The Seawind Flyer

Summer 2009

"The evolution of an intelligent design." ™

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SEAWIND IS OPEN FOR BUSINESS

I am pleased to say that the office and factory are open again, this time with more caution and with our main focus on completing certification.

We started rehiring previous key employees to open the engineering office and to resume operations in the shop.

After being closed for 20 months, we expected that many employees would no longer be available. Fortunately the structural engineering efforts are almost complete, and the structural engineers are available on a part-time basis.

Over 90 percent of the design and drawing work is finished. The remaining efforts are primarily to complete any drawing revision resulting from the first flight tests and any that may arise as the next test aircraft is assembled.

There are a few remaining tests that will require some development work such as HIRF (high intensity radio frequency) and the firewall, which has to withstand 2,000˚F for 15 minutes. The rest of the in-house certification tests are routine and low risk. A number of devices remain to be tested to qualify for use in the Seawind, i.e., hydraulic actuators, hand pump, trim motor, etc.

Before we could get started in earnest, we had to meet with the certification approval agencies to obtain their authorization of the two new companies that had been formed. We met with the regional manufacturing office early on and they scheduled their supporting personnel. They have been very supportive in the past, and we will be working with them closely to obtain our production certificate.

We also had to meet with the certification office. It took some time because they were undergoing reorganization. We met with them in mid June and obtained their authorization to resume operations. We are now moving ahead and can schedule our work and start building up the needed staff.

FLIGHT FAMILIARIZATION

Prior to the interruption of operations, we had discussions with the National Research Council (NRC), and they had agreed to take over the flight testing work for us.

I met with two of the test pilots who will be doing the testing to give them the opportunity to get familiar with the experimental version of the Seawind.

During earlier flight testing, it was decided to remove the flaperon mixer that drives the ailerons from a collective position of -10˚ to +20˚ for the purpose of providing additional lift. In aviation, when you gain one thing, you have to give up something else. In this case, to gain lift you have to use ample rudder to avoid adverse yaw. The Part 23 regulations are much more stringent now than when the Robertson STOL conversions, which incorporated flaperons, were being installed in many aircraft. My homebuilt version of the Seawind still has flaperons, so the NRC test pilots were witnessing Dutch roll that would not be present in the certified version.

I am not a test pilot, nor am I a flight instructor. I am an average pilot who enjoys flying from "here to there" and looking at wonderful sights in between.

I proceeded to fly with Robert Erdos, the NRC's chief test pilot, who is used to testing airplanes near the edge of the envelope to make sure they don't break or fail to meet standards.

I don't mind telling you I am always uncomfortable when a test pilot is doing that. For one and a half hours, Robert put the Seawind through its paces with all forms of stability tests as well as a preliminary stall regime, i.e., power on, power off, reflex flaps, zero flaps, as well as 20˚ and 30˚ flaps down. That's just to mention a few. After a number of landings at Gatineau Airport, we went back to Ottawa International for a debriefing.

At the end of our debriefing, I was pleased when Robert summarized it by saying that, within the scope of this kit familiarization flight, there may be some work ahead of us but he saw no show stoppers.

Then Anthony Brown, another experienced NRC test pilot, and I boarded the Seawind and, for another hour and 45 minutes, he did it all again. Anthony performed a number of additional tests as well.

Anthony was even more encouraging at our debriefing.

I have flown with a number of test pilots over the years, and there is no question in my mind that these two are most skillful, professional pilots. Neither one expressed any concern about completing the testing of the Seawind.

It was a very rewarding day. I enjoyed the relaxing 45-minute flight from Ottawa back to Saint-Jean-sur-Richelieu looking at the scenery.

SEAWIND IS ACCEPTING PRE-PRODUCTION ORDERS

We are now in a position to take pre-production, no risk orders. If you are interested in securing a production position, you can place a conditional order, which places your deposit in an interest-bearing escrow account. Pre-production orders show the investment community that there is a demand for the Seawind. Meanwhile your deposit is secure and earning interest and refundable to you at any time.

