QUESTAIR VENTURE

TWO TO GO

Nothing ventured, nothing gained

BY MARK R. TWOMBLY

When James E. Griswold set out to design an airplane, he pictured a weekend machine. Not a Saturday afternoon crow-hopper, mind you, but one that a couple could fly halfway across the country on a Friday afternoon and, following Sunday dinner, fly back home in time for a good night's sleep. "Not a hot, hero airplane,"

PHOTOGRAPHY BY MIKE FIZER

Griswold explains, "just a nice transportation package that makes the world smaller."

Griswold came prepared for the job. As the former director of engineering for Piper Aircraft, he headed the development of the Piper Malibu. The Malibu influence is apparent in the Venture, Griswold's new side-by-side, two-place, all-metal, kit-built design. Both have relatively short but wide fuselages and long, narrow, high-aspect-ratio wings.

The similarity is more than cursory. The Venture wing is a scaled-down copy of the Malibu wing with the same airfoil, twist, and taper. The horizontal stabilizer is miniature Malibu as well.

Griswold moved to Greensboro, North Carolina, after leaving Piper and set up a new company, Questair, to design, build, and test the Venture. Questair is based in a small shop at Greensboro's Piedmont Triad Airport. Griswold's son, Douglas, headed the design effort using a CAD/CAM (computer-aided design/manufacture) system. Edward P. MacDonough, a veteran aircraft engineer who did the preliminary design work on the Malibu, also is part of Questair's design team.

The Venture's stubbiness is most apparent when the airplane is viewed from the rear or in profile. From other angles the Venture is far more appealing.

Flight testing is well under way on the second Venture prototype. (The first was destroyed in a fuel-mismanagement accident.) The airplane has been designed and is being tested to Federal Aviation Regulation Part 23 standards, although there are no plans to certify it. Richard Gritter, Questair's chief of experimental test flight and a former Piper flight test engineer, has flown the Venture to 307 KIAS in a dive—seven knots above Vne—and will fly to 330 KIAS. Computer analysis will be used to verify structural integrity to 390 KIAS.

The typical initial reaction to the airplane is that the proportions are out of kilter. The truncated fuselage, which measures 16.3 feet from spinner to tail-


N62V

cone, is comfortably wide but appears too short for the 27.5-foot wing.

In fact, according to Griswold, given the narrow chord of wing and horizontal stabilizer, the distance between wing and stabilizer is within the range considered normal for pitch stability. Griswold could have extended the fuselage, but that would have increased wetted area and thus added drag.

The generous cabin width is due in part to a six-inch-wide channel that runs between the seats like a center console in a sports car. The channel houses the landing gear when retracted. The unusual pitch and roll control, part yoke, part side stick, works well and enhances the impression that this is a new and different airplane.

The Venture's stubbiness is most apparent when the airplane is viewed from the rear or in profile. Like outstretched arms, the wing appears to keep the tadpole-shaped body balanced on the tip of the triangular gear structure, which rides on tiny tires. From other angles the Venture is far more appealing—a mini-Malibu. It looks its best in the air, cleaned up and at speed. At the start of an air-to-air photography session, I watched as Dick Collins and Gritter approached our Cessna 210 to join up in formation. The little airplane looked terrific in the yellowing light of late afternoon: smooth, fast, and graceful, with the propeller scribing a translucent disc and the long wings banked against a backdrop of fluffy white cloud tops. The two grinning pilots were clearly visible through the expansive canopy.

The Venture's 270-horsepower (derated from 300) Continental IO-550 engine, custom two-blade McCauley propeller, and diminutive size combine for some very desirable performance. Climbing out at Gritter's recommended cruise climb speed of 150 KIAS, I observed a sustained 2,000- to 2,500-fpm climb rate. In level flight at 8,000 to 10,000 feet with the power set at 2,500 rpm and full throttle, the airspeed indicator settled on 200 knots. Questair's specifications call for a true airspeed of 242 knots at 7,000 feet.

