Riley Super Skyrocket

Super Personal Transportation

TEXT AND PHOTOS BY GEZA SZUROVY

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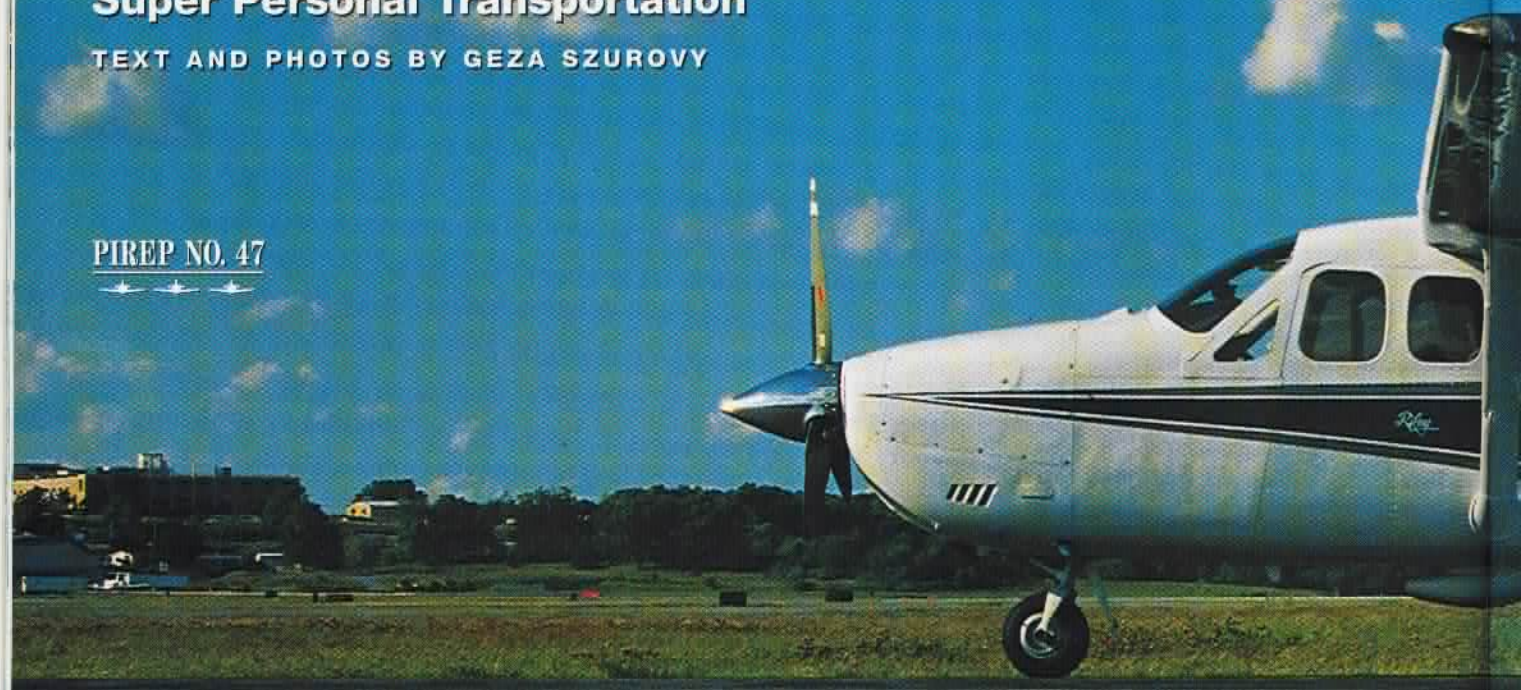

WHO HASN'T DREAMED of an airplane that could fly long distances at speeds in excess of 200 knots in pressurized comfort, take off and land on short grass strips, and have twin-engined redundancy without the challenges of asymmetric thrust if an engine failed? "Dream on," I thought, until I had the opportunity to join Doug Schuman in his Riley Super Skyrocket, a highly modified pressurized Skymaster offered by SuperSkyrocket, LLC, of Carlsbad, California, on a trip along the length of the U.S. East Coast.

