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Y-Tail Wonders

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the Amazing 170-mph Waix

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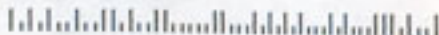




PHOTO: JIM KOEPNICK, EAA

John Monnett demonstrates the Waix over Wisconsin's Lake Winnebago, a familiar landmark for anyone who's flown to Oshkosh AirVenture.

Pedal to the Metal

The Y-Tail Waix combines unusual style with refreshing speed.

BY DAN JOHNSON

The airlines may be suffering and Light-Sport Aircraft (LSA) has yet to coalesce into a coherent industry segment, but Sonex Ltd. is having a fine run of business. During my visit on a beautiful fall day in Oshkosh, Sonex said it was ready to break ground on a new hangar, the third building of what has become the Sonex campus on Wittman Field. At press time, it was nearly complete.

Sonex is clearly ready for LSA, but the company has built its enterprise on delivering kits to the Experimental/Amateur-Built community. Steadily selling kits keeps Sonex in good business shape while LSA comes into focus. This

company is well positioned for whatever future recreational flying holds.

Waix Is For Y-Tail

We can see you fighting the name with all those vowels hung together. Don't say "WAY-ex." Say "WHY-ex," and the name immediately makes sense. That may seem new, but, except for its namesake Y-shaped tail, everything else on the Waix is identical to the Sonex model the company has sold since it began in 1998.

I flew the company's bright yellow Waix with designer John Monnett. Many earlier builders and enthusiasts know Monnett for his Monerai, Moni, and Monex Racer, all of which share the Y-tail. "The Waix is actually the airplane we had in mind even before the Sonex," Monnett told me.

In addition to a Bonanza-like control system—on the splayed portions of the tail, a pair of surfaces called ruddervators handle pitch and yaw—

the Waix includes a stub rudder at the furthest aft section of fuselage that moves in concert with the appropriate rudder pedal movement. Using the fuselage this way is a Steve Wittman design technique, Monnett said. It is a nice touch from an aerodynamics viewpoint but it also shows cleverness about using the airframe to best advantage.

With his longtime engineer, Pete Buck, Monnett and family created not only the Waix but the Xenos motorglider, both with Y-tails. (See article on Page 8). I took a flight in both machines and for a longtime soaring pilot like me, the Xenos motorglider holds great interest. For most pilots, however, the Waix may be the better choice.

According to Sonex, its aircraft deliver the a lot of performance for the dollar. Indeed, a chart in their literature package illustrates this succinctly. For a complete kit price (including a 120-hp Jabiru 3300 engine) of less than \$32,000 (assuming no major fluctuations in the

Waix

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U.S. to Australian dollar exchange rate), you can have a Waix that will see you zooming through the sky at 170 mph. By one calculation, that's quite a deal: total cost is only \$186 per mph. Were you to build a Van's RV-9 with a new Lycoming, you'd be in for approximately \$52,000, or \$267 per mph; make it a quickbuild and it's \$308 per mph. (Incidentally, the RV estimates come from Van's online cost estimator and assume a basic, VFR/cross-country aircraft. Sonex's own literature says the RV-9 will cost \$321 per mph.) Opt for the 80-hp, VW-based AeroVee kit engine and you'll get 150-mph cruise for a comparatively modest \$22,260. That calculates to an amazing \$148 per mph.

Most of us don't think in terms of dollars per mph—and the comparison with the RV-9 ignores the fact that the RV is larger, heavier and, as a result, more cross-country capable—but it certainly proves that the Monnett machine won't take too much of your money for the speed it can deliver. Add this to the mixture: the kit has been optimized in many ways, with laser-cut panels, much prefabricating, jigless con-

struction and factory builder seminars that discount the kit enough to make travel to Oshkosh worthwhile.

You can also choose between tri-cycle or conventional gear. The wings remove easily for transport. All major components are built of familiar, easily worked, inexpensive 6061 aluminum.

If Light-Sport Aircraft is the direction you want to go, here's some good news: *all* the Sonex machines qualify. You'll have to use a different prop on the Sonex and Waix, but they can then meet all the parameters of FAA's rule. The Xenos further qualifies as a motor-glider for which the FAA requires neither an aviation medical nor a driver's license.

One way Sonex keeps down the cost of its models is to offer two engine choices. One is the Australian-produced Jabiru. The four-cylinder, 80-hp 2200 model costs about \$10,000, close to a \$2000 savings over the 80-hp Rotax 912 (and the 100-hp Rotax 912S is about \$3000 more). For about \$14,000, you can go with the six-cylinder, 120-hp Jabiru 3300. This is more power, however, than you'll need if you choose to stay within the speed limit of the LSA category.

