an elephant in front of the airplane but you won't be able to see it. Mash the starter button and count three blades, then move the mags to "both" and listen. Almost immediately one of those substantial cylinders announces the end of its

slumber, followed shortly by two or three more as the engine recognizes that you mean business. A small cloud of white oil smoke emerges from the short exhaust stack as if to announce to the world that something good is about to occur, while everything on the airport comes to a stop and everyone looks and listens as the big Pratt begins its distinctive lope.

Strapped in, helmeted and goggled, you feel the passage of each propeller blade on the top of your head, even at idle. You move the seat down yet another notch, so your eyes are just above the cockpit coaming. Once 40 degrees Cel-

sius is showing on the oil temperature gauge, you may add power and begin to move. You rapidly discover that Bob's airplane has very good brakes, a common weak point on Stearmans, something for which you may later be profoundly grateful. This airplane balances its air-kindliness with an unblushing need for a firm hand anytime its wheels are touching the ground and in motion, so brakes matter. You weave gently along the taxiway, leaning alternately left and right to see the world ahead and make sure that someone has not inadvertently left a Mack truck on a portion of the airport you are to traverse. Were you to simply blunder along straight ahead you would never see an obstruction until you became puzzled by a slight deceleration and an engine rpm drop as the massive prop began to shred it.

Run up where you can be sure the prop blast will not blow other airplanes into the next county while you get a hint of the thunderous power that is aching

**Aerobatics are silky
smooth, reassuringly
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delight.**

to be released. Fuel feeds from a single tank in the center of the upper wing, so confirm that it is on, set the trim for take-off, make a strenuous effort to confirm that there are no airplanes about to land and carefully line up in position.

It is time: You slowly slide the massive throttle forward and the world comes alive with the most deeply satisfying, basso-profundo sound imaginable at 35 inches and 2,350 rpm. You watch around the side of the nose, concentrating with all that is in you on keeping this gem going where you want it to go. As you are shoved hard against the seat you neutralize the stick and the tail comes off the ground about a foot. You try to focus amidst the cacophony of noise and wind and pounding of the propwash on the top of your head and you wish you had put the seat another notch lower but, by gawd, then you couldn't see anything. The rudder is exquisitely responsive, the

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nose is veering left, it should with all that power, and you just think "right rudder" and the nose is back to where you desire. There is no compromise on takeoff or landing in this airplane; you must be in command, for the instant you become a passenger it will teach you its last lesson as a trainer: how to lose control in a ground loop.

In an astonishingly short distance, those four wings fill with lift and the 450 Stearman launches off the runway. Raise the nose still more to hold the normal climb speed of 75 mph. For those accustomed to the stock airplane, the climb attitude in a 450 Stearman seems far above stallspincrashandburn, yet the 450 claws for altitude as you reduce power to METO (maximum except take-off), 30 inches and 2,000 rpm, which still hauls you aloft at well over 2,000 fpm.

In moments, you are leveling off and setting cruise power, 28 inches and 1,800 rpm and leaning the mixture. Fuel is being converted to noise at a rate of some 20 gallons per hour while you move through the sky at about 120 mph in a stately fashion. You can push the power up a bit but all that will happen is that the fuel flow increases dramatically while speed increases modestly. The trade-off isn't worth it.

King of the sky

Once away from the airport, it's time to find out why the 450 Stearman has been so enduringly popular. The roll rate is satisfactory; however, the stick is so long that it is difficult to get full aileron deflection without hitting your knees, which explains why some 450s are modified by adding ailerons on the upper wings to increase the roll rate. The stick length is needed for adequate leverage for the ailerons and elevators and harmonizes them nicely with the rudders but, for taller pilots, it presents a significant challenge when doing aerobatics or landing with a crosswind.

Slow flight is easy, as are steep turns. Stalls, whether power off or on, break straight ahead so long as the airplane is rigged correctly and you keep the ball in the center. Should you make a primary student mistake and stall with the ball somewhere off to one side, you are in for a ride, as a Stearman spins quite nicely, thank you. It also recovers predictably, once full opposite rudder and lots of forward stick are applied. Matthews' 450 is not approved for spins or snap rolls, so you decide not to explore those areas of flight.

