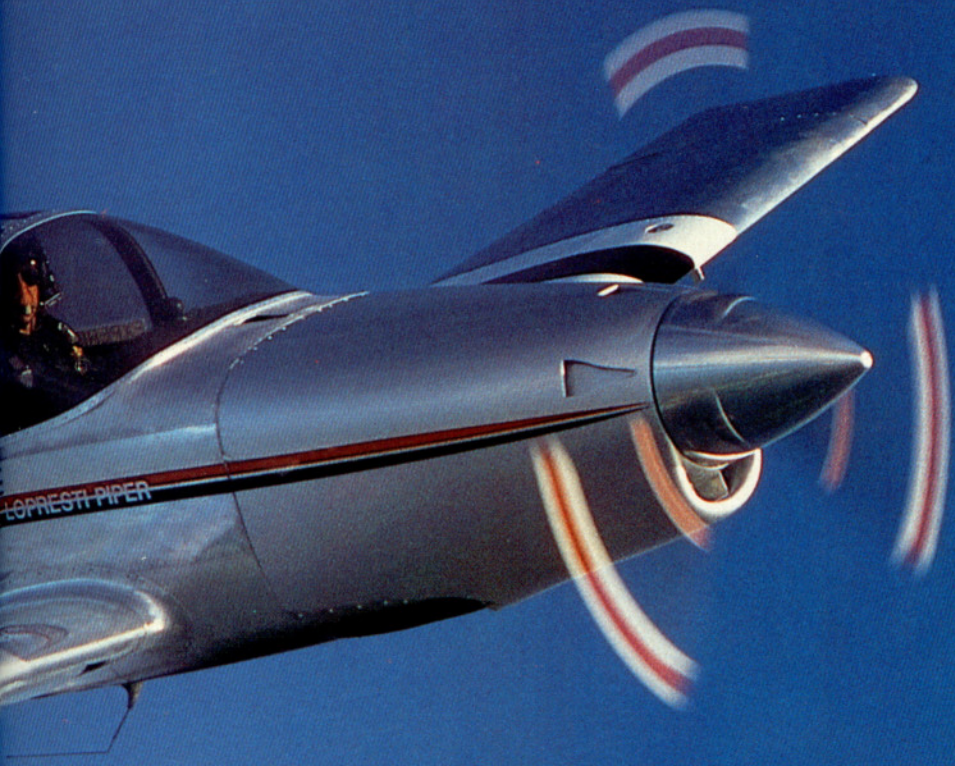
SWIFTER THAN EAGLES



LoPresti Piper Unleashes the Swiftfire

BY SETH B. GOLBEY

"They need to be very fast. They need to be so good-looking that people will drool over them. And they need to have great flying qualities." That's how Roy LoPresti describes the aircraft to be developed by the LoPresti Piper Aircraft Engineering Company. If the