SONEX LTD. WAIEX

Price (excluding quickbuild options)	\$13,495
Estimated completed price	\$25,000
Estimated build time	700 hours
Number flying (at press time) .....	.1
Powerplant	AeroVee 2180
	80 hp @ 3400 rpm
Propeller	Sensenich two-blade fixed-pitch
Powerplant options	Jabiru 2200, Jabiru 3300

Airframe

Wingspan .....	.22 ft
Wing loading .....	.11.22 lb/sq. ft
Fuel capacity .....	.16 gal
Maximum gross weight .....	.1100 lb
Typical empty weight .....	.620 lb
Typical useful load .....	.480 lb
Full-fuel payload .....	.384 lb
Seating capacity .....	.2
Cabin width .....	.40 in
Baggage capacity .....	.50 lb

Performance

Cruise speed .....	.150 mph (130 kt)
	8000 feet @ 75% power, 4 gph
Maximum rate of climb .....	.500 fpm (at max. gross)
	1200 fpm (at aerobatic weight)
Stall speed (landing configuration) .....	.40 mph (35 knots)
Stall speed (clean) .....	.46 mph (40 knots)
Takeoff distance .....	.400 ft
Landing distance .....	.500 ft

Specifications are manufacturer's estimates and are based on the configuration of the demonstrator aircraft. As they say, your mileage may vary.

Raring to go is one way to describe the lively Waix. This particular one has acquired the nickname *Yellow Jack*.



But the best powerplant bargain is the AeroVee kit engine. This son-of-a-Volkswagen dual-ignition powerplant starts easily, runs at engine revolutions familiar to most general-aviation pilots and costs a modest \$5695. I repeat that it is a kit—you get a DVD and/or video to help guide you through the assembly process—but this is certainly a way to keep the price tag from spiraling out of control. Incidentally, Sonex is the worldwide distributor for AeroConversions, manufacturer of the AeroVee.

At a time when some high-end LSAs are on the market for close to \$90,000, Sonex is doing the sport flying community a great service by selling a worthy series of aircraft at highly affordable prices.

Let's Fly the Waix

After Monnett thoroughly twisted my arm (yeah, right!), I decided it was time to go aloft. He rolled the Waix out using his clever tailwheel tow rig. It grasps the tailwheel axle and lifts it a few inches off the ground. Either Monnett has been hitting the Nautilus machine or this rig

The Waix gets its name from its Y-tail: a pair of surfaces called ruddervators to handle pitch and yaw control as well as a stub rudder (inset), which moves in concert with the appropriate rudder pedal movement.

helps move the Waix (and all other Sonex taildraggers) pretty easily.

Our evaluation airplane was equipped with the 80-hp AeroVee engine. Pipes left the fuselage amid flame decals. It has a Beetle sound to it, which may warm the hearts of some previous owners.

We hopped in and closed the canopy latch using a safety pin for additional security. Before the engine start and runup, we placed the brake lever in its park position. The AeroVee uses a redundant, solid-state ignition system independent of the electrical, and it was checked on the first switch position while an electronic system was on switch position two.

Openings on each side of the canopy draw in fresh air. They worked well even in taxi, which is good because the aircraft's clear canopy offers no sun cover. It does, however, make spotting traffic child's play.

As soon as you start to taxi this taildragger, you notice something different, something less sloppy than is often associated with tailwheel-steered aircraft. Pay thanks to a solid linkage from pedal to tailwheel, versus the more common cable-to-spring linkages with their spongier feel. This setup helps

reduce the need for the "dancing feet" technique needed to land some tailwheel aircraft without getting into a ground loop. With this solid linkage, Monnett says, you operate the aircraft more authoritatively. I liked it so much I wondered why more designs haven't employed this method.

Because it's a taildragger, you will need to move the Waix's nose somewhat for taxi visibility; the need wasn't great, however, as I could almost see directly forward by moving my head. We taxied out to the active at Wittman Field. (It always seems strange to fly at this airport without the torrent of activity I'm used to during AirVenture.) We were quickly number one—we rolled onto the runway, straightened out and opened the AeroVee's throttle fully.

Acceleration was brisk, a credit to the light weight of the aircraft. In a few hundred feet, we rotated and left the ground. Takeoff roll near maximum-gross weight is about 600 feet, Monnett indicated. While the Waix can zoom to pretty high speeds, it works well at low speeds; we had lifted off at about 55 mph.

The Waix trim system is different partly owing to the Y-tail. A rotating



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Waix

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knob is fitted just to the left of the throttle, and it sets a bungee cord system on the joystick. In this way, the Waix works like some ultralights that also bungee-load the joystick to provide relief to the pilot. By a rotating motion, you adjust the center position of the bungees. It may not sound as slick as a trimtab, but it did the job.

As we flew around in slower flight ranges, we explored the flap system. The Waix uses a two-position flap lever (15° and 30°) plus a neutral position. On landings later, I would find the second



Designer John Monnett actually conceived the ideas for the Xenos motorglider (front) and Waix prior to the Sonex, which the company has offered for seven years.



The demonstrator Waix is powered by an 80-hp AeroVee engine; using this flexible dipstick, you can check for oil without having to open any cowl doors.

position to be plenty; the aircraft does not need more flap than it has.

But Monnett wanted to show off the considerable speed of his Waix. He also wanted to go hunt for his son, Sonex General Manager Jeremy Monnett, who was out flying the Xenos. Being a soaring enthusiast and hoping for a flight later in the long-wing Xenos, I was equally interested in seeing the motorglider in flight.

