

Turbine Explorer 500T

# 'Honey, I shrunk the Caravan!'

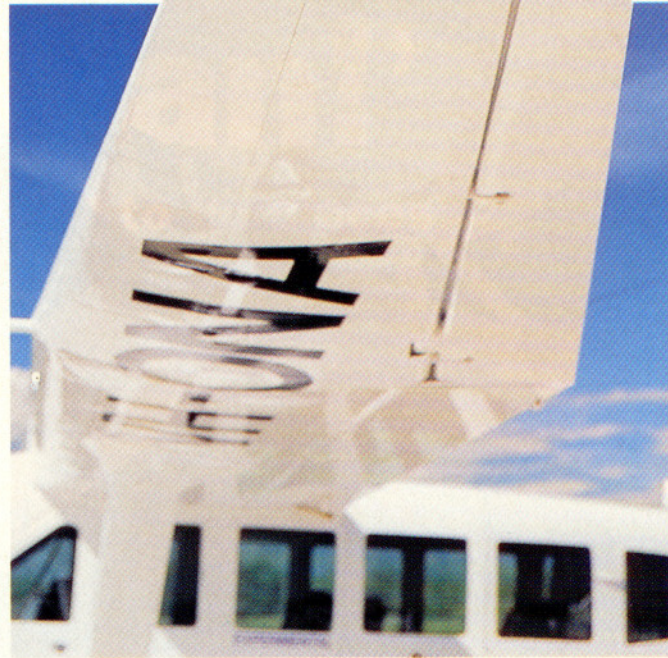
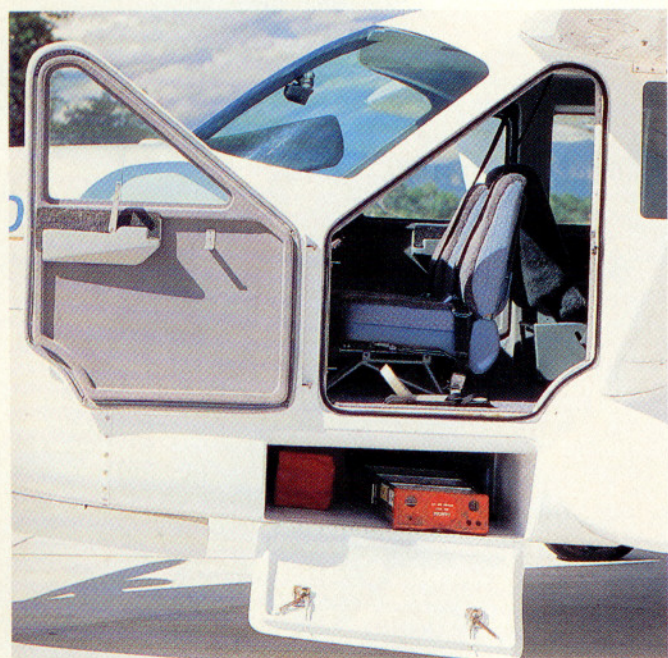
**A sport-ute prototype designed to go places**

**I**n 1999, a new company, Explorer Aircraft, introduced an innovative utility design from Australia. The company's original plan was to first build a prototype with a suitable 500-horsepower piston engine—trouble was, none existed at the time. Thus, a 300-horse Continental IO-550 engine was installed on the prototype to begin the market survey and proof of concept.

In the spring of 2000, Explorer Aircraft replaced the big-bore Continental with a 600-shaft-horsepower Pratt & Whitney PT-6A-135 engine. The new mill gave the Explorer more than a new look: It literally transformed this airplane, both in terms of performance and in the niche it occupied in the utility aircraft market. People who paid little attention to the Conti-

**BY MICHAEL MAYA CHARLES**

PHOTOGRAPHY BY MIKE FIZER



ental-powered version of the aircraft suddenly took note.

On the ramp, the new Turbine Explorer 500T looks a lot like a Cessna Caravan, only smaller. The unusual 47-foot aluminum wing is the first thing that catches your eye—very thick at the root yet tapering radically from the mid-wing strut to the tip. That wing is a large part of this airplane's magic; it was designed by noted aerodynamicist John Roncz in an attempt to combine low-speed qualities for short, unimproved strips with acceptable high-speed qualities for cruise.

For those familiar with Roncz, the wing doesn't look unusual at all. Roncz is

responsible for some of the more interesting wing designs from designer Burt Rutan's fertile stable, including the Earth-circling *Voyager*, *Long-EZ*, *Proteus*, and the Beech Starship. Roncz is also responsible for the airfoil designs of such diverse aircraft as the CarterCopter, the Freewing, Eagle 150 (see "Eagle 150B: A Royal Eagle," *March Pilot*) and the Van's RV-9.

