What it lacks in sizzle, it makes up in an almost complete lack of bad habits.

BY SETH B. GOLBEY

IN the early days of light twins, the Big Three general aviation manufacturers each had its own contender and its own market niche. Beech fielded the immense Twin Bonanza, with three-abreast seating and the aura of "class" that has always been associated with the marque. Cessna offered the 310, whose calling card was sleek looks and the high performance that goes with that; it looked fast, and it was. Piper, airplane maker for the masses, sought simple sales volume. It took five years of research and development, but in February 1954, the Apache was certified. And it surprised Piper dealers by selling well—even at the astronomical-for-a-Piper price of $32,500. But after all, the Twin Bonanza started at $75,500 that year;

PHOTOGRAPHY BY MIKE FIZER

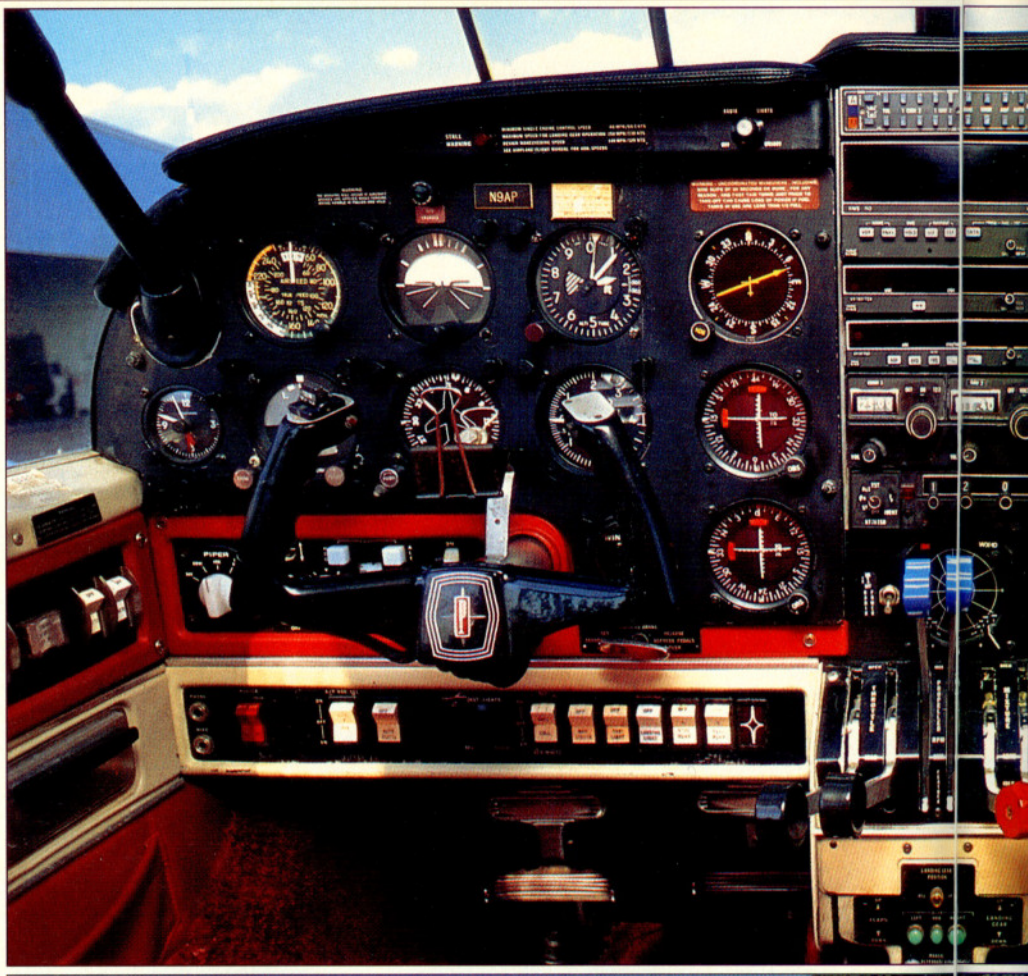
the 310, almost $50,000 when it was introduced a year later.