Please contact us at seawind@seawind.net for details and an order form with no unreadable fine print. Our no-risk contract is easy to read.

We have over 50 Seawinds to build and would like to have more so that we can project how quickly we should ramp up after certification.

THINKING AMPHIBIAN

Having owned a Lake Buccaneer and then flying the experimental kit version of the Seawind has been very valuable. The Lake taught me what not to do with the Seawind kit as well as the pitfalls of not thinking amphibian. The kit Seawind taught me what worked well and what needed refinement in the certified Seawind.

WHAT ARE THE DIFFERENCES BETWEEN THE LAKE AND THE SEAWIND KIT?

Everything! The differences are too numerous to mention.

WHAT ARE THE DIFFERENCES BETWEEN THE KIT SEAWIND AND THE CERTIFIED SEAWIND?

~ The kit Seawind had adequate headroom in the forward seats but was very tight in the rear seats. So we lowered the forward hull bottom two inches while keeping the top of the hull the same. Now the rear seat headroom is adequate for a six-foot-tall passenger, and the forward head room is generous even for a 6-foot-4-inch-tall pilot.

Lowering the hull bottom two inches gave the Seawind 15 inches of hull side freeboard above the water instead of 13 inches. It also allowed us to increase the aft hull bottom angle one additional degree for increased rotation on a water take-off.

~ The most noticeable change is the main landing gear. The kit had a bent leg main landing gear. Although strong, it was very stiff and was bumpy on unpaved runways. The certified Seawind has a trailing link landing gear, which is similar to the Lake and the Mooney aircraft. It is much smoother on unimproved runways, boat ramps, and gravel beaches.

The landing gear is trailing link type. The keel "V" and spray rails are sacrificial.

The main landing gear fits tightly into the wing to reduce drag, and it is estimated to increase the speed three knots over the experimental version.

~ The wing cord was increased two inches (3.7%) in the certified Seawind to 56 inches. The extra length was needed to accommodate the wing-mounted landing gear.

This landing gear change eliminated the two main gear leg pockets and the six hull penetrations that are in the kit version.

~ The horizontal tail cord was also increased 3.7%.

~ The forward hull center "V" was extended forward including the nose wheel doors to reduce the water slap on the nose just before coming off the step.

~ There are a number of less obvious changes in the certified Seawind such as:

- An emergency hatch in the top of the canopy.
- The water rudder extends horizontally in the certified version instead of vertically, making it more effective and less susceptible to damage from contacting the bottom in shallow water.
- The canopy has a one-piece silicone rubber seal with a much tighter fit-up. It has radius corners.
- Our state-of-the-art, precise molds are accurate to fifteen-thousandths of an inch, which have achieved a tight fit-up, uniform gaps, and smoother, cleaner surfaces.

THINK AMPHIBIAN ON LAND

One of the major features of any amphibious hull-type aircraft is its numerous landing options. Flying boats have been landed on snow, soft sand, marshes, corn fields, plowed fields, and soft turf. All of these landings are performed with wheels up. Done properly in a Seawind, you will have only cosmetic and paint damage.

You don't have to worry about a propeller strike or the nose digging in and the aircraft flipping over as you would in a fixed gear landplane.

You don't have to worry about prop pitting on a gravel landing surface.

The center "V" of the forward hull is there for hydrodynamics and, since it is not required structure, it is sacrificial.

A kit Seawind was landed on a runway gear-up and slid to a stop. Only the center "V" was damaged. The aircraft was lifted up and the gear lowered and then flown back home. Since the "V" is not structural, this aircraft was easily repaired in two days. There is no prop strike, no sudden engine stoppage, and no accident report needed. Best of all, no injuries and virtually no cost and no insurance claims.

See pp. 16 and 17 of the summer 2004 Seawind Flyer.

ON THE GROUND

Unlike land planes, flying boats are tail heavy. With the Seawind empty, there are only about 60 lbs. on the nose wheel. Since the fuel is only slightly forward of the center of gravity (cg), the nose can easily be lifted so the tail sits on the ground.

