



| LIGHT SPORT AIRCRAFT |

# Soul-stirring airplane

## Carbon Cub splashes in

**LIKE A DUCK** that switches from sitting placidly atop the water to a furiously splashing, flapping, quacking master of flight, the Amphibious Carbon Cub leaps into air with a burst of raw energy.

A typical water takeoff goes like this: Add full power with the stick aft and count to two. Now you're "on the step," so relax the back pressure and count to three. Now you're flying. There's hardly enough time to mess it up.

BY DAVE HIRSCHMAN  
PHOTOGRAPHY BY CHRIS ROSE



**VIDEO EXTRA**  
Fly along with the author in this online video.





The conditions for my introduction to the Carbon Cub on floats are poetic. Last year, at the fortieth annual International Seaplane Fly-In on central Maine's picturesque Moosehead Lake in Greenville on a cool, autumn-like afternoon, I meet owner Gary Lickle for a lap around the gorgeous region. Lickle is a serial Carbon Cub owner who flies on amphibious floats from his home in South Florida throughout the Everglades as well as the Bahamas. He bought this airplane, N711, a 2013 model, at the factory in Yakima, Washington, and has logged more than 300 hours in it since bringing it home in early 2013. He flew 1,600 miles just to attend the storied event for the first time.

We taxi from the ramp at the Greenville seaplane base and slide into the clear blue water that's textured by a 10-knot northwesterly breeze with gusts to 15. The wheels on the Baumann floats

come up, the water rudders go down (and up before takeoff), and the manual flaps are set to the 20-degree takeoff position. Even though the diminutive yellow airplane is loaded with two adults and stuffed with photo and video gear, it surges ahead and vaults off the water in five seconds. Pitching up to climb at  $V_y$  nets a sustained climb rate of 1,800 fpm at 71 mph.

We level off at 2,500 feet and leave the throttle wide open. The Carbon Cub reaches a maximum speed of 120 mph IAS at 2,700 rpm and 13 gph. Throttling back to 2,250 rpm, the fuel flow drops to 5.8 gph while the airspeed indicator settles on 110 mph.

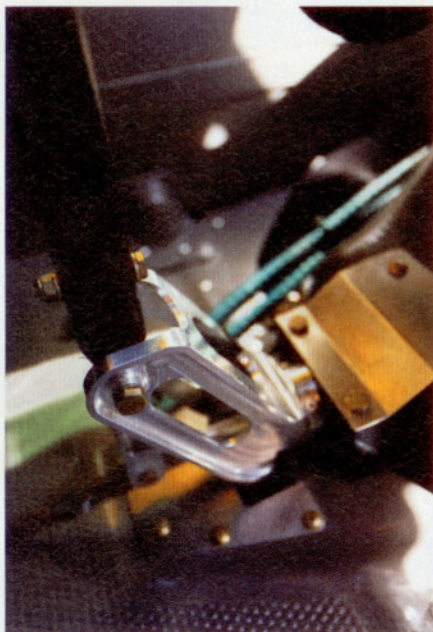
"The cruise performance is exactly the same with amphibious floats as it is with [26-inch] tundra tires," said Lickle, who two days later won the fly-in's short-takeoff, grapefruit bombing, and spot landing competitions in the same aircraft.

**A GARMIN** aera 796 is the heart of this Carbon Cub's VFR panel (above). Gary Lickle (right) beaches his airplane on a rocky shore.

"The ground roll on floats is slightly longer because of the additional weight, but there's no penalty once you get in the air."

**NOT FAIR.** The Carbon Cub stands out from other Light Sport aircraft for its muscular, adrenaline-inducing excitement. It's doing exceptionally well in an otherwise moribund LSA marketplace—and it is a lightning rod for controversy.





## Maybe it's the shape of the cowl that gives the Carbon Cub what appears to be a permanent smile.

The debate centers on the fact that the airplane is so capable. The 180-horsepower ECi engine, for example, with dual electronic ignition and other modern features, would be perfectly happy turning 2,700 rpm (or more) for its entire service life, yet the Carbon Cub POH limits full power to five minutes and 80 horsepower at cruise. At that cruise setting, the engine is loafing at 45-percent power.

Likewise, the LSA Carbon Cub's useful load is 420 pounds, yet identical airframes licensed under Experimental/Amateur-Built rules are approved for payloads of 1,000 pounds, and the company has tested

the airplane to even higher limits. So does anyone really expect the pilots of Carbon Cubs licensed as LSAs to strictly observe these restrictive limitations once they fly away from the factory? I didn't think so.

