MUSIC IN THE AIR

SINGING CIRRUS PILOT / P.66



ARKANSAS ADVENTURE

FLYING WITH THE BYRDS / P.74

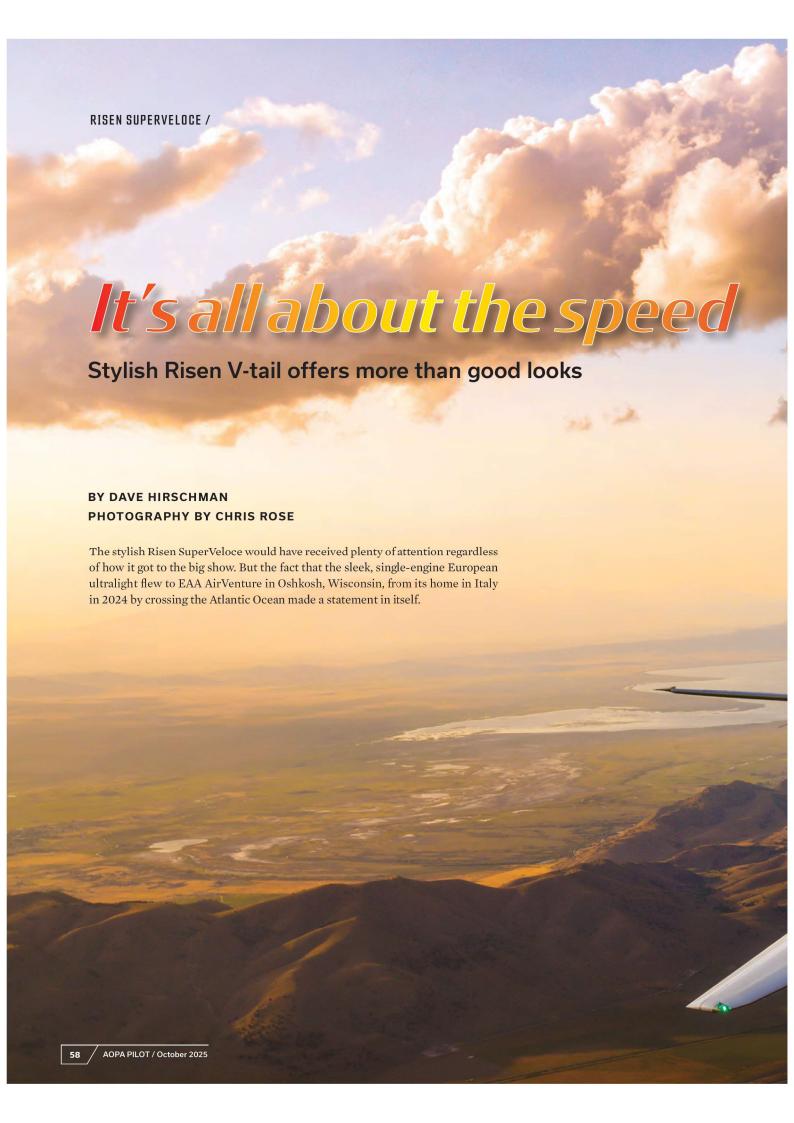
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RISEN SUPERVELOCE

SUPER SPEEDY

FLYING FAST AND FAR, WITH ASTOUNDING EFFICIENCY / P.58







With the recently announced FAA rule changes under MOSAIC (Modernization of Special Airworthiness Certification) allowing U.S. sport pilots to fly airplanes equipped with retractable landing gear, variable-pitch propellers, and top speeds well in excess of the current 120-knot light sport aircraft limit, the Risen is now even more compelling.

"We flew across the Atlantic to show that our performance claims about the airplane's speed and fuel efficiency are real," said Alberto Porto, the Risen designer and CEO, who made the 11-hour westbound flight across the Atlantic with friend and fellow pilot Andrea Venturini. "Our numbers are real and verifiable. They're not exaggerations."

At the conclusion of the massive annual aviation gathering, Porto flew the Risen back to Italy. This time, with the aid of a tailwind, the Risen made it from Goose Bay, Canada, to Ireland in nine hours. On those record-setting flights, the Risen's 160-horsepower Rotax 916iS consumed about 4 gallons of fuel per hour at 165 KTAS.

"We could have done a lot better if we'd flown higher," said Porto, an engineer who was born in Argentina and worked in Italy most of his career. "But a combination of clouds, wind, and air traffic controllers kept us at lower altitudes than we'd normally fly in a turbocharged airplane."

