

The Flying Boat

One of the all-time great airplanes from aviation's golden era

BY BARRY SCHIFF

We called McCarran International Approach for permission to enter the Class B airspace surrounding Las Vegas.

"Sikorsky Two-Eight-Victor, you're cleared into Class Bravo airspace. Descend to 2,700 feet."

I replied by saying that 500 feet over the city seemed a bit low.

"You're a helicopter, right?"

"Negative. We're a flying boat."

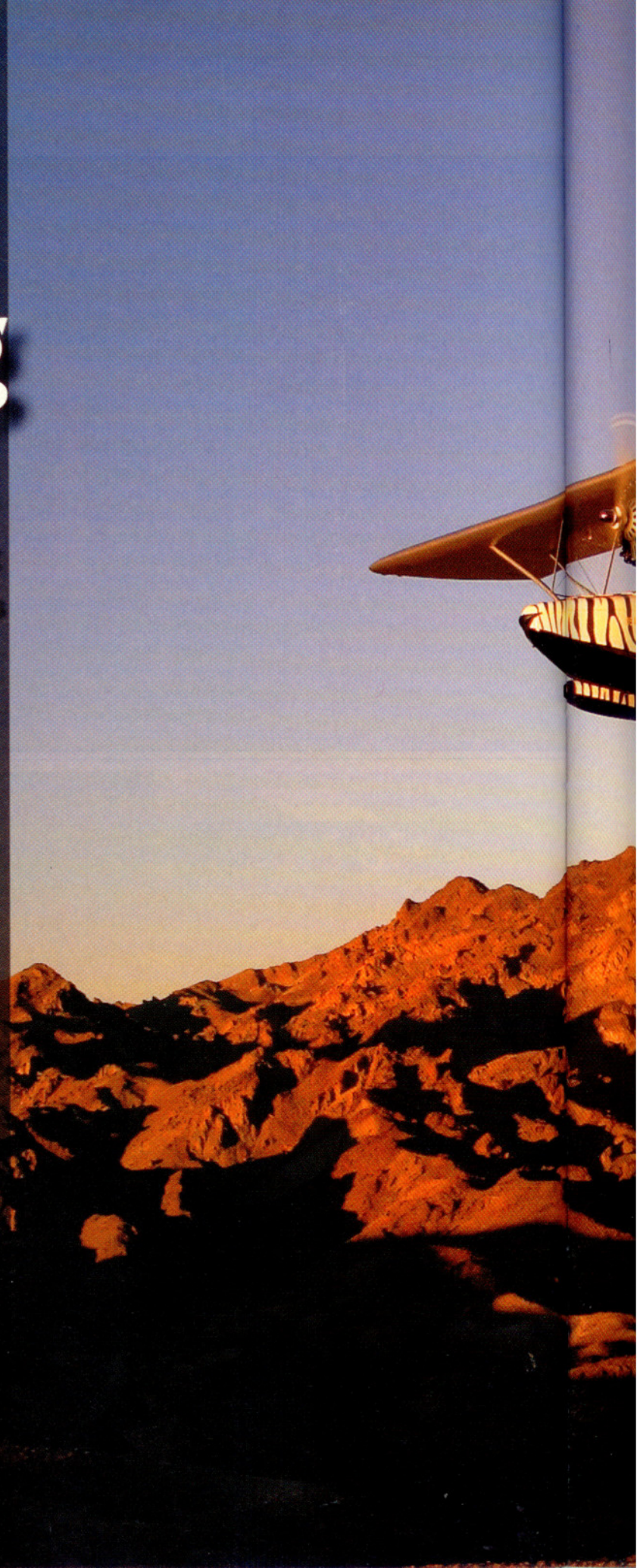
The pregnant silence was followed by instructions to maintain present altitude.

One cannot blame the controller for believing us to be a helicopter. There are very few Sikorsky airplanes in the air these days, but there was a time when the Sikorsky was queen of the sky.

The legendary designer, Igor Sikorsky, was born in 1889 and emigrated from Russia at the onset of the Bolshevik Revolution. He arrived in the United States in 1919 and developed the world's first practical helicopter a few years later.