PHOTOGRAPHY BY MIKE FIZER

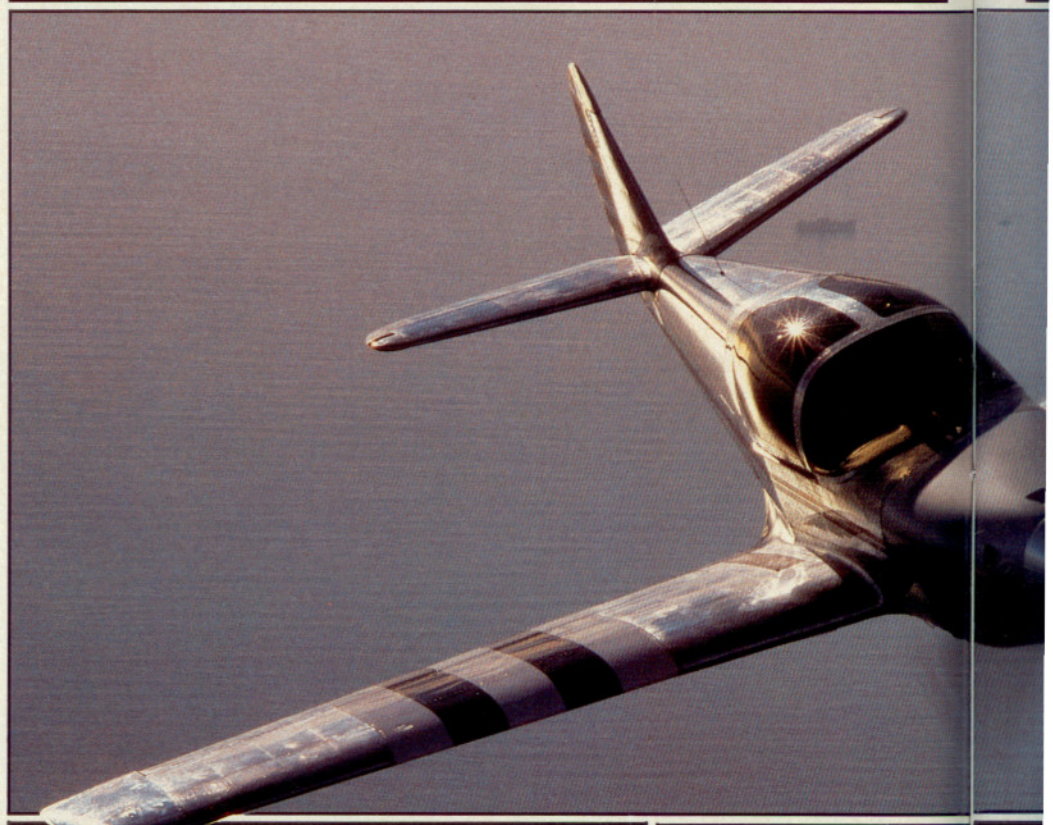
Swiftfire is any indication of this philosophy in action, general aviation's newest skunkworks is off to a very exciting start.

Fast? Just look at the N number—345LP. When LoPresti's drag-reduction program is complete, he expects this airplane, with its 420-shaft-horsepower Allison 250-B17C turboprop, to cruise at 345 mph (300 knots).

Good-looking? Judge for yourself. From various angles, the Swiftfire resembles the Curtiss P-40 Warhawk, North American P-51 Mustang, or Supermarine Spitfire. The long cowl with its hidden exhaust stacks, the large spinner, and the newly retractable tailwheel add an element of streamlining absent from off-the-shelf models.

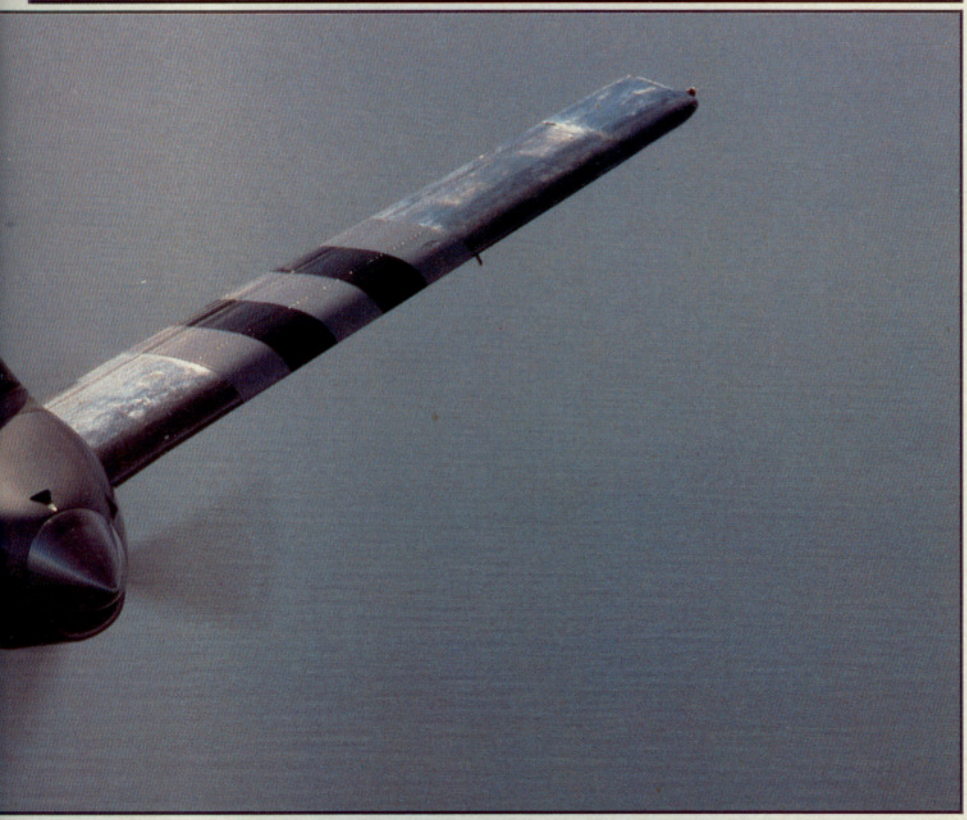
Great flying qualities? When *AOPA Pilot* visited LoPresti Piper's headquarters in Vero Beach, Florida, the Swiftfire had logged just three flight hours, but Roy LoPresti was already pleased. "It's just a delight. It makes you feel like you want to roll the airplane; you want to do aerobatics. When you fly the new Swift, you're going to say, 'Damn, that is absolutely wonderful,' " LoPresti promises.

