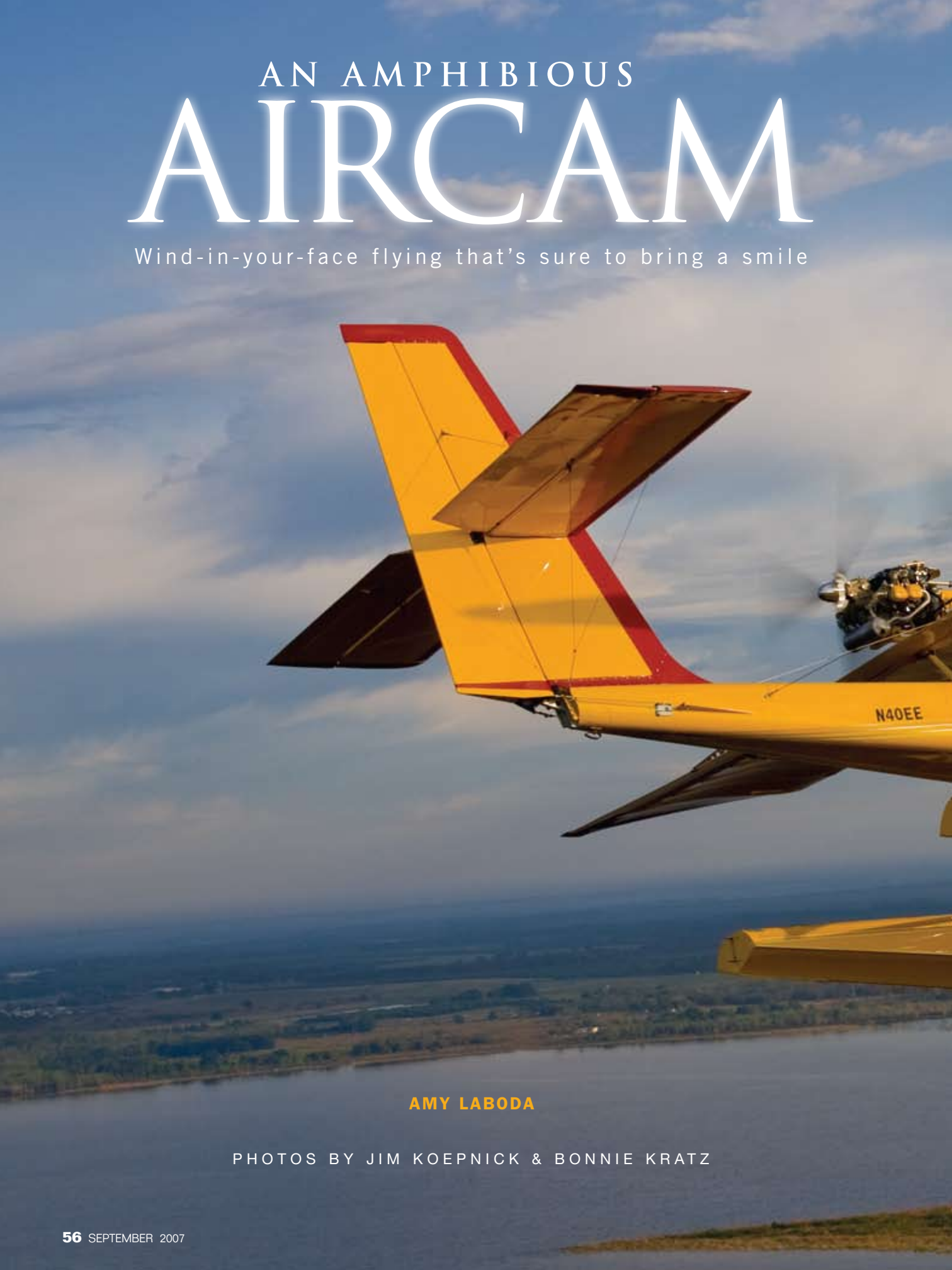
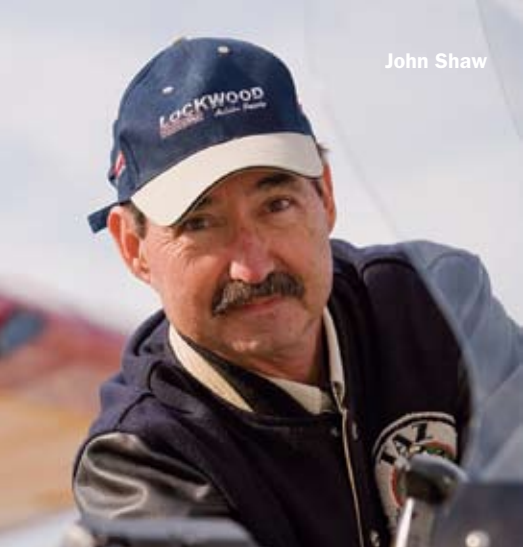
AN AMPHIBIOUS AIRCAM

