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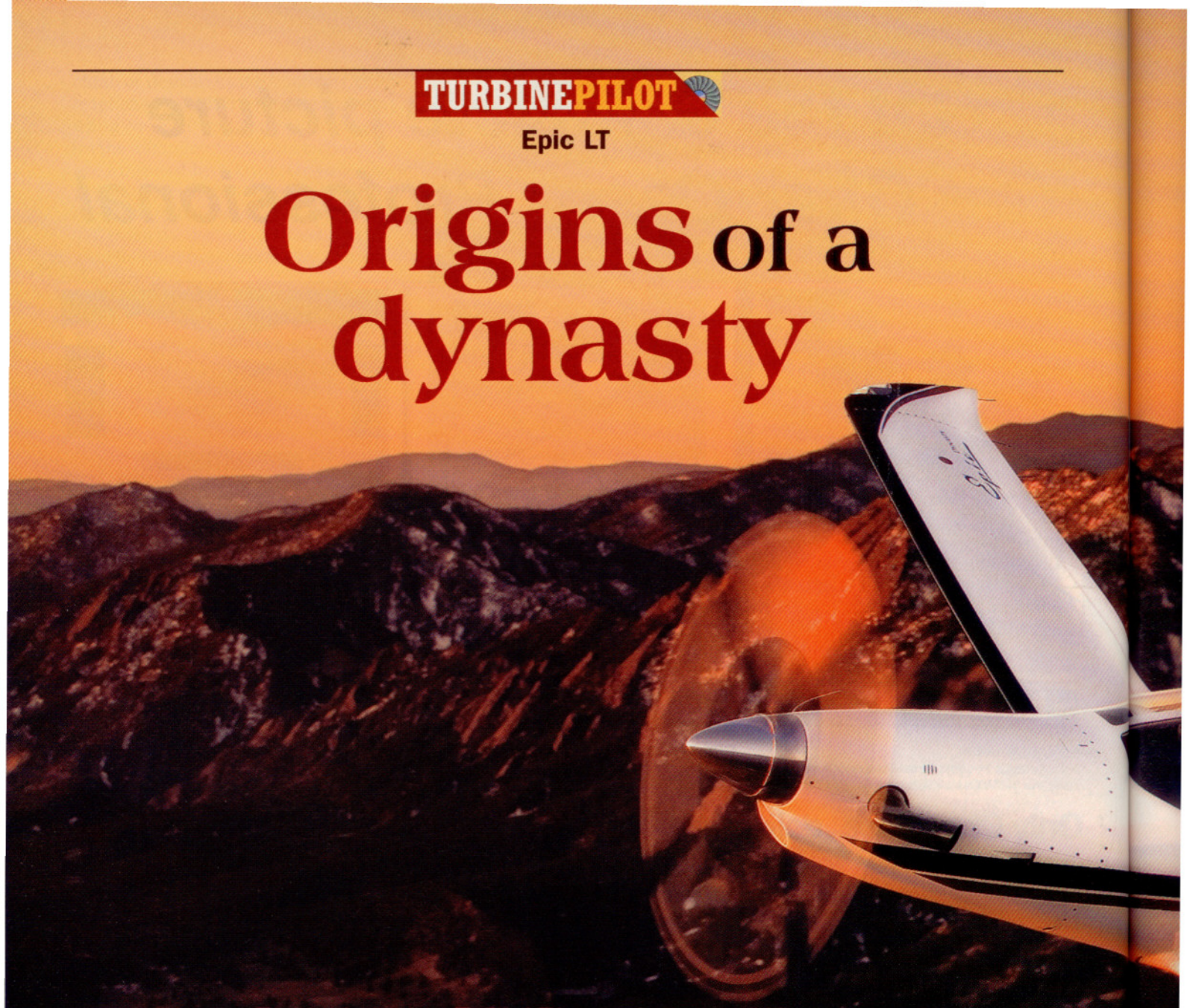
Origins of a dynasty



Exploring the Epic LT's path to certification

BY JULIE K. BOATMAN

A homebuilt turboprop?

