

## News

### The Zodiac series: One family's family of airplanes

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It may look like something from New Piper, but the Zodiac from Zenith Aircraft is a completely original design. The line's resemblance to Piper's popular Cherokee series can only help the marketing effort.

People like to buy familiar shapes, especially in aviation, where great diversity has distilled certain designs that seem to enjoy the best success. Piper's Cherokee line meets this definition. So does the Zodiac line from Zenith Aircraft of Mexico, Mo.

Attention GA pilots

Would you like a new airplane? New is nice, isn't it? But would you like the price tag to be less than \$150,000? If you could buy the same comfort and performance with confidence, of course, you would.

On their side, Piper has decades of good reputation for their engineering while Zenith Aircraft is a relative newcomer. The company name may be new to you, but the people behind it are deeply experienced.

All models from Zenith start with "CH-" which identifies Chris Heintz, father of an aviation-oriented family that will continue this work for decades into the future. Sons Sebastian and Nicolas are both emerging figureheads in the company their father founded.

Zenith Aircraft is one of the light aviation industry's most GA-like manufacturers. Accomplishing more than creating aircraft that look like Piper designs, the company has also demonstrated that it can certify aircraft. The Canadian-based company with manufacturing in Missouri has won government approval in other countries and is a leading candidate to offer a plane under the new Federal Aviation Administration "Sport Pilot" category.

Here's where it gets interesting

The FAA has offered their rule and the public has responded in droves (well over 2,000 comments, which exceeds the sum for most rules the FAA proposes). "Sport Pilot" appears to be coming and with it will come a new class of airplanes called Light Sport Aircraft.

Such machines will be able to weigh up to 1,232 pounds, cruise at 115 knots (max) and must stall at 39 knots or less when flaps or other devices are deployed. They can carry two persons in comfort and some, like the Zodiac XL, can cover 600 nautical miles non-stop.

Among the most important aspects of the new rule is that manufacturers like Zenith may fully build aircraft and sell them to customers. The Zenith aircraft might sell for \$59,000 — although no pricing has been set at this time. The first to roll off the line are months away at best.

A brand new 130-mph aircraft for about \$60,000 represents a bargain you can't replicate with any other certified aircraft. Even Cessna's 172 will exceed \$150,000 with basic equipment (though this price comparison is not a careful point-for-point evaluation).

Could this energize aviation? Possibly. You may be part of the answer if you are interested in buying one of these new Light Sport Aircraft, for example, the Zodiac XL. Why not have closer look at this interesting flying machine?

## A feel for Zodiac

Like most aircraft, Zodiac has evolved from the first model. Zodiac is now a line of four models and the XL is the largest and newest of the breed (except for a four seat model also in kit production).

Zodiac XL's new wing design features a slight taper for added cruise speed and crisper roll response. Inside the wing skin it has a shorter vertical tall spar so the seats can be more reclined. The XL's seats offer a supportive posture that still assures plenty of visibility. I found the long seat bottom restful for my legs and imagine that a six-hour cross country would be reasonably tolerable.

Zenith says that 500 pounds of useful load is the target for the Zodiac XL under the proposed Sport Pilot rules. While the company formerly recommended the O-235 Lycoming, they've switched to the Australian Jabiru or Austrian Rotax powerplant. Doing so significantly increased useful load and improved fuel consumption.

A new canopy configuration has the bubble top opening forward. It used to swing open to the side, but the new way permits both occupants to enter simultaneously. A gas piston on both sides of the canopy makes for easy raising of the large component.

As you take a big step up on the wing — no step is provided — you must avoid the flaps as you enter, just as with many GA planes. As you enter you may use the rear support aft of the cabin with one hand and another handle on the panel just above the radio stack. From this point, it is a fairly simple step down and inside the Zodiac XL.

Zenith factory pilots recommend you lower the flaps for entry/exit to make them easier to step over. Full lowering can be done visually, but our test plane had a panel indicator to show flap deployment in the settings of 10, 20, and 30 degrees.

Zodiac XL's flaps work electrically and move quite swiftly. Zenith factory pilots say you can lower them before slowing to white arc range so long as you don't put down full flaps above white arc speeds. I hit the responsive switch carefully to avoid this. With a few deployments, you get the hang of the fast-moving flaps.

As I've seen on several engine starts in varying aircraft, the 6-cylinder Jabiru engine has always started very rapidly. At the end of the flight, engine shut down is simply a key switch.

One non-GA idea is the center stick. Most Part 23 airplanes use yokes while sport pilots often prefer joysticks. This attitude may be changing though; the new Cirrus and Lancair certified aircraft use side yokes where the PIC flies with his or her left hand.

All my landings went well, thanks to good preparation from Zenith factory pilot Nick Heintz. He advised me not to bring the Zodiac XL to a high flare as I might touch the tail. Though I prefer to execute full-stall landings, I guarded against that reaction and the plane settled in beautifully.

Basically I adopted an attitude landing technique as a substitute for full-stall touchdowns. Such a method does not allow you to slow dramatically as is useful for soft or very short field landings. Most GA pilots will find Zodiac XL's behavior well suited to their experience.

On further advice, I used 70 mph on approach and rounded out at about 60 mph. Later I discovered that I could use approach speeds down into the 50s as could any user with a bit of experience.