On a hot summer afternoon, we departed Naples, Florida, for the Northeast with a pile of household baggage and a full fuel load of 150 gallons that put the big push-pull twin right up to its gross weight of 4,700 pounds. We leapt off the runway in about 1000 feet, ascended in cruise climb at less than half the airplane's maximum climb rate of 2500 fpm and in 20 minutes, we were level at 19,000 feet, truing out at 215 knots and relaxing at a cabin altitude of 9000 feet. Upon arrival at Chester, Connecticut, the day's final destination, Schuman would shoehorn the big airplane onto the 2400-foot runway as easily as if it were the proverbial Supercub.

Schuman needs an airplane with such a wide performance range to meet his demanding travel needs. He splits his time between his Connecticut and Florida homes and also goes up to Maine, where his Connecticut-based business (which makes electronic controls for mechanical machinery) has a production facility next to a 2500-foot grass strip.

The first airplane he started using for business was

a Cessna 210, which he bought in 1990 when he established his company's Maine plant. "The choices to get up there came down to a six-hour drive from Connecticut or the 210. It was an easy decision," he recalls. "I flew the 210 for two years and really liked it, but I came to realize that I could use more speed, pressurization and twin-engined redundancy, including greater systems redundancy."

Skymasters Into Super Skyrockets

One intriguing option was the Riley Skyrocket, the pressurized Skymaster modified into the airplane it should have been when Cessna was making it. Schuman was also drawn (in addition to its performance) to the airplane because of the safety benefit of the push-pull configuration. "You either love the concept or hate it," he says. "There seems to be no middle ground. As an engineer, I like elegant solutions to design problems. The simplicity of using centerline thrust to eliminate handling problems in case of an engine failure really appealed to me."

At the heart of the Skyrocket modification is a Riley intercooler that greatly improves the original pressurized Skymaster's takeoff, climb and cruise performance by pumping cooler air from the turbochargers into the 225-horsepower Continental TSIO-360 engines. STOL modifications to the wing, spoilers, a comprehensive avionics package, turbine-style engine gauges, air conditioning and a total airframe refurbishment, including new paint and custom interior, round out the typical Skyrocket package.

But Riley had something even sexier in the works

Turbine-style engine gauges are mixed with a full instrument panel.

when Schuman got in touch: the Super Skyrocket. It was a similar package to the Skyrocket, but with three-blade propellers, two turbocharged 310-horsepower Continental TSIO 520s and larger intercoolers to go with the bigger engines. It would add a whopping 170 horses to the total horsepower and forever lay to rest any quips about lackluster Skymaster performance.

The Super Skyrocket promised everything Schuman was looking for. With factory-remanufactured engines, brand-new accessories and avionics, and a complete airframe refurbishment, it would cost about as much as a new top-of-the-line unpressurized piston single or light twin.

The problem was that it wasn't yet available. But FAA approval of the STC was just around the corner, so Schuman made a deal. He would buy a Riley Skyrocket and as soon as the STC was approved, he would trade it in for the first Super Skyrocket.

In early 1993, he took delivery of a freshly completed Skyrocket that had started life as a 1975 pressurized Skymaster, and expected to own it for no more than 60 days. Then came a major setback. First, the STC ran into delays and next, for a variety of reasons unrelated to the soundness and quality of the modification work, Riley went out of business.

Schuman resigned himself to foregoing the Super Skyrocket, but good ideas have a way of getting a second chance. Four years and 500 flying hours after taking delivery of his Skyrocket, he got a call from a company called Super Skyrocket, LLC, from Carlsbad, California. The new firm had acquired Riley's STCs for the Skymaster and was making Skyrockets again. It also had in hand the approved STC for the Super Skyrocket. Would Schuman be interested in upgrading his current airplane? He was, and after checking out the new operation and finding that ex-Riley craftsmen were involved in doing the work, he decided to proceed.

The conversion was done in six months. This sounds like a long time (and was longer than the original estimate) but is not surprising, given the magnitude of the job and the fact that Schuman's airplane was the guinea pig Super Skyrocket. Installing the larger engines isn't a simple matter of bolting them on and rerouting a few cables and hoses. A tremendous amount of engine compartment modification is also required, including extensive sheet metal work and new engine mounts. Schuman also took the opportunity to have the exterior painted and the interior redone again. It had been a long time coming, but in July 1997, Schuman finally had his Super Skyrocket.