Well, of course, that's been done—on a slightly smaller scale. A handful of turbine Lancair PropJets and Comp Air 7s and 8s have flitted across the radar screen for several years now, wowing the lookie-lous and inspiring the young bucks. These four-passenger rockets and haulers appeal to pilots with sheer speed and brutish capability—but the numbers you must pay attention to are not at the top end, but over the fence, into the stall—places where high performance can hurt those who can't keep up.

Like the speedy aircraft from its Lancair neighbors on the Bend Municipal Airport, in Oregon, the Epic LT looks like another slick Bend product—on steroids. And though it's nearly twice as big (in weight as well as in several dimensions), it's in many ways more manageable than the hot rod it echoes—simply because it looks and feels like the substantial, serious airplane it is, so a pilot's expectations are in the right place right from the start.

And that makes this Experimental airplane a fitting springboard for an ambitious line of certified turboprops and light jets planned by Epic Aircraft.

Beginning an Epic

Epic Aircraft is the brainchild of Rick Schrameck, a veteran of the computer hardware and aviation composites industries. Along with two other investors, Schrameck has provided not only the funding to get Epic off the ground, but also much of the overlying vision. "The product is not as important as the process," said Schrameck in a recent interview conducted for this report. "The [manufacturing] process is the same whether it's a notebook computer or an airplane. Every nut,

PHOTOGRAPHY BY MIKE FIZER

bolt, and screw has to be in place, or you can't turn the computer on." It's the same with aircraft, contests Schrameck, who began flying in 1973, and began working with aircraft composites at roughly the same time.

The vision that would make Epic Aircraft ostensibly different from other certified turboprop and jet manufacturers? It would begin its certification program with an Experimental aircraft—and produce several with real customers, who would log more than 2,500 hours on the model before the company produced a flight-conforming airplane for type certification. That mostly conforming airplane (conforming in aerodynamics, landing gear, hydraulics, flight controls, and firewall forward—engine and propeller) was estimated to be delivered to Transport Canada for certification testing in mid-June.

The LT is that Experimental platform: a turbine-powered, composite, pressurized six-seater with executive interior appointments aimed at the owner-flown high-performance single-engine market. The LT will someday become the Dynasty, a certified production version of the aircraft.

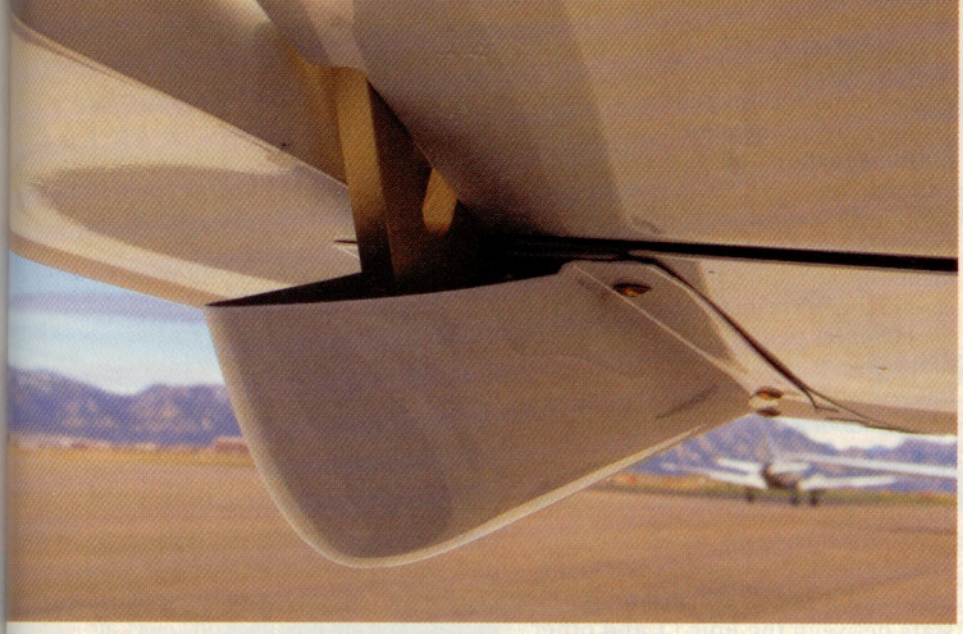
To facilitate the owner-build process, Epic appears to have patterned its plans on successful factory-assist programs currently pumping out Glasairs and Lancairs and other kit aircraft. Epic's 100,000-square-foot facility in Bend was completed in 2005; within it, up to 40 customer airplanes can be accommodated, although only about 20 are in there now. That's to make room for Epic's next aircraft programs, the twin-engine Elite very light jet (eventually destined for certification) and single-engine Victory VLJ (available as an Experimental aircraft). There are currently nine LT turboprops flying, and each has helped form the eventual Dynasty prototype. Schrameck sees little difference between running the owner-assist facility and operating the aircraft's production line. "If we can teach a busy professional person to 'owner-assist' build the airplane, we can train a worker to do it under a production certificate." Epic is building a 100,000-square-foot facility at Springbank Airport, just west of Calgary, Alberta, that will be a "cookie-cutter" of the facility in Bend, with the capacity to produce about 40 airplanes each year.