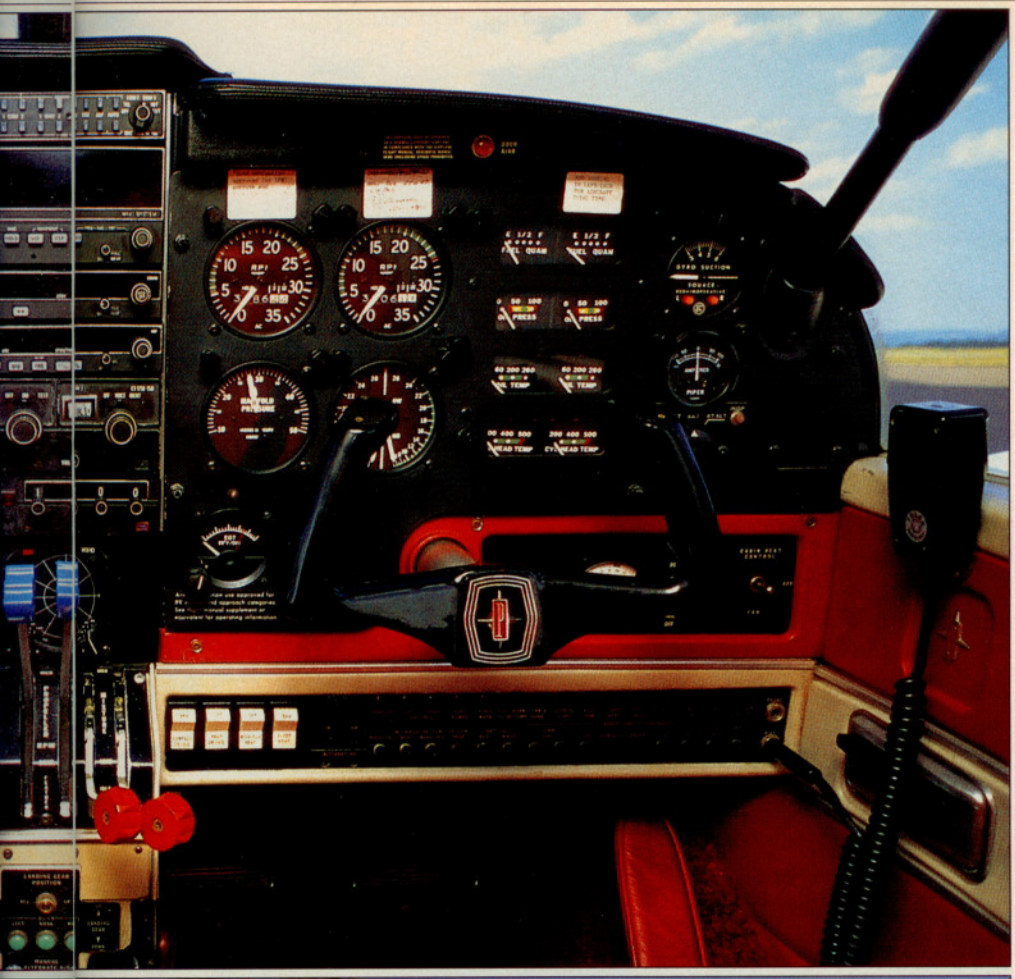
By the end of the decade, however, it was clear that the market wanted something bigger and faster out of Piper, and Piper wanted something that could compete in passenger and baggage space as well as performance, even though the Apache had gained a fifth seat in 1955. Thus was born the Aztec, with six-cylinder, 250-horsepower Lycoming O-540 engines replacing the Apache's four-jug, 160-hp O-320 mills (early models had 150-hp engines), and a stabilator, borrowed from the Comanche, in place of the Apache's horizontal stabilizer and elevator. Otherwise, the airframe changed little and therefore shared the same model designation—PA–23—but now with a -250 extension.