Wind-in-your-face flying that's sure to bring a smile



AMY LABODA

PHOTOS BY JIM KOEPNICK & BONNIE KRATZ



John Shaw

As I lumber up to EAAer John Shaw's AirCam, a giant yellow beast of a two-seater, I wonder what it is about amphibious floats that make even a Piper Cub look larger than life. I strap myself into its four-point harness designed to secure the rear passenger to a simply upholstered bucket seat and arrange my headset cords. Here I go again, I think, as I take up the military-style Gentex helmet with integrated active noise-reduction headset and glare shield. This is ostensibly to keep the hordes of Everglades' mosquitoes out of my eyes. It's up to me to keep them out of my teeth. John demonstrates how to snap and tighten my chin strap, then turns to take care of business up front.

He flips the oversized airline-style, rubber-sheathed switches, pushes the throttles forward and turns the fuel shut-off knobs, and with the push of a button the two Rotax 912S powerplants mounted above my head purr to life. At approximately 4000 rpm, the engines each produce 100 hp while burning just 3 gallons per hour each. This gives roughly 200 hp to lift the AirCam on amphibious composite floats. The aircraft's empty weight is just less than 1,600 pounds; maximum gross weight is 2,100 pounds. At maximum gross, that puts John's AirCam just under the empty weight of a stock Cirrus SR20, with the same

The front panel is fully equipped for flying in IFR conditions, and includes a Garmin 496, a Sigma Tek electric attitude gyro, and a 2-inch Becker AR 4201 transponder.

John chose Calmar floats for his AirCam. Since they were the first installation of these floats on this type of aircraft, Clamar owner Clair Sceli came down to Florida with technical advisor Tim Smith to help with the installation.

horsepower to pull it into the air.

Unlike most aircraft retrofitted with amphibious floats, John's floatplane has horsepower to spare. Better yet, horsepower is divvied up into two equal and independent power sources placed as close to the aircraft's centerline as possible, affording him the best possible single-engine performance in the case of an engine-out situation. It's not the prettiest bird on the block; even with its canary yellow paint, it comes off gangly and, well, really, really tall for something with Dacron wings and a tandem open cockpit. But the AirCam is a homebuilt airplane that John (EAA 249489), a retired airline pilot, fell in love with on sight.

As we bump down the taxiway at Wellington Aero Club's turf strip, I am thankful for the accumulator struts attached to the extra large 10-inch retractable nose wheels on the floats that absorb the brunt of the rough ride. After a few brief run-up checks, we roll out to Runway 33 and announce our departure. With just a nudge of John's left hand, the hummers above my head crescendo to a raucous whine. Soon we're at 50 knots and rotating off the ground. The AirCam's big, rectangular wings cushion the burbles right out of the mid-morning south Florida thermal action.

John retracts the gear, and I watch as the lights on his panel cycle from green to blue. He points to the float tips, where manual indicators there do the same, and finally to the dual parabolic mirrors mounted on the struts, where, with a glance, he can confirm his main gear is up. He reduces power to 4000 rpm, and we level at 1,000 feet. Moving along at about 70 knots, he offers the controls to me.

With a full set of basic instruments (including a Garmin 295) in front of me and a decent forward view over John's shoulder, it's a cinch flying the docile, nicely balanced AirCam from the rear. I can see ahead of us, through my own custom windscreen, and I also can see a goodly portion of the front-seater's full instrument flight rules main panel, which includes a Garmin 496, a Sigma Tek electric attitude gyro, and a 2-inch Becker AR 4201 transponder, as well as the controls for the PS Engineering PM501 intercom.

The aircraft's oversize tail, reaching nearly 8 feet high on these Clamar floats, easily compensates for the additional yawing, pendulum-like effect that is often a characteristic of float-adapted aircraft. The airplane's large ailerons and elevator (all with additional stiffening for the seaplane application) give the AirCam handling qualities akin to a big bore Cessna high-wing aircraft. Electric elevator trim takes out the challenge of handling the machine, which at first glance comes across as an ultralight Drifter on heavy steroids.

