



Peppy Pipers

How to turn a Cherokee 140 into an Archer for \$3,200.

A speed boost of 20 mph is pretty impressive in a 170-mph airplane like a Mooney Executive. Such an increase would be absolutely astounding in a 130-mph turtle like a Cherokee 140. However, that's what Laminar Flow Systems, the Virgin-Islands-based Piper mod shop, is claiming for its souped-up prototype Cherokee trainer. And several *Aviation Consumer* flights in the LFS testbed suggest that the ratty old 1966 140 with its 2,300-hour engine is indeed a 150-mph-plus airplane that will outperform a Cherokee 180 and perhaps even nip at the heels of a 200-hp retractable Arrow.

Over the past two years, LFS has developed a set of wing modifications (flap and aileron gap seals, flap track fairings, wing rivet fairings and leading edge contour smoothing) for the Piper Seneca,

Lance, and Cherokee lines. The wing improvements usually add 10-17 mph cruise speed on these aircraft.

LFS chief Robin Thomas has now come up with two more engine and airframe modifications which, combined with the wing mods, improve the lowly 140 to a startling degree. At this writing, neither new mod was FAA-approved yet, but Thomas anticipates approval soon.

Fancy Pants

The first improvement is a set of fairings for the standard-issue Piper wheel pants on the 140 and all the other early Cherokees. (About 1979, Piper offered a much more refined mainwheel pant; the LFS pant fairings won't fit those.)

The standard Cherokee wheel pant, like most others, seems to defy all logic. Piper put the pant around the tire, which is already curved and smooth, but left the dangling sharp-cornered brake mechanisms, compression struts and nosewheel forks exposed to the airflow. The LFS fairings cover up these gaping airflow interrupters and fair them smoothly into the wing and the Piper pant.

Mod number two is a tuned engine exhaust system. In a tuned system,

Bedecked with wing and landing gear fairings, this lowly Cherokee 140 can cruise at 150-plus mph and rival an Archer in vigor.

all the exhaust pipes are carefully dimensioned so that reflected exhaust pressure pulses "scavenge" the exhaust and improve engine breathing. A properly designed system can increase power to a surprising degree. (Much of the Piper Malibu's excellent performance is credited to a tuned exhaust system, but no other aircraft that we're aware of has one.)

Bow-Wow

Taken all together, the wing, wheel pant and exhaust mods do wonders. The LFS prototype airplane, in its original stock form, was always considered a terrible dog around the St. Thomas, Virgin Islands airport where LFS is based. "Every time I took off in it, I prayed," commented one previous owner of the plane. "It barely cleared the pass at the end of the runway." Thomas bought the plane for practically nothing, set to work modifying, and has turned the former dog into a greyhound.

This metamorphosis was rather graphically demonstrated when Thomas and an *Aviation Consumer* reporter flew the LFS testbed side-by-side with a standard Cherokee

140 now owned by the former dog-owner.

We allowed the standard airplane to take off a minute ahead of us. But within eight minutes, to the great astonishment of the other Cherokee pilot, her former dog had made up both the one-mile head start and the 500-foot altitude advantage, and was climbing away from her at a very smart clip.

"Pretty Impressive"

After leveling off at 6,000 feet, we tried a side-by-side speed race. It was no contest; we passed the standard airplane easily. The other pilot, as she watched her former dog zip by, radioed, "Okay, Robin, you've made your point." Later, on the ground, she commented, "That was pretty impressive."

Our indicated airspeed had been 140 mph, hers about 117. Our indicated 140 mph worked out to a rather phenomenal 155 mph true. (We later calibrated both airspeed indicators to confirm these readings.) It's hard to escape the conclusion that the LFS mods add at least 20 mph.

Are we to believe that this lowly ancient Cherokee 140 can actually outpace a brand new 180-hp Archer II with tapered wing and high-tech Piper pants (book speed 149 mph)?

PR Race

To erase all doubts, Thomas, a master of public relations, organized an air race for the principle purpose of demonstrating the merits of his Cherokee mods. "The Caribbean International Simple Airplane Race" took place at St. Thomas on February 24, and was open to all fixed-gear, fixed-pitch airplanes. The idea was to lure in a bunch of standard Cherokees and blow their doors off in the name of LFS product promotion.

Ten planes entered the race, including six Cherokees of various types. A Cessna Hawk XP (technically ineligible because of its

constant-speed prop) was allowed to enter because the owner was a buddy of Thomas's, and because the ever-confident Thomas secretly believed he could beat the 195-hp XP as well.

He was almost right. The LFS Cherokee 140, with an *Aviation Consumer* reporter aboard, stayed right with the XP, in both climb and cruise, until late in the race. We finally finished 45 seconds behind the XP over the 77-mile course. Our average speed for the race was 126 mph, which included take-off and climb but no high-speed descent (the finish line was at 6,000 feet.) The LFS Cherokee burned 7.9 gallons of fuel, compared to 11.8 for the XP.

Thomas feels he would have beaten the XP but for an unexplained



Standard Piper wheel pants (top) leaves mechanical guts exposed, and adds only three mph over bare wheels. LFS fairings (bottom) hide rough spots and boost speed 10 mph.

drop in indicated airspeed in the latter part of the race. Under the same conditions in which the plane had indicated 140 mph a few days previously, the plane showed only 133-35 during the contest. Thomas immediately did a compression check on the engine and says he found two cylinders way down. He vows to fix the engine and challenge the XP to a match race.

King of the Cherokees

As expected, the LFS 140 beat the other Cherokees in the race—two stock 140s, an old 180 and two taper-wing 160-hp Warriors, one with the latest Piper wheel pants. The Warrior owner had gone to great lengths to prepare for the race, pre-running the course several times, waxing his plane to a high sheen, and (he claimed with a semi-straight face) rubbing the wing leading edges with chicken fat. Nevertheless, the grungy LFS 140 averaged three mph faster for the race and used less fuel to boot.

The LFS-140 soundly trounced the pair of stock 140s by an average of 16 mph, burning 20 percent less fuel in the process. Using the CAFE formula for fuel efficiency (speed x miles per gallon), the LFS ship handily beat all the four-place planes in the race, including the Hawk XP.

20 MPH

Engine perturbations aside, it's clear to us that the LFS wing, wheel pants and exhaust mods add at least 20 mph to the Cherokee 140, and perhaps as much as 26 or 27. (That's the figure claimed by Thomas, based on a comparison of the original unmodified dogplane to the finished speedster.) We couldn't vouch for a 27-mph speed increase, but 20 looks pretty good, based on what we saw.