Integral leading-edge tanks hold a total of 56 gallons of fuel, good for about three and a half hours of flying with VFR reserves. Gross weight is being increased to 2,000 pounds. Griswold's goal for a typical empty weight is 1,200 pounds. That would leave enough for full fuel, 50 pounds of baggage to stow

in the large bay behind the seats, and 415 pounds of pilot and passenger.

The marriage of big engine to little airframe presages a tempestuous relationship, but the Venture has several features that make it surprisingly stable and manageable. Chief among them is three-axis electric trim, which changes the tension of springs in the control system rather than adjusting tabs on control surfaces. Griswold and company have done a considerable amount of fiddling with the springs to achieve the most desirable balance of stability and control harmony. We flew the Venture on two separate occasions, before and after aileron and rudder springs were adjusted. The final iteration yielded light, delicately balanced roll and yaw control forces countered by relatively heavy pitch forces. The stiffness of the elevator

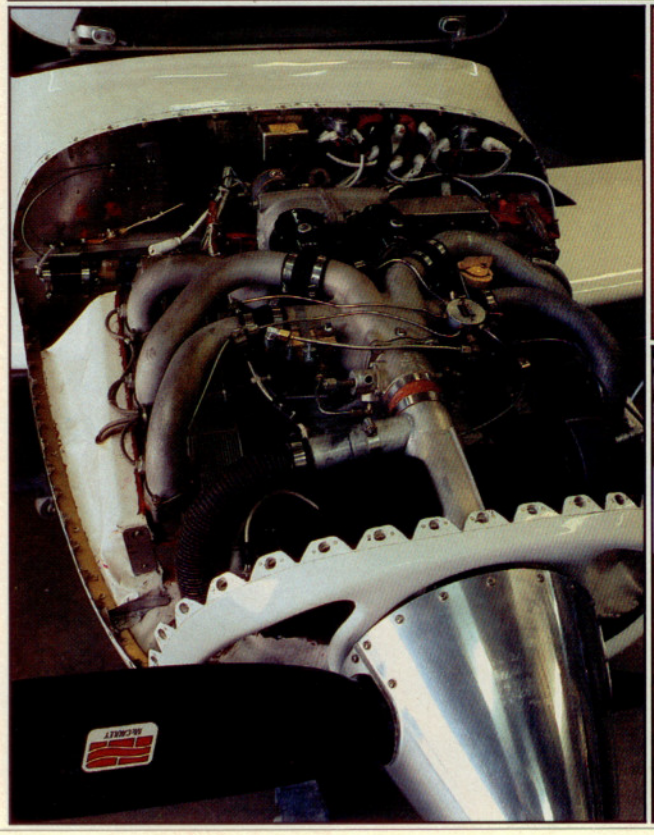
The marriage of big engine to little airframe presages a tempestuous relationship, but several features make the Venture surprisingly stable and manageable.

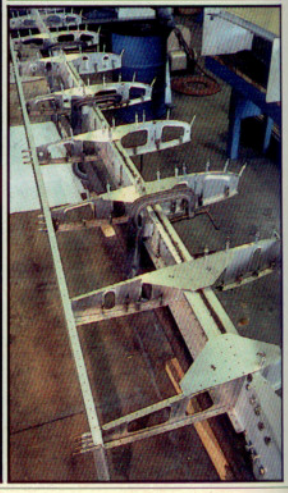
spring dampens any tendency to overrotate on takeoff or in the landing flare and makes it easy to trim and hold a target climb speed and stable cruise.