I find myself able to use fingertip pressures on the stick to coax N40EE right, left, up, or down at will. With the wind in my face and the sea of grass that is the eastern gate to the Everglades National Park below, I feel

SPECIFICATIONS FOR AIRCAM N40EE

BUILDER: John Shaw, Wellington Aero Club, Florida
(Specifications are at gross weight, at mean sea level, with no wind except where specified.)
ENGINES: Two 100-hp Rotax 912S
GROSS WEIGHT: 1,680 pounds on wheels, 2,100 pounds on floats
EMPTY WEIGHT: 1,186 pounds on wheels, 1,519 pounds on floats
USEFUL LOAD: 494 pounds on wheels, 581 pounds on floats
STALL SPEED: 39 mph
CRUISE SPEED: 50 to 100 mph
VNE (NEVER EXCEED SPEED): 110 mph
RATE OF CLIMB: 1,000 fpm
SINGLE ENGINE: 150 fpm
FUEL CAPACITY: 29 gallons
FUEL BURN: 6 gph
RANGE: 315 miles at 70 mph
ENDURANCE: 4.5 hours
LANDING ROLL: 300 feet on land, 100-300 feet on water
TAKEOFF ROLL: 500-800 feet on land, 5-8 seconds on water

DIMENSIONS

WINGSPAN: 36 feet
LENGTH: 27 feet
HEIGHT: Vertical stabilizer 8 feet 4 inches on wheels, approximately 12 feet on floats (varies with installation)
WIDTH: Center section, 7 feet
GEAR WIDTH: 8 feet 6 inches (float width varies with installation)

LOCKWOOD AIRCRAFT CORPORATION

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Sebring, FL 33870
863-655-4242 *info@lockwood-aviation.com*
www.lockwoodaircraft.com

CLAMAR MODEL 2200 FLOAT SPECIFICATIONS

LENGTH: 16 feet 4 inches
WIDTH:
-TAIL: 20 inches
-MID: 29 inches
-NOSE: 19.5 inches
HEIGHT: 23.5 inches (highest point)
COMPARTMENTS: Six, all accessible with 6-inch spin-off covers or baggage doors
MAIN BAGGAGE COMPARTMENT: 11- by 21.75-inch opening

WHEELS:

-MAINS: 5.00-5 with 15-inch tires, 6.00-5on request
-AZUSALITE NOSE: 4.00-5, full 10-inch wheel, 4.5 inches wide

CLAMAR FLOATS

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like I am a pterodactyl cruising for its next meal.

On John's command, I ease the beast down to 300 feet near a drainage pond that he pointed out as our water-landing site. Now he takes over. I watch as he runs through his water-landing checklist with airline pilot precision. He confirms the landing gear is up (blue light, blue manual indicators on the float tips, and in the parabolic mirrors angled to reflect the position of the main gear). We clear the area and swing around onto final approach. With the deftness of a swan, John sets N40EE gracefully onto the glassy containment pond.

As we putter downwind, John tells me that N40EE is not the first AirCam he's built. "I discovered the AirCam when my neighbor got into one and convinced me to go to the factory with him to take a demo ride. This was in the mid 1990s, just after Phil Lockwood came back from doing his *National Geographic* bit in the Congo, which is what the airplane was originally designed for," he explains. "I loved it. I loved the safety of it, and the performance. I wasn't looking for a traveling machine; I was looking for an airplane I could have fun in. I got serial No. 10."

John built that AirCam with his buddy Sal Arena, in Sebring, Florida, and flew it for a number of years. When he decided to create an AirCam on floats in 2003, he wanted the advantages of an upgraded AirCam fuselage. "I wanted to beef it up for the floats from day one," he recalls. The second aircraft, N40EE, was finished in 2004, constructed completely in John's Wellington Aero Club hangar.

Not content with even a late-model stock AirCam, John studied the kit and made adjustments where he felt he needed to. The result was an airplane that won best metal amphibian at the 2007 Sun 'n Fun Fly-In at Lakeland, Florida. "I sanded off and filled all of the Avex and Cherry Max rivets, to give the airplane a smoother look," says John. He also wrapped the leading edge spar of the AirCam's wings with a foam rubber lip, which smoothed it, too, hiding the rib bolts that typically protrude from the Dacron sleeves that tightly wrap the wings.