Because there were so few airports and so much water, he focused his great intuition and engineering genius on seaplanes, airplanes that "could take

PHOTOGRAPHY BY MIKE FIZER





The S-38 is a large airplane with a 72-foot wingspan, about the same as a Ford Tri-motor—but don't call it a biplane.

their airports with them." His first certified airplane was the Sikorsky S-38 Amphibion, a spelling he preferred over the standard *amphibian*. The airplane was developed primarily for Pan American Airways. The fledgling airline used the eight-passenger Sikorsky to expand its route structure from 90 miles (Key West, Florida, to Havana, Cuba) to a 13,000-mile network that included more of the Caribbean as well as Central and South America. Pan Am was so pleased with the seven-hour range that it purchased 38 of the Amphibions. Its expanding operations eventually evolved into the halcyon era of the China Clipper.

Charles Lindbergh flew an S-38 for Pan Am on proving flights between Miami, Panama, and Brazil. Hawaiian Island Air Services used Amphibions to provide interisland service, and Western Air Express used them to serve Avalon, a tourist resort on Santa Catalina Island off the coast of Southern California. Sikorsky's amphibious airplanes proved to be rugged and reliable in what were occasionally difficult operating circumstances.

Larger and faster seaplanes followed in the wake of the S-38. The final Sikorsky seaplane was the long-range, four-engine VS-44A flying boat (not an amphibian) that provided the fastest (183 knots) military passenger service across the Atlantic to Europe during World War II. The Great Seaplane Era ended soon after the war, and Igor Sikorsky shifted his attention to helicopters.

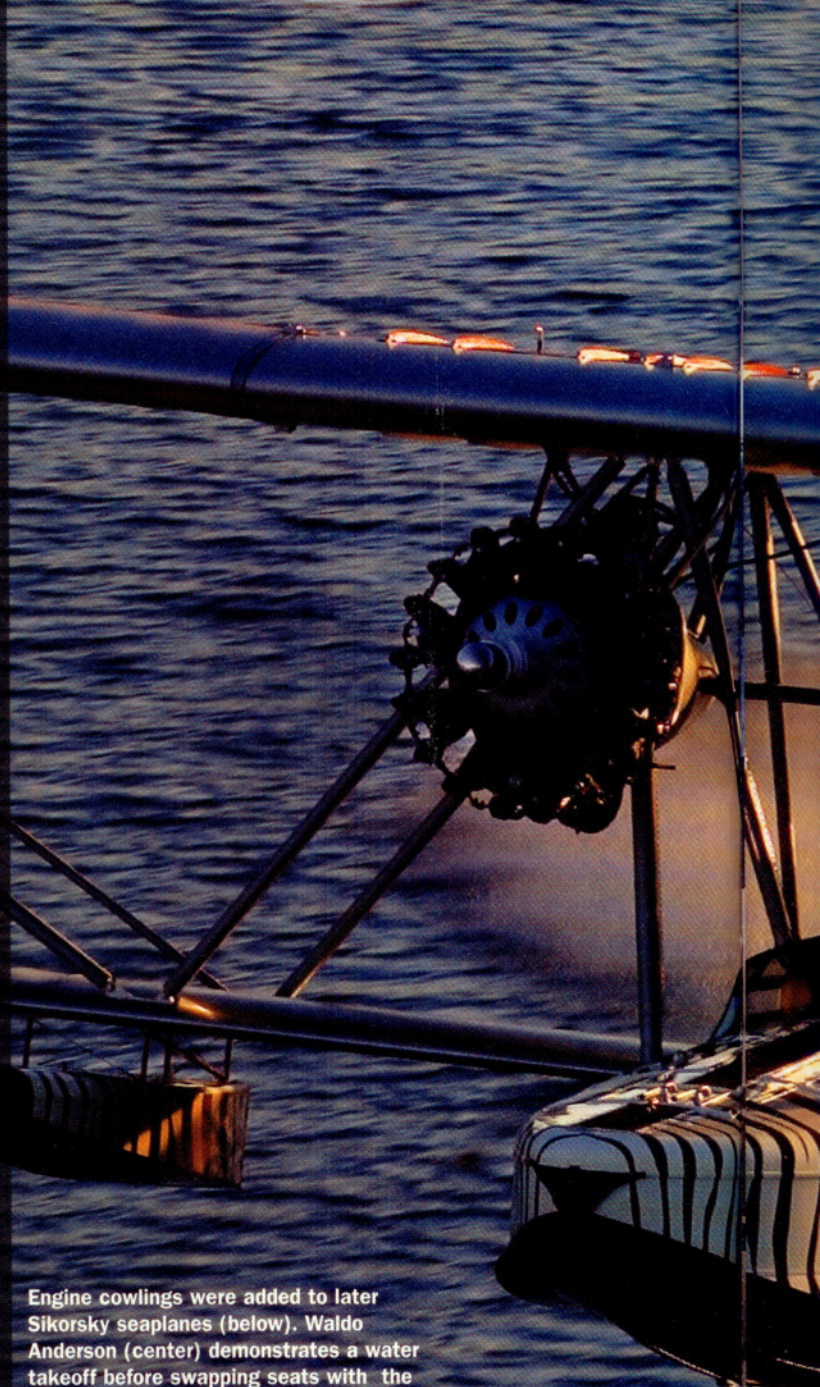
The S-38 made its maiden flight from the Sikorsky Manufacturing Corporation in College Point on Long Island, New York, on June 25, 1928. The Amphibion caught the attention of Martin and Osa Johnson, a husband-and-wife team of explorers, naturalists, authors, and motion-picture producers.