In fact, the original five-seat Aztec, introduced in 1960, looked much like the Apache except for a larger, swept vertical fin. The last Apache model, produced with 235-hp O-540 engines from 1962 to 1965, shared the same tail, so a close look is necessary to differentiate the two models. (The Aztec also cost considerably more than the Apache, so the Twin Comanche was introduced in 1963 to fill the low-cost twin niche.)

As the Aztec's sales literature made plain, the growing use of airplanes as business tools was not lost on Piper: "No other means of travel can provide transportation that's so quick, easy, and convenient for the majority of business trips. . . . All progressive cities and towns have airport facilities and more are being built. Such convenience of landing places and complete flexibility of scheduling means private air transportation is often the fastest way to go—and so much more restful. . . . Little wonder that modern industry considers the business airplane a wise, sound investment." The well-heeled private owner was not entirely ignored, either: "For pleasure travel, the Aztec is equally alluring."

The Aztec B, introduced in 1962, established the Aztec profile most pilots are familiar with, adding a sixth seat and a long, blunt nose housing a second baggage compartment. (Piper was to make much of the volume of the two compartments—over 40 cubic feet—but each was forever limited to 150 pounds.) The B was one of the first GA airplanes to feature a modular instrument panel, allowing instruments





and avionics to be removed and replaced much more easily than before. The B also had removable skin panels in the nose to ease access to the area behind the panel, the battery, "brake valves," and hydraulic fluid supply. The window on the left side of the second seat row was modified to serve as an emergency exit. The B was the first Aztec to be available with turbocharged engines, allowing a 75-percent-power cruise speed at 25,000 feet of 235 mph true (204 KTAS).

The C model, which came along in 1964 and would be produced in the greatest numbers, added fiberglass landing gear doors and borrowed the Twin Comanche's streamlined "Tiger Shark" engine nacelles. Fuel injection and dual alternators came standard on the C (they had been optional on the B). The suggested retail price of the airplane that year was $54,990, but avionics and operational packages (including propeller and wing deice and oxygen) added from $5,565 to $28,405, depending on the equipment selected. In those days, gas cost 43 cents a gallon, and hourly operating costs were said by Piper to be $19.34. A normally aspirated C had a top speed of 218 mph (189 knots) and cruised at 208 mph (181 kt). At the long-range power setting, endurance was nearly 8 hours and range was 1,300 statute miles (1,130 nm) with no reserves. In reality, at a "normal" cruise power setting (about 80-percent power), fuel would last about 4 hours and 830 miles with no reserves.

In the D, which entered production in 1969, Piper finally standardized (in a conventional T configuration) what had been a scatter-shot instrument panel. Power controls received differently shaped knobs for mixture, props, and throttles. Ram's horn control wheels improved the view of the panel. Ignition and starter switches migrated to the left side wall. The normally aspirated model gained a couple of knots of airspeed, and the turbo version sped up to 250 mph (217 KTAS) at 24,000 feet. The cabin was refined to add to the already luxurious accommodations, including removable armrests for the middle and front seat rows.