The roomy baggage area, which also holds the battery, is enclosed with a hatch that is secured with button latches made for Boeing 727 and 737 aircraft. The fiberglass nose cone comes off with a couple of camlock screws, revealing easy access to all of

the pilot's instrumentation and the GPS antenna, mounted on its own bracket. John used color-coded mil-spec wiring neatly bundled to make servicing his avionics and instruments child's play.

The stock throttle quadrant wasn't to his liking, so he and Sal designed a streamlined box that would accommodate fuel shut-off valves—another upgrade. Red fuel lights in the panel back up the position of the knobs, making it difficult for a pilot to attempt a takeoff with the valves in the "off" position. John and Sal also hid the throttle and fuel cables in aluminum tubing that runs the length of the cockpit area, blending nicely with the gray interior.

Exterior cabling and tubing is either concealed in speed fairings or blends in with the shiny gray paint that matches the speed cuffs and fairings' anodized aluminum look. The engine valve covers were repainted yellow to match the airplane (stock Rotax is green), and the dual Warp Drive three-bladed composite props with tough nickel leading edges are capped off by polished aluminum spinners. All that and a great paint job are just the surface accoutrements, though.

"I wanted a stiffer airplane for the floats, so we chose an O-24 thickness aluminum for the fuselage skin on each side and doubled up all the potential attach points for the floats that I knew were coming," says John. That also played into the decision to stiffen the ailerons and elevators and double up the attachments there, too. Even with all that beefing up, the finished airplane weighed in at less than 1,160 pounds empty, leaving a useful load of 524 pounds. Plenty for two passengers and 29 gallons of fuel.

With the wind in my face and the sea of grass that is the Eastern gate to the Everglades National Park below, I feel like I am a pterodactyl cruising for its next meal.

After flying the airplane on wheels for nearly two years, John finally found what he thinks are the perfect floats for his airplane. The Clamar amphibious floats are the brainchild of Clair Sceli, who manufactures them near London, Ontario, Canada. The floats are constructed from an epoxy vacuum-bagging process that uses infusion with a Corcell base foam and carbon fiber, which results in an exceptionally tight, strong, and light float (8 percent to 12 percent lighter than comparable aluminum floats). The floats added 300 pounds to his AirCam, so John went back to the experimental drawing board and re-certificated his aircraft to a higher useful load of 2,100 pounds, preserving his fuel and payload capabilities.

All Clamar floats include a Kevlar sister keelson in the step area, as well as 3- and 4-inch gussets lengthwise and around the bulkheads, near the points where the spreader bars attach. The amphibious 2200 floats that John chose use an Oildyne 108 series electric hydraulic pump set at 500 psi to hold the wheels up for water landings or, with the flip of a switch, move the wheels down and hold them slightly over center against a rubber backstop that also absorbs the bumps. The oversized 10-inch nose wheels and 15-inch mains are ideal for John's grass-field operations. "These floats are tight," he says, pointing out that the only water he's ever seen inside the six bulkheads—just a few drops—came in from an inspection port that had not been sealed properly.

Fitting the floats was a challenge made easier by the Florida arrival of Clamar owner Clair Sceli. "Since we

THE AIRCAM

The twin-engine, open-cockpit Lockwood AirCam came into existence to serve a need. Phil Lockwood had been flying a Maxair Drifter for National Geographic Society (NGS) photographers Des and Jen Bartlett in Southwest Africa, but NGS had a new mission. It wanted Phil to fly photographer Nick Nichols over the Ndoki Rain Forest in the Republic of the Congo. That was May of 1993. While Phil was enthused about the opportunity, he wasn't enamored with the idea of flying a single-engine airplane over a forest of 300-foot trees with no alternative landing sites. He needed a twin-engine airplane.

Initially, Phil thought he'd simply enlarge the dimensions of the Drifter, but that didn't work. Once he started beefing up the airframe to handle two Rotax 582 engines (now the aircraft comes with twin 912 or 912S engines), the need for larger wings and tail surfaces became apparent. Thus, the AirCam was born. Six months later, the first AirCam was shipped to Africa. (Read the story of the Ndoki flying experience, "Air Cam Adventure in the Congo," in the August 1995 issue of *EAA Sport Aviation*.)

In 1994, Phil displayed a second AirCam at the Sun 'n Fun Fly-In in Lakeland, Florida. Cuban-born flying enthusiast Antonio Leza took it for a flight and offered to go into partnership with Phil to produce the grasshopper-like machine. A few years later, Antonio purchased the full rights to the design while Phil concentrated on developing Lockwood Aviation Supply and Lockwood Engine Repair.