While the corporate charter of LoPresti Piper as a research and development company is to develop new airplanes to be manufactured by the Piper Aircraft Corporation (see "Pilot to Pilot: LeRoy P. LoPresti," February *Pilot*, p. 47), the company is wholly independent of Piper and is free to develop aircraft for other manufacturers as long as these designs do not compete with Piper's product line. LoPresti Piper is even located on the opposite side of the main runway from Piper at Vero Beach. The most direct connection between the two companies is that LoPresti Piper is owned jointly by LoPresti and M. Stuart Millar, Piper's visionary owner. The partnership is an auspicious one. The two men first met on October 31, 1987, and, as LoPresti puts it, "the vibes were



SWIFTFIRE

"I know what sells. Sex sells in the airplane business." Roy LoPresti's philosophy of design is that an airplane must look good, fly fast, and possess superior handling qualities. The Swiftfire is LoPresti's aerial Ferrari.

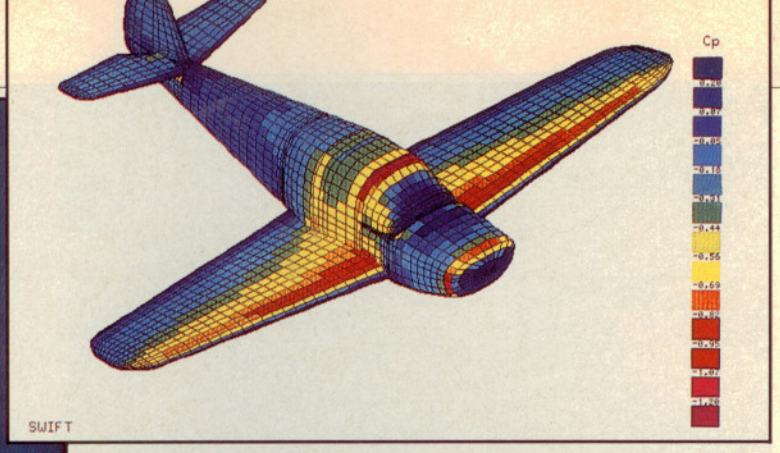


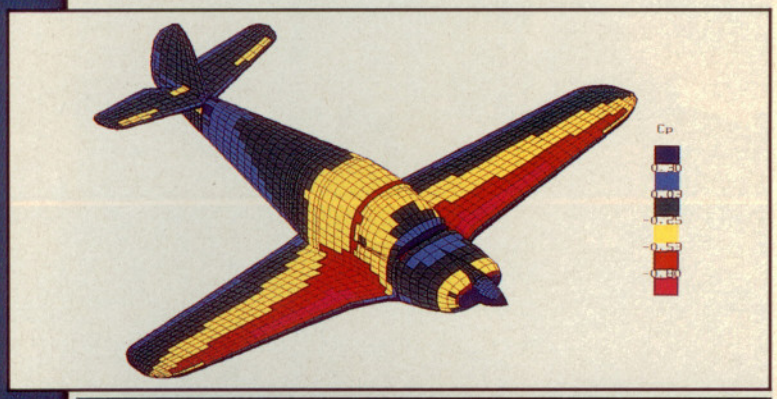
just superb." Several months ago, at the outset of the Swift program, LoPresti promised Millar he'd have an aircraft in the air within 100 days. He almost made it. The Swiftfire made its maiden flight on July 19, 101 days later.

