Quick Links
- Water Landing
- Directory
- **Articles**
- WF Update
- FAQ
- Misc Info
- Seaplanes
- Floats
- Solo Rental
- Operators

Floats and Boats

Proficiency in one type does not always mean safety in the other

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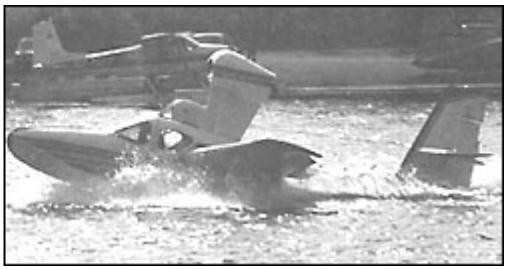

The Federal Aviation Administration sums it up in one line: Single Engine Sea. It is a rating to fly any single engine seaplane, whether it is a floatplane or flying boat. Proficiency in one, however, does not guarantee safety in the other. Nowhere else in the world of light aircraft does the phrase in type have so much significance.

My water-flying experience has been limited to high-wing floatplanes ranging from Taylorcrafts to Cessna 185s and 206s on straight floats and on amphibious floats, so I welcomed the chance to take the excellent course that Lake Aircraft provides for new owners of its amphibian. Lake's chief pilot, Bill Moulton, took me through an abbreviated version of the school, and together we explored some of the technical differences between floats and boats.

Since the Lake is the only single-engine hull amphibian currently in production, it makes sense to compare its specific qualities to a popular amphibious floatplane, the Cessna 206. While the differences in size, power and airframe configuration are obvious, a few details deserve special attention.

Few seaplanes (or, indeed, few landplanes) can carry full fuel, full seats, full baggage and fly. Weight and balance is critical and the loading requirements of these aircraft are diametrically opposed. When the Lake is loaded lightly, the center of gravity (CG) may be rear of limits. The Cessna (particularly Turbo models) when light may exceed the forward CG limit. Conversely, a fully loaded Lake could exceed forward CG and become more nose heavy as fuel is burned off, whereas a fully loaded floatplane can exceed aft CG, and its balance also deteriorates as fuel is consumed. Certainly, a complete understanding of weight and balance is imperative.

No one should fly an aircraft without a thorough review of its systems and procedures. The Lake has more hydraulics than most small airplanes, and pilots

unfamiliar with the variety of manual, electric and hydraulic systems found on floatplanes should pay close attention during initial training.

Taxiing any amphibian for the first time is a unique experience. The free-castoring nosewheel on the Lake is sensitive, and a proficient pilot can maneuver in amazingly tight situations; however, it requires practice to keep the airplane from heading off in directions all its own. A Cessna amphibian, on the other hand, with its four wheels wants to go wherever it was last pointed. Firm application of power and brake is required to make it behave.

Takeoff and landing procedures differ in one major respect. The Lake uses full flaps for all operations. With a 16-knot change between Vso and Vsl and a unique characteristic of a minimum controllable airspeed (which is three knots above stall in the landing configuration and seven knots above stall in a clean configuration), the flaps provide a desirable safety margin. Most floatplanes limit flaps for takeoff to 10 to 20 degrees.

A glance at the oversized trim tab on the Lake will tell you that proper trim positions are needed for different aircraft loadings. The trim can be checked with the indicator and also by looking outside the aircraft at the elevator. A properly trimmed Lake Buccaneer will fly off the ground on its own; any attempt to rotate will actually prolong the takeoff roll. Floatplanes will require a positive rotation to get them airborne in the shortest distance.

Airwork will uncover many differences in flight characteristics. The Lake can almost be flown around its pitch axis using the trim; this is not true for most floatplanes.

During transition, attitude flying in all configurations should be practiced. The Lake's sloping nose, contrasted with the almost square cowling of most floatplanes, creates an illusion during straight-and-level flight that will lead a pilot to apply incorrect control pressure to correct a perceived climb or descent. An overdependence on the flight instruments to correct this tendency during airwork will lead to serious problems on approach when visual references are required.

Power changes have an opposite effect on pitch in these two types of aircraft. The pusher propeller on the Lake will force the nose down as power is added. Tractor propellers produce a distinct pitch up with the application of power. The reverse is true for power reductions. These differences are most noticeable in the slow flight, stall, landing and takeoff phases of operation. A pilot who is used to the Lake may compound his problems in a floatplane if he expects the application of power to lower his nose during stall recovery. A floatplane pilot transitioning to a Lake could be unpleasantly surprised during an aborted landing and go-around close to the water or obstacles as the application of power produces a forward pitch and nose-down attitude.