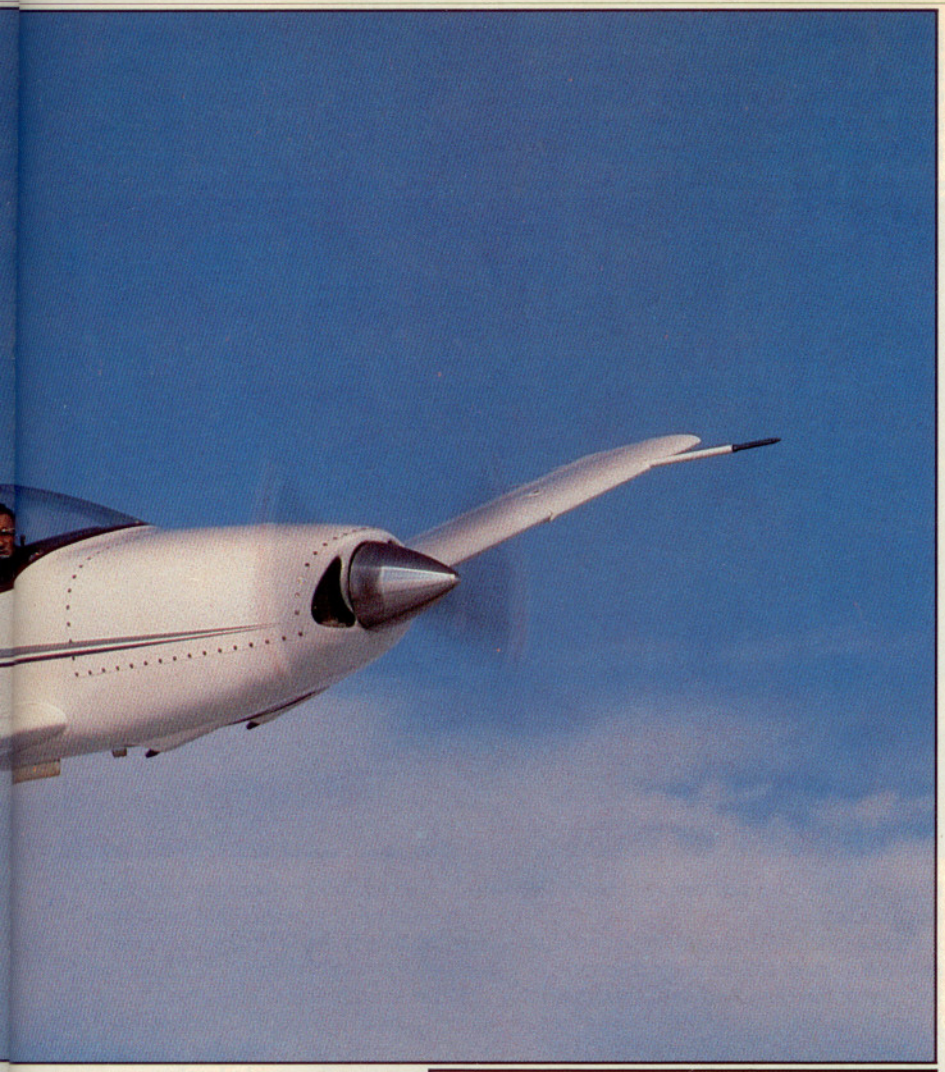
The test of the Venture's mild manners came in a practice full-procedure ILS hand-flown under the hood. With 14 inches of power, we sped along at 140 KIAS on the initial segment of the approach and had no problem controlling altitude, heading, and attitude. At glideslope intercept the gear was extended and the airplane trimmed for 100 KIAS to track the needles.

