Lincoln PT–K

A wing and a prayer

During the Roaring Twenties, a significant number of small manufacturers appeared to build aircraft designed to replace the aging trainers left over from the Great War. One of these was the Lincoln Aircraft Company of Lincoln, Nebraska. The company was founded by Ray Page and produced a popular line of aircraft. One was the two-place Lincoln PT–K, so called because it is a Page Trainer with a Kinner engine. (The previous model, the PT, was equipped with a Curtiss OX-5 engine.)

John W. Cook was one of many who received their aerial baptism in a PT–K. He made his first solo in one at Blythe, California, before World War II and eventually became a pilot for TWA. He is remembered, along

Extensive restoration brings a 1920s' biplane roaring back to life

BY BARRY SCHIFF
PHOTOGRAPHY BY MIKE FIZER


NC412M


AIRSPEED
MPH
ALTITUDE
TEMPERATURE
LT PTM 615
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LINCOLN, NEBRASKA

with his friend Robert Timm, for having established in 1958 and 1959 an endurance record of 64 days, 22 hours, and 19 minutes in a Cessna 172. (Ground-to-air refueling was accomplished by handing a fuel hose to one of the pilots as the pair flew low and slow over a pickup truck.)

As he neared retirement, Capt. Cook's sense of nostalgia inspired him to locate and purchase the rag, tube, and wood PT–K in which he had first taken to sky.

Cook located the aircraft but was dismayed at what he found. The PT–K was a basket case, a beleaguered machine that would never again fly unless someone was willing to undertake a complete restoration. Cook accepted the challenge and dedicated himself to resuscitating the biplane. Unfortunately, he died long before the project could be completed.

In the meantime, Rick Martin, a 2,000-hour private pilot and emergency room physician at the St. Rose Dominican Hospitals in Henderson, Nevada, had an itch to rebuild an airplane even though he had never done it before. He wanted to learn what makes an airplane tick from the inside out. Martin was inspired by his close friend Joe Maridon, who had rebuilt a Waco UPF–7 that he uses to sell biplane rides over Las Vegas.

Maridon had learned from an advertising flier that John Cook's widow wanted to sell her husband's Lincoln PT–K. It was not long before he and Martin were in the Cook garage studying a project that obviously had a long way to go and would require a great deal of work. But Martin liked the idea of buying "a piece of history that could be brought to life while learning about airplane building in the process."

It took Martin four years to rebuild his PT–K, and he is quick to acknowledge that he had a great deal of help in the process. He is particularly grateful to Al Ball, Dwight Baumberger, Ron Kodimer, Joe and Betty Maridon, Norm Mayer, John McIntyre, Paul Seright, and Dawn Wagenknecht for sharing their labor and expertise.

The airplane is emblazoned in its original colors and many believe that it is better than when new in 1930. It would have made Capt. Cook proud.

Painstakingly restored to its original glory, the PT–K appears to be in better shape than when it was new in 1930.

The 1930 Lincoln PT–K originally sold for $3,865, a princely price in those days. Although Martin paid $22,500 for the project, he has no idea what the airplane is worth today—although he has turned down an offer of $200,000.

The PT–K has a long, thin fuselage not unlike earlier trainers such as the Curtiss JN–4D Jenny. Its most distinctive visual features are the unusual shape of its vertical stabilizer and its wire-spoke wheels. (The Goodrich tires are borrowed from a Model A Ford.)

Anyone about to fly a PT–K should wear overalls and gloves because of the preflight servicing required. The rocker arms of the 100-horsepower, five-cylinder Kinner K-5 radial engine must be greased before every flight, and the wheel bearings must be greased before every other flight.

One then switches from a grease gun to a can of Marvel Mystery Oil, which must be added to the fuel and engine oil. It also must be squirted liberally into the valve guides before every flight.

The single, 28.5-gallon fuel tank is between the engine and the front cockpit. The PT-K has a maximum-allowable gross weight of 1,767 pounds, an empty weight of 1,200 pounds, and a useful load of 567 pounds. A small baggage area behind the rear seat is limited to 50 pounds, but this must be reduced by the weight of any parachutes being worn.

The front of the "all-weather" cowling has five teardrop-

shape openings, one in front of each cylinder. The original cowling was equipped with cockpit-controlled shutters that restricted airflow through the openings to keep the engine warm on cold days. Martin has yet to build the shutters but he is not in a hurry, given the desert climate of southern Nevada.

A critical preflight item is thrusting a hand through an access door on the left side of the cowling and opening a valve in the oil line leading from the oil tank to the engine. oil supply usually is turned off after each flight to prevent oil drainage from the tank into the lower cylinders.

