The Piper Aztec is not the kind of airplane that most pilots dream about owning some day. It is neither fast nor very good looking. With a corpulent fuselage, Jimmy Durante nose, thick and graceless wings and rather anemic cruise performance, the Aztec has none of the aesthetic/magnetic appeal of a Beech Baron or a Cessna 310. The macho image—so important among purchasers of twins—just is not there.

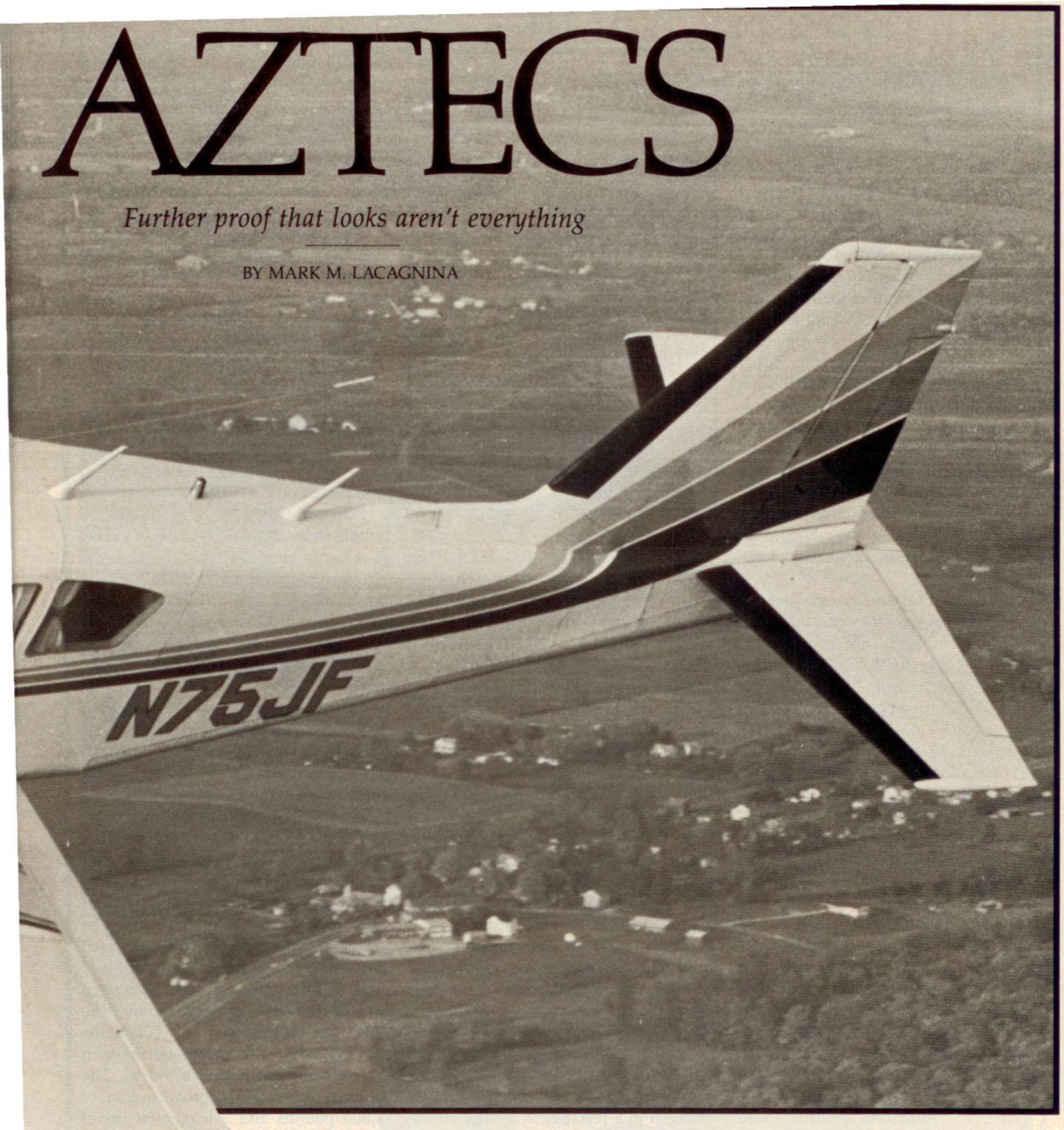
Although it cannot command the limelight, the Aztec is, in many respects, a fine performer. It is a rugged, forgiving, easy-to-fly and reliable workhorse that can haul a remarkable load of people, baggage and fuel. An Aztec can get in and out of fields too short for a Baron or a 310. These qualities have prompted a few devotees to characterize the Aztec as general aviation's version of the Douglas DC-3.