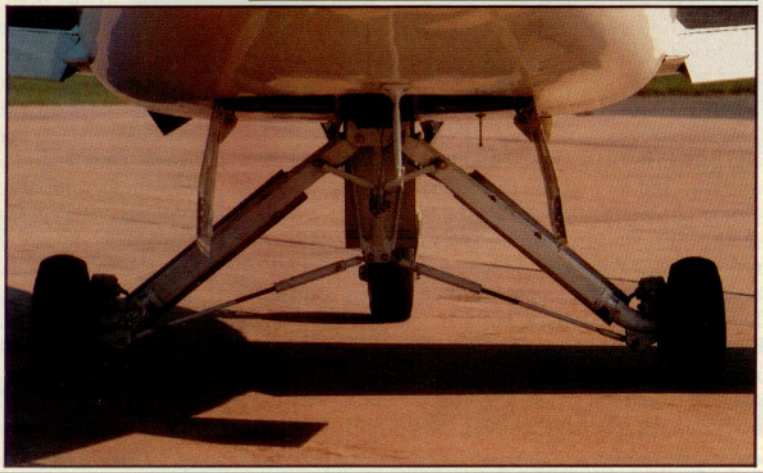
Close to the ground, the Venture is flown more like a taildragger. The nose-high attitude in the landing flare makes it difficult to keep sight of the runway centerline. The solution is to look out at an oblique angle to the side of the runway to judge height and alignment.

The main gear takes a long 16 seconds to retract or extend (about half that time for the nosewheel). It can be a maddening wait, but on reflection there are definite advantages. The slow retraction time keeps the airplane from accelerat-









A lot of engineering is packed into the Venture's small frame (clockwise, from right): Leading edge cuffs developed by NASA and the University of North Carolina inhibit a stall from developing into a spin; high-drag landing gear and lift-producing drooping ailerons obviate need for flaps; hydraulic cylinder steers nosewheel; IO-550 engine produces 200-knot indicated airspeed at cruising altitudes; metal spar and ribs are prefabricated.

ing too quickly after takeoff and leaving the pilot's composure back on the runway. Conversely, leisurely extension makes for more gradual deceleration. Trim changes in pitch and roll, which are considerable with gear actuation, also are easier to manage. The tremendous drag of the gear, combined with full-span ailerons that droop 16 degrees when the gear is extended, causes an initial nose-up pitch followed by strong nose-down pitch as the gear extends fully, but there is ample time to anticipate and counter with trim.

The Venture's short fuselage necessitated some creative engineering in the rudder/brake/steering system. Conventional rudder pedals and toe brakes would have required a five-inch fuselage stretch. Rudder pedals are attached to the ends of a horizontal bar that is bolted to a vertical tube. Brake pedals, which double as steering pedals, are positioned inboard of the rudder pedals.

Brake pedals actuate the master cylinder and also a second hydraulic cylinder attached to the nosewheel fork. Depressing a pedal forces hydraulic fluid to displace a piston inside the nosewheel cylinder, which forces the nosewheel to swing. Depressing both pedals simultaneously works the brake master cylinder but not the steering cylinder. To stop, mash both brake pedals. To turn, mash one or the other brake pedal depending on which way you want to turn.

Taxiing is a cinch. The problems come in trying to do two things at once, such as brake and turn, and in transitioning from braking/steering pedals to rudder pedals. Tracking the centerline on the initial takeoff roll or hard braking on the landing rollout call for deft footwork. Gritter had not yet had an opportunity to tackle crosswinds.

Questair supplies builders with four separate kits. The empennage is shipped first, followed by wing, fuselage, and a finish kit including a factory-new engine and prop. Questair machines and assembles the spar, stretch-forms skin panels, and pre-drills all the parts. Building time is estimated at 2,000 to 3,000 hours. The customer pays a $5,000 deposit when the purchase order is signed, then makes progress payments with the delivery of each of the four kits. Total price is $49,450.

At the time of our visit, 15 Ventures had been sold, and empennage kits were being shipped. All but one of the customers had signed purchase orders

without first flying the prototype. I found that surprising. Outwardly, the Venture appears to be another twitchy, homebuilt pocket rocket. Flying it confirms the performance promise and dispels the handling myth. Why, then, do people buy before they fly? The answer came from a young pilot who spotted us on the ramp and raced over to examine the Venture. He had read about it but had never seen it before, much less flown it. To him, the Venture represents the future, and he is excited about it. Those who are anteing up deposits must feel the same way. □

TESTING THE TWO-PLACE MARKET

A big segment of the market for a super-speedy two-place airplane like the Venture will have to be found among those now flying, or considering, high-performance singles and light twins. Trade up to turboprop speed at no increase in operating cost. Climb to cruise much faster than before. Do it all at not much more investment than is now required to buy a used Bonanza or Baron. Is this reality or fantasy? Can this fast little dude replace Ol' Paint as an all-purpose traveler?