At the time of our visit, four days after the Swiftfire's first flight, the aircraft had been run up to 90-percent power in climb but was limited to 165 knots pending successful completion of flutter tests. Until a full flight test program is completed, final performance figures will not be available. The airplane's speed and agility were obvious, however, throughout our air-to-air photography session.

The Swiftfire is based on the venerable Globe/Temco Swift, 1,521 of which were built from 1946 to 1951. (For the history of the Swift and a description of some of the modifications currently available for existing Swifts, see "Yesterday's Wings Today: Becoming of Age," April 1986 *Pilot*, p. 60.) The seeds of the Swiftfire were sown in LoPresti's imagination during conversations with people who saw the need for a small turbine aircraft in which to train future airline pilots. His thought was "Let's put a turbine engine in the airplane and see what it's like. If it makes good sense, we'll reconfigure it with a nose gear and stretch the fuselage to four seats. You'd have an airplane that flies at about 300 knots, is fun to fly, is sexy as hell, and can be used as an airline pilot training airplane or can be used by the wealthy guy who wants the best he can get."

LoPresti is not just developing the Swiftfire, but is exploring a family of developmental Swift designs. He envisions an array of two- and four-seat tailwheel and tricycle-gear airplanes powered by turbine and piston engines. By early October, a 180-hp Lycoming piston-engine-powered version is expected to fly, and "we have on the drawing





SWIFTFIRE

A 37-percent reduction in drag for the stock Swift (top) was achieved through computational aerodynamics. State-of-the-art computer-aided design is an essential tool in the LoPresti Piper engineering department.

board a four-place, tricycle-gear, [200-hp] version that will blow the doors off the Mooney 201," LoPresti says.

The Swiftfire and other derivatives will benefit from the kind of aerodynamic and systems refinements that have made LoPresti noted among aircraft designers and engineers for his ability to extract significantly improved performance from production airplanes.

The renaissance of the Swift begins with an all-new control system in which control sticks replace the standard yokes. Aileron and elevator control cables will be replaced by independent push rods, one for each control surface. "You can lose the left elevator and the left push rod and still fly the airplane with the right elevator and the right push rod. Same for the ailerons," LoPresti explains. "It's a level of redundancy you don't find in nonmilitary airplanes."

The aircraft's drag-reduction program is being performed with the assistance of aerodynamicist John Roncz, who worked with LoPresti on the Starship program when LoPresti was chief of engineering for Beech. Using a computer modeling technique known as computational aerodynamics to explore the effects of various airframe configurations on drag, the engineers saw a curious and suggestive fact emerging.

In 1946, when the Swift's original 85-hp engine was replaced with a 125-hp powerplant, lead was added in the tail to balance the heavier engine. LoPresti is mounting even heavier engines, so to avoid adding weight to the tail, he is moving the wing four inches forward. (This has the added benefit of increasing the tail arm, which is good for stability.) The engineers were surprised to find that, according to the computer model, the new wing position would dramatically decrease drag. Additional analysis indicated that the airflow

A

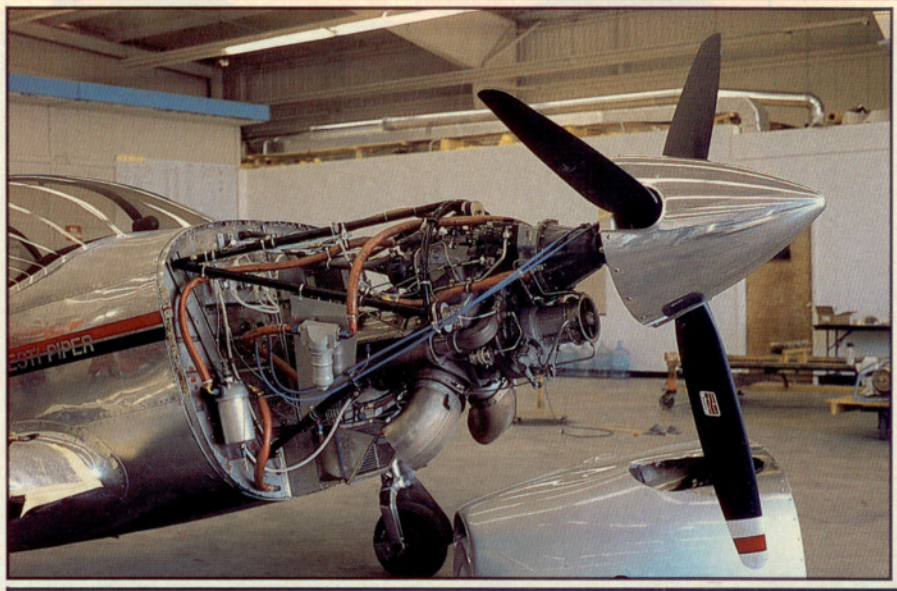
around the fuselage and the airflow around the wing interacted very poorly in the original configuration. The interaction of the flow fields was greatly improved, however, by moving the wing forward.