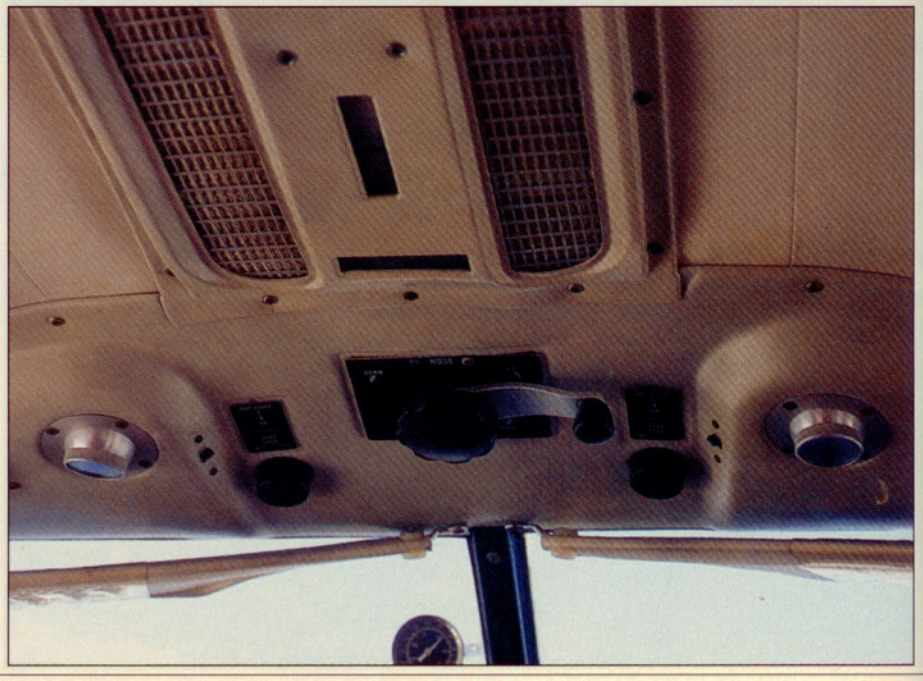
The load-carrying ability of the Aztec had always been one of its selling points, and it truly was prodigious: You could fill the tanks, seats (with 170-pound FAA-standard people), and

baggage compartments and still not reach the maximum certificated takeoff weight of 5,200 pounds in the normally aspirated (and minimally equipped) D (the earliest models had a 4,800-pound MTOW). The straight D had a useful load of 2,267 pounds; the turbo, 2,077 pounds.

The E model, introduced in 1971 at a base price of $69,990 (turbocharging added $10,125), had a stretched, pointy noise with a recessed landing light. The stretch cut useful load by a little over 100 pounds. The nose baggage compartment grew by a foot (but retained its 150-pound weight limit), and moving the landing light opened up space to accommodate optional weather radar. Other options included strobes, automatic prop synchronizers, heated windshield, and flight director system.

By this time, the Aztec's low V_{MC} of 80 mph (70 KIAS), superior short-field performance (820-foot takeoff roll, 1,250 feet to clear a 50-foot obstacle, 1,250 feet to clear the same obstacle coming back, and 850-foot landing roll), rate of climb (1,490 fpm fully loaded for the normally aspirated E; 1,530 fpm for the turbo), and 1,600-pound cargo payload had made it a favorite both at home and abroad in mail, cargo, and air ambulance applications, as well as air taxi and charter work, and Piper pursued these markets with vigor. By 1974, gas was still only 52 cents a gallon and operating costs ran about $25 an hour, according to Piper.

The last Aztec, the F, was built from 1976 through 1981 and sported squared-off wing tips and a rectangular stabilator. An automatic flaps-to-stabilator-trim interconnect was added to counteract the airplane's only bad habit—its characteristic pitch-up as flaps are deployed. Pilots didn't like the new stabilator, though, and Piper returned to the traditional one in 1980. If you found the four 36-gallon wing fuel tanks the Aztec had used to this point to be insufficient, the F could be had with 20-gallon tip tanks, which allowed a 1,300-nm range with 45-minute reserves (1,145 nm for the turbo). The F lost a little takeoff performance but offered a shorter accelerate/stop distance than its predecessors (1,985 feet). A full set of copilot instruments was an option. The four front seats got new backs like the ones on the Navajo; the fuel filler



ports and caps likewise came from the Navajo. (With the F, too, Piper finally began marking the airspeed indicator in knots and documenting performance accordingly.)

When it was introduced, the F had a standard price of $99,600, but by 1981, the price had ballooned to $165,960, and avionics packages could increase that by $34,000; the "turbo group" of options added another $39,580. Fuel was now $1.75 a gallon, and operating costs had risen to $80 an hour for the normally aspirated F and over $95 an hour for the turbo. A fully equipped Aztec could cost over a quarter of a million dollars: The turbo F featured in a December 1979 *Pilot* article carried a price tag of $247,988, not chicken feed then and equivalent to about $420,000 today (but still quite a bit less than a new Beech Baron).