Super Workmanship

When you first see it, you think you are looking at a factory-new airplane. In fact, no stock Skymaster ever looked as good when it rolled off the Cessna assembly line. The light-gray custom leather interior is first-class, reminiscent of a top-of-the-line luxury car, including the scent. The split clamshell door is slick and cavernous and is adorned with a Riley door seal superior to the original.

The interior space, however, is rather cramped for an airplane billed as a five-seater. Because of the positioning of the rear engine, the problem is not cabin width, but length. The baggage space aft of the fifth seat is tiny. It became the object of such a common gripe about Skymasters that Cessna devised an ugly but effective optional external belly-mounted baggage pod for the line.

A simpler and more elegant way to handle the baggage space problem is to

Schuman was drawn to the airplane because of the safety benefit of the push-pull configuration. "You either love the concept or hate it."

Riley Super Skyrocket

Price $565,000

SPECIFICATIONS

Engines (two) . . . . . Teledyne Continental TSIO-520-NB
Horsepower . . . . . 310 hp
Propeller . . . Hartzell three-blade
Wingspan. . . . . 38.2 ft
Seats 5
Fuel Capacity . . . . . 150 gal.

Weights and Loading

Gross weight . . . . . 4,700 lb.
Empty weight . . . . . 3,404 lb.
Useful load . . . . . 1,296 lb.
Power loading . . . . . 7.5 lb./hp

PERFORMANCE

Maximum speed . . . . . 270 kt
Normal cruise speed . . . . 223 kt
Range, VFR reserves . . . 846 nm
Rate of climb, sea level . . . . . 2500 fpm
Single-engine rate of climb, sea level . . . . . 675 fpm
Certified ceiling . . . . . 20,000 ft.
Takeoff distance (50-ft obstacle) . . . . . 1125 ft.
Landing distance (50-ft obstacle) . . . . . 1489 ft.
Stall speed. . . . . 40 kt

Information

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Dept. PPM
2026 Palomar Airport Road
Carlsbad, California 92008
800/841-1115, fax 760/929-2801
www.superskyrocket.com.

admit that the Skymaster is really a roomy four-seat airplane, rather than a cramped five-seater. This is especially true of the Super Skyrocket because the extra weight of the modifications has eroded the useful load to 1,296 pounds, down from 1,533 pounds on the last stock pressurized Skymasters. If you want to fill the tanks to their 150-gallon capacity for maximum range, you are left with 396 pounds to put in the cabin (and a mad temptation to lie about your girth on the weight-and-balance sheet). With a slightly lower fuel load, however, it is a solid four-passenger airplane.

A peek under the jam-packed rear cowling confirms that the pusher engine

The split clamshell door is slick and cavernous. Custom leather seats are reminiscent of a top-of-the-line luxury car.

is still a bear to work on, although both Schuman and his maintenance technician say that due to the different location of some accessories on the new engine, some routine maintenance tasks have become marginally easier.

The Super Skyrocket is fired up like any other fuel-injected twin—with one exception: You always start the rear engine first for foolproof confirmation that it is working properly. The only other rare item to remember on the pretakeoff checks is to set the pressurization system.

The rear engine also gets the VIP treatment on takeoff. The standard procedure is to advance the rear throttle first to verify that the pusher is pushing before coming in with power on the front engine. A treat with centerline thrust on takeoff is the lack of a critical Vmc. If an engine fails, you just go to Vxse of Vyse, depending on obstacle clearance requirements. The downside is that a multi rating earned in an airplane with centerline thrust isn't valid in conventional twins.

Skyrocketing Performance

As would be expected from an airplane that had its power loading changed from 10.4 lb./hp to 7.5 lb./hp, the Super Skyrocket lives up to its name on departure, achieving an initial climb rate of 2500 fpm at gross weight. Leaving Naples, we accelerated to the 80-knot rotation speed in about 1000 feet and restricted climb to 1000 fpm to see over the nose and make some forward progress. At 34 inches and 2500 rpm, we indicated 110 knots in cruise climb. Cowl flaps kept the engine temperatures in check during the ascent.

Another indication of climb performance is a comparison to the airplane's performance when it was a Skyrocket. "Back then, it could hold 1000 fpm to around 10,000 feet. Now, it will hold it all the way up to its 20,000-foot certified ceiling," says Schuman.