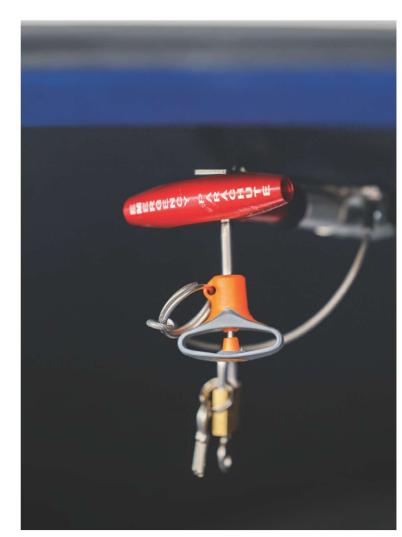
My introduction to the Risen takes place in Nephi, Utah. Risen builds complete airplanes at its factory near Milan for European customers. But U.S. buyers who license their airplanes under experimental/amateur-built rules follow a far different path.

"They travel to Milan and work in the factory for about two weeks," said Robert Barnes, U.S. representative for Risen aircraft. "All the structural parts are made with expert supervision from factory employees, and the process is carefully documented."

Risen uses retractable landing gear and a constant-speed propeller to great effect, with an uncompromising approach to gaining speed, range, and flight efficiency.















Risen designer and CEO Alberto
Porto shows his confidence in the
airplanes his company builds through
extraordinary long-range flights as
well as local speed tests. His airplanes
include high-quality components such
as Garmin digital avionics and Beringer
wheels and brakes.

Barnes said the factory building experience is both educational and enjoyable, and northern Italy is a popular destination where visitors will want to spend extra time. Once the airplane is complete, it's disassembled, loaded into a shipping container, and sent to Nephi (pronounced *NEE-figh*).

There, at a nontowered airport about an hour's drive south of Salt Lake City, the owner-built airplanes are reassembled, licensed, and test flown. A factory pilot typically makes the first few test flights to verify performance before the buyer takes over.

Barnes, a former Gulfstream pilot, has owned and flown his own Risen for several years and knows the process well. He's also a flight instructor and patiently guides me through an introductory flight.

Astonishing performance

My initial impression of the Risen is the most obvious: It's all about speed. From the tight cowl to the angular canopy to the V-tail, Risen has gone to extreme lengths to reduce weight and aerodynamic drag.

LED landing lights, for example, are attached to the main landing gear struts so that they're tucked away out of the slipstream in flight; composite surfaces are smooth to the touch; control surfaces have minimal gaps, and most of them are sealed; navigation and strobe lights are faired inside clear covers.

The Rotax 916 iS produces a great deal of heat, and the Risen cowl uses unusually small scoops to provide outside air to the oil cooler, turbocharger, and cylinders. The Risen's high cruise speed makes that cooling air especially effective.

The composite wing blends multiple sections to allow it to fly both fast and slow. The swept tips have a trapezoidal shape for high-speed efficiency. The trailing edge has long metal tracks for Fowler flaps capable of extending more than 40 degrees. The combination allows an extraordinarily broad speed range in which the Risen's never exceed speed (205 knots) is almost five times greater than its stall speed of 43 knots.









That spread gets far greater in terms of true airspeed. At 18,000 feet, for example, the Risen's top speed is 226 knots in level flight.

An electric motor raises and lowers the single-piece canopy and latches on both sides to secure it to the 48-inch-wide flight deck. The IFR-capable instrument panel contains two Garmin G3X primary flight display/multifunction displays, a GTN 750 navigator, audio panel, and a digital Garmin autopilot.

Two floor-mounted control sticks, each with an elevator trim and radio transmit switch, arise from the base of the leather seats. A pedestal-mounted throttle and propeller rpm lever are mounted between the seats along with a fuel selector and electric flap control knob.

The tricycle landing gear is raised and lowered via an industrial-sized toggle switch at the base of the instrument panel perfectly centered so both occupants can easily reach it. A whole-airframe ballistic parachute is stowed in the upper fuselage just aft of the cockpit. It can be deployed at airspeeds up to 175 knots via an emergency pull handle.

Climbing into the Risen requires preplanning and dexterity. First, sit on the wing, then reach into the airplane and grab a crossbar for support. Step onto the bucket seat and make sure the four-point harness, headset, and kneeboard/iPad are out of the way. Then brace yourself with a hand on the top of the instrument panel and/or cockpit sidewall as you lower yourself down. Once inside, the Risen is remarkably roomy and the bubble canopy accentuates that airiness.

I elect to fly in the right seat because I have an overwhelming desire to fly with the control stick with my right hand and throttle in the left. Any other arrangement seems intolerable, although I realize I'm in the minority, and many more dexterous pilots are happy to manipulate the stick with either hand.

