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How the Pros Handle Icing

A New Series by Gordon Baxter

The Easy Way to Air-File IFR

Blue-Ribbon Beech: the Duke

18081

A royal package of speed and comfort,
Beech's pressurized twin comes as close to
jet sophistication as most
pilot-owners' pocketbooks can reach.
by Richard L. Collins

Duke

Duke

THE DUKE appears to be a small airplane . . . except for the engines. They look sufficient for a much larger airframe. You don't get any flesh when you pinch a Duke, though. It is lean and firm. Take another look, and you'll see that the Duke is a very special airplane: It was developed for the owner-pilot market, to offer light-twin buyers a step-up airplane with the comfort and sophistication of a jet.

The Duke is also an airplane you must experience to know. It has been said that the Duke isn't competitive—a view that is easy to harbor until you know the airplane. If you just fly a Duke around the patch, you don't put the performance, the benefits of pressurization and the sophisticated systems together into the complete package that they are. For example, while the cabin was designed for the owner-flown market, it is not small; the Duke offers full six-place capability with baggage room and payload to match. More important, it holds its utility as you add to it the things that are necessary in an airplane in this class—air-conditioning, radar, de-icing equipment, autopilot and sophisticated avionics.

First impressions? The cabin area, which has a club seating arrangement, is much bigger than you might imagine. While it takes an agile pilot to squirm into the flight deck, it's comfortable once you are seated. The visibility through the comparatively small windows is good, too, when you realize that you can see everything you need to see. Takeoff runway requirements require some consideration if single-engine performance weighs heavily on your mind, but this is true of all twins. The controls are beautifully responsive, and the airplane is endowed with features that help keep the pilot in full charge at all times. The landing that follows an approach at the proper speed can be very satisfying. Finally, the sophistication apparent everywhere tells you a pilot needs more than a quick check-out and the keys before assuming command of a Duke. It is for pilots who take their flying seriously.

I showed up at the Duke pilot school at Beech early one Monday morning, for two days of ground school followed by a thorough flight check-out. The class included a pair of salesmen from a Beech dealership, the owner of a new Duke, his company pilot and his son (also a pilot). The group might well have been typical of Duke users: Over half the Dukes in use are flown by their owners. Some of them also employ a pilot, however, to get better utilization out of the airplane.

The ground school took us through the airplane's systems, limitations, and normal and emergency operating procedures. The exercise was technical in spots—but a pilot's knowledge of his airplane has no upper limit; the information was all useful. It was frank,

At first glance, the Duke appears to have been designed around a giant cone. The severely tapered fuselage is topped by a tail with the longest dorsal fin—proportionally—of any airplane around.

Duke

At altitude or on the ground, the Duke's air conditioner makes the cabin a comfortable and surprisingly spacious little world (below). The 380-hp Lycomings are big and authoritative (right), but they crave more attention in return for all that power.

ginning of the takeoff roll, seems a touch slow. The book shows a normal ground roll of over 2,000 feet on a paved and level runway under warm conditions—even at a slightly reduced weight—and an accelerate-stop distance of about 3,500 feet. Obstacle takeoff procedures give comparatively spectacular performance, of course—over a 50-foot obstacle in less than 2,000 feet on a hot day at gross weight—but the liftoff speed and speed over the obstacle are 12 knots *less* than minimum single-engine control speed. I can do without that.

A circle of the strip at Basin Harbor helped close the deal on a decision to land at Burlington and get a rental car. Summer rain had been plentiful in New England, and the runway looked like it could be soft. Had the airport been firm and had the pilot logged 100 hours in the airplane instead of 10, there would have been no question: We'd have kept the weight down, made a compromise with single-engine capability and used the 3,000-foot sod strip without a second thought.

The next day, on a 4,000-foot runway at Saranac Lake, New York, departure with four and nearly full fuel aboard was not impressive. The air was warm, the climb was over rising terrain, it was a bit gusty, and the airspeed wasn't up to the blue line until we were well out of the airport. In retrospect, though, my waiting for the blue line before breathing easy was a mistake. That's the best *rate*-of-climb speed. The best *angle* is what counts when dealing with rising ground, and it is 10 knots under best-rate speed.

We would be upping the Duke's load to three adults and three children with the addition of a passenger at Lock Haven, so I checked the weight closely. Our airplane had an allowable cabin load with full tanks of 858 pounds, taking advantage of an extra 44 pounds allowable ramp weight to provide for fuel burn-off during taxi. As close as I could figure it without weighing everything, we would be at gross weight for the takeoff.