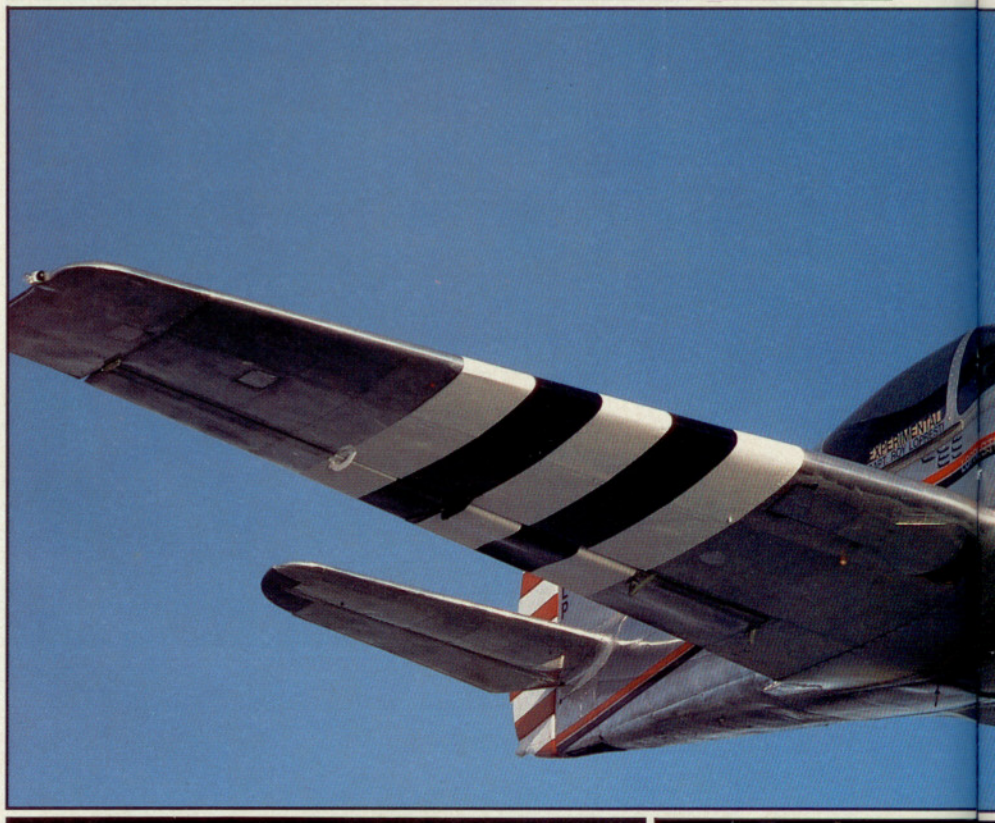
Other drag-reducing measures include changing the incidence of the tail, increasing the dihedral of the horizontal stabilizer, installing a retractable tailwheel, revising the canopy shape, completely enclosing the main gear when retracted, eliminating the use of corrugated metal and leading-edge slots on the wings, installing wing-root fairings, using flush rivets throughout, using butt joints instead of lap joints on skin panels, and replacing the large extrusion at the base of the canopy with an internal structure. "The net effect is a reduction of drag of 37 percent," LoPresti says with satisfaction. (The Swiftfire you see here had not yet undergone much of this "tweaking.")