And the idea that Carbon Cub pilots may not actually fly in perfect accordance with LSA rules mostly demonstrates the folly of current regulations. In fact, the Carbon Cub would make a persuasive Exhibit A in support of the AOPA/EAA petition to allow pilots to fly simple, fixed-gear airplanes in day VFR conditions recreationally without FAA medicals.

So the criticism of the Carbon Cub is

essentially that it complies with the letter of the LSA rules—not the spirit. That's only true, however, if you accept that the spirit of the LSA category has to be dull and boring—and the Carbon Cub emphatically rejects any such notion.

**CUBCRAFTERS.** Cubcrafters had been rebuilding and modifying Super Cubs for many years when it decided to launch the Carbon Cub, and the design incorporates many of its most popular upgrades.

Chief among them, the cockpit is four inches wider at the shoulders; the panel is shifted forward; the flap handle is high on the left side of the cockpit (instead of the floor); and hydraulic toe brakes replace the old, failure prone, heel-operated expander tubes.

Up front, a two-blade Catto composite prop with a broad metal leading edge translates power from the ECi engine into

## EARNING WATER WINGS

### A new rating can be yours in a fast-paced weekend

Surreal. Backing up in a Cessna 172. And I don't mean flying really slowly on a windy day. With the engine stopped, flaps down, and doors open, the Skyhawk on floats drifted backward across the Florida lake, helping to reposition us to a point where we could take off without having to make a turn on the water that might tip over the airplane. Sailing is just one trick seaplane pilots must learn in order to safely operate a craft that is at times an airplane and at times a boat. As soon as a seaplane touches down on the water, it

is considered a boat and, interestingly, the craft that must give way to real boats—despite the fact that a seaplane is about the least maneuverable vehicle on the water.

With the sailing demonstration over, instructor Dave Young wanted to see my best confined-area takeoff. With the water rudders up, yoke back, and full power traveling crosswind, the airplane climbed up on the step. I relaxed back pressure and backed off the rpm a little to keep it there and then turned upwind. With full throttle and the addition of 20 degrees of flaps, the airplane popped into the air. I kept the airplane in a climbing turn, circling my way up to a safe altitude. With the right water and wind conditions, we could get the airplane out of a very small lake. Fortunately the one we were practicing on had plenty of leeway.

Young is a former corporate pilot who now oversees an aircraft management company in Lakeland, Florida, but on the side he instructs for Adventure Seaplanes and Brown's Seaplane Base. It's clear he enjoys getting out of the office and onto the water.

I'm spending a February weekend in the Sunshine State getting a single-engine seaplane rating from Adventure Seaplanes, which operates out of the Cherry Pocket community on Lake Pierce, just south of Orlando. In the summer, Adventure Seaplanes owner Brian Schanche migrates his fleet of floatplanes north to Surfside Seaplane Base, north of Minneapolis. Students with good planning can join the migration north or south each year and get some great experiences along the way, landing on the Mississippi River and numerous lakes in Kentucky, Alabama, and Florida—the sort of practical training that goes well beyond splashing from lake to lake within a few miles of home base.

While the rating can be earned in about five or six hours of flying, I quickly learn how much I don't know about seaplane operations. In the air, a floatplane flies about like any airplane, but on or near the surface, it's a whole new ballgame. For one thing, if the engine is running, you're moving, so before engine start you'd better know the direction of the wind, where the nose is pointed, and what's nearby—because you can't stop. Did I mention that watercraft sometimes get in the way—or that watercraft sometimes challenge you on the water, and without a clue as to how unmaneuverable you are on the water?

The hours and the weekend literally and figuratively flew by, and Young declared me ready for the checkride after about five hours. Examiner Jon Brown from Brown's Seaplane Base agreed, because I passed, but only with a new appreciation for all it takes to safely fly a seaplane—and a big desire to go do it some more.

—Thomas B. Haines

#### WANT TO KNOW MORE?

Adventure Seaplanes ([www.adventureseaplanes.com](http://www.adventureseaplanes.com)) and the Seaplane Pilots Association (<http://seaplanes.org>).



**VIRTUALLY ALL OF THE** Carbon Cub parts—such as the control column fittings (far left)—are made at the Yakima, Washington, factory. Vortex generators make the Carbon Cub wing exceptionally stable at high angles of attack. Flying with open doors and windows isn't just allowed in Carbon Cubs—it's encouraged. Note the tinted skylight and the high position of the flap handle.

thrust. The engine is far lighter than FAA-approved models of similar horsepower, and it's easier to start and smoother running, too. If electrical power is ever lost, the Lightspeed Engineering dual electronic ignition system is designed to continue to run for at least 30 minutes on standby power.