Barnes and I cinch into four-point harnesses, and he lowers the canopy and starts the Rotax. I feel out the Beringer wheels and toe brakes during the quartermile taxi to Runway 17.

The two-seat Risen flight deck is 48 inches wide, and the semi-reclined seats are meant to keep occupants comfortable during long-range flights. A ballistic whole-airframe parachute system is standard equipment.





The wind is out of the southwest at 10 knots, airport elevation is 5,022 feet, and the density altitude is about 6,500 feet. Runup is normal for a fuel-injected, turbocharged Rotax and the engine monitor shows no anomalies.

Barnes sets the rotary dial for takeoff flaps and confirms their position visually. I advance the power lever all the way forward and reach the airplane's 60-knot rotation speed in about seven seconds.

Elevator forces are light but not twitchy as I aim for a 10-degree nose-up attitude, then raise the gear and aim for a best-climb speed of 81 knots.

An electric motor takes about five seconds to fold all three landing gear aft and up into the fuselage. I reduce engine power to 44 inches of manifold pressure and engine rpm to 5,400 during a cruise climb at 95 knots.

We level at 7,500 feet and let the airplane smoothly accelerate. Control forces are light and well balanced, and the roll rate is crisp with no noticeable adverse yaw.

I'm curious about slow flight and reduce the power to idle to get down to flap deployment speed. Even with a constant-speed propeller, the Risen is so aerodynamically clean that it's reluctant to slow down. Slowing to the 87-knot flap deployment speed means raising the nose and entering a slight climb.

Once the flaps are partially down, we slow to 70 knots to lower the landing gear, then deploy landing flaps. Aerodynamically dirty, the Risen is willing to descend at 500 feet per minute and idle power without gaining much speed. It's still somewhat slippery, though, and I find myself inadvertently going beyond the 70-knot limit while tracking the visual glideslope on the two-light PAPI.

Barnes counsels carrying some power all the way into ground effect before flaring and I follow his advice. The airplane touches down on the main landing gear slightly right of center, and the nosewheel makes contact a couple seconds later.

Barnes raises the flaps to the takeoff position and I add full engine power for another takeoff. The ruddervators don't provide effective steering on the ground until the airplane reaches about 30 knots, so directional control, especially in a crosswind, requires a touch of brakes. After three circuits, we make a full-stop landing, put the airplane away, and prepare it for a formation photo flight that evening.



Incredible things

My main takeaways from the introductory flight are that the Risen is a thoughtfully designed, highly capable airplane with a clear purpose: flying fast, and far, with astounding efficiency.

That became even clearer on our second flight, an hour-long photography flight along the rocky, 10,000-foot peaks of the Wasatch Mountains. The Risen flew next to a Cessna 210 while AOPA colleagues Chris Rose and Michelle Walker pointed their cameras out the photo windows.

During the flight, Cessna photo pilot Jim Hoddenbach asked about the Risen's fuel consumption while calculating how long we should continue. The hard-for-me-to-believe answer was that the diminutive speedster was only burning three gallons an hour while flying next to the Cessna at 135 KIAS.

MOSAIC rules make the Risen and other high-performance factory-built airplanes widely available to U.S. sport pilots. That will

The Risen is a thoughtfully designed, highly capable airplane with a clear purpose: flying fast, and far, with astounding efficiency.

be a welcomed change. But no-compromise designs like the Risen (or JMB, or Tarragon, or similar models) require more pilot skill than previous U.S. light sport designs.

Their light wing loading and high cruise speeds make them punishing to fly in turbulence. Their ability to fly at high altitudes puts a premium on avoiding icing conditions and other adverse weather. And very low landing gear and flap extension and retraction speeds require thinking ahead with careful descent planning and precise airspeed control. MOSAIC expands sport pilot privileges through additional training and endorsements for things like retractable gear operations.

The Risen is a striking airplane with astonishing performance. It's only got two seats, of course. But it's faster than a normally aspirated Beech Baron and can literally cross an ocean on the amount of fuel a new Cessna 182 can hold in just one wing tank. The Risen isn't for everyone. It requires a knowledgeable, proficient pilot with a deft touch on the controls, solid judgment, and a passion for speed, range, and flight efficiency. But in the right hands, it can do incredible things.

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A distinctive V-tail design is a Risen hallmark that minimizes aerodynamic drag, and it's visible from every angle as well as the company logo. The company's U.S. hangar is in Nephi, Utah, where the aircraft built in Italy are licensed and flown.