A standard item of the conversion package is the two-axis S-Tech 65 autopilot/flight director with altitude preselect, coupled to the Silver Crown nav radios and the KLN 90B GPS. This capable flight management package reduces the single-pilot IFR workload to a reasonable level, even at peak traffic times in the Northeast corridor. An optional Stormscope® rounds out Schuman's avionics package. So far into the flight, he had been using it in checklist mode, but later in the afternoon, he would also make good use of its primary purpose.

Level at FL190, there was little to do but monitor our progress toward our enroute fuel stop in North Carolina, pat Cosette, Schuman's fluffy little white Bichon Frise, on the head as she snoozed at our feet and enjoy the CAVU view. One strong suit of the airplane is excellent visibility from the front seats. You sit well ahead of the high wing and with the exception of a slight obstruction as you look aft and up, the whole world is at your feet. Cockpit visibility was a key factor in convincing the USAF to select the unpressurized version of the Skymaster as a forward air controller aircraft for the Vietnam war.

With the power set to 31.5 inches and 2230 rpm, the TAS edged up to 220 knots in normal cruise. "That is an improvement of between 20 to 25 knots over the previous engines," said Schuman.

Monitoring the engine temperatures in cruise is worth extra attention in the Super Skyrocket, given the aft engine's tendency to run a little hotter than the one up front, in spite of the big overhead air scoop's best efforts. Schuman tracks engine parameters on the optional JPI engine monitoring system. It takes an extra 2 gph of fuel flow and an occasional touch of cowl flaps to keep the rear engine on a par with the one up front. Super Skyrocket says the problem is the location of the oil cooler. It is too close to the hottest (number-six) cylinder. The opening in the baffling that is required to route air to the oil cooler slightly decreases the airflow over the cylinder. The company is working on a fix.

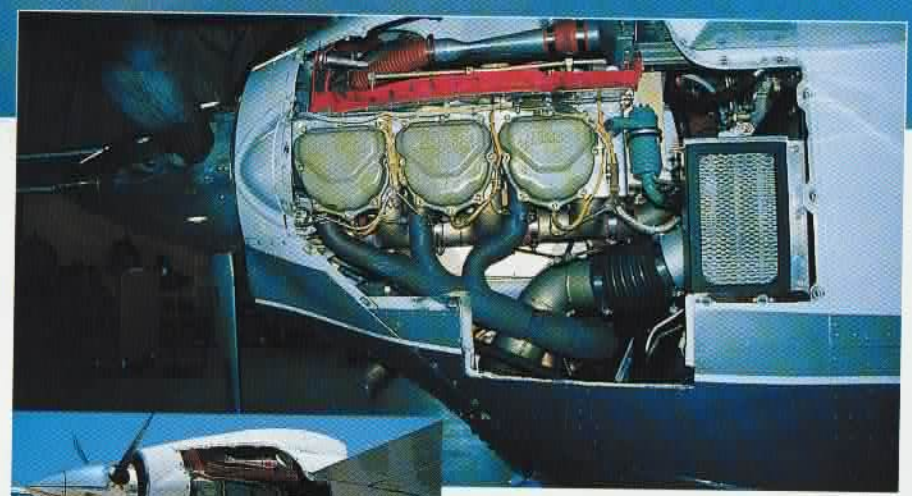
A minor annoyance is a tendency for the props to go out of synch, requiring frequent readjustment. SuperSkyrocket has traced this problem to the Woodward prop governor's electronic synchrophaser, which senses the rpm to which the rear engine is set and adjusts the front engine through a feedback loop. The sychrophaser's algorithm currently can't handle minor rpm fluctuations. A solution is being devised.

A Vote for Centerline Thrust

During a lull in the radio traffic, I asked Schuman how he felt about centerline thrust, now that he is pushing over 700 hours in the airplane. Very good, as it turns out, because he has had the opportunity to sample its benign sin-

Twin boom tail, an icon for the Cessna 337

Without a doubt, the Super Skyrocket is super personal transportation. It is the closest you can come to a factory-new pressurized twin.



A peek under the jam-packed rear cowling confirms that the pusher engine is still a bear to work on.

A Continental 310-hp engine is shoehorned into the nose of this unique aircraft.