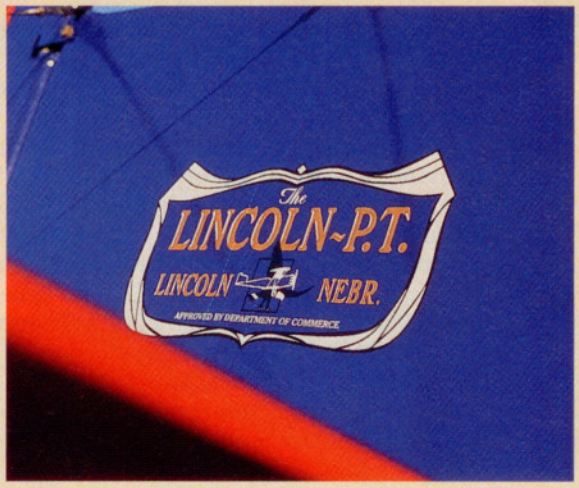
Also, engine oil must be warm before engine start, which means that it must be preheated prior to starting in cold weather.

After stepping onto the lower wing, lowering myself through the 24-by-42-inch cockpit entrance, and settling into the bucket seat, I was delighted to discover that the cockpit is comfortable and roomy even for someone of my sizable proportions.

Martin's PT–K is equipped with a Bloxham Safety Stick to resolve any problem caused by a student freezing on the controls. The instructor pulls a cable that disconnects the student's control stick from the flight-control system and leaves the stick free and harmless in the student's hand. "Surprise!" There have been times when I would have loved to have a Bloxham Safety Control Wheel, had there been such a thing.

According to aviation historian Joseph P. Juptner, an instructor accomplished the same result during the days of the Jenny by conking the student on the head with a fire extinguisher, but this was frowned upon and considered primitive.

When the PT–K was originally built it was uncertain whether the aviation industry would decide that the pilot should operate the control stick with his right hand and the throttle with his left, or vice versa. So that it could be flown either way, the PT–K was equipped with two throttles in each cockpit, one on the right and one on the left. That's right; the PT–K has four interconnected throttles. Take your pick. Also, the throttles are not gripped conventionally. That is, they are not held with an overhand (palm down) grip. The throttles extend down from their pivot points and are operated with an underhand grip (palm up). This initially feels awkward, but adaptation comes quickly and easily.



The PT–K has a wing area of 297 square feet and a light wing loading of only 5.9 pounds per square foot, so it can be a handful in turbulence.

The PT–K is equipped with neither a starter nor an electrical system, so the fixed-pitch propeller must be turned by hand. The first step requires turning it a few times to ensure that oil has not leaked into the bottom cylinders and formed a hydraulic lock.

The engine is then primed four to six times, and the throttle is pumped two to four times or until fuel drips from the carburetor. Although this is undesirable with modern engines, such a "wet start" is standard for the Kinner K-5. After applying pressure to the mechanical heel brakes (rear cockpit only), the pilot is ready to start.

The wood propeller is flicked easily, and the engine starts with a delightful crackling sound that seems to echo from the past. This is when the pilot finds out if he has been sufficiently liberal about oiling the valve guides. Unless the windshields become coated with oil and grease after engine start, the pilot did not use enough of the stuff. This is not a good time to stick one's head out of the cockpit and into the prop wash (or should I say *oil wash*?).

CIGAR (controls, instruments, gasoline, attitude, and runup) serves as a thorough checklist because there is nothing else to do. You never set the altimeter because there is no way to correct a nonsensitive altimeter. (The single hand of the altimeter makes one revolution every 10,000 feet and obviously is not very accurate.)

A sufficiently high oil temperature is critical for takeoff. The engine is not considered warm or safe enough for takeoff unless a full-power, static runup can be performed without oil pressure exceeding 180 psi. If it appears that oil pressure will exceed this value before reaching full power, retard the throttle and wait for the oil to warm further. (Engine oil is changed every 10 hours.)

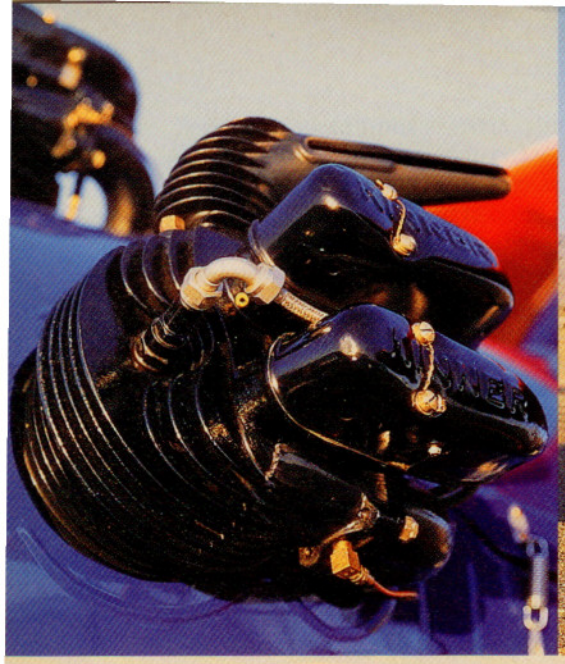
There is nothing remarkable about taking off in a PT–K as long as one is attentive to directional control. With a 10-mph headwind, the aircraft reportedly can lift off in six seconds after a roll of only 100 feet. Climb performance, though, is anemic. One reason that the airplane had little inclination to ascend during my checkout was an ambient temperature of 100 degrees Fahrenheit, resulting in a density altitude at the North Las Vegas Airport of 5,270 feet. It was impossible to reach pattern altitude within the confines of the traffic pattern.