The tractor aircraft pilot will have an advantage getting on the step, as the added power brings the nose up; in the flare, however, the advantage moves to the Lake, where a reduction in power does not result in the aircraft pitching down.

Water handling presents the greatest differences between floats and boats. The theories are the same, but the technique and perspective are varied. Recognition of the proper attitude for each operation requires practice.

Boats sit deeper in the water, present less surface to the wind and have a lower CG along the roll axis than floatplanes. Wing-tip sponsons, or floats, aid in the stability of the single planing surface of the hull. Floatplanes offset their higher lateral CG with pontoons set in a catamaran configuration to provide stability. These differences all contribute to the variation in water-handling techniques.

Normal taxi, takeoff and landing techniques are similar. One difference is the application of elevator control. A floatplane should always be taxied or transitioned to the step with the stick full aft; transition from touchdown to displacement in the landing phase should always be accomplished with the stick full aft. In the Lake, during some phases of these operations, the yoke is in a neutral position. For instance, full-aft control travel just after touchdown is undesirable and may result in a bounce or skip. Improper application of elevator in either aircraft type will result in serious consequences.

Crosswind techniques presents some major conflicts. In a floatplane, as in a landplane, aileron is held into the wind, and the surface track is maintained parallel to the aircraft's longitudinal axis. The upwind wing is lowered into the wind, and directional control is maintained with rudder and aileron. On takeoff, this will result in the downwind float lifting out of the water first. On landing, the upwind float will touch down first. In the Lake, the wings are always kept level. The airplane takes off and lands essentially in a crab, or with a surface track offset from the longitudinal axis. A floatplane landed in this manner would be in imminent danger of capsizing as sideward movement, wind effect and centrifugal force combine to override the stability of the aircraft.

Conversely, a Lake landed in a slip would contact the water with the upwind wing tip float first, hooking the float and causing the aircraft to pivot around the point of contact, creating the possibility of damage and/or loss of control. Good crosswind landing technique is a developed habit. Changing this habit is difficult but essential for the safe transition between these types of aircraft.

Glassy water procedures are consistent. Again, Lake Aircraft recommends full flaps (20 degrees), while most floatplanes use anywhere from 0 to 20 degrees. Attitude in the Lake is slightly flatter than in a floatplane.

Rough-water techniques are similar. The Lake has more surface in contact with the water during the transition to the step, and care must be taken to protect the nose-gear doors and the wingtip floats. Each pilot must use his discretion as to what constitutes rough water for a particular make of aircraft, and operations under extreme conditions should be avoided until a high level of experience and proficiency is attained, regardless of type.

Sailing is more effective in floatplanes than in boats because of the higher profile presented by the wind. Larger flaps and the use of doors increase this advantage. The Lake's lower profile and increased airflow over the rudder, because of the location of the prop, may allow it to turn in stronger wind conditions, reducing the need for this technique.

Docking is easier in a floatplane because of the high obstacle clearance of the wings. Depending on wind conditions, the aircraft may be brought alongside a dock or float or nosed straight in. The Lake is limited to nose-in docking. The reversible propeller (available as an option starting with the 1983 LA-4-200) provides a big advantage in maneuvering the aircraft during docking, but approach paths are still

limited.

The Lake seems to have an advantage in beaching. The gear is well designed to allow the aircraft to be driven out of the water in all but the softest of sand, and its maneuverability is impressive. Both types handle a ramp well; and, although procedures are different, both are easily secured along a shoreline.

The Lake is well-mannered and responsive and can be as safe and versatile as any floatplane. Proper training is the key to happiness, however.

Seaplanes have one purpose: to operate on and off water. Whatever the type, they are a pleasure to fly and they offer rewards and opportunities that the land-locked pilot cannot imagine. The water environment, however, is ever changing and encompasses hazards that pilot and aircraft face nowhere else.

Safe water operation requires training, judgment and discipline. This is impossible without a thorough knowledge of an aircraft's capabilities and limitations. Proper transitional training in each type of watercraft is imperative. The seaplane rating allows you to fly all types of waterplanes, but it takes a thorough checkout in each make and model to make you safe. A floatplane pilot has no right to assume that he is qualified to fly a Lake, and a pilot trained solely in flying boats would be similarly out of place as pilot in command of a floatplane.

I am generally opposed to any increase in the regulations that govern or limit our right to fly, however, separate ratings for float or hull seaplanes is an issue that should be examined.

The differences in flight characteristics and techniques required for flying the two types are sufficient to demand our recognition.

Source: 1983 Water Flying Annual

Back Top

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