To work, the Venture has to be an effective IFR airplane that can be flown as easily as what it might replace. The airplane seems to do well here. I got the Venture wet for its first time, on an approach back into Greensboro, North Carolina, from on top of an undercast that had become solid during our photo mission. The tops were about 5,500 feet, the bases just below 3,000, and the clouds were thick and juicy. You can't judge an airplane by a few minutes of instrument flying, but first impression was that the Venture would, when compared with factory-built airplanes, be about in the middle when considering the degree of difficulty found in instrument flying. It is quick, but not so quick that instrument flying is like balancing a broom on your hand. The Venture's stability and spring-loaded control system contribute to relatively easy flying. If you wonder about the side-stick control, it becomes the natural way to do it after only a few moments.

The airplane has a neat feeling in the clouds, too. The canopy is close by and extends back over your head. The clouds and moisture zipping by so close, at such a high airspeed, give you a real feeling of being "in cloud." Cozy.

From a mission standpoint the Venture has as much or more still-air range than most of the current traveling machines, even though it carries far less fuel. But this doesn't mean quite what it says because reserve fuel is subtracted in time, not in miles. If following the good practice of saving an hour's worth of fuel, 42 of the 56 total gallons are available for the mission. At maximum recommended cruise at 12,000 feet, fuel burn of the IO-550 will be about 14 gallons per hour with the exhaust gas temperature 50 degrees rich of peak. Three gallons have to come off for taxi, takeoff, and climb. The remaining 39 gallons gives two plus 45 for an IFR flight plan to the destination and alternate. If the ground-to-ground still-air average speed is 220 knots, that's 605 range. Subtract 50 to the alternate and 555 nautical is the comfortable IFR number, add for a tailwind and subtract for a headwind. Just remember that the flight plan time is in the twos, not the threes when it comes to hours.

By comparison, on a trip to Greensboro and back in my 210, I clocked an hour and 30 one way and an hour 40 the other. Richard Gritter of Questair flew the Venture over the same course, clocking an hour and eight minutes one way and a minute longer the other way. I did have a bit longer IFR routing than his more direct VFR track, but that does give some idea of the time advantage on what might be considered an average-length trip of about 225 nautical miles. The Venture's fuel burn was about nine gallons less than that of the 210, which has a turbocharged engine.

One item of performance that helps minimize trip time is the Venture's rate of climb. Being able to climb at almost 2,000 feet per minute to smooth air is a definite benefit. Less time is spent at high fuel flow in climb, which helps on overall fuel burn.

On longer trips the speed advantage would offer even more benefits, and westbound in the winter the Venture could easily make the difference between a slow and a reasonable trip. It isn't uncommon in a 160-knot airplane to see groundspeed close to 100 knots just ahead of or behind a strong cold front. With 50 on the nose, the Venture will be a lot closer to 200 than to 100 knots.

In return for this performance and operating economy you give up from two to four seats. This means people, or the luxury of carrying all the things that you own plus a level of comfort that accrues from being able to move around. The Venture seats are comfortable, but there's not much squirming room. That is made less noticeable because every destination becomes closer in time.

It is an intriguing concept, one that will eventually force an answer to the question about the relative importance of speed. If going as fast as possible comes in first, then the big-engine two-place might take the place of a lot of larger airplanes that are now the mainstay of the business/personal fleet. For now, the Venture is available only in kit form. To really test the market it will have to be available as a completed product. No plans for this now, but demand can make anything happen.

—Richard L. Collins