PHOTOGRAPHY BY ART DAVIS

AZTECS

Further proof that looks aren't everything

BY MARK M. LACAGNINA



The Aztec has won no beauty contests or races, but it did perform very well where it counted: in the marketplace. During the 1960s and early 1970s, the Aztec was general aviation's best-selling twin, proving itself very popular among commercial, corporate and private operators. Thousands of pilots have earned advanced licenses and ratings in Aztecs.

The airplane is acclaimed by flight instructors as an excellent multi-engine and instrument training platform. Pilots used to flying other twins will find the transition to an Aztec presents very few difficulties. The systems and operating procedures are simple and straightforward. On the ground, the Aztec can be maneuvered with little fancy footwork and throttle-jockeying. In the air, the Aztec behaves like a big Cherokee. It is a stable airplane, and the

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feel of the controls is quite pleasant.

The fat wings stall reluctantly. I was impressed that, during the buffet preceding an approach stall, the Aztec (an E model) was sinking at only 500 fpm. With a bit of forward yoke and power, the airplane was flying again.

The only problem I had in transitioning to the Aztec was getting used to the manual stabilator trim control. Standard equipment on several Piper models, the control is a rather stout-looking crank hanging from the Aztec's roof and appears to require energetic manipulation. However, this resulted in some rather dramatic pitch excursions, and I soon found a light touch is all that is needed.

Surprisingly, the pilot needs some thought and time to slow the chubby Aztec down to pattern and approach speeds. Maximum gear-extension speed is a low 130 knots. I found that with gear and flaps extended, power had to be pulled back between 12 and 15 inches during approach.

Unlike a 310 or an Aerostar, the airplane does not require constant attention, except for pitch trim. A good two-axis autopilot is a desirable item.

After a few hours in Aztecs, I found I could tell from the feel of the controls and the sounds of the engines what the airplane was doing and going to do. And that says a lot *for the airplane*.

The Aztec is a good short-field performer, requiring less than 2,000 feet to take off or land over a 50-foot obstacle.

Optimum cruise altitude is about 8,000 feet for the normally aspirated E model that I flew.

The airplane soldiered along at 178 knots while burning a little more than 27 gallons per hour at 75-percent power. At lower altitudes, the turbosupercharged models are only a few knots faster and burn about four more gallons of fuel per hour. At 20,000 feet and 65-percent power, a Turbo Aztec F cruises at about 183 knots and burns about 30 gph.

Vmc, the minimum control speed with the critical engine inoperative, is a relatively low 70 knots. Like most light-twin airplanes, the Aztec's climb performance on one engine is poor: 240 fpm for the normally aspirated models; and 225 fpm for the Turbo Aztecs at sea level and gross weight. Single-engine service ceilings for the aircraft are 5,000 and 18,700 feet, respectively.

The essence of an Aztec is, of course, its load-carrying ability. Maximum payload with full fuel is more than 1,400 pounds. Turbosupercharged models can haul up to 1,059 pounds of payload with tanks full. With auxiliary wing-tip fuel tanks, 240 pounds of payload are sacrificed for a little over an hour more endurance.

The PA-23-250 Aztec was introduced in 1959 as the "newest, largest, fastest airplane in Piper's fleet of business aircraft." A descendant of the Stinson Twin and Piper's PA-23-150 Apache, the Aztec has a fat, high-lift USA-35B airfoil, similar to the wing on the J-3 Cub. The Aztec's internal structure is sturdy. Tubes running up the sides of the windshield are evidence of a welded steel frame that extends from the nosewheel to the tailcone. The front and rear wing spars are attached to the frame, and the heavy, stepped-down main wing spars are bolted together below the cabin floor and serve as attachments for the front seats.

The empennage is a swept, single-piece horizontal stabilator (later changed to a rectangular design on the Aztec F), a swept vertical fin and a large, counterbalanced rudder. All flight control surfaces are activated by cables and pulleys.

The flaps and landing gear are actuated on most Aztecs by a hydraulic pump on the left engine. Failure of the left engine—the critical engine—during takeoff or initial climb is especially challenging, in that the landing gear must be retracted manually with a large handle below the power control console. Part of the before takeoff check for many pilots is to extend the handle and advise the right seat passenger to pump on command. According to the Aztec information manual, it takes between 30 and 40 strokes to pump the gear up (or down).

Should the hydraulic pump or the left engine fail during approach, about 12 strokes of the hand pump will lower the flaps. Most models have a carbon dioxide cylinder beneath the pilot's seat to blow the gear down should a rupture in the hydraulic system preclude use of either the engine-driven or hand pumps.

A hydraulic pump for the right engine was offered as an option for several models and was made standard equipment on the Aztec F.

Standard fuel capacity is 140 gallons within four 36-gallon wing bladders. The sump and fuel strainer drains are grouped together under a hatch on the lower, inboard side of each engine nacelle. The crossfeed drains are between the front seats, and they should be activated at the beginning of each preflight.