The Johnsons had spent years in Kenya, the Congo, British North Borneo, and the South Pacific taking more than 10,000 photographs of animals, people, and places that had never before been seen through a lens. They also produced nine full-length motion pictures and 17 shorter films (using hand-crank cameras) that captured the public's imagination with these first views of the customs, cultures, and civilizations found in remote regions of the world. The Johnsons wrote 18 books, one of the most popular being *I Married Adventure* (1940), a bestseller written by Osa.

Perhaps the best way to put the Johnsons into perspective is to say that they were, during the 1920s and 1930s, what Jacques Cousteau was during later years.

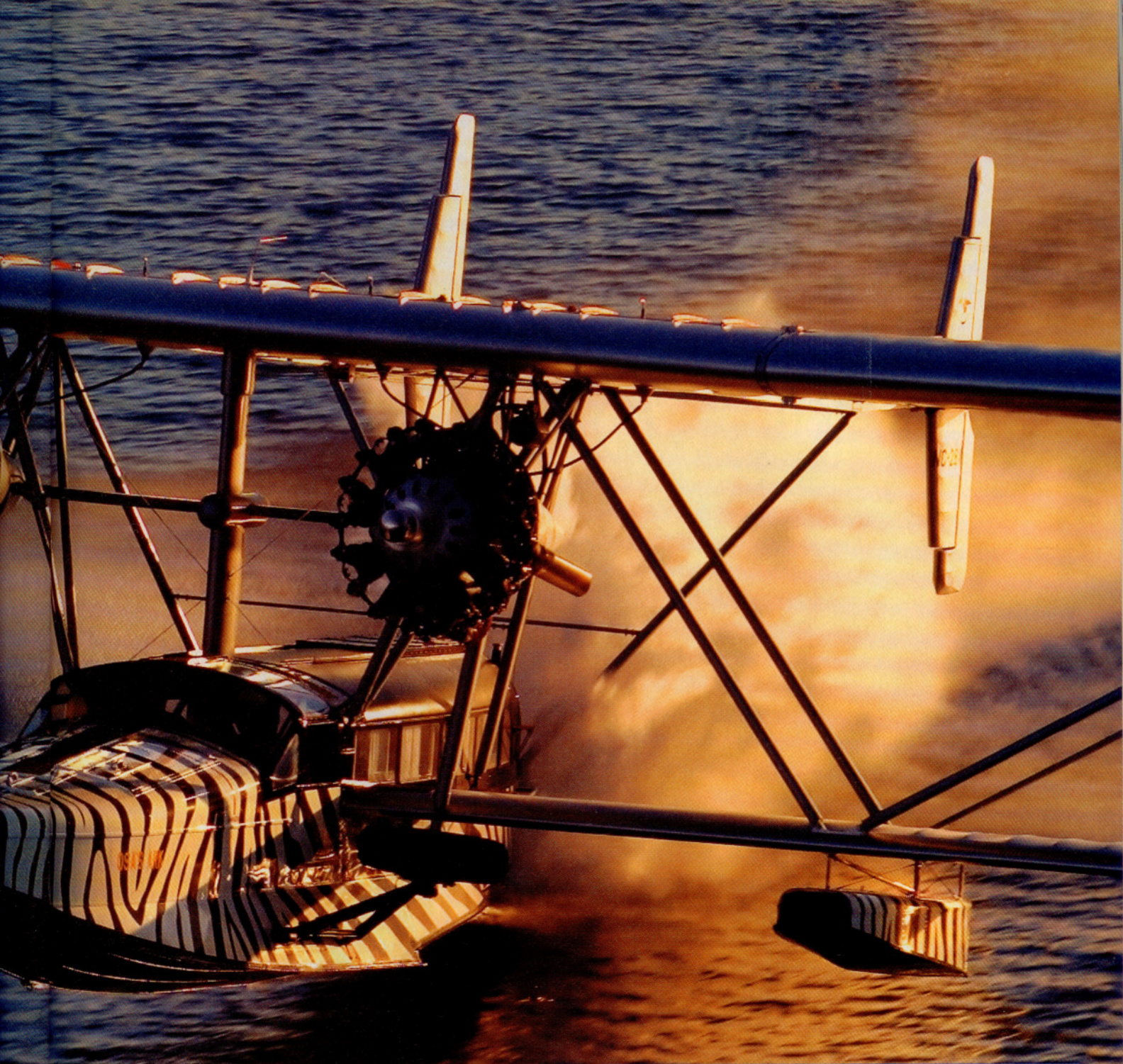
The Johnsons painted their Amphibion to resemble a zebra and called it *Osa's Ark*. It was used to make their first flying foray into Africa. They also purchased a smaller, single-engine Sikorsky S-39 (NC52V) to serve as a companion aircraft. It was painted with the reticulated pattern of a giraffe and was called the *Spirit of Africa*. Their pilots on this journey were Boris Sergievsky and Vern Carstens. (Carstens taught the Johnsons to fly and eventually became manager of flight test engineering and chief test pilot for Beech Aircraft.)

Flying in Africa in 1933 and 1934 was as primitive as the lands over which they flew. Airports were scarce, and inaccu-



Engine cowlings were added to later Sikorsky seaplanes (below). Waldo Anderson (center) demonstrates a water takeoff before swapping seats with the author. The Pratt & Whitney engines are relatively close to the aircraft's centerline (right), which simplifies engine-out procedures.