The Lock Haven runway is 3,350 feet long, and the temperature was around 90 degrees. The chart suggested we'd be better than 50 feet high at the end of the runway on takeoff, with a speed of at least 93 knots indicated, but the accelerate-stop chart showed 3,700 feet would be required to go to what they call "decision speed" and stop. (Actually, the term "decision speed" is a misnomer; it is the terminology used in Part 25 airplanes for the speed below which you can stop and above which you can continue the takeoff and clear a 35-foot obstacle in the specified distance after an engine failure on takeoff. The Duke chart is a pure accelerate-stop chart, and has nothing to do with the distance required to go out in case of engine failure.)

The Duke's runway and engine-out limitations are hardly unusual. Its nose-to-nose competition Cessna's pressurized 414, has an accelerate-stop distance of about 3,550 feet under the conditions that existed during our Lock Haven takeoff—not much less than the Duke. Also, the 414 manual has a chart

showing the distance required to accelerate to a safe single-engine speed, lose an engine and then climb to 50 feet. The answer, under the conditions outlined, is 50 feet. The Duke manual has no such chart, and while its single-engine rate of climb is higher than the 414's (307 fpm versus 240), even the twin with the best single-engine climb, the Cessna Turbo 310 (408 fpm), requires 6,000 feet to clear a 50-foot obstacle under the warm conditions we experienced at Lock Haven. Most light twins have two engines because under some conditions, they need them. That's an important thing for twin pilots to remember so they won't someday make a situation worse by trying to make their airplane do the impossible.

No weather was in our Lock Haven-to-Dothan, Alabama, forecast, but it was summertime, and soon after leaving Lock Haven, the inevitable thunderstorms appeared on the horizon. Center was talking with other aircraft about them, and as we came closer, the weather began appearing on our RCA radar, which soon proved its worth by making this leg of the flight easy where it would have been difficult otherwise. A buyer who doesn't put a seeing eye in the nose of an airplane in this class is kidding himself.

The miles slid smoothly by in less than four hours at a rate of over 200 nautical per, and it was on this leg that the Duke let us

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Beechcraft A60 Duke

Basic price	$179,500
Basic IFR price (including de-ice, radar, TSOed radio, air-conditioner)	$236,034
Price as equipped	$261,709
Engine	Lycoming TIO-541-E1A4 380 hp, direct-drive, turbocharged
TBO	1,200 hrs
Propeller	3-blade, 74 inch, constant-speed,full-feathering
Length	33 ft. 5 in.
Height	12 ft. 4 in.
Wingspan	39 ft. 3 in.
Airfoil	NACA 23016.5 root, 23010.5 tip
Wing area	212.9 sq. ft.
Wing loading	31.8 lb./sq. ft.
Seats	6
Empty weight, as equipped	4,687 lbs.
Useful load, as equipped	2,132 lbs.
Payload with full fuel, as equipped	858 lbs.
Maximum ramp weight	6,819 lbs.
Maximum takeoff weight	6,775 lbs.
Power loading	8.91 lbs./hp
Fuel capacity	204 gals./1,224 lbs.
Baggage capacity	500 lbs.
Baggage area	32.5 cu. ft.

Performance

Minimum runway requirement	3,045 ft.
Rate of climb	1,601 fpm
Single-engine rate of climb	307 fpm
Service ceiling	30,800 ft.
Single-engine service ceiling	15,100 ft.
Maximum speed	286 mph/244 knots
Cruise (75% @ 26,000')	276 mph/239 knots
Econ cruise (55% @ 29,000')	246 mph/213 knots
Range @ max cruise (45-min reserve)	1,035 sm/900 nm
Range @ econ cruise (45-min reserve)	1,168 sm/1,015 nm
Duration @ max cruise (no reserve)	4.67 hrs.
Stall speed (clean)	98 mph/85 knots
Stall speed (gear and flaps down)	87 mph/76 knots

Flight characteristics

Handling qualities (cruise)	Excellent
Handling qualities (slow flight)	Excellent
Stall recovery	Excellent
Hands-off stability	Excellent
Runway and taxi handling	Excellent
Crosswind handling	Good

Pilot utility

Visibility	Good
Seat comfort	Excellent
Occupant-protection features	Shoulder harness not available
Panel layout	Good

Cabin comfort

Entry-exit ease	Excellent (except for flight deck)
Cabin room	Excellent
Ventilation (in flight)	Air-conditioned (optional)
Ventilation (on ground)	Air-conditioned (optional)
Cabin sound (@ 65% power)	Quiet and smooth

Quality

Interior finish	Excellent
Exterior finish	Excellent
Accessories and mechanisms	Excellent