Almost 5,000 Aztecs were built during the airplane's 21-year production run, and more than 2,500 remain registered with the FAA today. Many have headed overseas to satisfy foreigners' insatiable hunger for American airplanes. A well-equipped 1981 F model will run you about $94,500, with the turbo costing about $110,500. An average 1968 C model would go for around $38,500, with the turbo version running about $42,500, according to the *Aircraft Bluebook–Price Digest.*

The Aztec was incrementally refined over the years, but it never really changed much in any big way. Aside from the wildly disorganized instrument panels found on pre-D models, the systems in one are pretty much like the systems in another.

Flaps and landing gear are hydraulic, driven by a pump on the left engine. Though later models had one on the right engine as well, many older airplanes have been retrofitted with an auxiliary electrically powered hydraulic pump. Should both fail, manual gear (and flap) extension can be easily accomplished using a hand pump that telescopes from under the power quadrant; 30 to 40 strokes are required to raise or lower the gear (about a dozen for the flaps), but the leverage is excellent. Most models also were equipped with a CO_2-powered blow-down system, activated by pulling a ring under the pilot's seat in case of hydraulic system failure. The flaps and landing gear handles are reversed from today's standard, with the flap handle on the left and the gear

handle on the right.

The fuel system is straightforward. Inboard or outboard tanks are selected for either side. If the 20-gallon auxiliaries are fitted, these drain automatically into the outboards with no pilot intervention. (Some airplanes have been retrofitted with nacelle tanks, the contents of which generally have to be pumped into the wing tanks before the fuel can be used.) The console between the front seats housing fuel selectors, crossfeed control, and cowl flap levers is a model of ergonomic efficiency. Crossfeed is either on or off and is generally unnecessary unless a long distance must be flown on one engine; fuel can be pumped from any tank to either engine.

One thing to be wary of, particularly on older airplanes that don't fly much, is the rubber fuel tank bladders, which can dry out and crack if not kept full, allowing fuel to drain into the wing. An airworthiness directive was issued in 1988 requiring inspection of fuel caps and doors. Loose caps will allow water into the tanks, so it's important that they be carefully checked before flight. Another AD that would have required expensive alterations of fuel tanks was rescinded shortly after it was issued in late 1990. The FAA is currently studying whether any additional rulemaking is needed.

Climbing into an Aztec for the first time, you'll notice steel tubes extending from the corners of the windshield down to the instrument panel. The Aztec's skin is wrapped around a tubular steel cage, a throwback to the days when Piper planned to produce the Apache with a fabric fuselage. By the time the decision was made to go with metal, reengineering the fuselage was deemed too expensive.

The Aztec's docile handling characteristics make it an ideal multiengine trainer. If it seems to handle like a giant Cub, that's because it shares the earlier airplane's wing cross-section. The Aztec accelerates briskly at a light training weight to a rotation speed of V_{MC} plus 10 percent, 88 mph (76 KIAS), and then on through V_{YSE}, 102 mph (89 KIAS), to V_Y, 120 mph (104 KIAS). (These speeds are for a C model but are typical.) In high density altitude conditions, the recommended cruise climb speed of 135 mph (117 KIAS) results in a very leisurely climb rate. Visibility over the nose is not bad at 120, and the cowl flaps do a good job of keeping cylinder head temperatures in the green.

In cruise, the flight controls are typically heavy of a high-speed airplane in roll and yaw, a bit lighter in pitch. Steep turns can be accomplished without any straining or sweating—indeed, without retrimming. Power-off stalls are unremarkable; you'll feel the buffet through the control wheel well before reaching the 68 mph (59 KIAS) stall speed. Nose it over to accelerate through V_{MC} before adding power; this takes a moment in the draggy landing configuration. Departure stalls are similarly bland; lower the nose and let the airplane accelerate.

Under the hood, you will find the airplane stable and predictable, even with the critical engine feathered. One note here is that Aztecs with 120 pounds of fuel in each aux tip tank tend to dutch-roll a bit in turbulence, so standard practice is to burn off the outboards first.