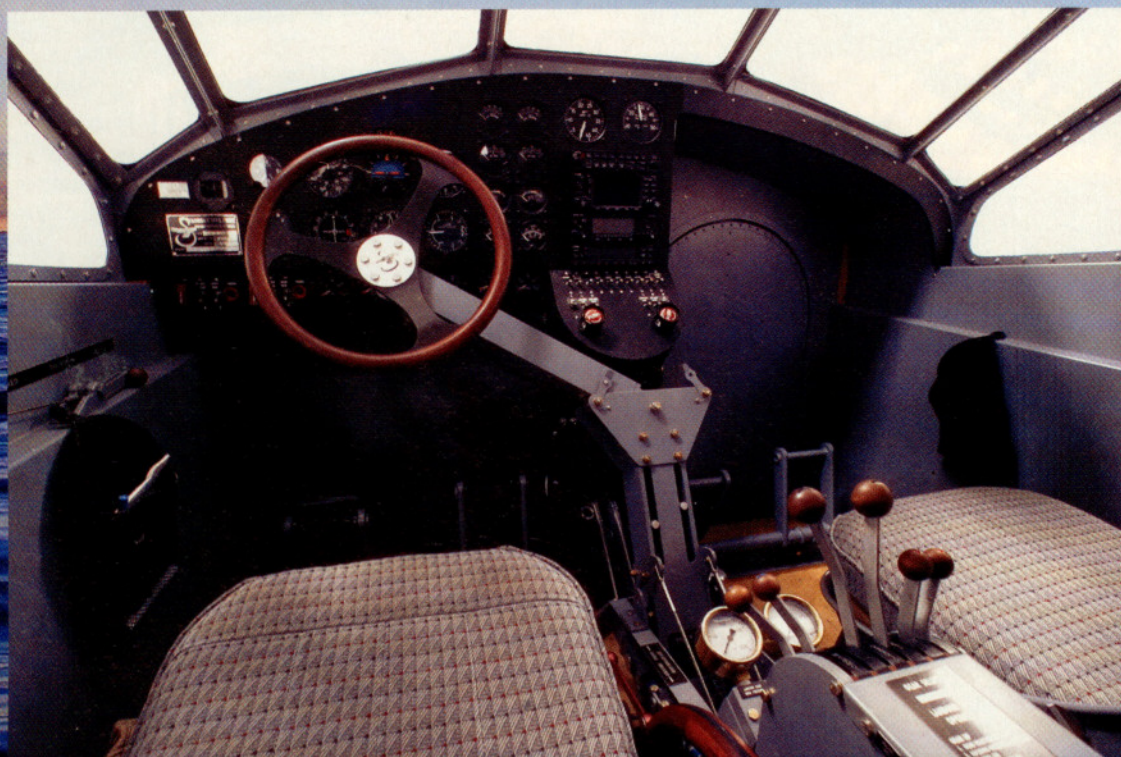
rate maps provided misleading guidance. The Johnsons were the first to photograph Tanzania's Mount Kilimanjaro from above.

Coincidentally, another Johnson used a Sikorsky Amphibion for a 15,500-mile expedition to South America. S.C. Johnson was in search of carnauba, a vegetable wax exuded by the leaves of the Brazilian carnauba palm. SC Johnson & Sons is perhaps best known for Johnson Wax.

Of the 111 S-38s manufactured, none survived. Wanting to take his two sons on a re-creation of his father's 1935 expedition to Brazil, S.C.'s son Samuel Johnson commissioned Born

Again Restorations of Owatonna, Minnesota, to build an S-38 from scratch using plans that thankfully were still available. The flight was made in 1998, and the *Carnauba* now resides in the Johnson Museum in Racine, Wisconsin. (See "Pilots: Sam Johnson," January 1999 *Pilot*.)

R.W. "Buzz" Kaplan, Born Again Restorations' owner, and his friend Tom Schrade, a real estate investor and developer, were enamored of the aircraft and decided to build a second S-38, a restoration of *Osa's Ark*, that is the subject of this article. It is considered a restoration because it includes the wings and tail booms of an original Amphibion. The project



The "air yacht" configuration (above) comfortably seats five plus two in the cockpit. Fear not. The wicker seats are bolted to the floor. The control wheel (left) can be swung to starboard to accommodate the right-seat pilot.