Earlier this year, Phil purchased the design rights and production tooling from Antonio. The AirCam has come full circle. Phil is in the process of re-establishing an AirCam kit production line. He'll also reintroduce the Drifter later this year.—*Mary Jones*

WITHIN FIVE SECONDS, WE'RE OFF THE WATER AND RISING ABOVE THE UNDULATING GRASSES, HEADING EAST BACK TO THE RELATIVE COMFORTS OF CIVILIZATION.

were the first AirCam installation, Clair was kind enough to come down here with Tim Smith, his technical advisor, to lend us a hand and their expertise," recalls John.

Every float installation is a little different, and this is especially the case when it comes to custom homebuilts such as the AirCam. As with many things in experimental aviation, the first installation was not the charm. "You're basically asking the airplane to be a boat when it's on the water, and you're asking the floats to fly in the air," says John. "It requires a bit of ingenuity to make the necessary compromises and come out with something that does both jobs well."

On the first go around, the float team mounted the fuselage a few inches too far forward on the floats and experienced a tendency for the floats to submarine because of the position of the center of floatation. They quickly rectified the situation by shifting the fuselage back about 4 inches on the floats and spreading the floats about 10 inches farther apart. "We had to cut all new struts and spreader bars," says John, "but it worked." The airplane was far more stable on the water and on the land, and its handling characteristics, on water especially, were tamed. Once they'd wrestled with stability and center of flotation issues, they de-installed the floats for a third time and beefed up the attaching hardware before the final installation.

All this sounds like a lot of work, and it was, but it was work made easier by the correct tools. John and his friends built a homemade gantry crane inside his hangar that allowed him to lift the entire airplane in one piece into the air for each float fitting. He maintains that he can have the airplane back on wheels in a matter of a couple of hours because the gantry makes it so simple.

As we maneuver in the drainage pond, it's easy to see that the floats are sitting right on their sweet spot now. Water handling, even without water rudders, is positive. John left them off as a nod to simplicity. Again, the big AirCam tail sitting up in the slipstream of the twin propellers makes maneuvering on top of the water easy. John demonstrates step taxis and plow taxis,

takeoffs, and a few landings. The Clamar's sweet spot is at a natural pitch attitude and plenty fat for a novice to find, exhibiting no undue tendencies toward porpoising or submarining.

"Ah, our friends," chuckles John, as we dillydally in a drainage canal inside 8- to 10-foot walls of water grasses. From every direction, I suddenly notice beady black eyes studying our lanky yellow craft from the waterline. Alligators—at least a dozen—are curiously closing in on us. It definitely feels like time to move on.

John hits the power and the gators submerge. Within five seconds, we're off the water and rising above the undulating grasses, heading east, back to the relative comforts of civilization. Looking down at the deceptively pastoral grasslands, ponds, and canals below, I quickly understand the charm of the two Rotax engines, especially when it only takes one of the engines to keep the airplane in flight until you can find a safe and accessible landing site.

The first landing site we come to, of course, is Wellington. John runs the pre-landing checklist for terra firma and positions the gear handle down. There is no perceptible center of gravity change as I watch his panel lights cycle from blue to green while the float-tip manual indicators move to match the lights. Finally, I look in the mirrors and see those big 15-inchers down and locked.

As we float in the morning sky over ranches and turf onto final, I notice that our flare height is nearly that of a Cessna 206 on floats. Lucky for me, the shock absorbers in the mains and the nose gear make even my first attempt at a landing presentable. More than likely it is the responsiveness of the twin Rotaxes whirring back to life above and behind me when I nudge the throttles in the flare that saves me. I'm liking this two-engine thing more and more.

Back on the ground we taxi up to John's hangar. He pirouettes the machine with a combination of differential thrust and braking to shut it down next to my noticeably diminutive Kitfox IV.

Now it's my turn to laugh. These two yellow airplanes, sitting side-by-side, were both borne of the homebuilt revolution that kept general aviation afloat in this country during the toughest years, between 1986 and 1996, when no factories were pumping out light aircraft (at least not in the United States).

The two aircraft have a lot in common, I tell John. They were built by professional pilots looking for an aircraft that is good for just one thing—pure, unadulterated flying fun. John pops off his Gentex helmet and turns to me, but he doesn't need to talk. The sparkle in his eye and an ear-to-ear grin tell me all I need to know.

Amy Laboda is the editor in chief of Aviation for Women *magazine. She flies a Kitfox IV that her husband built for her more than 14 years ago, and she is helping him build an RV-10.*