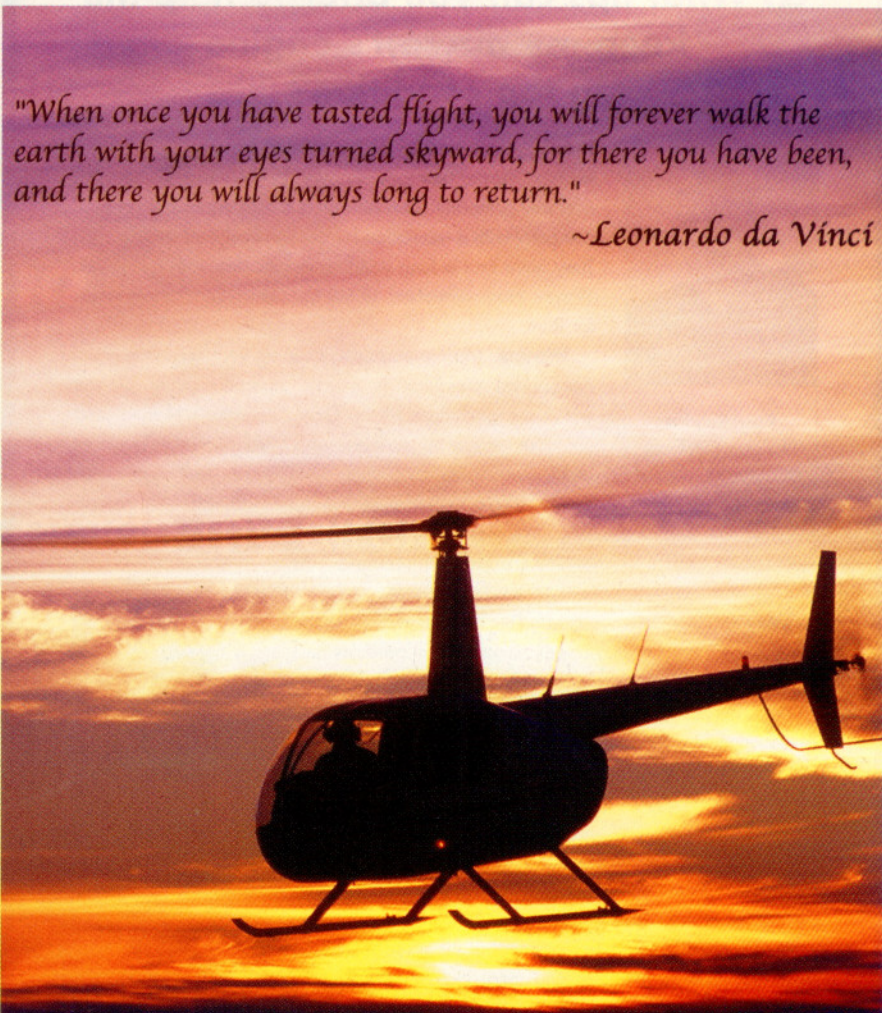
Aerobatics are silky smooth, reassuringly solid (which may explain why the 450 is often used for wing-walking acts) and a pure delight. You set the power and forget it, then dive to the all-purpose entry speed of 140 mph. With the horses up front, loops are big, round portraits in the sky. You snap on the "smoke" switch, just because you can, and as you float over the top and spy the trail you left in the sky, you easily rejoin it, coming out at 140 mph, ready and eager to go into an aileron roll (you'll forgo any zero or negative G maneuvers out of consideration for engine lubrication) and pitch way,

way up, to give yourself time to fold those wings over themselves and roll the world around. Then it is 140 mph once again and pull up at 3 Gs into a towering hammerhead, the power giving you time to fly straight up a while, something impossible in the stock ship. Laughing aloud and marveling at the elegant power and grace of the 450 Stearman doing aerobatics, you understand why they have been showstoppers for over half a century.

Far too soon the fuel gauge tells you in no uncertain terms it is time to return. There is not much to do to prepare, carb

"When once you have tasted flight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return."

~Leonardo da Vinci



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heat is not needed unless there is an indication of icing, and fuel is drawn from but one tank. Power comes back to about 15 inches opposite the point of touchdown and you learn that when that big Pratt isn't pulling, it's sure as heck dragging. You want to keep the runway in sight as long as you can, so you will turn almost all the way until you flare, only allowing the nose to block the view ahead at the last moment.

At 70 mph over the fence with the throttle slowly closing, you round out and watch out one side of the cockpit for the ground while using every visual cue you can find to keep this work of art going straight. It three-points on landing like a ballet dancer alighting, and your work begins. Any incipient swerve, any deviation from straight ahead must be immediately corrected. There is adequate rudder for the purpose; it just requires determination on your part.

You hold the stick hard aft and keep a vigilant watch and make small corrections with the rudder right now and start to feed in the brakes gently and now you are at walking speed and that was just plain work. Your heart is pounding, yet more than anything you want to taxi back and do it again. So you do. Wheel landings are a similar joy; honest to the point the airplane starts rolling and then demanding of your undivided attention.

After you taxi in, have pulled the mixture to idle cutoff and the prop has slowly coasted to a stop you think of something Bob Matthews said to you before the flight. Years after he bought this Stearman and went through a difficult, expensive, and frustrating rebuild, he and his father attended a reunion at the Naval Air Station at Ottumwa, Iowa, where Matthews, senior, had instructed. The organizers had tracked the serial numbers of the airplanes that had been based at the field to see if any were now flying in civilian hands.

Not only had Matthews' airplane been based at Ottumwa, a check of Matthews' father's logbook quickly showed that he had instructed in it. Matthews did not seek out this airplane and often considered selling it when the maintenance bills became huge, but he kept it. One has to wonder whether the airplane sought him out; to return to the family of one who had once flown it and where it knew it would be cherished.

ACPA

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