Enthusiastic as he is about each of the potential incarnations of the Swift, LoPresti is nevertheless quick to point out that no decisions have been made regarding production or pricing of any individual model. Any production would be new production, not modification or remanufacturing of existing aircraft, and aircraft manufacturing is not the job of LoPresti Piper.

The Swift is not the only hot project at the skunkworks. In one corner of the hangar stands a turbocharged Comanche 260C, which LoPresti intends to make over into a 285-mph (248-knot) four-seater. Plans for this airplane include a windshield/door combination that is hinged at its front center and sweeps around the cockpit without corner posts; the whole affair will lift up on gas pistons. LoPresti is also considering a sidearm controller to replace the conventional control wheel.

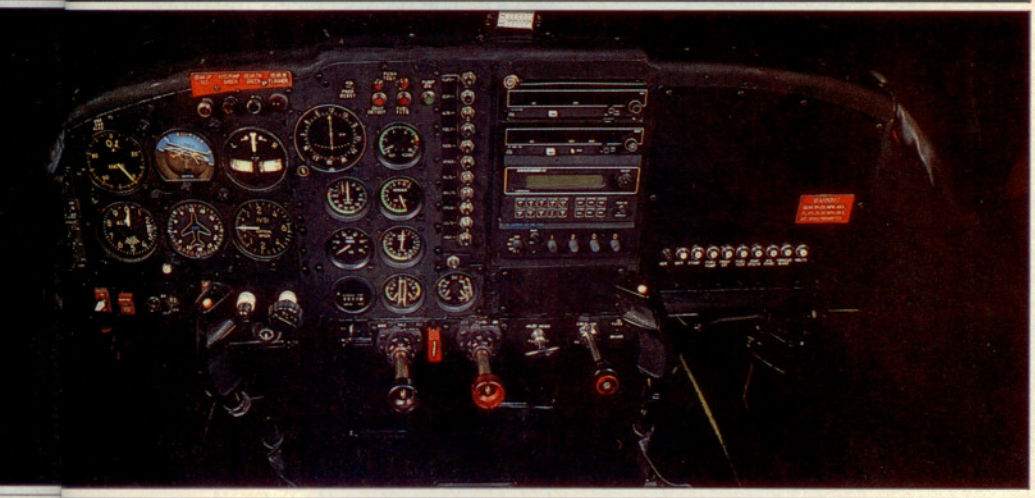
The company is also in the initial stages of designing an all-new "very low-cost" airplane,





SWIFTFIRE

The Swiftfire is a no-frills experimental airplane, but its progeny may include two- and four-seat models using piston and turbine engines. Tricycle and taildragger versions are contemplated, but no plans for production have yet been made.



"kind of an everyman airplane." While details have not been finalized, this airplane probably will not use a Lycoming or Continental powerplant due to their high cost. An alternative engine is being sought.

Still, LoPresti won't waste his time on purely theoretical "paper" airplanes. "You can't see a paper airplane. You've got to sit in it, fly it. You've got to feel it. You've got to fall in love with it. You can't fall in love with a piece of paper."

LoPresti is eager to share the credit for the company's projects with his staff. As president of LoPresti Piper, he is aided by sons Curt (Swift project engineer), Jim (Comanche project engineer), and Dave (administration); wife Peg (executive assistant); engineer Rocky Howard (chief of structures); and shop supervisor Jack Jansen. About 30 other employees, divided among the shop, the engineering department, and the front office, constitute the rest of the crew.

Clearly, Roy LoPresti shares Stuart Millar's dedication to general aviation. Reflecting on an industry that has had little to celebrate in recent years, he says, "In our business, the company lives or dies by the product. If we provide new and exciting airplanes and Piper produces those airplanes, they'll do well. Not only is it important psychologically for us to be successful, it's good for Piper, and it's good for the country.

"If Piper isn't successful, you're going to find that business is going to go to France, to Germany, and eventually to Japan. I don't want to see that happen. It's a war, but in this war, no one gets killed; you just lose your job. If we do our job well, Piper ends up being successful, and if Piper is successful, the personal airplane business stays in this country where it belongs and where it deserves to be.

"It's a responsibility we don't take lightly." □