The aircraft's most distinctive visual features are the unusual shape of its vertical stabilizer and its wire-spoke wheels.

The ailerons (two on each wing) are heavy and respond poorly. Sealing the unusually large aileron gaps probably would enhance roll rate and give the PT–K's climb rate a kick in the rudder.

The airplane is not easy to fly; you have to work at it. Particularly disconcerting is that the PT–K approaches being neutrally stable about all axes. If a wing goes down, the nose yaws, or the nose dips, the condition is likely to persist until corrective action is taken.

But one should not complain about the PT–K's handling qualities. According to Maridon, "Designers [of that era]



were more concerned that the airplane would actually fly than how it would fly."

The good news is that pitch trim (an adjustable horizontal stabilizer) is seldom needed because the nose stays wherever it is put, irrespective of airspeed and power variations.

With a wing area of 297 square feet and a light wing loading of only 5.9 pounds per square foot, the airplane responds to every gust and can be a handful in turbulence.

The two rocker-arm pushrods behind each cylinder are exposed and can be seen moving rapidly up and down, each one opposite to the other. It is like watching a pair of sewing machines working in opposition. But you don't need to observe the pushrods to know that the engine is running.

Exhaust stacks atop each cylinder amplify the noise of the engine. Pitch trim, provided by an adjustable horizontal stabilizer, is seldom needed.

Although the 372-cubic-inch engine makes a pleasant sound reminiscent of a bygone era, it makes too much. The airplane is very noisy and not because of its blistering airspeed. A short exhaust stack atop each cylinder seems specifically designed to amplify the noise and aim it directly at the pilots. In later years, radial engines were equipped with

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collector rings that gathered exhaust from all cylinders and directed it beneath the aircraft (and, thankfully, away from the pilots).

The engine in Martin's PT–K is at least as old as the airplane, and Kinner expert Al Ball says that it probably belongs in a museum rather than bolted onto the business end of an airplane. There is no published TBO for the engine, but Ball says that a Kinner K-5 should get about 500 hours between overhauls.

There also is no pilot's operating handbook for the PT–K, and performance information published in some books appears to be more rumor than reality. At the maximum-allowable power setting of 1,810 rpm, the airplane is supposed to step out at 104 mph (not!), and normal cruise at 1,500 rpm is 85 mph. There is no redline airspeed shown in the single page of operating limitations, perhaps because the aircraft could never reach it.

The PT–K reportedly can do a loop from straight-and-level flight, but this seems doubtful.

The aircraft is mild mannered during a power-off stall and simply enters a mushing descent at 45 mph. Based on this, 60 mph seems a reasonable airspeed for climb, glide, and approach. A pilot does not have to worry about the effects of excess speed on final approach because the airplane has built-in speed brakes: its own drag. Pull the power back and it decelerates quickly.

Although wheel landings are relatively easy, a three-point landing is not. This might be because Martin replaced the short tail skid with a large Scott 3200 tailwheel that necessitates touching down in a relatively flat attitude, which almost assures a bounce. Once on the ground, be prepared to work the rudder pedals with vigor. The PT–K seems to have an aversion to rolling straight.

Martin has only 20 hours in taildraggers (some in the PT–K) and has yet to solo his airplane. He wanted to fly it to the EAA AirVenture Fly-In Convention in Oshkosh this year because the airplane would likely be an award winner. But given the aircraft's limited performance, Martin has been discouraged from doing so because of the difficulty he would have crossing the Continental Divide and the incessant work required to keep the airplane on an even keel (especially in turbulence).

Martin's Lincoln is nevertheless a beautiful example of a pioneering aircraft, and its capabilities should be considered in context. Although the PT–K was manufactured in 1930, it is based on a 1921 design that had languished for the better part of a decade. It was designed only 18 years after the Wright Brothers' first powered flight and three years after the end of World War I, and it gives us a wonderful opportunity to fly into the yellowing pages of history and learn what it was like to have been a pilot of that era. ACPA

i Visit the author's Web site (www.barryschiff.com).