required an investment of 2.5 years, 40,000 man-hours, and more than \$2 million. Gary Underland was the artisan and primary builder of both S-38s.

Schrade and Kaplan had planned to fly their aircraft to Africa, until Kaplan died in his 1917 Curtiss JN-4 Jenny in July 2002.

(Richard "Dick" Jackson of Rochester, New Hampshire, rebuilt a single-engine S-39 that is emblazoned with the giraffe-like markings of the *Spirit of Africa*. N50V, which is the original N number, is the oldest Sikorsky airplane in the world and is the only airworthy S-39.)

The Sikorsky S-38 Amphibion is one of the all-time great airplanes from aviation's golden era. One of its most distinguishing features and a Sikorsky trademark are the twin booms that keep the tail high above the water and in line with the propeller slipstreams (to enhance the effectiveness of the elevator and twin rudders). The airplane is a labyrinthine maze of struts, braces, supports, and wires that provides a rigid structure for the parasol wing, lower wing, tail booms, and fuselage, which also is the hull and is divided

into six watertight compartments. Lateral stability on the water is provided by a pontoon (float) under each of the lower wings.

The S-38 is a large airplane with a 72-foot wingspan, about the same as a Ford Tri-motor, but do not call it a biplane. Because the lower wing area is less than half that of the upper wing, the S-38 is more accurately described as a sesquiplane.

