

GETTING A Good Start



Sonex T-Flight program.

BY PAUL DYE



There is no doubt about it—no two Experimental airplanes are ever alike. In the certified aircraft world, you can be assured that one Cherokee flies much like another; if you've flown one, you've pretty much flown them all. But in the Experimental world, you can't be assured that two of any manufacturer's design fly alike (they might have very different engines or props)—much less that one sport plane flies like another. Stall characteristics, speeds, control response—these are all unique to each airplane in a wide continuum that stretches from low-and-slow STOL airplanes to turbine-powered flight-level cruisers. For this reason, transition training is becoming a hot topic in the Experimental world—and savvy kit companies are not only listening, they are responding.

Taking advantage of the FAA LODA program that gives instructors a way around the “no commercial use of Experimental aircraft rules,” individual instructors, owner groups, and factory programs are offering more and better opportunities for pilots to learn about their new aircraft before running into a dark corner of the envelope on their own. The NTSB has encouraged the FAA to do something about fatalities in the Experimental world, a large number being caused by pilot mis-control, and training is an excellent way to address this without additional excessive



Good transition training will go over the specifics of each aircraft's design and construction. Here, Joe Norris explains the Sonex's construction to the author.

regulation. Programs in this new world of training vary from syllabuses passed from instructor to instructor, to full-up training programs provided by kit manufacturers. We took advantage of an opportunity to drop in on the Sonex T-Flight training program last summer, the week before AirVenture, at their Oshkosh headquarters.

The Man With the Plan

Joe Norris is no stranger to the homebuilt world. Now working as the flight operations manager for Sonex, Joe began flying when he was a cranberry farmer in central Wisconsin, about forty miles west of Oshkosh, and ended up as

the homebuilt Community Manager for the EAA. He has been a DAR, has built numerous aircraft, and joined Sonex after leaving the EAA due to management changes a few years ago. Full of laughter, yet serious about the need for transition training, he has put together a program that allows new or future Sonex owners to develop the skills they need to handle these small sporty planes.

Most Experimental airplanes fly well, and this is true of the Sonex airframes—yet it is important for new pilots to understand the unique characteristics of handling, sight pictures, and operating techniques. These can be discovered by good pilots on their own—but it is



A variety of Sonex aircraft are available for the T-Flight program, but not the single-seat Onexes (shown here with the wings folded); Sonex offers dual instruction only.

so much quicker (and safer) to build on the knowledge already gained by those who have gone before. Sonex is not alone in developing transition training for their customers, but their structured approach and promotion of T-Flight puts them near the top of the list of companies leading the charge to make good transition training the default in our industry.

Getting Started

Sonex Aircraft, LLC is located on the hallowed grounds at Wittman Regional Airport in Oshkosh, Wisconsin. As someone who has flown into Wittman during the annual EAA convention, I figured that I knew the airport—but in truth, it is a very different place for 51 weeks of the year. The tower operates like any other tower—a bit sleepy, in fact. Without 10,000 other airplanes converging on the area, an arriving pilot like myself actually had more time to look around at the airport environs—and it is a pretty place with lots of runways. Most of us who have never been there in the off season don't know that runways 13-31 or 4-22 even exist—yet up there in the northeast corner, between the two, is a cluster of hangars that house aviation businesses like Sonex.

Pilots flying in to do a T-Flight program can taxi right to Sonex's front door—or better yet, take advantage of special deals



Spending time in the classroom saves time in flight. The T-Flight program at Sonex includes two hours of ground school to talk about unique aspects of the Sonex line.

they have with Hilton Garden Inn on the north boundary of the airport. The Hilton has aircraft parking and tie-down space at their back door, and will provide a ride over to the Sonex complex in the morning. You don't have to rent a car for the visit. Joe and the rest of the Sonex family are great hosts, and that makes it easy to forget the logistics and concentrate on the learning.

The first thing we did was look around the Sonex factory facility and take a look at airplanes. The flight operations hangar—home to the factory's flying aircraft fleet—can best be described as a sea of yellow. There is no doubt that Sun yellow must be John Monnett's favorite color—or he gets a

great deal on it when bought in quantity. The only Sonex aircraft I saw in different livery was the second version of the SubSonex jet, the JSX-2, which was done up in military gray with a shark's mouth. Say what you will about color choice though—yellow is highly visible, and it does brighten up a hangar! The current fleet available for T-Flight includes three different types of Sonexes, a Waiex, and a Xenos motorglider. There are also two single-seat Onexes in the hangar, but these aren't used for T-Flight because Sonex gives dual instruction only. Yes, the JSX-2 jet is there as well, but it is not currently on the list for anyone but the factory test pilot to enjoy.

