



## PILOT REPORT

# Quest Kodiak

Brings solid feel and sure handling to utility role.

Text and photography by Nigel Moll

Quest Aircraft bills the Kodiak as the “next generation of STOL aircraft capable of bringing services and heavy supplies to the most remote regions on the planet,” and the Idaho-based manufacturer has built 222 since the sturdy turboprop single was certified in 2007.

“Third generation” would be accurate too, in that the Cessna Caravan dates to the early 1980s.

The first generation would be the Pilatus Porter (340 hp)/Turbo Porter (550 shp) and Helio Courier (295 to 400 hp). In the context of the Kodiak, the Helio seems particularly noteworthy because both it and the Kodiak were designed originally to serve missionary pilots flying on and off short, narrow strips carved out of some of the harshest terrain on the planet. Indeed, the Kodiak’s 45-foot

wing span (seven feet shorter than the Caravan's) was dictated by the 50-foot width of many strips carved out of jungle.

In the years since it was designed, the Kodiak has caught on with a market beyond the missionary mission but for the same reasons: short takeoff (less than 1,000 feet at max weight) and landing; an emphasis on safety not just by careful attention to aerodynamic and structural design but also in the choice of Garmin's onboard systems; versatility in a roomy cabin; and the efficiency and reliability of a single PT6 turboprop in the nose for copious power on widely available jet fuel and range of 1,000 nm with wheeled gear. For the GA market, Quest defines the Kodiak as the machine to satisfy the need for lift between a business jet—speedy but needy in the runway department—and a helicopter (land anywhere but complex and don't plan on carrying a ton of bulky stuff).

This summer Quest launched the Kodiak amphibian on a North American tour. Flown by company marketing director and lead demo pilot Mark Brown, accompanied by his fiancée, Flight-Safety second-in-command and contract corporate pilot Ashley Atkinson, the airplane dropped by my home on Skaneateles Lake in Central New York. For Quest the purpose of the stop here was two-fold: demonstrate the airplane to this magazine for a pilot report and also to my good friend and neighbor Tony, who likes the look of the Kodiak as a possible replacement for not only his IO-720-powered Helio 800 amphib (see sidebar on page 37) but also the “family Winnebago,” a PA-31-310 Navajo. The allure of one PT6 versus 20 cylinders is a powerful persuader.

During a stint in the cabin of the Kodiak while Tony was in the left seat, I could almost see cogs turning in his mind as he contemplated the possibilities



**The three-screen Garmin G1000 suite dominates the panel. The steep sides of narrow and deep Skaneateles Lake dominate the view through the windshield.**

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opened by the smooth whistling hum up front and the big screens delivering anything he could ever wish to know about the task at hand. The contrast with his mildly updated '60s- and '80s-vintage fleet was stark.

### FLYING THE KODIAK

Faced with scaling the big Aerocet carbon-fiber floats and their struts to board the Kodiak amphibian through the front left pilot door, I'm struck by the notion that this is a large flying machine to have swooped into little Skaneateles Aerodrome (6B9) and its two 3,000-foot runways—one grass, one blacktop. The pilot's eyeline when seated is not much shy of 10 feet up—about where it is in a 727.

The cockpit exudes quality: the high-contrast white-on-black design, the sturdy switches, the leather-wrapped control wheel and the hefty black lumps of milled aluminum through which the control shafts disappear into the panel, the absence of plastic pretty much everywhere except knobs and buttons. This is the pilot's everyday interface with the machine, and it conveys a solidity that is borne out when the airplane is in its element charging through chop on the water or in the air.

Before starting the PT6 you need to make sure both overhead fuel selectors are on. With just one engine, there's no provision for transferring fuel from one tank to the other. If the airplane is parked on a slope with both selectors on, fuel will migrate to the downhill wing, so you turn them both on before start as part of the preflight.

Beyond that, the process is simple and requires little more than keeping the usual sharp eye out for a temperature spike during the process: fuel pump on, igniters on, hold the starter down to low throughout the sequence. At 15-percent NG, introduce fuel, monitor ITT and NG and at 54-percent NG let the starter go, having reached a peak temp of typically 680 deg C in this airplane. The green arc extends a couple of hundred degrees C beyond that. "It's a really cool-starting engine," observed Brown. Igniters off, fuel pump to standby, aux bus on, generator

and alternator on, prop to max rpm, "and then I'll set 20 degrees of flap right after that because that's the setting for every takeoff," added Brown.