Schrade's airplane, NC28V, is pristine, apparently better than when it originally left the factory, but there have been a few significant upgrades. A tailskid would not be conducive to operating from hard-surface runways and taxiways, so it was replaced with a robust, fully castering tail-wheel borrowed from the nose of a Cessna 182. A pair of supercharged 450-horsepower Pratt & Whitney R-985 Wasp engines (sans cowlings) replace the 420-hp versions. The Johnsons would no doubt have paid a king's ransom for the pair of Garmin GPS moving-map displays, and other modern avionics on the instrument panel. The Johnsons wrote that "it was not unusual to get lost flying over Africa [during the early 1930s]."



The cabin has an "air-yacht" configuration almost identical to that of the original *Osa's Ark*. It has the appearance of a stateroom on a luxurious turn-of-the-century seafaring yacht. There are curtains to keep the sun out, thank you, two bolted-down wicker chairs on the right, a divan that seats three on the left (for a total of five passengers), and beautiful mahogany paneling and trim. A storage cabinet contains the elements needed for libation as well as a pullout table upon which to place the glasses. (Osa used the table for writing.) The rear of the cabin has room for a toilet and baggage.

A delightful feature is the hatch on top of the rear fuselage. It allows a passenger (or two) to stand and stick his head and shoulders out for a magnificent panoramic view in any direction. The vista is especially exciting when standing there during flight.

One of the Johnsons' movies, *Ba-boona*, includes a scene that shows *Osa's Ark* surrounded by a pride of lions. Osa opens the S-38's hatch and quickly closes it as lions try to jump in.

Schrade keeps his airplane at the North Las Vegas Airport, which is where I was checked out in the S-38 by his

friend and instructor Waldo Anderson. Anderson retired as chief pilot for the University of Minnesota in 1997. There he ran the flight school and transported state personnel in a Beechcraft King Air and a Baron. He met Schrade in 1975, and instructed him for most of his ratings (including a flight instructor certificate). At 68, Anderson spends much of his time with Schrade flying the Sikorsky amphibian to airshows all over the country.

You enter the cockpit by stepping on a tire and climbing through the side and overhead windows. Passengers gain access by climbing through a hatch on the aft left side of the cabin. Agility is required in either case. Unfortunately, you cannot go back and forth between the cabin and the cockpit.

Starting the engines is unremarkable except for the wonderful sound of radial engines that always takes me back to a bygone era. Taxiing without a steerable tailwheel is not difficult using differential power and brakes.

Rotation is not needed for takeoff. When allowed, the airplane simply levitates in three-point attitude at 45 knots. Lower the nose a wee bit to 65 knots, pull the go knobs back to 30 inches and 2,000 rpm, and climb rates settle at 500 to 800 fpm, depending on load.

The original S-38 required manually pumping up the landing gear one leg at a time. Schrade's airplane has an electric hydraulic pump that results in a quaint ritual involving selector handles, locking valves, and pump switches. Although this requires less physical effort, the legs still come up very slowly and one at a time.

Raising the landing gear does not reduce drag. It simply raises the wheels and places them flush with the bottoms of the lower wings to get them out of the way for water operations. For land operations only, performance does not suffer if the wheels are left down, but the purist raises them anyway because he knows that the airplane looks better that way.

Schrade thankfully provides pilots with Telex noise-canceling headsets. Otherwise, the noise and vibration of the Amphibion would be fatiguing. I cannot begin to imagine how Martin and Osa Johnson endured such lengthy journeys in an S-38 without hearing protection. One can only wonder how the Johnsons avoided becoming stone deaf, like the rabbits that dwell between the runways at Los Angeles International Airport.

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At 27 inches and 1,900 rpm at 6,000 feet, the S-38 cruises at 90 knots while consuming 46 gallons per hour. Total fuel capacity of the four tanks (all in the upper wing) is 340 gallons. Maximum allowable gross weight is 10,480 pounds.