The Carbon Cub holds 25 gallons (24 usable) of fuel in two wing tanks, and both drain to a header tank that feeds the engine. Twenty-four gallons isn't a huge amount of fuel, particularly for a



**THE AUTHOR** with CFI Dave Young.

## AMBASSADORS TO ADVENTURE

### Seaplane-friendly Mainers host fly-in.

At a time when airports are hemmed in by high fences, barbed wire, and security gates, seaplanes provide increasingly rare direct public access. When seaplanes land on lakes and water taxi to beaches, docks, or marinas, people can see them up close, talk to pilots and passengers, and get inspired about aviation.

"As seaplane pilots, we have some unique and positive things to offer general aviation," said Steve McCaughey, executive director of the Seaplane Pilots Association (SPA). "We have unfiltered access to the public. Our airplanes are people magnets, and we can be ambassadors to adventure."

Nowhere are these attributes more visible than at Greenville, Maine, a town of 1,700 people on Moosehead Lake, which hosted its fortieth annual International Seaplane Fly-In in 2013 (the forty-first annual event is September 4 through 7, 2014). The fly-in is the biggest event of the year on the picturesque lake and typically draws about 100 seaplanes and 20,000 visitors. The only traffic light in Greenville is temporary, and it's installed for fly-in weekend.

A cove at the southwestern tip of the expansive lake is center for seaplane activity during the three-day event, and final approach brings aircraft swooping low over the town's waterfront buildings. Instead of complaining about airplane noise, residents cheer new arrivals and watch the spirited group's contests—which include grapefruit bombing, short takeoffs, spot landings, and canoe pickups and transports.

"We decided a long time ago that this event was going to be about having fun and flying airplanes," said David Quam, a founder of both the fly-in and the Seaplane Pilots Association. "We don't do a lot of speeches or formal presentations and all that."


Greenville hotels fill up well in advance of fly-in weekend, and scores of recreational vehicles fill camping areas. Many airplanes land at the Greenville Municipal Airport (3B1) about three miles away and take shuttles to the seaplane base (52B).

Just 3 percent of U.S. pilots are rated to fly seaplanes, even though it's widely recognized as one of the most enjoyable and affordable add-ons. The Seaplane Pilots Association has 6,700 members, well more than 65 percent of the 10,000 active U.S. seaplane pilots.

AOPA and the Seaplane Pilots Association have worked together to defeat a proposed seaplane ban in New Mexico, and to create online training courses for pilots on how to avoid spreading invasive species via airplanes.

McCaughey, an accomplished pilot rated in the Grumman Albatross—among other rare aircraft—says seaplane flying is poised for growth through amphibious Light Sport aircraft and other areas.

"There are some exciting new seaplanes to fly," he said, "and we're pushing to open even more areas to recreational seaplane flying. Events like the International Seaplane Fly-In provide a model for how seaplane pilots and communities can pull together and work cooperatively." —*Dave Hirschman*



**LOBSTER DINNERS**, idyllic conditions, and enthusiastic participants and observers are hallmarks of this annual Maine event.



floatplane made to operate in remote areas where avgas can be scarce. But it's enough for about four hours of flying at economy cruise. For longer trips Lickle carries 10 additional gallons in plastic cans in the float storage compartments. That's good for two extra hours in flight, or 200 statute miles in no-wind conditions.

This aircraft is equipped with metal Baumann 1500 floats that have two storage compartments on each float. The wheel retraction system is manual. Lickle regularly operates in saltwater and the floats show no corrosion whatsoever. But Baumann went out of business in 2011 and those who own their products must make their own arrangements for parts and service. Fortunately for Carbon Cub owners, several other firms—including Aerocet, Claymar, Mead, and Wipline—have stepped in with their own products.

**IMPRESSIONS.** Stepping into the Carbon Cub, the additional space in the cockpit is immediately apparent. Lickle is 6 feet 7 inches tall, and he fits comfortably in either seat without yoga contortions.

The Oregon Aero seats are both firm and extraordinarily comfortable. Engine start is normal for a carbureted powerplant, and preflight procedures are standard with the exception of the magneto check, which is actually an ignition check. Moving the key position shifts between left and right ignitions, and the resulting drop of about 30 rpm is far less than the 100 or so you'd expect with magnetos.

Once in the water, the wheels are retracted with a single pull of the floor-mounted Johnson

**HOT-ROD-INSPIRED** flames next to the wing fuel gauges (below) are purely decorative. A well-traveled Carbon Cub in its natural habitat (bottom).





bar, and the water rudders are extended. Steering is conventional from the front or rear seat, and we deploy lift flaps.