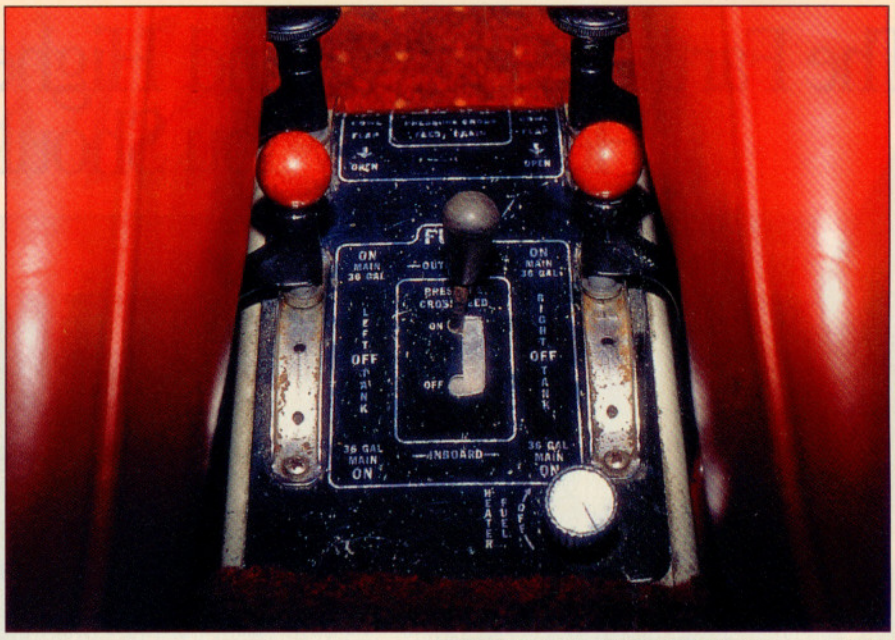
Engine failures are easily coped with. The yaw is overcome with moderate pedal pressure, and a swipe of the trim crank relieves that. The trim controls are overhead and consist of an outer crank for pitch and an inner crank for yaw. After a couple of flights, you become acclimated to the proper directions to turn them. This is important because, as noted above, the airplane exhibits a moderate pitch up with flap extension and pitch down with flap retraction. Most of the pitch change comes with the first quarter flaps, which is no big deal on pattern entry or downwind, where you'd normally first deploy them. The challenge

comes on the go-around, when the full-power/flaps-up drill requires considerable back pressure on the wheel until you get retrimmed. There is little if any trim change with gear extension or retraction.

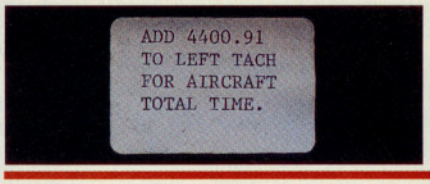
Quarter flaps can come down at 160 mph (139 KIAS), but there are no detents; there is a flap-position indicator on the panel, but it's more efficient to learn how long to hold the flap lever down or up to reach the desired setting. Gear can be extended at 150 mph (130 KIAS). The gear handle, in the shape of a tire, is clear plastic; if a throttle is retarded with the gear up, a red light in the handle starts flashing. If both throttles are brought back below about 12 inches of manifold pressure, the gear horn sounds. The gear handle is equipped with a mechanical latch to prevent inadvertent gear retraction on the ground (there's also a squat switch).

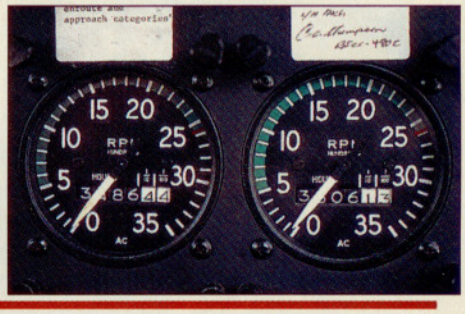
A smooth power reduction over the numbers, accompanied by a slight nose-up attitude, and the airplane touches down gently just as the throttles hit the stops, the arrival cushioned by big oleo struts. The gear is beefy enough to absorb clumsy landings or unimproved landing sites, and, if proper speed control is exercised, the airplane stays planted; when that wing stops flying, it stops flying. Nosewheel steering is heavy, as might be expected. Even at idle power settings, the airplane will build up speed in the taxi. Avoid riding the brakes. Instead, take a tip from the airliner cockpit: Let the airplane speed up on its own, then apply the brakes to slow to walking speed. Cycling the brakes in this way helps keep them cool.