The airplane is heavily damped in roll, has poor roll response, requires effort to maneuver, and is a handful in turbulence. It also has neutral lateral stability, which means that you cannot pick up a wing with rudder. One can only imagine the physical effort required to fly an S-38 through and near the intertropical convergence zone of central Africa. The airplane is undoubtedly challenging during takeoffs and landings in gusty crosswinds.

Conversely, pitch forces are relatively light. The nose hunts noticeably about the yaw axis even during mild turbulence, a characteristic probably caused by the long bow.

Coping with an engine failure is a no-brainer because the engines are so close to the aircraft centerline. Very little rudder is required to keep the Sikorsky on an even keel even during low-speed climbs with the "good" engine developing maximum power. Engine-out climb performance at heavy weights, however, is virtually nil, even with a feathered propeller.

The S-38 has benign stall characteristics even during a power-on stall with an engine shut down. Although there is very little stall warning—only a mild buffet a few knots before the break—it does not seem to matter because the airplane is so well mannered.

An advantage of the North Las Vegas Airport is its proximity to sprawling Lake Mead, a paradise for boating and seaplane enthusiasts.

Touchdown attitude for a water landing is about the same as when making a three-point landing on a runway. The S-38 seemingly has no bad habits in the water and makes consistently smooth landings without a noticeable tendency to porpoise. However, the airplane has limited elevator authority with a forward center of gravity so power is helpful in establishing the nose-high touchdown attitude.

Like other multiengine seaplanes, the S-38 does not have a water rudder, but it turns easily using differential power. If necessary, you can lower one landing gear leg to add water drag that helps to turn more sharply in that direction.

During the plowing phase of a water takeoff, forward visibility all but disappears behind the heavy spray across the

windshield, but this clears away rapidly as the airplane comes over the hump and onto the step. After that, it is a simple matter of establishing and holding the right attitude (finding the "sweet spot") and allowing the Sikorsky to accelerate and fly itself off the water.

Overall, the Sikorsky S-38 is an advanced, well-behaved airplane considering that it was designed only a year after Lindbergh's historic flight and 25 years after the Wright brothers' first successful effort.

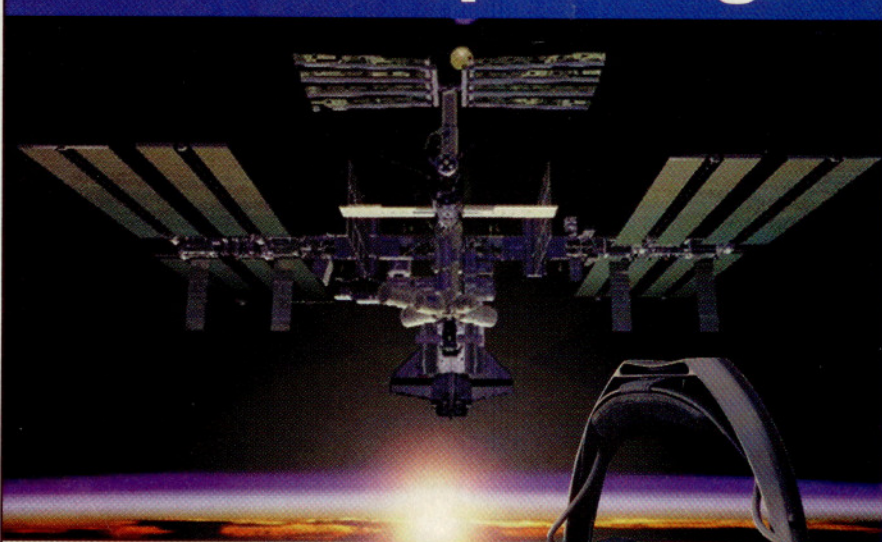
Those interested in the adventurous exploits of Martin and Osa Johnson are

encouraged to visit the Martin and Osa Johnson Safari Museum's Web site (www.safarimuseum.com).

You are also invited to visit the museum in Chanute, Kansas. The city was named after aviation pioneer Octave Chanute and is the birthplace of Osa Johnson. Not coincidentally, Chanute is served by the Chanute Martin Johnson Airport. **ACPA**

i Links to additional information on Sikorsky aircraft may be found on AOPA Online (www.aopa.org/pilot/links.shtml). Keyword search: Sikorsky.