The takeoff is exhilarating and brief, and the stall warning horn chirps as we leave the rippled surface. A  $V_x$  climb at 51 mph results in an absurdly steep climb angle that I estimate at 35 degrees (there's no attitude indicator) and the Garmin 796 on the panel shows a climb rate of 1,700 fpm.

Level at 3,000 feet, I let the airplane accelerate and am surprised by the relatively heavy stick forces. The stick itself is short, so perhaps the stiffness is partially the result of a lack of mechanical advantage. The control feel is pleasant and well balanced, however, and gives a big-airplane feel to what is assuredly a very small aircraft.

Power-off stalls are preceded by mild aerodynamic buffeting and take place at 35 mph IAS clean and 25 mph IAS with full flaps. (There are three flap settings: 20, 35, and 50 degrees.) The roll rate with full

## **It's rugged, rowdy, extremely well-designed, beautifully crafted, and a pure joy to fly from water or land.**

aileron deflection is about 60 degrees per second, and steep turns at an estimated 2 Gs result in 180 degrees of heading change in about seven seconds.

A normal approach to a water landing is made at 50 mph IAS, and touchdown in an estimated 6-degree nose-up attitude takes place at 38 mph. Deceleration is rapid because there's relatively little mass to bring to a stop.

Lickle uses the acronym CRUMP in preparation for landing: Carburetor heat; Rudders; Undercarriage; Mixture; and Peek—as in, look at the gear position indicators and watch for obstacles.

Simulated engine-out water landings are made at the best glide speed of

70 mph IAS and result in a descent rate of 830 fpm with the wings level and flaps up. Adding flaps near the top of the white arc on the airspeed indicator (80 mph) creates a significant nose-up pitching moment that must be trimmed away using the rocker switch atop the stick, but the nose-up moment is far less when the flaps are lowered at a reduced speed. Control of the electric elevator trim can be shifted to the front- or rear-seat pilot via a switch on the electrical panel. (There is no manual trim.)

The back seat is a clever and feather-light sling that can be easily removed or shifted for easy access to the main baggage area, which has a 100-pound limit.

A separate rear baggage area holds up to 60 additional pounds and has an external access door.

The back seat is made of a mesh material that's cool and comfortable, but even wearing a four-point harness with inertial reel shoulder belts, the bar beneath the passenger's thighs wobbles in turbulence, and uncoordinated turns bounce the rider from side to side like a pinball. We take a leisurely aerial tour of the expansive lake before heading back to the seaplane base for a last splash.

**CONCLUSIONS.** The attributes that have made the Carbon Cub such a winner in the LSA marketplace also make it a superlative seaplane.

It's rugged, rowdy, extremely well-designed, beautifully crafted, and a pure joy to fly from water or land. Its incredibly smooth power gives it brilliant short-field capability, yet it's quite obedient and not particularly demanding from

a ground-handling standpoint. P-factor on takeoff is easily countered by an authoritative rudder, and the forgiving Cub airfoil (aided by vortex generators) makes inadvertent stalls unlikely.

The powerful engine and electronic ignition give Carbon Cub pilots tremendous operational flexibility. They can burn lots of fuel making impossibly short takeoffs and steep climbs, or they can sip fuel and cover long distances economically.

There's also something about the Carbon Cub's appearance that makes it less intimidating than other hardcore bush airplanes. Perhaps it's the Carbon Cub's shorter stature, or its flatter deck angle, or that anything based on a Cub is pleasantly familiar. Maybe it's the shape of the cowl that gives the Carbon Cub what appears to be a permanent smile.

Finally, the resentment other aircraft manufacturers feel toward the Carbon Cub's being licensed as an LSA is totally understandable. The Carbon Cub

competes directly with FAA-certified airplanes such as Aviat Aircraft's Husky and American Champion's Scout and Adventurer—models that must live with far more onerous and burdensome regulations, which increase costs and present obstacles to innovation.

But instead of blaming Cubcrafters for building an exciting, soul-stirring airplane that fits, however awkwardly, into existing LSA standards, perhaps we should focus on making those standards more inclusive. Looking ahead, there's an excellent chance that the FAA's ossified Part 23 certification standards will be revised in a way that levels the playing field and enables all aircraft manufacturers to put forward their own very best work.

Regardless of what happens on the regulatory front, however, count on Carbon Cub to lead the way to an adventurous future on land, water, and air. **AOPA**