

Budget Buys

SILVAIRE SPARK

Separating the axes of flight in a restored Luscombe 8





A series of newly implemented ideas can take a company from struggle to spark.

An all-metal fuselage doesn't seem groundbreaking now, in an era of composites and friction-stir welding, but in the 1930s when most aircraft derived from spruce and grade-A cotton, the Luscombe Aircraft Company made history with the Silvaire. The company also outsourced the manufacturing of many primary materials and components. Today it seems natural that Schweizer Aircraft would produce

specialized winglets for the Boeing 747, or that bonded pieces created by ChemFab in Arkansas are shipped to West Virginia for assembly into the new AG-5B Tiger.

Luscombe's creative use of outsourced materials began well before the Silvaire model series. In the mid-1930s, Luscombe produced a hot rod called the Phantom at its Trenton, New Jersey, factory. Rather than keep airframes around for pilots to select from, the company assembled the Phantom from a collection of farmed-out parts and factory-made pieces after receiving a customer's deposit. Luscombe ordered new parts from its suppliers only when sales dictated, stretching dollars worn to doped shreds in the Depression-era economy.

The company also used an age-old tradition—apprenticeship—and launched a similar program for mechanics in 1936. The first class paid the company \$466 for the privilege of building Luscombe aircraft and thereby learning a skilled trade.

After testing its engineering legs during the design and very brief production of several interim models, the company began work on its best new idea, the airplane that would be the Luscombe Model 8. Originally called the "50" in-house for its new Continental A-50 engine with 50 horsepower, the model went through several iterations and engine upgrades prior to the attack on Pearl Harbor. In the last days of

1941, Luscombe scrambled to finish building airplanes for which it had engines on order. The pre-war run totaled 1,119 airplanes in the Model-8 series with various Continental installations ranging from 50 to 75 hp.

During World War II, production of the Silvaire ceased and the factory, given its expertise with aluminum, filled military contracts. After the war ended, the Silvaire streamed off the line again. A low price and rugged construction—and side-by-side seating—made the Silvaire more accessible to the average consumer than other airplanes of the day. Though it wasn't the easiest to maneuver on terra firma, the Silvaire had no truly bad habits to keep it from flying with its contemporaries, the Stinson 108, the Piper J-3, and later, the Cessna 120 and 140.

And consumers lapped up the new airplane, with nearly 5,800 orders for the 85-hp 8E filled in 1946 and 1947. The 8F would add 5 hp and go on to sell about 860 units in model years 1948, 1949, and 1950.

However, deliveries from the Luscombe factory were agonizingly slow in the first years after the war—while Aeronca boasted a production rate of 20 to 35 aircraft a day in 1946, Luscombes were only coming together at the rate of four a day. When the decision was made to redesign the still-fabric-covered 8A wing for increased production in 1946, the company didn't go straight to an all-metal wing. The original wing was framed with aluminum tubing and took longer to produce than company leaders envisioned. With a new stamped-rib wing, production hit nine aircraft a day in May 1946, but the rate was still too slow to catch up with the 1,000-order backlog.

The all-metal wing came in August 1946. The next year Leopold Klotz, who took controlling interest in the company in 1939 and ushered Don Luscombe out, announced a \$500 price decrease to \$2,495 on the 8A standard model, making it the least expensive all-metal airplane on the market. Klotz felt the price could be sustained because of increases in production efficiency achieved at the factory, which

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PHOTOGRAPHY BY MICHAEL P. COLLINS



had since moved to Garland, Texas. The 8E Deluxe sold for \$3,495. In 1948, the Cessna 140 sold for \$3,345, which did not include a landing light, dual brakes, dome light, or prop spinner. All but the dual brakes were included on the 8E Deluxe. An all-metal airplane made for the masses would finally realize Don Luscombe's dream, though he was no longer part of the company.

The Silvaire may have been a prince at a good price among two-seat airplanes, but the spark didn't last long. With no other models to help the company survive the cyclical drop in aircraft sales at the end of the 1940s and little cash flow from the deeply discounted Silvaires moving out the door, Luscombe stopped paying its taxes and employees and eventually hit bottom in 1949.