My first takeoff was from the hard runway at Skaneateles Aerodrome: advance the power to the top of the green on the screen, start to get the weight off the nosewheels at 55 knots, and it wants to start flying at between 60 and 65 knots. Once airborne, establish 10 degrees pitch and look for 85 knots for the climb over obstacles before bringing the flaps in to 10 degrees and the prop back to 2000 rpm from the 2200 rpm used on takeoff. "Power is the same at 2000 rpm and 2200 but there's less noise inside and out at 2000," said Brown.

"The nice thing about the Garmin setup is that as long as everything stays green we're within our allotted limit," he continued. "The yellow arc on the ITT and torque gauges is the 700- to 750-shp range, so it depends on the conditions of the day (density altitude) whether you'll torque out first or temp out first." The full 750 shp for takeoff can be used for five minutes and then you have to bring the power lever back into the green arc. If you stray beyond the yellow power arc on takeoff and climb you get an aural alert as well as a bright warning on the PFD that you have overpowered the engine.

Even with the headset lifted away from the ears momentarily, the noise level inside the Kodiak is low, thanks in part to inflatable door seals that are standard equipment and inflate automatically when the master switch is turned on. The quality in the cabin continues the standard set in the cockpit. Leather is standard for all seating packages. The aircraft flown for this report had the mid-range Timberline interior with four forward-facing passenger seats in the cabin, slip-resistant flooring under removable carpet, eight passenger headset jacks and PSU vents and reading lights. The Summit interior is the top offering, providing more comfortable and versatile seating with three-point harnesses in a club configuration with two fold-out tables, two cabinets with removable ice bins and Thermos provisions, carpet, overhead air and lighting and oxygen and charging ports at each seat and an optional sixth passenger

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seat; this is the choice for an airplane destined for business or family use. Tundra is more of a commuter style, offering no carpet but instead a floor protected by a layer of rubber compound, no ultrasuede sidewalls and fewer amenities, but it still has leather seats (four in the cabin), each removable in about 30 seconds and stowable for conversion between passenger and cargo ops. Both the Timberline and Tundra passenger seats have four-point safety harnesses.

My first water takeoff in the Kodiak was to the south at the south end of Skaneateles Lake, whose steep sides create something of a canyon in this area. The airplane felt solid with application of power and back pressure on the wheel, which got the water moving beneath the floats. Soon enough, some relaxation on the wheel put the airplane on the step and set us accelerating toward liftoff at 60 knots or so and climbing strongly with five people on board and a light fuel load. The amphibian's book takeoff performance on water at max weight shows a run of 1,000 feet taking 20 seconds.

A gentle right turn toward the densely treed western slope of the canyon positioned the airplane to make a climbing left turn at 80 knots across the narrow valley and toward the equally treed eastern slope as we headed north back to the Aerodrome. The Kodiak's "discontinuous leading edge" wing design came into play in this maneuvering. The outboard, tapered section of each wing has a fixed leading edge that protrudes forward and down in relation to the inboard leading edge, an arrangement that retains full aileron control at low speeds—even sub-stall in a corner where other airplanes could be inclined to spin. It makes for handling that inspires confidence at times when your instincts are buzzing because you know you're asking a lot of the wings at low speed.

The Kodiak is certified under the Part 23 standards that were in effect when Quest submitted its application in the early 2000s. Quest asserts that the Kodiak has "more than 1,000 safety enhancements that our competition does not have," citing the seats (dynamically sled-tested to 26 g rather than just

drop-tested to 9 g); flammability requirements for the entire airframe, firewall to cargo bay (not just in passenger areas); more stringent lightning-strike protections; and successful demonstration of post-takeoff engine failure at 50 feet.

The Kodiak also lays claim to being the first turboprop to have the full Garmin GFC 700 autopilot package with the level option. "We call it the level switch," said Brown, "and it's a standard safety feature. If you get disoriented at night or in IMC and you don't have the autopilot on, flipping the level switch brings you back to straight and level." The Garmin suite is a three-screen G1000 with two PFDs and one MFD. Each PFD runs off its own pitot-static and ADHRS, no different from a Part 25 airplane. Optional TKS anti-ice is certified for flight into known icing with wheeled landing gear but not with floats; the tank holds 16.3 gallons of fluid, good for about 2.5 hours at normal flow.