LODAs for Training

Why does Sonex need a LODA? Because of a fundamental problem in the current rules that prohibit using an Experimental/Amateur-Built aircraft for commercial purposes. It is legal to pay an instructor to give you training in an airplane, but it is *not* legal to rent an Experimental airplane for the purpose of said training. So an individual could hire an instructor to give them time in an airplane that the individual owns, or for an instructor to give training in an airplane that they provide for *free* (although this has other inherent problems dealing with insurance and other considerations), but the instructor cannot charge for the use of their airplane to provide training—without a Letter of Deviation Authority.

LODAs for training were hard to get because they were not well understood by many of the Flight Standards District Offices (FSDOs) around the country. Several years ago, the process for issuance was revised by the FAA headquarters, and clarification was communicated to the local FSDOs—with mixed results. Recently, however, with the help of the NTSB, the FAA has begun to realize the importance of transition training for new pilots of Experimental aircraft, and has tried to encourage that training through LODA issuance. Many CFIs continue to run up against roadblocks with their local FSDOs, but the ice appears to be cracking in some parts of the country, especially with well-defined, formal arrangements such as Sonex's T-Flight program.

—P.D.

Programs and LODAs

After inspecting the fleet, we sat down in the T-Flight training room to go over the agenda for the program. The basic T-Flight program consists of two hours of ground school and two hours of flight training. It can be tailored, of course, for those who would like more of each, but for an experienced pilot, it seemed about right. It gave us plenty of time to talk about the characteristics of the aircraft, as well as sampling the handling qualities in the air.

The ground school is structured to meet the intent and scope of the Letter of Deviation Authority (LODA) issued to Sonex to conduct the training. Part of the formalities include describing the conditions of the LODA and how



The T-Flight program has a lot of factory airplanes from which the student can choose to do their transition training. They'll all, of course, be yellow.

it allows training to each student at the start of the ground school—a formality, but one that at least educates more pilots about the LODA process. Since Sonex owns the airplanes and effectively “rents” them to the students for the T-Flight program, a LODA is necessary to make it all legal per the FARs.

Talking Sonex

With the formalities out of the way, we were able to get down to training. Learning to fly a new type of aircraft doesn't really vary that much, whether you are talking about a simple Light Sport or a 747. You need to learn about the design of the aircraft, the basic characteristics,

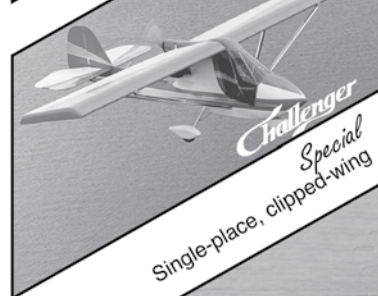
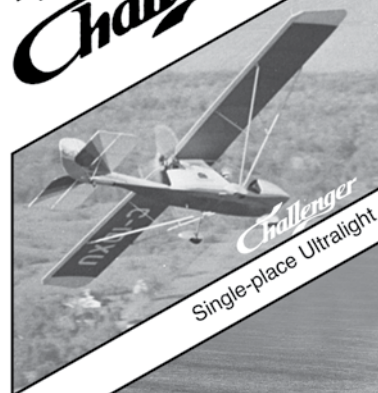
the operations of its various systems, and then, specifics about how it flies. For those who have checked out in certified aircraft, the basis for training is usually the POH. Since Experimental aircraft frequently don't have such a complete document, but often have unique systems and handling characteristics, it is doubly important to listen to voices of experience.

The various Sonex models share numerous characteristics, some of which are unique to the brand. For pilots who have spent most of their time with popular certified engines, the AeroVee engine with its slide-type “carburetor” required some explanation. It was important to learn that if the fuel tank valve is open,



Sonex keeps their cockpits and instrument panels simple. T-Flight is about flying the airplane, not learning a complicated EFIS.

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and the mixture is anywhere but in the full lean position, gas simply pours out of the jets and onto the ground. This means a different set of motions are required on the ground for starting and stopping than with a Lycoming or Continental. For example, extra care must be taken to be sure that you don't push the mixture in until you are ready to hit the starter. Likewise, for many airplanes, the fuel valve is not routinely placed in the "off" position—but with an AeroVee, this is something you definitely want to do after flight. And equally important, you must remember to open it before the next engine start!