By 1950, Temco—which had recently bought rights to another popular bird, the Swift—purchased the bankrupt company. It delivered about 50 8Fs (with flaps and a 90-hp engine) in 1950 and 1951 after a failed swing at a military contract with the Observer liaison model. Temco then sold the production rights, tooling, and other equipment in 1955 to Otis Massey and what would become the Silvaire Aircraft Company based in Fort Collins, Colorado. Silvaire produced 80 8Fs through 1960. Moody Larsen bought the type certificate in

A light-airplane speed record for a production aircraft with a 65-hp engine was set by Edward Walz in a Luscombe 8A on January 30, 1940, at 118.746 mph. Most Luscombes don't fly that fast without the benefit of extra horsepower.

late 1963 and focused his efforts on conversions to the 8 series, including a popular supplemental type certificate for a 150-hp conversion (see "Classic With Punch," February 1986 *Pilot*). Out of production, the model languished until 1994, when the Don Luscombe Aviation History Foundation (DLAHF) purchased the type certificate.

DLAHF

One lifelong attachment to the Luscombe began 30 years ago. Doug Combs, who leads the DLAHF, started flying tailwheel aircraft while working as a lineboy in Urbana, Illinois, in the early 1970s. He flew the Aeronca Champ first, and then he checked himself out in a Luscombe 8E that he bought and restored while in airframe and powerplant school. ("Self-checkouts are not the way to do it," he advises.) He flew a Luscombe on pipeline patrol across the Midwest while in college when the Cessna 172 was down: "Fifteen hundred miles of low altitude each week plus a six- to eight-hour cross-country home." Combs was also on the flight team for Southern Illinois University in 1976, flying



Serial number 5920, rolled out the door on January 5, 1948, and was the first of the 8 series equipped with the Silflex landing gear, also installed on Nievin's Luscombe (top). A handle installed on the empennage aids in parking the airplane (bottom).

rather than building new airplanes, the foundation focuses on rebuilding 8-series Luscombes from assembled airframes and parts—learning from the past to keep the model flying for another generation. The foundation also incorporates new ideas to solve problems that have surfaced over the model's life span.

his 8E in precision landing and other nonaerobatic competitions.

The DLAHF concept germinated in 1990 to promote and preserve Luscombe aircraft, with incorporation and tax-exempt status achieved in 1992. In 1994, the foundation purchased the Luscombe 8-series type certificates. The type certificate on the Luscombe 11A Sedan (a four-place, high-wing single) went to Land Air Sales in 1992, and was subsequently transferred to Luscombe Aircraft Company, of Altus, Oklahoma. The company revised the 11A to the 11E Spartan with a 185-hp Teledyne Continental engine, and the 11E received its type certificate in December 2002. The DLAHF, based in Chandler, Arizona, and the Luscombe Aircraft Company are separate entities.