Equally striking is the hefty, fiberglass retractable gear. This gear retracts

**Easy access for maximum utility is apparent in the aircraft's design. Ailerons remain effective in stalls.**

into large pods at the lower corners of the fuselage, with the left wheel going into right pod and vice versa. These composite pods cleverly house the marker beacon, transponder, and glideslope antennas, and the company is considering including a radar dish in the pods at some future date.

For those interested in utility aircraft, though, the real appeal is found in the cavernous cabin. The fuselage is all carbon fiber, a material chosen to provide stiffness for large windows optimized for sightseeing operators, and a yawning 48-by-50-inch door designed for clumsy cargo. The door opens to a flat cabin





floor that is 11 feet long and 59 to 61 inches wide; the cabin is 53 inches high.

Once settled in the left seat, you feel a bit like you're in the middle of a railroad car. The left sidewall is nearly an arm's length away and there's a lot of real estate around you. The wide-open space is also

the oil pressure as the prop comes out of feather, turn on the radios, and you are ready to tango.

The Explorer prototype is equipped with a Piper Navajo nose gear and the sluggish steering during taxiing will be smoothed in production airplanes,

## Once settled in the left seat, you feel a bit like you're in the middle of a railroad car.

evident in the large instrument panel, with enough room for all the moving maps and avionics you might want. Meggitt primary flight and nav displays—similar to those going into AOPA's Sweepstakes Bonanza and the New Piper Malibu Meridian's—are installed on the left side of the Explorer, supplemented by conventional "round dial" instruments on the copilot's side.

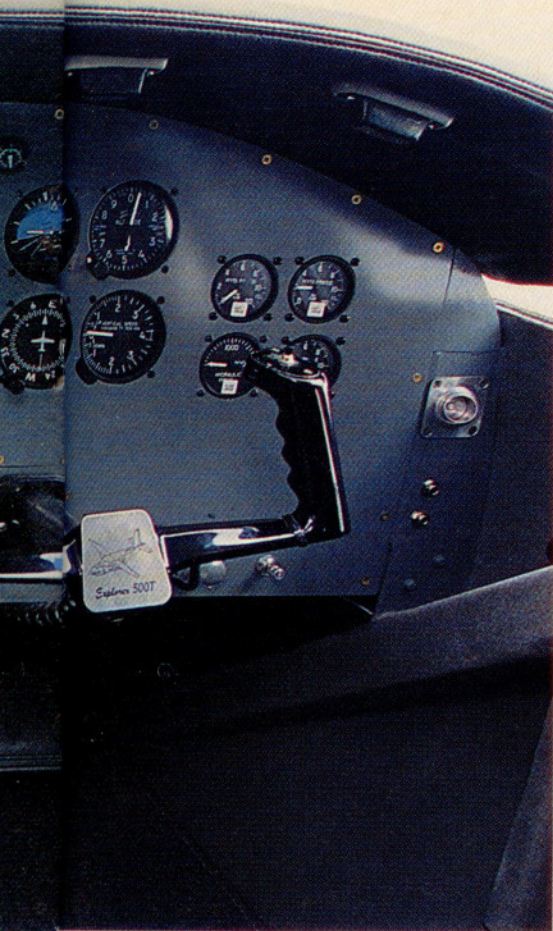
Starting the Explorer couldn't be much simpler: Check the battery level, hit the start switch, and introduce fuel when the gas generator indicates about 15 percent. Monitor the light-off, check

according to Geoffrey Danes, director of Explorer's research and development operations who occupied the right seat on a recent flight. We made our way to the runway at Tri-County Airport in Erie, Colorado—elevation 5,130 feet—and completed our simple pretakeoff checks, then took the active runway, and pushed the power up to the full 600-shp torque setting. Acceleration was brisk and pitch forces light on rotation. We quickly cleaned up, and detected a slight yaw and bump with gear retraction. To improve the visibility over the broad nose, I used 125 knots IAS

and noted an average 1,800-fpm climb on the 50-degree Fahrenheit morning. This was with two people aboard, no baggage, and just 450 pounds of fuel. The prototype weighs 3,767 pounds empty, although the company has targeted the production aircraft for an empty weight of 3,500 pounds. Maximum gross weight is planned at 6,200 pounds.

Stalls in the Explorer were quite interesting. Near stall, at high angles of attack, the ailerons had the most control I've ever felt in a general aviation airplane. The rudder seemed a little soft but there was little need for it, since the ailerons provided plenty of control authority. With full aft control wheel, the airplane simply pitch-porpoised up and down, with no tendency for the nose to drop through the horizon. Those qualities will make backcountry arrivals and departures very comfortable.

At 12,000 feet pressure altitude and 50 degrees F, we set 1,100 pounds of torque, a setting that Danes equates to about 66-percent power. Our indicated airspeed settled on 147 kt for a true airspeed of 182 kt. A two-way ground-speed check seemed to roughly verify



that speed. Fuel flow was 265 pounds per hour, or a tad under 40 gallons. Although the prototype only holds 161 gallons of fuel, the production aircraft is slated to carry 2,000 pounds, or just under 300 gallons.