## Vigorous performance

Using 100 mph for good over-the-nose visibility, Zodiac XL's climb rate hit 900 fpm with two on board weighing something less than full gross. Using a climb prop installed for Sport Pilot — to restrain its speed so as to stay within the definition — the climb rate might exceed 1,000 fpm.

My trials with steep turns done at 45-50° of bank showed stable and steady characteristics. No additional power was needed as is common with most aircraft, and this also explains why little back stick pressure was needed to maintain the turn at a constant altitude. It reveals the Zodiac as an efficient flying machine.

Some of the turn qualities no doubt derive from Chris Heintz's use of an all-flying rudder. Much like a stabilator for horizontal tails, the all-flying rudder — which has no fixed surface — is said to promote a cleaner airflow across both sides of the surface. Smoother movement across the surface generates less flow separation on the lower pressure side.

Zodiac XL's pitch will seem on the sensitive side to most GA pilots although it gave good feedback to movement. In a couple hours, most licensed pilots will become accustomed to the effortless feel.

Full stalls come at 45 mph when flaps are fully deployed. Zodiac stalls exhibit very benign qualities with no tendency to fall off on a wing. After discovering the stall qualities, I believe approaches can be done at 55 mph or so, which would shorten overall landing distances significantly.

While doing dutch roll coordination exercises, I found very little rudder was needed; the ailerons can execute turns very much on their own. The coordination between ailerons and rudder was quite acceptable in the Zodiac XL and this may be partially due to that full-flying rudder design.

Zodiac XL's adverse yaw is very modest. I found only a slight hesitation before initiating a normal coordinated turn. I saw no tendency to turn in the opposite direction in any adverse yaw trials. Such good behavior further burnishes Zodiac XL's image for GA pilots.

At a 130-mph cruise, Zodiac XL felt faster. The numbers don't relate perfectly to the sensation of speed. It might have been the open bubble canopy, which insures massive visibility, but also imparts a sense of motion. The canopy had good optical qualities, seeming distortion free to my eyes. However, I wore a ball cap to keep the sun off my head in Florida's bright sunshine.

The right light plane for you?

During steep turns it was simple to visually keep the maneuvering area free of other traffic. In straight and level flight, my view of the world was enormous in every direction except downward.

Overall, Zodiac XL felt very solid. Zenith reports the design is stressed for 6 Gs plus or minus; this is a figure that exceeds nearly every GA airplane being manufactured today. That doesn't mean you should reconsider learning how to do outside loops if you buy a Zodiac, but you'll have a tough machine.

Our test aircraft used the six jug, 3300 cubic centimeter Jabiru engine. You may select the Australian engine or the four cylinder Austrian Rotax 912S for your powerplant. Both are four stroke engines but the Lycoming of the older Zodiacs is not recommended for the Sport Pilot Zodiac XL model. GA pilots who prefer the familiar Lycoming name up front can obtain it on other Zodiac models, although these will only be available in a kit purchase.

My test aircraft had 12 gallons of fuel per side but an optional system can double the capacity for those who prefer to fly very long distances non-stop. With the 3300 Jabiru, the standard tanks translate to about four hours of operation. Consumption is about 6 gph at 2800 rpm, a setting you might use in cruise.

The Rotax 912S powerplant offers much better fuel economy, with 24 gallons lasting six hours while yielding only seven less horsepower. Under the proposed limitations of Sport Pilot (115 knot cruise) it appears the R-912S offers more than enough power and goes significantly further on Zodiac XL's fuel supply.

My evaluation of cruise speed showed about 140 mph at 2800-2900 rpm, however, the company plans a different prop for Sport Pilot. The FAA has not yet determined how this speed limit will be measured (or enforced) so Zenith will specify a few prop choices that can adequately restrain Zodiac's speedy ways.

Observing the Jabiru's operation, I saw very little temperature variation even in 85° heat and high humidity. My entire hour and a quarter flight remained in the hot, damp air a couple thousand feet off the ground. Zenith's use of a two-blade prop with a lot of twist near the root creates added engine cooling. Jabiru has been impressive in several aircraft I've flown and its slightly higher fuel consumption shouldn't be enough to push you away from the Australian choice.

As Sport Pilot approaches, airplanes that qualify under still-to-be-devised consensus standards will start to emerge. Many of these, I predict, will be designs from overseas. All may catch your attention, but the ones you've known about for 20 years may seem to be — and may actually be — the better choice. Zenith is certainly among the standard bearer brand names for North American pilots and this may be satisfying to those hailing from the GA community.

Until Sport Pilot becomes law, you can buy the kit Zodiac for a substantial discount (by not buying ready-to-fly). The complete airframe kit for the Zodiac XL sells for \$15,890. Not included in this price are the firewall-forward package, instruments, paint, or upholstery. The company sells the Rotax 912S engine for \$11,550 and you'll also need the engine mounting accessories — \$3,700, plus some basic instruments for \$1,000 more. These items add up to more than \$32,000 and you haven't painted or finished an interior yet. My estimate is that you are looking at more than \$35,000 for a flyable kit.

Zenith didn't wish to discuss figures about fully built aircraft yet, but I would guess \$55,000 to \$60,000 for a complete and ready-to-fly Zodiac XL.

For GA pilots, Zodiac XL is a conventional looking light aircraft with handsome performance for its class, very cooperative handling, and room for two to travel. At 130 mph in good comfort with an enormous view, you and a friend could cover 600 miles in a day's flying. For a fraction of the cost of a new Piper or Cessna, the Zenith aircraft deserves a closer look.

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