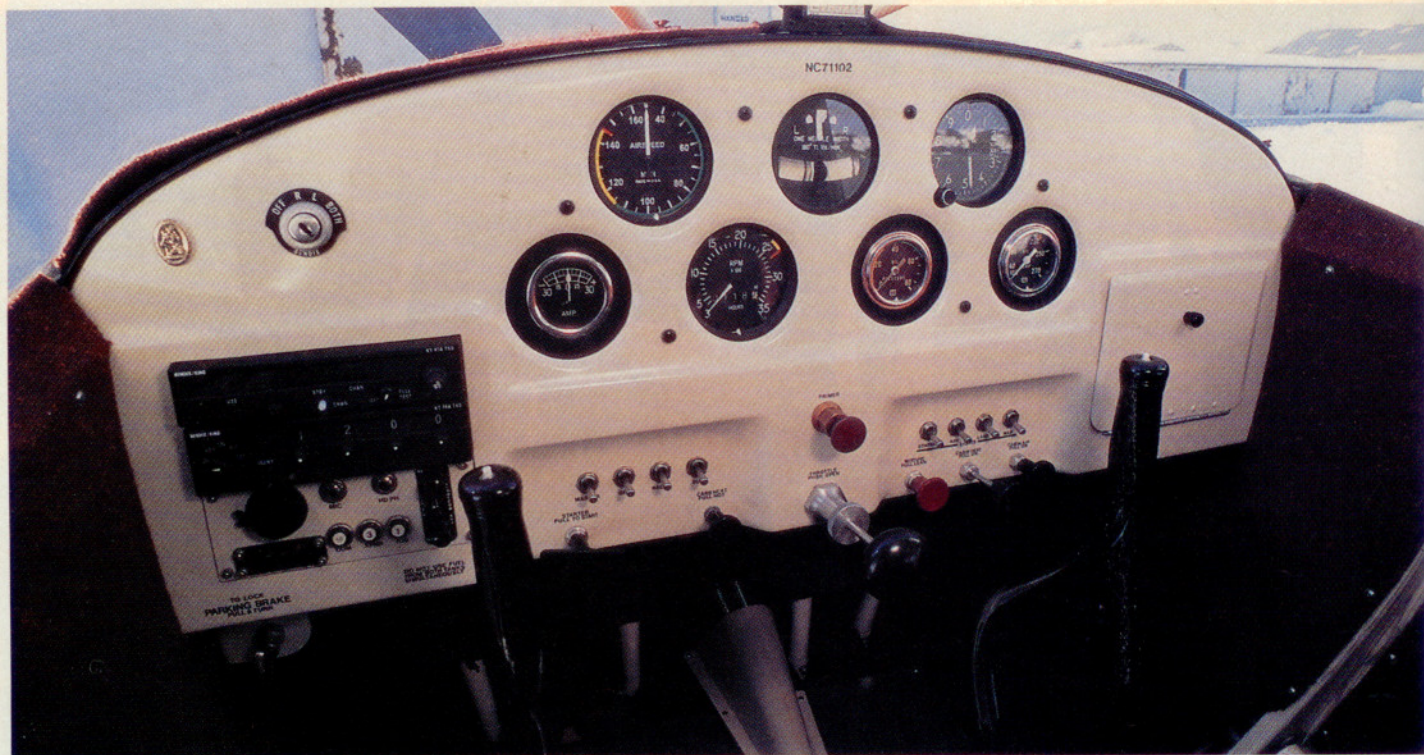
Recently the foundation turned a corner in its relationship with the FAA, and Combs expects to expand some PMA certifications this summer. With several hundred thousand dollars' worth of parts inventory on the DLAHF shelves, he foresees no parts problems except with a few select items: "Those will get handled," says Combs.



A venturi on the right side of the cowl (above) supplies vacuum pressure for the airplane's turn and bank gyro.

Newly built parts are a small sideline to the restoration work and inventory of scavenged parts that DLAHF keeps. Gaining parts manufacturing approval (PMA) to create new parts for a 1940s-era airplane has been a rough road. Deriving important data from the original drawings and coming up with creative solutions to engineering and materials problems have proved challenging, as has coordinating this effort with the FAA. In one example, when building a strut for the fabric-covered wing the foundation discovered that replacing the original 1010 tubing with new 4130 tubing required shaping at the inboard fitting area not specifically depicted on the original FAA-approved print. The end result wasn't pretty, though it was serviceable. Some re-engineering and modifications were needed to resolve the material substitution matter.

Those will get handled," says Combs.



Hits and Misses

Hits

- Great short-field capability. Control stick contributes to ease of handling.
- Parts support good for an antique aircraft.
- Reasonable cruise speed for its class.
- Economical fuel burn.
- Side-by-side seating in a tail wheel aircraft.
- Fair payload for its class.

Misses

- Unique ground handling requires competent instruction in the model.
- Corrosion in the wings and fuselage a potential minefield; many available need extensive restoration.
- Original fuel selector valves problematic.
- Seats vary widely; many not adjustable.
- Those with low-hp engines may not have electrical systems; venturis used for gyroscopic instruments.