The road to certification

The company has yet to certify any airplane—initial projections made at the company's EAA AirVenture 2003 debut placed certification by late last year; now the company forecasts that the Dynasty—the certified version of the LT flown for this report—is expected by the fourth quarter of 2008 at a base price of $1.95 million. The LT is currently offered at $1.25 million, including engine and propeller, and a basic avionics package.

Epic decided to certify the airplane first in Canada for several reasons—chief among them was a recent investment made at Springbank. Launched by the Canadian Centre for Aerospace Development, the Canadian Centre for Aircraft Certification is a 50,000-square-foot testing and evaluation facility specializing in the certification of composite general aviation aircraft. Testing and evaluation services will be conducted in accordance with the respective regulations of the certifying country; since initial certification of the Dynasty will be via Transport Canada, the Dynasty will meet Canadian aviation regulations, and, with any luck, FAA approval will follow shortly thereafter.

Schrameck maintains that it hasn't been bureaucracy—on either Transport Canada's or the FAA's part—that has slowed certification on the Dynasty, but the company's desire to bring its latest designs into reality alongside its initial turboprop project.



The executive-style interior (above) is typical of LTs. The aileron pushrod fairings (left) are a special mod to 468TT.

To that end, Schrameck and the other investors have poured "north of $100 million—let's say north of comfortable" into the company, jokes Schrameck. He intimated that they have just begun seeking the first round of outside investment in May. "We had sales and deliveries before asking someone outside to take a risk."

Dieter Koehler, vice president of engineering and certification, leads the engineering team at Epic. Koehler has successfully led four previous composite-aircraft certification programs, including the Dimona (predecessor to Diamond Aircraft) HK36 Super Dimona motor glider and DV20 Katana (predecessor to the DA20) and the Columbia 300. No, none of these aircraft is quite as fast as those in the Epic line, but Koehler understands well the extensive flutter testing and ground vibration testing necessary for high-performance composite aircraft.

The owners

Mac Lewis, owner and builder of 468TT, came to Epic from a 1999 Piper Malibu JetProp turboprop conversion that he'd owned for four years and in which he'd logged 900 hours. Epic 468TT is serial number 12 of the LT line (and the seventh to achieve Experimental airworthiness certification), and because Lewis is a 1968 Princeton graduate, the registration creates a kind of collegiate cheer: "For sixty-eight, Tiger, Tiger!" Lewis, an investor from the Minneapolis area, built 468TT

SPECSHEET

Mac Lewis' Epic LT

Kit price (in 2004): $1.1 million
Price as tested: $1.3 million

Specifications

Powerplant .....Pratt & Whitney PT6-67A turbine, 1,200 shp
Recommended TBO .....3,500 hr
Propeller .....four-blade, 105-in dia, constant-speed, feathering, full-reverse
Length .....35 ft 10 in
Height .....12 ft 6 in
Wingspan ..... 43 ft
Wing area..... 203.6 sq ft
Wing loading .....35.9 lb/sq ft
Power loading.....6.1 lb/hp
Seats 6
Cabin length .....15 ft
Cabin width .....4 ft 7 in
Cabin height .....4 ft 11 in
Empty weight, as tested.....4,400 lb
Max takeoff weight .....7,700 lb
Useful load, as tested .....3,300 lb
Payload w/full fuel, as tested.....1,398 lb
Fuel capacity, std .....288 gal (284 gal usable) 1,930 lb (1,902 lb usable)
Baggage capacity .....300 lb, 27.6 cu ft