The Aztec was never the fastest light twin, nor the one with the greatest payload, nor the most powerful. But in terms of cabin space, load-hauling ability, fuel economy, range, V_{MC}, short-field performance, durability, and accelerate/stop distance, it matched or beat its rivals handily. What it lacked in panache, it made up in good manners. Today, more than 30 years on, it continues to provide comfortable personal transportation and to labor honestly in the vineyards of commercial aviation. Perhaps more important, it offers many students their introduction to the challenges of multiengine flight, where, like any good instructor, the Aztec is a gentle and reliable friend. □



The Aztec E in the photos accompanying this story sees daily use in air taxi operations, where it continues to provide safe, comfortable, and efficient transportation.





1971 Piper Aztec E
Base price: $69,990
Current market value: $48,000

Specifications

Powerplants	Two Lycoming IO-540-C4B5, 250 hp ea @ 2,575 rpm
Recommended TBO	2,000 hr
Propellers	Hartzell constant-speed, full-feathering, two-blade, 77-in diameter
Length	31 ft 2 in
Height	10 ft 4 in
Wingspan	37 ft 2 in
Wing area	207.6 sq ft
Wing loading	25.05 lb/sq ft
Power loading	10.4 lb/hp
Seats	6
Cabin length	8 ft 6 in
Cabin width	3 ft 9 in
Cabin height	4 ft 2 in
Empty weight	3,042 lb
Gross weight	5,200 lb
Useful load	2,158 lb
Payload w/full fuel	1,318 lb
Max takeoff weight	5,200 lb
Max landing weight	4,940 lb
Max zero fuel weight	4,400 lb
Fuel capacity, std	144 gal (140 gal usable) 864 lb (840 lb usable)
Fuel capacity, w/opt tanks	184 gal (180 gal usable) 1,104 lb (1,080 lb usable)
Oil capacity, ea engine	12 qt
Baggage capacity	300 lb, 46.7 cu ft

Performance

Takeoff distance, ground roll	820 ft
Takeoff distance over 50-ft obstacle	1,250 ft
Accelerate-stop distance	2,220 ft
Max demonstrated crosswind component	12 kt
Rate of climb, sea level	1,490 fpm
Single-engine ROC, sea level	240 fpm
Max level speed	188 kt
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption, total)	
normal cruise	182 kt/3.4 hr
4,000 ft	(204 pph/34 gph)
intermediate cruise	181 kt/4.4 hr
6,000 ft	(162 pph/27 gph)
economy cruise	177 kt/4.9 hr
6,400 ft	(150 pph/25 gph)
long-range cruise	169 kt/5.9 hr
10,200 ft	(126 pph/21 gph)
Service ceiling	21,100 ft
Single-engine service ceiling	6,400 ft
Landing distance over 50-ft obstacle	1,250 ft
Landing distance, ground roll	850 ft

Limiting and Recommended Airspeeds

V_{MC} (min control w/critical engine inoperative	64 KIAS
V_X (best angle of climb)	89 KIAS
V_Y (best rate of climb)	104 KIAS
V_{XSE} (best single-engine angle of climb)	83 KIAS
V_{YSE} (best single-engine rate of climb)	89 KIAS
V_A (design maneuvering)	131 KIAS
V_{FE} (max flap extended)	108–141 KIAS
V_{LE} (max gear extended)	132 KIAS
V_{LO} (max gear operating)	132 KIAS
V_{NO} (max structural cruising)	175 KIAS
V_{NE} (never exceed)	221 KIAS
V_{S1} (stall, clean)	61 KIAS
V_{SO} (stall, in landing configuration)	55 KIAS

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted. □