The basic configuration of NC71102's panel reflects its connection to an ingenious era.

foundation gave away its tenth airplane last fall and limits ticket sales to 2,800. Tickets run \$40 for one, \$100 for three, and \$300 for 10. In addition, the foundation has several airplanes available for sale or for use as future raffle airplanes. More airframes are donated each year, along with loose parts.

Another good source for Luscombe information and social support is the Continental Luscombe Association (www.luscombe-cla.org). CLA fly-ins take place every year at various locations around the country, including the annual Gathering of Luscombes in Columbia, California, scheduled for May 16 through 18, 2003.

An all-around winner

Garrett Nievin met his DLAHF-restored 1946 8A/F in October 2001. An aviation nut since his days as a teen in the Aviation Explorers wing of the Boy Scouts of America, Nievin had flown an 8A at a local FBO while stationed at Kelly Air Force Base in San Antonio. After a move that took him back into Cessnas for a while, the bug to own a tailwheel airplane bit hard. Though friends steered him toward the Aeronca Champ, Nievin found that the Luscombe still appealed to him.

Most Luscombe 8s that fly today bear little resemblance to how they came off the production line. No Frankenstein's monster, Nievin's *Silvaire*, NC71102, instead represents parts and pieces of the model's history carefully mated into a more perfect whole.

In its original state as an 8A, NC71102 first flew on fabric-covered wings. The original owner, made anonymous by fading history, installed a pair of all-metal wings after 220 hours on the airframe. NC71102 then suffered an accident and was sold to another owner who promptly wrecked it, after which it was put into storage. The rust and ravages of time crept in; the airframe only had 340 hours on it when the DLAHF began its work.

Because Luscombe made several different wings across the 8-series run, fuel tanks vary from 14-gallon fuselage tanks in early models to 15-gallon Pliocel nylon wing tanks in later ones. In fact, it's not out of order to find some Luscombes



ferrying two different-size tanks—so many of the aircraft have suffered mishaps over their nearly 60-year life spans that intermodel marriage of replacement wings isn't frowned upon. Nievin's Luscombe has a 12.5-gallon tank in each wing.

Original 8-series cowls required folks working on the airplane to remove the spinner and propeller in order to fully remove the cowl. A split cowl made by the DLAHF allows less painful access on NC71102 and also shrouds another upgrade: the 90-hp Continental engine.

A 65-hp Continental A-65 engine first sent the 8As skyward, but Nievin wanted more power. He bases the airplane at Leesburg, Virginia, tucked under a 1,500-foot shelf of the Washington, D.C., Class B airspace. Sixty-five horses aren't enough to drive a serious generator, and Nievin wanted not only a com radio and transponder, but also strobes to stay visible amongst the high-density traffic in the area. The 90-hp engine was hung, and NC71102 converted to an 8A/F. He bought an alternator that he'll use to replace the generator currently installed for more consistent operation at low rpm. However, the 12-volt battery alone has proven enough to power the modest avionics stack (two slim units high) and pull starter for several cranks and a couple of hours' flying time. Staying small has its rewards.

You don't have to *be* small to enjoy the Luscombe. Nievin's in-type friends refer to him as the world's largest Luscombe pilot, because, at 6 feet 4 inches, he fills the cockpit. Though somewhat limited in his choice of passengers—those busting the standard FAA person weight budget need not apply—Nievin finds the airplane quite comfortable. Or maybe he just enjoys the way it flies too much to argue with the tight quarters.

Nievin has flown NC71102 as far as Oshkosh, Wisconsin, for EAA AirVenture 2002, where the airplane took the Best Luscombe award. He credits the DLAHF for this, as its restoration left no sheet metal untouched. The 8 series carries one large bugaboo, one that was corrected during the restoration of Nievin's aircraft, owing to the live-for-the-moment outlook of its manufacturers: Dissimilar metals touch and electrify each

The diamond around the S signals a postwar 8A Silvaire; pre-war model 8Cs and -Ds had a circle around the S. Luscombe returned to the circled S with the 8E—just one clue in determining what model Luscombe you're viewing. Luscombe employees tagged the airplane with the Silvaire name.