During the hunt, we relied on the Stratomaster Ultra electronic information system, which weighs less than 2 pounds. This is an "ultralight industry" instrument from South Africa that combines flight and engine instrumentation and portrays the readings in both digital and analog formats. (The system costs around \$2500 with the attitude module and all sensors for a four-cylinder engine.) Monnett had also installed a TruTrak Flight Systems Digitrak autopilot, which weighs a mere 5 pounds.

With Monnett next to me in the 40-inch-wide cockpit, I found it a little crowded; neither of us is particularly large. We were touching slightly, and I was also bumping the canopy. Two big fellows would be tight, but as Monnett feels and as surveys have revealed, most two-seat aircraft are flown solo.



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Waix

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Gone Flying...Fast

Sonex says the maximum climb rate while solo is about 1200 fpm, and the AeroVee produced about 800 fpm near gross. During climb, the tachometer was showing about 3200 rpm. Since the engine noise at this power setting was quite noticeable on my tape recorder, I'd consider a headset essential; I didn't want to remove the one I was wearing. At a density altitude of 3500 feet, while not much below the 1100-pound maximum gross weight and flying at full throttle (3400 rpm indicated), the airspeed indicator showed 138 mph, LSA's maximum speed limit. Averaged runs back and forth using a GPS readout verified the number.

The Waix holds 17 gallons of fuel and the AeroVee burns about 4 gph, so you have 3.5 hours of endurance even with reserves. At a cruise of, say, 130 mph, that calculates to a 450-mile no-wind range.

Slow flight with plenty of trim dialed in indicated 60 mph at which the nose angle was quite high. During the slow flight period, the stick remained pleasant to use with light control forces and good response. Despite the additional area of the stub rudder, the pedals felt much softer, much less authoritative at this speed, where at high cruise the rudder felt very powerful, facts John attributed to the Y-tail.

Stall speeds were slightly lower than dictated by LSA, that is, about 45 mph (the rule is 45 knots or 52 mph). Stall behavior was benign. A significant airframe quiver foretold the stall onset

with plenty of warning.

Power-on stalls produced steep deck angles; it would be hard to miss stall entry if you have a visual on the horizon. Accelerated stalls also got to a high nose angle but rolled cooperatively to level on stall break, which was quite muted even when I stalled more aggressively. During one exaggerated effort, I managed to induce one wing to drop a bit, but the resulting bank angle was not steep. Recovery from any stall involved no more than lowering the nose. Adding power is not necessary, though perhaps advisable.

Is a Waix In Your Future?

If what you've read interests you, follow up with some further research. Sonex offers a detailed literature package with

Aside from the Y-tail, everything else on the Waix is identical to the Sonex, the company's better known kit airplane.



Flying the Sonex Virtually

There are not many things that can substitute for flying the aircraft you're considering building, but "Right Seat with Tony Spicer" gives a close approximation for potential Sonex customers. I watched all 52 minutes of the DVD production before writing this review, and I must congratulate Spicer on the job he's done.

A Sonex builder, Spicer says he hounded the daylights out of the Monnett family and the staff at Sonex while he was building his airplane. In return, he created a homemade video of pretty darned good quality (though obviously not a Hollywood production).

On the DVD, Spicer introduces his Sonex and takes you for a ride from the cockpit of the aircraft. You'll take off, climb out and zoom down a river near his home field (where his vivid imagination has the two of you shooting at combatants in their river boats). Throughout the video, you'll hear Spicer relating the G loads, hitting just over 4 G in tight maneuvering (those imaginary enemies are remarkably elusive).

Next, you'll climb up higher where Spicer takes you through barrel rolls in each direction, a loop, a Cuban Eight, slow flight, stalls and other maneuvers. Finally you'll return to his home turf where you'll witness a couple of high-speed passes ("to shoo away the stray sheep") followed by a touch and go and a full-stop landing.

Want one? Call Sonex and order one for \$5.

—Dan Johnson

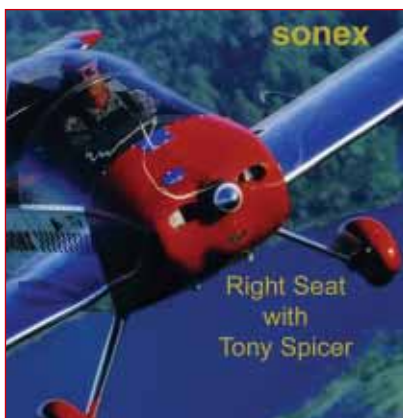


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informative DVDs as well as another DVD production titled "Right Seat with Tony Spicer," (see sidebar). The company also holds builder workshops a few times per year that give you a chance to meet the factory staff, learn about the construction of the airplanes and build your confidence by actually completing a piece of a Sonex wing.

So, no wonder Sonex is thriving: It's got the right combination of a fun-to-fly design in the Waix along with reasonable prices, lauded factory support and straightforward construction techniques. †

For more information on the Waix, Sonex or Xenos, visit www.sonex-ltd.com or call 920/231-8297.



The Waix doesn't feature a large panel, but modern avionics cut the need for many old-fashioned steam gauges. The central screen by Stratomaster represents the usual gauges and provides digital readouts.

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