Performance

Takeoff distance over 50-ft obstacle..1,600 ft
Max demonstrated crosswind component.. .....25 kt
Rate of climb, sea level ..... 4,000 fpm
Cruise speed/range w/45-min rsv (fuel consumption)
@ max power, 28,000 ft ....330 kt/1,210 nm (62 gph)
Cruise speed/range w/45-min reserve (fuel consumption)
@ economy cruise, 28,000 ft ....282 kt/1,540 nm (44 gph)
Service ceiling .....28,000 ft
Landing distance over 50-ft obstacle ....1,840 ft

Limiting and Recommended Airspeeds

V_X (best angle of climb) .....126 KIAS
V_Y (best rate of climb) .....144 KIAS
V_A (design maneuvering).....180 KIAS
V_{FE} (max flap extended, 10 degrees) ....180 KIAS
V_{FE} (max flap extended, 40 degrees)..... .....130 KIAS
V_{LE} (max landing gear extended)..... .....160 KIAS
V_{NO} (max structural cruising) ....220 KIAS
V_{NE} (never exceed) .....280 KIAS
V_R (rotation) .....75 KIAS short field; 90 KIAS
V_{S1} (stall, clean) .....78 KIAS
V_{SO} (stall, in landing configuration) ....67 KIAS

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.

over the course of 10 months at the Epic factory. The airplane's first flight and airworthiness certificate were issued on December 19, 2006; Lewis and his wife, Mary, took delivery on February 12, 2007. Lewis relates that he hit a groundspeed of 399 knots on his very first trip home to Minnesota—even without much of a tailwind. "I've observed that most planes are a trade-off between speed, useful load, and range," says Lewis. "[The] Epic LT can do all three at the same time."

Lewis has about $1.3 million in the airplane, based on 2004 pricing, which includes $1.1 million in the basic kit package from Epic ($375,000 went to a 1,000-hour used Pratt & Whitney PT6-67A with a fresh hot section by P&W Canada), and $120,000 in avionics upgrades. The rest of the $1.3 million includes at least $50,000 in airframe and interior extras, plus Lewis' travel and living costs for the months spent working in Bend.

When I flew the airplane for the first time, in March, it had 69 hours' total time. Lewis has equipped the airplane with a three-screen Chelton Flight Systems FlightLogic EFIS (electronic flight information system), a TruTrak Sorcerer autopilot, and an Electronics International MVP-50 GEM (graphic engine monitoring) system. All three Chelton units can show either primary flight display or navigation information; two displays are on the pilot's panel, with the third on the co-pilot's panel.

At the Sun 'n Fun Fly-In in April, Epic announced that it would offer Garmin G900 integrated flight decks in its experimental aircraft, and G1000 systems in its certified products, including the Dynasty. As Schrameck puts it, "I don't have to sell the avionics if it has the Garmins in it." As this was written, the first G900-equipped LT was about a week away from its first flight, according to Schrameck.

The goods

The Epic LT packs a 1,200-shaft-horsepower Pratt & Whitney PT6-67A on its lean frame. When you compare the stats between the Epic LT and other PT6-powered rides (such as the 7,430-lb EADS Socata TBM 850, which has a PT6A producing 850 shp, or the 8,750-lb Cessna Grand Caravan, with a PT6A producing 675 shp), you can't help but expect great things—such as excellent cruise speeds and impressive climb rates. The LT delivers both, with the Dynasty likely to follow, as it will have the same engine and propeller combination on the same airframe.

I still had the impression that there was a lot of minor futzing left to do. "Oh, we're still trying this out" was a comment I heard several times from various folks—and there's nothing wrong with that. But ultimately, for a production aircraft, conformity must reign. Lewis' airplane is a good case in point. As an Experimental LT, the airplane could be modified in certain ways to try out various ideas that may—or may not—make their way to the production airplane.

One mod was to the outboard aileron pushrods. Lewis wanted to try fairings on the pushrods, which are beefy and hang substantially into the airflow under the ailerons. So Epic helped him develop the fairings, which are now on the airplane. Lewis' airplane was also the first LT to have inner gear doors, which not only add speed but also make the cabin quieter. But they were delivered a little too early in the flight-testing process, and are now back off Lewis' airplane and installed on another company airplane to work out kinks in the sequencing system. Once fully tested, the doors could be worth 12 knots, according to Schrameck.