Notable ADs

AD 55-24-01 requires the inspection of the cabin superstructure carry-through spars. In 2001, the DLAHF recommended a process to eliminate this repetitive inspection in Luscombe Foundation Service Recommendation #8.

AD 94-16-05 was addressed by Luscombe Foundation Service Recommendation #1 in 1993, which noted a fitting upgrade to the round-tipped vertical fin (some later models have a squared-off vertical fin).

Wing internal inspection kits have been produced by the DLAHF and wing inspections are addressed in Luscombe Foundation Service Recommendations #2, #6, and #7.

Additional **corrosion problem** areas are addressed in Luscombe Foundation Service Recommendation #10.

other throughout the airframe, creating pockets of corrosion in places that don't often see the light of day.

For this reason, a number of the Luscombe 8s advertised for sale in the \$15,000-to-\$20,000 range aren't necessarily good buys. "People think it's cheap, indestructible, and requires no maintenance. None of that is true," says Combs. A lot of "really pretty flying basket cases" lurk in hangars ready for the unsuspecting buyer.

You have two options, according to Combs and other Luscombe experts: You can spend \$15,000 on a project and put \$30,000 into the restoration, or you can spend \$40,000

to \$50,000 and get a nice-looking airplane that's also healthy beneath its skin. NC71102 cost \$44,000 after restoration by the foundation, and it has been essentially trouble-free.

The truism applies to many aging airplanes. "It's the nickels and dimes, but it's also the time involved," says Nievin. "Something breaks and there's two weeks that it's down."

The fabric wings had 13 to 15 inspection holes that allowed for a closeup look at wing spars. The metal wings had panels but no access except for where the aileron cables run through pulleys. One

answer to the lack of original access panels is to cut new ones, an idea that doesn't sit well with purists. Nievin's airplane has an additional six access panels on the wings' leading edges.

Improvements made to the 8A include one that helps mitigate the airplane's reputation for aileron heaviness. For whatever reason, most Don Luscombe-inspired airplanes, going back to the Monocoupe, are heavy on the ailerons and light on the rudder.

Over the years, bad pulleys, frozen bearings, and tight cables (Luscombe aileron-cable tension is measured by

finger displacement, not by tension meter—these cables have a lot of play) led to complaints that the ailerons don't feel like they should. Nievin's 8A has the benefit of new well-lubricated bearings and proper maintenance.

To work with the lighter-than-average rudder, Nievin devised a clever solution. In the summer, he flies barefoot, resulting in a light touch. For winter flights, like those we made for this story, he wears down-filled booties. The technique works, as other Luscombe aficionados have found.

A good fit

While I'd read that the Luscombe was "reathy," I found that with a cushion behind me to help reach the rudder pedals, the controls fit fine. Because of my 5-foot-5-inch frame, I also felt little need to duck to see out from under the wing.

Since I was not proficient in tail-wheel aircraft during the writing of this article, I approached the airplane as a pilot transitioning from tricycle-gear craft and began a course of instruction in a 150-hp 8F. My apprehension in the face of stories regarding the Silvaire's ground handling softened as I came to understand the reasoning behind this reputation.

The airplane comes off the ground in short order on a cold day at sea level, especially with one of the higher-horsepower engines. No "rotation" is involved—the airplane flies itself off in a three-point attitude, the same one for which you strive on landing, an attitude preferred by most Luscombe pilots interviewed for this story. The lightness of the rudder becomes apparent early in the ground roll, and it's easy to overcorrect until you have flying speed.

Medium-bank turns fall to hand nicely, with definite rudder pressure needed in both directions. However, as turns steepen, the heaviness of the ailerons comes into play, and sharp lazy 8s take practice, as do crisp Dutch rolls. Power-off stalls involve mush rather than break, and we didn't do any power-on stalls during our test flight because of low ceilings—a stunning angle of attack is required in models with 90-plus hp.