Three-blade Hartzell propellers are used forward and aft.

gle-engine characteristics firsthand when the rear engine failed—twice.

The first time was in Skyrocket configuration over Atlantic City in the winter, above a solid undercast. Shortly after the engine failed, the airplane also developed a cabin leak. The only way was down, into the muck. Schuman describes the approach as "wild," with nasty windshear and a 35-knot headwind, fortunately, right down the runway. "In a conventional twin, it could have been marginal," he says. The problem turned out to be an intake hose that worked its way loose and disconnected.

Handling the second failure was a nonevent in good weather, but the incident proved to be more annoying in a way, because the engine did, indeed, fail and had to be replaced. This was after the Super Skymaster conversion, with barely 120 hours on the engine. A failed seal had allowed oil into a magneto. The oil carbonized, causing a short. The resultant pre-ignition poked a hole in a cylinder. Suffice it to say that Schuman is all for centerline thrust.

We reached Duplin County Airport, our refueling stop in North Carolina, three hours and 14 minutes after departing Naples—not bad for 650 nm into a 24-knot headwind. We had used 123 gallons of fuel. Schuman's rule-of-thumb for maximum endurance in the airplane in economy cruise is four hours with reserves, which works out to about 800 nm. The only weather to contend with was broken cumulus on the way down, but the darkening sky to the north suggested that the easier half of the trip was over.

Handling Heavy Weather

Following a quick turnaround by the nice folks at Duplin County, we were soon climbing again into blossoming shades of gray. Cosette must have sensed something was up, perhaps from the tone of our conversation as we watched the Stormscope, for she stuck her head up between our seats, seeking reassurance. For us, reassurance came from the Stormscope, which neatly displayed a mass of electrical discharges along a 100-nm line to the west, but nothing ahead.

At 14,000 feet, ascending in climb cruise, we entered a solid overcast with the tops reported at 17,000 feet. Traces of ice soon began to form, first at the bottom of the windshield and then, along the wing's leading edge and the struts. Schuman's airplane has propeller de-icing but no de-icing boots (it was an option on Skymasters), so we watched the buildup and the airspeed indicator with extra care.

We broke out on top at FL180, well before the deterioration in the climb rate and airspeed would have dictated a descent back into the warm air close below us. We were in the clouds for only about five minutes, but as I peered at the half-inch-thick layer of ice along the wings, I was reminded of how little it takes to turn an airframe into a lethal ice sculpture. Boots would get my vote in any purchase of a SuperSkyrocket.

"Let's hope sublimation works," Schuman said, as we leveled out at FL190 and calculated that the load of ice was lopping off 25 knots from cruise speed. It does work, but oh, so slowly: It took well over an hour for the last traces of ice to disappear. The good news was that for the moment, it was CAVU on top. Cosette curled up on the floor and went back to sleep.

We heard about the next hurdle on the radio before we saw it. The daily late afternoon armada of airliners was converging on New York City and every one of them was asking for a deviation to keep the ride smooth. The weather picture was much the same as earlier over North Carolina. A line of thunderstorms extended westward but again, it looked as if we could do an end run around them, with a slight detour to the east.

Watching the Stormscope, Schuman asked for and got a deviation around a patch of boiling blackness in our path; we droned into the more benign murk to the east. A furry head popped up between the seats well before the first jolts of moderate turbulence hit us but in minutes, we were through. A fantastic pastel palette of oranges, blues, grays and brilliant white gave way to sunshine over Long Island Sound. It was clear sailing all the way to Hanscom Field, near Boston, where Schuman dropped me off before hopping back down to Connecticut. The total flight time from Naples was 6+22, headwinds and icing included. Schuman routinely sees 5+30 between Florida and Connecticut, plus a 30-minute fuel stop. Door to door, that beats the airlines.

Without a doubt, the Super Skyrocket is super personal transportation. It is the closest you can come to a factory-new pressurized twin. It delivers more performance and redundancy than any new or fully refurbished alternative in its price range. It is easily mastered by anyone competent in a complex light airplane. Its power, pressurization and avionics make routine trips out of flights that would be taxing adventures in only slightly less-capable airplanes. And if you do sign up for a Super Skyrocket, your dog will love you if you pick one with de-icing boots.