Flight epic

My introduction to the LT was during an early morning photo mission on the Front Range of the Rockies. After takeoff from the Rocky Mountain Metropolitan

The LT feels like a larger airplane, but stays fairly nimble in the low end of the speed envelope.

The hefty trailing-link main gear has locking pins to insert for ground handling and parking.

Airport near sunrise, we searched in vain for smooth air. Wouldn't you know it, we finally found the good stuff at about the time that Epic instructor pilot Peter Stiles handed the airplane over to me. Life really isn't fair, huh, Peter?

We were flying off a Cessna Turbo Stationair, which is well suited to the mountains that formed our backdrop but kept us down in the low end of the Epic's speed range for the duration of the photo flight. Although this wasn't ideal for photographs—we did our best to manage without putting out the flaps—it offered me an excellent opportunity to sample the airplane's low-speed-handling characteristics.

Stiles had explained earlier that the airplane exhibited docile manners in stalls and slow flight, and as I traced the length of the white arc during the mission, I had to agree. Controls felt positive through the entire low-end range, with excellent aileron response to each lump in the air.

We wrapped up the flight with a landing back at the Airport Formerly Known as Jeffco, easily made within 2,000 feet of landing roll, using the propeller's beta setting. With flap speeds starting at 180 KIAS, and gear extension speed at 160 KIAS, slowing down for the approach was no problem. I aimed for 120 KIAS in the pattern, and an over-the-fence speed of 90 KIAS, which worked out pretty well. The wheels met terra firma with a reassuring *pa-dumph*—made softer by the trailing-link gear, built by the Czech Republic company Technometra Radotin, a.s., the same company that makes the landing gear for the L–39 Albatross jet trainer (which has a maximum ramp weight of 12,500 pounds) and that makes the gear much tougher than necessary for the Epic's 7,300-pound maximum gross weight.

The airplane boasts a maximum useful load (with standard fuel tanks carrying 300 gallons, which 468TT has) of 1,350 pounds. Range with standard tanks and IFR reserves is 1,200 nm; long-range tanks (with 350 gallons total usable) extend the range to 1,874 nm.

At altitude

We missed making a high flight during that trip, so I caught up with the Epic Aircraft crowd at Sun 'n Fun this spring in Lakeland, Florida. Lewis had brought in 468TT as a display aircraft, so I reacquainted myself with the airplane under the direction of company demonstration pilot Mike Hooper. At that point the airplane had 93 hours on it. After starting up in front of a crowd of curious onlookers, we elbowed our way out of the exhibit area and taxied out to Runway 9 to get up and out of there.

We set a course for Okeechobee County Airport, about 76 nm to the southeast. We'd make a dogleg to skirt the military operations areas along our route, climbing to 17,500 feet msl to get the most altitude without having to file IFR on such a nice day (and skirting as well the headaches associated with going in and out of the airshow IFR on a busy Saturday).

The takeoff was more like a launch—the Epic has plenty of horsepower to spare—and we were up and away after a rolling takeoff in well under 2,500 feet at our light weight. With the PT6 dialed back to 56-percent torque, and 160 KIAS, we still made 1,700 fpm in the climb. No need to make the other kids jealous.

Once at altitude, we cruised at 88-percent torque (which produced an N_1 of 103.8 percent, just below the 104 percent limit), giving us 242 KIAS and a true airspeed of 322 knots at the ISA-plus-13 temperature. Meanwhile, the PT6 burned 53 gallons per hour. Fuel management is simple—a lever just by the pilot's knees on the subpanel shows detents for Right, Left, and Off. Fuel capacity in Lewis' airplane (the first nine serial numbers vary slightly) is 288 gallons usable, 144 gallons per side.

After a landing at Okeechobee, and a top off to avoid the high price of fuel back at Lakeland, we returned at 14,500 feet, where at 81-percent torque we indicated 223 KIAS at ISA-plus 12, for a true airspeed of 282 knots in economy cruise. Highly respectable.

With the inner gear doors, Lewis hopes to have the fastest LT flying. It's OK to be a bit competitive about these things. AOPA

E-mail the author at julie.boatman@aopa.org.

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