Another good point to learn in operating an AeroVee is that the propeller turns "backwards" compared to that of most common aircraft engines in the U.S. (I can't speak for Europe). For those who learned to add right rudder on take-off by rote, this is important. If you learned to apply rudder to center the ball as required, then you'll be OK—but you'll notice that it will be left rudder instead of right. It is also a shock to hit



A thorough cockpit check before engine start is an efficient way to make use of time. Each of the Sonex airplanes is equipped slightly differently, and Norris took the time to explain the characteristics of each panel.

the starter and see the propeller turning "the wrong way"—better to hear about this in class than before you hit the button for the first time.

One unique bit you learn in the T-Flight program is that Sonex aircraft usually have a single hand brake that controls both wheels, so no differential steering. Steering on the ground is with a steerable nose- or tailwheel. Other than

these items, the airframe is reasonably conventional, and without surprises.

Flight characteristics were next on the list. The most time was spent on sight pictures—the Sonex features a very long glare shield between the panel and firewall. This is the space taken up by the fuel tank, and the shallow sloped windshield above this space creates a different look for most

“Did You Fly the Jet?”

Probably the first and most common question I have been asked since I attended the Sonex T-Flight experience was about the new SubSonex single-engine jet. And the answer (unfortunately) is no, I didn't fly it.

SubSonex test pilot Bob Carlton is currently the only holder of a permanent Letter of Authorization (LOA) for the SubSonex series of aircraft. However, John Monnett has a temporary LOA used in his flights with JSX-1, the SubSonex proof-of-concept jet, and is awaiting paperwork to convert from temporary to permanent LOA status.

Carlton is well known in airshow circles for his beautiful aerobatic routines flown in his jet-powered sailplane. Since the sailplane uses the same PBS TJ-100 turbojet engine as the SubSonex, he is quite experienced with its operation and flight characteristics. This experience convinced the FAA to issue him the necessary letter to allow flight testing of John Monnett's dream—the personal jet.

When I was at Sonex last July, Carlton was still testing the JSX-2 and, at the same time, was preparing the curriculum to be used for PBS TJ-100 turbojet engine systems training, which will be offered via his two-place TJ-100-powered BonusJet motorglider out of his home base in Albuquerque, New Mexico. SubSonex customers will be able to combine this systems training course with other qualifications to apply for an LOA to fly the SubSonex.

Jeremy Monnett, CEO of Sonex Aircraft and son of Sonex founder John, was scheduled to begin engine systems training with Bob in November in the BonusJet. Jeremy has no turbine time, so he will serve

as a test subject to evaluate the program's effectiveness for transitioning future SubSonex pilots coming from a piston-only background. T-Flight Transition Training in Sonex's piston fleet may be useful, even to SubSonex LOA applicants, if they do not have recent light-aircraft time, or time in quick-handling aerobatic-capable aircraft.

I did get to sit in the cockpit mockup. And yes—if it flies as nice as the cockpit fits, it should be a fun machine. If I get the opportunity, I might even go through the training to obtain my own LOA.

—P.D.



The SubSonex kit includes the PBS TJ-100 turbojet engine, retractable gear, and a BRS full-aircraft parachute recovery system.

pilots. Joe drew some pictures on his whiteboard showing what the pilot should expect (this of course will vary with the height of the pilot), and how the left turn picture and right turn picture will be significantly different. Many pilots who have only flown more conventionally shaped aircraft will at first have trouble keeping the airplane from climbing or diving in turns—but the descriptions given in the T-Flight ground school should help this transition go much more quickly.

As you would expect, stall characteristics are discussed during this phase (they are benign). Takeoff procedures were discussed—factory pilots generally let the airplane fly off from a three-point attitude, although raising the tail and then rotating works as well. Landing pattern discussions were similarly conventional—speed and flap settings will surprise no one, and three-point landings were described as easy (for the taildragger version, of course).

Overall, Joe made the ground school useful, painless, and tailored to the individual pilot's experience. No matter where you are in your flying career—rookie, novice, or ace of the base—you'll find that Joe adjusts and builds the ground school at an appropriate level. It is well worth the couple of hours it takes, and prepares you for the fun afternoon to come!

The Skies of Wisconsin

With the ground school complete, it was time to get airborne. As mentioned above, for any experienced Experimental pilot, one of the most remarkable things about flying with Sonex is the opportunity to fly at Wittman Field operating as a normal airport. Gone are the crowds, gone the many pink-shirted ATC pros, and gone are the hordes of airplanes coming from every direction. This was the first time I had ever just looked around at the scenery while operating at the field—did you know that there are a whole bunch of DC-3s on the east side of the field undergoing turbine modifications? Did you know that the gravel pit to the north is huge? And did you know



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that there are so many taxiways in the northeast corner that it is not impossible to get lost? It pays to have a good look at the taxi diagram before heading out. The alternative is to do as I did: Let Joe deal with ground and the tower, and you can concentrate on moving the airplane around. We call that good crew coordination where I'm from—and it certainly makes the piloting task easier.