### VERSATILE VEHICLE

The Kodiak is game for many missions. Brazil's National Skydiving Center, 70 miles from São Paulo, uses the Kodiak to take 15 jumpers to 12,000 feet in 9.5 minutes. Botswana's Ministry of the Environment uses the airplane to monitor wildlife, conduct search-and-rescue, deliver equipment and deter poaching, loitering for up to 9.9 hours with three crew. In Japan, the Bella Vista Spa & Marina smoothed out the "last mile" by introducing Kodiak amphibian service to bring incoming guests from Hiroshima Airport. The amphib has a useful load of about 2,630 pounds. Flown by one pilot (175 pounds), the resort's amphib can carry three couples and their bags (1,350 pounds) to the resort in 15 minutes, eliminating a 90-minute bus ride. Book max cruise speed for the amphib is 162 ktas. Key numbers for the tricycle-gear wheeled airplane: 174 ktas cruise at 12,000 feet for a max range of 1,005 nm/5.8 hours at 45 gph/301 pph with the full 320 gal/2,144 pounds of fuel.

Missionary and humanitarian aid, the role the Kodiak's designers had in mind at the outset, continues to feature in the airplane's résumé. It served



with Samaritan's Purse and Mission Aviation Fellowship affiliate Alas de Socorro del Ecuador in the aftermath of the 7.8 earthquake in a remote coastal region of Ecuador last year.

Befitting an airplane with so many roles, the list of options is substantial. An external cargo compartment (ECC) mounted on the belly can carry 750 pounds and handle loading of 65 pounds per square foot at a cost of only one or two knots in cruise

## ROOTS

Tom Hamilton (designer of the Stoddard-Hamilton Glasair) was a co-founder of Quest Aircraft. He is also the founder and owner of float manufacturer Aerocet, based in Priest River, Idaho, not far west of Quest's hometown of Sandpoint. Hamilton designed the Kodiak knowing it would go on floats, and Quest says it's the only airplane currently made that you can put on floats without any structural upgrades. Remove the gear and bolt on the floats and it's ready to go, with no add-ons (such as the extra strakes seen on other floatplanes) or other mods needed. In 2015 Quest was acquired by Setouchi Holdings, a Japanese company in shipbuilding, transportation and related industries. —N.M.

speed. The ECC also allows repositioning the TKS alcohol tank from the cockpit to the nose of the belly pod. Fitting 29-inch tires takes the max landing weight to the 7,255-pound mtow. For operations on floats, the pitch latch propeller option allows the prop to remain in fine pitch when the engine is shut down. When the engine is started with the blades in fine pitch, forward thrust is available sooner—important when there's wind or current and obstructions close by. Optional 10-place oxygen replaces the standard 50-cu-ft two-place bottle with a 115-cu-ft composite bottle and ports for eight passengers. Air conditioning is optional. Standard on all Kodiaks, though, is the big cargo door (49 inches by 49 inches) on the left side of the aft fuselage providing outside access to the 248 cubic feet of cabin volume with all but the pilot's seat removed.

When you compare the Aerocet amphib Kodiak with the standard wheeled model, the versatility of the amphib floats comes at a price on all fronts: \$400,000 higher sticker because the Aerocet carbon-fiber floats are the world's primo pontoons, 400 pounds (two people) lighter than their metal equivalent; an operating weight empty 1,030 pounds higher; and a max cruise speed 21 ktas slower. But that's the cost of equipping the Kodiak to walk on water and land, an attribute that expands the utility of this impressive airplane and also, by huge measure, the fun it can provide. □



## FIRST GENERATION VS THIRD GENERATION: HELIO 800 VS KODIAK

Both of these STOL utility aircraft have missionary and disaster-relief roles in their roots, and they show how far the concept has evolved in the four decades that separate the start of H-295 Helio production in 1965 (it ended in 1974) to certification of the Kodiak in 2007. The 1984 Helio 800, S/N H-18, in the photo below is the last one built in Kansas when production resumed briefly in Kansas in 1982 for the last time.

In a nutshell: flying the Kodiak is simple and relatively effortless; the Helio is a workout, and putting it on floats serves to magnify some of the quirks. Note how close the ends of the floats are to the runway during rotation to the sharp angle of attack at which that wing can clamber aloft with slats extended like claws. Now imagine trying to give the wing that angle of attack on water with the floats extending far behind the axis of rotation and buoyantly resisting being pushed deeper into the water by backpressure on the wheel. It can be done, but it's awkward; patience is better if there's enough water.