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Sergei Sikorsky

Fourteen-year-old Sergei Sikorsky just barely missed being an eyewitness to history—his father Igor's first tethered flight in the very first helicopter, the VS-300,

on September 14, 1939. "But I was there probably a week later when he made his first untethered hops and jumps," says Sikorsky. "[Igor] did most of his flying fairly well dressed," Sikorsky explains. "He was from an older world, where men always wore jackets and neckties." And bowler hats—which stayed on Igor's head through all that rotor downdraft, while he mastered flying the unstable open-cockpit helicopter.

Like his dad, Sergei Sikorsky oozes old-world charm. He is polite, gentle, and dignified. You can discern a hint of some kind of European accent in his voice as he recalls his life. "I was proud of dad long before the helicopter," he recalls. Igor was a White Russian, a supporter of the Czar, who abandoned his country around the time of the Communist revolution. Before doing so, though, he built the world's first four-engine airplane, the Bolshoi Baltiskii, in 1913. Eventually, he made his way to the United States and began building huge amphibious airplanes, which airlines such as Pan Am chose for flying pioneering routes to South America and throughout the Pacific islands.

Sergei was born in 1925, and he remembers such aviation luminaries as Charles Lindbergh, Juan Tripp (Pan Am's president), and air racer Roscoe Turner being invited to the Sikorsky home for lunch. His first flight was in one of his father's amphibians—an S-38 twin. As a 10-year-old he sat on his father's lap in the amphib's right seat while the company's chief test pilot taxied it down the ramp at the Sikorsky plant in Stratford, Connecticut, and into the Housatonic River. The pilot gave her power and took

off for a brief test hop over Long Island Sound. "I remember seeing the horizon expanding miraculously," he says. "That's when I decided to become a pilot."

He started flight training in 1940—in a Piper J-3 Cub—and almost had his pilot certificate when the Japanese bombed Pearl Harbor. "Then much of aviation was shut down like September 11, and the flying schools had to move inland 100 miles," he says. But he did solo in 1942 and was drafted when he came of age. It wasn't until the end of the war that Sergei soloed in a helicopter. Still, most of his flying has been in fixed-wing aircraft: 2,200 hours versus 600 hours in helicopters. He has so many more airplane than helicopter hours for the "simple reason that Sikorsky for many years led the pack in building bigger and heavier helicopters," he says. "Unfortunately, that had a side effect of increasing per-hour costs. I was a fairly good pilot on the old S-55, H-19, and H-34, but when they began to build the S-61 series the cost per flying hour got too expensive. I couldn't see justifying flying 20 or 25 hours in an aircraft as complex as an S-61. I would be a threat to myself and anybody flying with me." Wait—the son of the helicopter's inventor had to pay to fly his father's machines? "I worked for United Aircraft, and United Aircraft was a fairly conservative company," says Sikorsky. So, like anyone else, he



had to fork over the cash or stay on the ground.

In about 1952 the company sent him to Europe on the first of many overseas assignments. He mastered German, French, and Italian, in addition to Russian—enough to give technical lectures on the exacting details of helicopters. He marketed helicopters in Germany, France, Italy, and

Japan, and if the number ordered justified production in that country, he became an engineering liaison in the factory built there by United Aircraft.

He introduced the S-58 into the German armed forces, then was part of a marketing campaign to sell the Germans a heavy transport helicopter, the CH-53. The contract was worth \$500 million. "I was very proud to send the cable that the Germans had committed to comanufacture 120 CH-53 helicopters," he says.

In 1992 he retired at age 67 and eventually moved just outside of Phoenix. As a hobby, and possibly for a book, he's collecting anecdotes and aphorisms by his father about flight. "I treasure the comments of my father describing his start in aviation in '08 or '09." Among them: "We were ignorant, and we were ignorant of the fact that we were ignorant. That is ignorance squared, and it can lead to disaster." Another: "At that time [1909] the chief engineer was almost always the chief test pilot as well. That had the fortunate result of eliminating poor engineering early in aviation."

Sergei turns 78 on February 1. "I'm looking seriously at renewing my license," he says. "Talking about airplanes," Sikorsky says, "is a very pleasant mental disease."

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