To be honest, our day was a bit atypical of the T-Flight program, as my goal was not just to fly one airplane, but as many of the Sonex fleet as I could fit in. We started with the AeroVee-powered Sonex tricycle-gear demonstrator, followed that up with the Jabiru-powered Sonex taildragger, and then moved on to the Xenos motorglider. The final craft was to be the single-seat Onex, but alas, radio gremlins set in and made

it impossible for me to talk with the tower. While it would have been fun to simply work with light signals, the combination of a new, single-seat aircraft and a new airport made that choice less than optimum, so we settled for the three two-seaters.

The first step with each airplane was a good preflight—a chance to get familiar with finding the oil dipstick and fuel filler (which are a little different in the Sonex line). We worked our way around the airplane, looking at piano hinged control surfaces and the care and feeding of the large swing-over canopy. We finally settled into the cockpit and went over the controls—especially that aforementioned fuel valve (necessary to be manipulated on engine start and shutdown due to the AeroVee carb) and the single brake lever. With Joe on the right and me on the left, I was also responsible

for getting the canopy latched—something we went over carefully.

With Joe's unobtrusive, but appropriate instruction, we got through engine start and taxi, and were soon lined up for takeoff. Sonexes are sporty airplanes, and we were off the ground in no time. For our training flights, we climbed out of Oshkosh to the west. The normal checkout work included turns, slow flight and, of course, stalls—although they weren't overly emphasized. The Sonex has plenty of stall warning and all were benign. Handling qualities are good, with harmonious controls. Visibility is excellent from the big Plexiglas canopy. The cockpit is comfortable and conducive to learning—and before I knew it, we were headed back to swap stands. Joe likes to simply let you fly, and he makes suggestions now and again—laid-back, yet

Sonex—Behind the Scenes

It would have been a mistake to spend a day at T-Flight without poking around the factory a bit, and the Monnetts graciously opened their doors to show a newcomer to the Sonex world what they have in the works. Sonex Aircraft inhabits several buildings on the northeast corner of Wittman field in Oshkosh. Their front office has space for people, and is the site of their frequent builder seminars. The T-Flight program resides in their flight operations hangar—along with half a dozen yellow airplanes just waiting to be flown. Adjacent to that is the prototype shop, currently housing two SubSonex jets, the long-winged Xenos Motorglider, shop facilities, and an engine test cell.

Kit production is housed in a larger hangar/building across the driveway. Here, rows and rows of shelves stock parts used to assemble customer kits, punching and cutting is always in the works, and we got a chance to see them blowing a bubble canopy destined for some lucky

customer. While many parts are produced by subcontractors, much is still done in-house. Packing of individual kits is done when a customer orders a project, and our experience being at the receiving end was that it is done with precision. We ordered a complete Xenos kit with an AeroVee engine, and the inventory matched the thousands of parts in the boxes exactly.

So what's going on behind the scenes? We were surprised to see not one, but *two* JSX-2 SubSonex jets in the prototype shop. One (the yellow one) had been flying for a few months (and flew the next week at AirVenture). The second, painted gray with a military scheme, was undergoing final assembly and checkout. Both are kit prototypes—they are the version that initial builders will find when they open their boxes.

In the engine shop, Joe Norris and others were busy testing a new turbocharger for the AeroVee engine that can be retrofitted into



The new turbocharger adds horsepower to the AeroVee engine in a clean, spacious installation. Shown here in a test stand, it is currently flying in a factory Sonex.



The AeroVee engine is available as a kit, and the crankshaft can come with the prop flange pre-assembled or in a DIY package (shown here).



Trophies of static load testing adorn the prototype shop wall. This Sonex wing failed well above design loads.

effective, instruction that is not intimidating to the pilot getting checked out. We shot a number of landings to get the feel of the airframe and the appropriate pattern speeds—as well, as reminding me how to fly a nose-dragger. I think I can safely say that the airframe was reusable when we were done, so I'd call my tricycle-gear checkout a success!