**Explorer Aircraft plans a new production facility for its roomy airplane in Jasper, Texas.**

While in formation with the turbo Cessna 206 photo ship, the forward window posts at each side of the windscreen blocked a fair amount of view. Danes assured me that they would be narrowed on production airplanes for better visibility.

The only aerodynamic burr that I noticed during the flight was that the rudder doesn't return very well to a neutral, streamlined position. The Explorer folks were well aware of the problem and plan to smooth the flow over the rudder horn.

The Meggitt displays were easily readable during our brief evaluation, even in the bright morning sunlight. Flight information is found in the standard T-formation, although all of the "instruments" are found on one screen instead of scattered on the usual six. Redundancy will be provided with the





**The Turbine Explorer 500T crosses its legs during gear retraction.**

addition of switching capability to allow either of the two screens to display all or part of the system's information.

The airplane is not easy to slow down, in part because of the rather low-drag landing gear. Pilots will be required to plan descents carefully, although the turbine engine allows the pilot to pull the power lever to flight idle without worrying about engine cooling.

One hundred knots in the pattern is a comfortable speed and flap extension produced a moderate pitch-up. Thirty-eight degrees is the max flap setting. Once configured, the airplane is very stable; I used 65 kt over the fence at our light weight. Flare required a modest pull at our forward-CG location, but the airplane is easy to get solidly onto the mains with the nosewheel held high. Because of a high prop-pitch stop setting on the prototype, the Explorer floated enthusiastically in the flare, but with a little beta from the prop, turning off at the 1,800-foot midfield intersection took no effort at all.

Explorer Aircraft has a contender in the

## SPEC SHEET

### Turbine Explorer 500T Projected price: \$1.034 million

#### Specifications

Powerplant	Pratt & Whitney PT6A-135 600 shp
Propeller	Hartzell, four-blade
Length	31 ft 9 in
Height	15 ft 6 in
Wingspan	47 ft 4 in
Wing aspect ratio	11.3
Wing loading	31.4 lb/sq ft
Power loading	10.3 lb/shp
Seats	Up to 11
Cabin length	11 ft 0 in
Cabin width	5 ft 1 in
Cabin height	4 ft 5 in
Cabin volume	250 cu ft
Cargo pod volume	50 cu ft
Empty weight, production model	3,500 lb
Empty weight, as tested	3,767 lb
Maximum gross weight	6,200 lb
Useful load, production model	2,700 lb
Useful load, as tested	2,433 lb
Payload w/full fuel, production model	
	844 lb
Payload w/full fuel, as tested	1,355 lb

Fuel capacity, production model	277 gal (1,856 lb)
Fuel capacity, as tested	161 gal (1,078 lb)

#### Performance

Takeoff distance, ground roll	1,200 ft
Maximum rate of climb, sea level	1,000 fpm
Maximum cruise speed	200 kt
Cruise speed	180 kt
Stall speed	61 kt
Service ceiling	25,000 ft
Maximum range	950 nm

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

*For more information, contact Explorer Aircraft Inc., 1 Great Place, Jasper, Texas 75951; telephone 409/489-1500; fax 409/489-1700; or visit the Web site ([www.exploreraircraft.com](http://www.exploreraircraft.com)).*

sport-ute market here if it can find the right combination of financing, certification, and production. "The Explorer 500T really doesn't have any *direct* competition in the marketplace," according to Danes. "It's designed to fill the market void

between the Cessna 206 and the Caravan, and we think it will replace many of the aging Beavers, Cessna 404s, and Navajos."

A piston version of the Explorer, powered by an Orenda 500-horse V-8 engine, is still slated for production once the tur-

boprop version is certified. The two versions are virtually identical from the firewall aft. The company also plans a future growth version, with a six-foot fuselage stretch and a 750-horse PT-6A.

Explorer Aircraft is now accepting \$25,000 escrow deposits on the aircraft and is looking for investors to carry the project to fruition. If all goes well, first production airplanes will roll off the Jasper, Texas, assembly line in early 2004. If the company can get the airplane to market with a basic IFR Meggitt and dual Garmin GNS 430 package for its projected \$1.034 million selling price (in year 2000 dollars)—a few hundred thousand dollars less than the Caravan—the folks in Wichita just might have to make room for their first competitor in a market that they invented, and have had all to themselves for many years.

AOPA

*Michael Maya Charles is a McDonnell*

**i** Links to additional information about the Turbine Explorer may be found on AOPA Online ([www.aopa.org/pilot/links.shtml](http://www.aopa.org/pilot/links.shtml)).

*Douglas DC-10 captain for a major airline and owns a Cessna 185 and a Piper J-3 Cub. Visit his Web site ([www.airsafetyexperts.com](http://www.airsafetyexperts.com)).*