Contrary to some dubious popular "wisdom," the Silvaire is not an Aerobatic category airplane and never was, by modern definition. The airplane was originally stressed to 4.5 positive and 2.2 negative Gs—hardly outside the realm of the Normal category today.

You don't want this Escort!

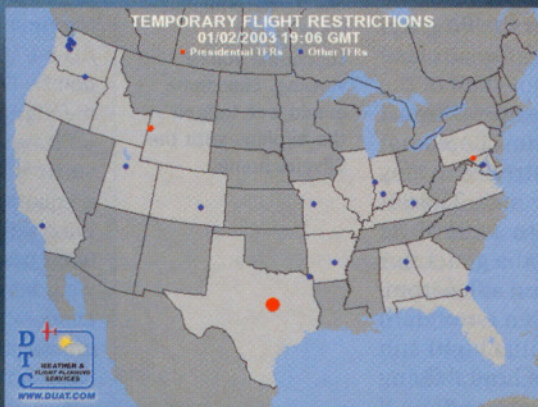
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And 50-plus years of age and unknown handling lead prudent Luscombe pilots to honor the green arc and not stray from normal maneuvers.

The Silvaire doesn't have flaps, so the prelanding check involves assuring adequate fuel supply (the wing and fuselage tanks are independently set on and off) and applying carburetor heat before slowing down the airplane. The Silvaire is slippery and easily surpasses its 115-mph V_{NO} (maximum structural cruising speed) when going downhill. Slowing to 80 mph on downwind and to 70 mph (or 65 if lightly loaded) on final is paramount. The airplane has a lot of rudder authority despite its light feel, so slips to

adjust glidepath are positive and fun. The airplane can handle a fair amount of crosswind: You cannot accept any drift at the moment of touchdown, which is true of most conventional-gear airplanes.

We did three-point landings during our flights. On rollout, the rudders' sensitivity was apparent. Pressure—that's all—guides the airplane straight, with any wind handled by displacing the ailerons. All airplanes, conventional or not, can be flown better by separating the flight axes in this way, rather than the pilot allowing the landing gear and tires to absorb the shock of a less-than-straight touchdown.

We could feel my pilot-induced oscillations from overcontrolling the rudder during each landing, but with practice and some more instruction, the right amount of rudder pressure will come to me. Sometimes revisiting "old" ideas can spark new ones as well.

ACPA

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i Links to additional information about Luscombe aircraft may be found on AOPA Online (www.aopa.org/pilot/links.shtml).

SPEC SHEET

Luscombe 8A/F

Current market value: \$14,000 to \$50,000

Price as tested: \$44,000

Specifications

Powerplant	Continental C-90, 90 hp
Recommended TBO	1,800 hr
Propeller	McCauley 2-blade, 71-in dia, fixed pitch
Length	20 ft
Height	6 ft 3 in
Wingspan	35 ft
Wing area	140 sq ft
Wing loading	10 lb/sq ft
Power loading	15.5 lb/hp
Seats	2
Standard empty weight	940 lb
Max gross weight	1,400 lb
Max useful load	460 lb
Payload w/full fuel	310 lb
Fuel capacity, std	25 gal (25 gal usable)
	150 lb (150 lb usable)
Baggage capacity	75 lb

Performance

Takeoff distance, ground roll	575 ft
Rate of climb, sea level	800 fpm
Cruise speed/range w/45-min rsv (fuel consumption) @ 65% power, best-power mixture, 5,000 ft	105 mph/410 nm (5.5 gph)
Service ceiling	16,500 ft
Landing distance, ground roll	450 ft

Limiting and Recommended Airspeeds

V_X (best angle of climb)	65 mph
V_Y (best rate of climb)	70 mph
V_{NO} (max structural cruising)	115 mph
V_{NE} (never exceed)	145 mph
V_{S1} (stall, clean)	48 mph

All specifications are based on manufacturer's calculations, but please note that most modern performance figures were not required by the Civil Aviation Authority (CAA), nor were they developed by the manufacturer. Therefore, the figures given are based on operator experience and may vary. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.



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