~ Therefore, when you tie down a Seawind, you tie down the nose wheel and the main landing gear, but not the tail. You also lock the controls with the control wheel yoke pushed forward, not pulled aft as with a land plane.

~ There are advantages when you wash the Seawind. Set it gently on its tail on a pad. It makes it easier to wash the vertical tail, engine cowling and horizontal tail. It also makes it easier to wash the top and bottom surfaces of the wings and the underside of the hull.

~ The optional canopy cover is specially designed for the Seawind. The straps do not go under the fuselage or around the wing root. That would not work well on the water unless you were a frogman. The Seawind canopy cover snaps onto the canopy frame on the inside with the canopy open. When the canopy is closed, the straps go under the seal.

~ Land planes have protruding steps to enter the cabin. The Seawind has aerodynamically clean, flush pockets to put your foot in and to keep the water out.

~ All amphibians steer with differential brakes and a castering nose wheel. However, the Seawind also has a hydraulic assist nose wheel actuator, so you can steer with the brakes or steer with hydraulics or steer with both. They are independent systems either of which can steer the Seawind on the ground. In the case of a systems runaway, the brakes can overpower the hydraulic steering.

THINK AMPHIBIAN ON SNOW

There is no need to put skis on a Seawind, nor is there any reason it cannot land on snow. Many flying boats and float planes have landed on snow and taken off again.

This is an emergency procedure available to any Seawind pilot.

To make it a normal operational procedure without damage to the sacrificial "V," we will offer a separate plastic surface wear guard, which will bolt onto the hull center "V." Two smaller flat strips will be attached to the wingtip sponsons as wear strips. These can be removed in warm weather. At this time, we have no snow take-off or landing data for the Seawind, so we do not know if there will be any limitations. All we know for sure is that it will work.

Essential to any snow operations is the need for a good heating system. The Seawind has an excellent system with heat at each occupant's feet and effective defrosters. It can deliver a 101° F rise in air discharge temperature. That equates to an 80° F rise in cabin temperature. You maintain 70° F (21° C) even with a cold -10° F (-23° C) outside temperature. You fly in comfort in shirtsleeves after 15 minutes.

THINK AMBHIBIAN CONCEPTUALLY

CABIN DESIGN

A seaplane presents significant challenges in cabin design, not only for entering and exiting on land, but also from a dock, from a shallow beach, and from a deep water swim. The cabin must be flexible, durable, comfortable, and the finishes must be resistant to sun, salt water, and mildew. The fabrics must also breathe for long distance, cross country flights.

ENTRY & EXIT

Docking is the only advantage that a float plane has over a flying boat. The Seawind has to be nosed into a standard dock. Some special dock designs were shown in the spring 2007 Seawind Flyer. The instrument glare shield and the nose deck door are structural. They can be walked on while boarding or exiting.

The Seawind cabin is the widest in its class. The aft seat passenger can step between the forward seats to disembark over the nose. An old-fashioned tub mat will protect the surface, and the suction cup design prevents slipping off the surface.

The Seawind has three recessed footstep pockets with spring-loaded covers, one on each side forward and one on the left side aft. On land it is 16 inches above the ground and even with the cabin floor. The rear footstep pocket can also be used to step up onto the longeron and then the wing to check the engine oil. The footstep pocket can be used when swimming or scuba diving in deep water to reboard the Seawind. If you beach the Seawind on a sandy beach, boarding is easily done in 16 inches of water.

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To provide cabin freedom of movement, we designed the forward shoulder belt retractors to attach inside the seatback structure. The seat was designed to withstand the 26g forward crash shoulder load into the seat frame, which carries the load down to the floor track.

There are many other design and operational features that required us to *think amphibian*. They will be discussed in future Seawind Flyers as we *think landplane*, *think waterplane*, *think snowplane*, and *think wilderness*.

Many of our customers and readers have far more experience than I, and we invite you to participate in sharing your knowledge and ideas in *THINKING AMPHIBIAN.*

Richard Silva