Oshkosh Tower is clearly used to Sonex's operation and gave us landing and taxi clearance directly to the hangar when we were on final. We taxied up to the hangar where the taildragger was waiting, and talked about how it would fly pretty much the same once we were off the ground—with the exception being that the Jabiru had 20 more horsepower than the AeroVee, so we'd see better performance. Since all three of my current airplanes have the little wheel in back, I was looking forward to



The Sonex cockpits are plenty roomy for two people, making for a good instructional environment. Norris does this a lot, and is passionate about getting pilots comfortable in their aircraft.

seeing how it handled in that configuration—especially without differential braking. The answer was just fine. The tailwheel is linked directly to the rudder, so steering response is quick and crisp.

The lack of a full-swiveling tailwheel and the ability to lock one wheel makes it harder to pivot in place, so it is wise not to taxi yourself into a corner. But if you do, you can always climb out and lift the

existing aircraft for those who want a little more power at altitude. The clean looking design should bolt easily into new or existing firewall-forward installations and is already flying in one of the factory aircraft.

Electric Aircraft? They've done that, too! Sitting with wings and cowling off, the electric Sonex resides in a corner of the prototype shop, awaiting a breakthrough in battery technology. According to John Monnett, it flies well, but the \$30,000+ price for batteries is something he doesn't feel the market will bear—so they'll revisit it when a new breakthrough in energy storage presents itself.

Sonex takes pride in their development and testing—to the point of hanging their trophies on the wall. Surrounding the prototype shop you'll find wing and tail panels that have been stressed to the breaking point during static load testing. While this might seem a bit macabre, the trophies are, in fact, testaments to the design and testing program in which the Monnetts take pride. All of the failed components broke well above design loads—and that assures builders and pilots that there is margin in the design.

—P.D.



Sonex prototype employees are not above having a little fun, along with their emphasis on safety.



Although battery packs are large, electric motors are small, and the next incarnation of the electric Sonex will probably sport an even lighter unit.



The battery pack for the electric Sonex is currently too expensive for the market—but technology is advancing quickly, and we expect this project might come back off the shelf soon.

tail around, We never got to that point, so it really isn't a problem.

We briefed the tailwheel takeoff, but it was uneventful—and quick. The additional ponies were noticeable in climb and cruise speed, but other than that, the airplane was hard to tell from the first Sonex. Coming back, we shot a few landings, and the extra climb performance meant we could get back to pattern altitude more quickly, and stay closer to the field—nice when shooting touch and goes. Landings themselves were natural, and the three-point attitude was right where the airplane wanted to be at touchdown. I frequently wheel land a new taildragger, but this one just settled in sweetly on all three, so that's what we did.

The final plane of the day was the Xenos—a Sonex with long wings and a larger tail designed as a motorglider to give the pilot the chance to shut down the engine and soar. Unfortunately, the Oshkosh area doesn't have much lift that time of year, but we did find a few areas that had less sink, and it was a fun ride. The biggest difference between this and the Sonexes were those long wings during taxi. I have my glider rating, but had

never actually taxied one (I don't have a motorglider endorsement), so seeing those wingtips out in the next zip code was odd. The centerline is your friend; those taxiway markers look awfully close, and at least if you're on the centerline, you did your best to miss them.

Takeoff was quick! In fact, it was a trick of levitation. The big wing needs little airspeed to fly, and we were off before we knew it. After the requisite air work and a little thermal hunting, we called the tower from five miles to the west and were cleared for a straight-in to Runway 09. Joe suggested a low—almost idling—power setting that gave us just a tad bit of a descent rate, and we used the spoilers to control glideslope all the way to the runway. After a couple of landings and takeoffs, we called it a day—one that I was sad to see end.

Worth the Time—Worth the Effort

Transition training into a new type is not just a good idea—it is looked upon favorably by insurers, kit companies, and the FAA. Pilots who take the time to get type-specific training before flying their new homebuilts have fewer accidents during Phase 1 and are better

prepared to make the test period count. Most of the major kit manufacturers (especially those who belong to AKIA) are now working on or have already implemented transition training programs. Sonex is one that has been leading the way. Their T-Flight program is simple, fun, effective, and convenient. The bonus for a builder is the chance to see the factory where their kit was put together, and talk with the designers and engineers behind the product. If you sign up for T-Flight early in your build—or even before you start—it is a good way to decide if building a Sonex is right for you, and if the airplane is something that you'll enjoy. If you wait until your airplane is almost ready to fly, your learning will be fresh and you'll be current when you decide it is time to slip into the pilot's seat of your new plane. Either way, T-Flight is organized, thorough, and just makes sense.

Joe Norris, the Monnetts, and the rest of the Sonex personnel are welcoming and friendly, and you don't have to work very hard on Joe to get him to take you to his favorite lunch places. Imagine getting food in Oshkosh without having to stand in line—that alone is worth the trip! †