As the floats begin to rise out of the water, easing the backpressure gets them up onto the step. If you hold the correct attitude to nail the floats' sweet spot, the acceleration builds nicely and takes the speed to the point that lift can prevail without awkward alpha, and a gentle nudge of backpressure breaks the floats free of the water. It takes more water and more time, but this technique is more elegant than yanking the airplane into the air at a forced alpha and then having to do a balancing act to stay airborne while building speed and reducing alpha.

The Kodiak seems to shrug off the water takeoff with less drama, not least because there's 750 shp on the prop and the slickest floats you can buy slicing through the swell. The Kodiak's handling is a lot less brawny and more refined.

Landing the Helio on water is a more relaxed affair when it's not in tight confines, and narrow Skaneateles Lake's 16-mile length makes for a low-stress runway. After checking that the gear is retracted into the floats, select 20 degrees of flap, bring back the power and set up a nice shallow rate of descent. As the water gets closer, raising the nose will lower the speed and cause the slats to pop out, calling for a not timid application of power as the drag rises. Holding that attitude and power almost to the water and then pulling back gently on the wheel and power makes for a smooth splashdown, followed by a sharp pull back on the wheel to the stops to make sure the floats' prows don't dig in. The technique is similar with the Kodiak, but without the abrupt extension of slats and need for power to compensate.

On wheeled landing gear, the Helio 800 excels, leaving the ground in 290 feet or less. The best technique is not to try to lift the tail and accelerate in a level attitude, as you would on most taildraggers, but to accelerate on all three wheels and let the airplane fly from that attitude when it's ready.

The cockpit and cabin of the 4,000-pound Helio are cramped compared with the much larger Kodiak's, and up front there's only one door (on the pilot's side), but one each side in the cabin. Each front-seater gets a door in the Kodiak, and there's also the big door on the left side of the cabin.

As with the takeoff using wheeled landing gear, the Helio prefers to be on all three wheels throughout the landing, and the far-forward main-gear attachment geometry lets you stomp on the brakes as hard as you like. The landing run for the 800 is published as 228 feet, but in expert hands at light weight in a good breeze it can be considerably less than that.

—N.M.

## Quest Kodiak 100 Amphibian Specifications and Performance

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|---|---|
| Price   | (base landplane) \$2,075,000  |
|   | (amphibian as flown for this report) \$2,625,150                        |
| Engines (1)   | Pratt & Whitney Canada PT6A-34, 750 shp takeoff, 700 shp max continuous |
| Avionics  | Garmin G1000  |
| Passengers  | 1 crew + 5-9 pax  |
| Max range (135 ktas, w/NBAA reserves, 100-nm alternate) | landplane 1,132 nm  |
|   | amphib 975 nm   |
| High-speed cruise                                       | landplane 183 ktas  |
|   | amphib 162 ktas   |
| Long-range cruise speed                                 | landplane 135 ktas  |
|   | amphib no figures   |
| Fuel capacity   | 320 gal/2,144 lbs   |
| Max payload w/full fuel                                 | landplane 1,391 lbs   |
|   | (amphib as flown for this report) 360 lbs                               |
| Ceiling (certified)                                     | 25,000 ft   |
| Max takeoff weight                                      | 7,255 lbs   |
| Empty weight  | landplane 3,770 lbs   |
|   | amphib as flown 4,800 lbs   |
| Takeoff run/roll at mtow (sea level, standard)          | landplane 934 ft  |
|   | amphib 975 ft   |
| Landing run/roll  | landplane 765 ft  |
|   | amphib 1,291 ft   |
| Length  | 34 ft   |
| Wingspan  | 45 ft   |
| Height  | landplane 14.7 ft   |
|   | amphib 17.3 ft  |
| Cabin   | Volume (excluding cockpit) 248 cu ft                                    |
|   | Width 4.5 ft  |
|   | Height 4.75 ft  |
|   | Length (instrument panel to rear bulkhead) 15.9 ft                      |
| Baggage capacity  | variable  |
| FAA certification (basis, date)                         | FAR Part 23, May 2007   |
| Number built (through August 2017)                      | 222   |

Source: Quest Aircraft