All Aztecs are powered by 250-hp, 540-cubic-inch Avco Lycoming engines and two-blade, full-feathering Hartzell propellers. Each engine drives its own vacuum pump and alternator.

With a short, bulbous nose, the original Aztec looks very much like an Apache. It is a five-seat airplane: two seats for the pilot and a front passenger; a bench seat for two more passengers; and a removable fifth seat in the baggage compartment. The carbureted Lycoming O-540-A15B engine initially had a recommended time between overhauls (TBO) of 1,200 hours. The TBO can be extended to 2,000 hours by replacing the three-eighths-inch valves with one-half-inch valves. The original Aztec has a gross weight of 4,800 pounds and a maximum useful load of 2,025 pounds.

The Aztec B was introduced in 1962 with a longer nose with a forward baggage compartment and a radio rack. The front and rear baggage compartments can hold up to 150 pounds each. The rear baggage compartment was moved back in order to make room for a second bench seat in the six-place Aztec B. In addition, the middle window on the left side of the cabin was

SPOTTER'S GUIDE

The original Aztec looks very much like an Apache, except for its larger, squared-off vertical tail. The last Apache—the 235-hp model—has the same tail, as well as a removable fifth seat in the baggage bay; so you'll have to get close enough to read insignia to tell an Aztec from an Apache 235. The original Aztec was produced in 1960 and 1961.

The Aztec B, built from 1962 through 1964, has six seats and a long, blunt nose that houses a forward baggage compartment.

Slim engine nacelles and landing-gear doors differentiate the Aztec C from earlier models. The Aztec C was produced from 1964 through 1968. The D model, built in 1969 and 1970, looks very much like its predecessor but has ram's horn control yokes and rocker switches in the panel.

The Aztec E has a long, pointed nose with a recessed landing light. This model was built from 1971 through 1975.

Rectangular wing tips and stabilator are only on the F model. Aztecs built from 1976 through 1980 also have external balance horns on their stabilators. The horns were eliminated in 1981, the last year of Aztec production.

modified to serve as an emergency exit.

Bendix fuel injection and AiResearch turbosuperchargers were added to the options list for the Aztec B. Originally, the turbocharging system had its own oil reservoir and manual on/off controls for the pilot. When the option was continued for the Aztec C in 1964, the turbocharging system was redesigned to use oil from the engine crankcase, and the manual controls were eliminated.

Also eliminated were the Aztec's carburetors and fat nacelles. The C model has fuel-injected Lycoming IO-540-C4B5 engines enclosed in what Piper called Tiger Shark nacelles, which are similar to the trim designs used on the Twin Comanche at the time.

The main wheels—which previously had protruded, uncovered, when retracted—are enclosed within hydraulically operated, fiberglass doors beneath the Aztec C's nacelles.

At a gross weight of 5,200 pounds, the Aztec C is 400 pounds heavier than earlier models, and useful load is about 240 pounds greater. The C model also is quieter than its precursors, due to extra soundproofing material within the cabin and double-pane windows.

The Aztec D was introduced in 1969 with Lycoming IO-540-J4A5 engines having a recommended TBO of 2,000 hours. Other changes were subtle. Ram's horn control yokes replaced rectangular wheels, and the toggle switches on the panel gave way to back-lighted plastic rocker switches.

The Aztec E appeared in 1970 with a 12-inch-longer nose for more baggage and/or weather radar. Although the volume of the forward compartment is greater, the 150-pound loading limit was retained. Minor changes included repositioning the flap indicator from the panel to the lower control console, on top of the flap selector, and replacing the small gear-position indicator lights with larger, turn-to-dim bulbs.

Piper also attempted to improve the Aztec's static longitudinal stability (previous models tend to wander above and below the desired and trimmed-for altitude) by increasing the downspring tension in the Aztec E's stabilator. This diminished the airplane's tendency to wander but increased the control pressure required for a landing flare, as well.

The F model was introduced in 1976 with a redesigned stabilator. It is rectangular with a constant chord and has external balance horns at the tips. Many Aztec pilots did not like the change: The F model just did not *feel* like an Aztec. Piper switched back to the previous stabilator design in 1980, after an airworthiness directive targeted cracks and attachment problems.

There was one change incorporated in the F model that did address a long-standing problem. Aztecs built before 1976 tend to pitch up excessively when flaps are lowered. The Aztec F has a connection between its flap and stabilator cables. When flaps are lowered, the interconnect neutralizes pitch control pressures.

The tips of the Aztec F's wings are rectangular, rather than semielliptical. Tip tanks holding a total of 40 gallons of fuel, all usable, were offered as an option. The option included external

sight gauges that indicate the amount of fuel contained within the interconnected tip and outboard main tanks.

In addition, the fuel filler caps, which had been recessed within small wing hatches in earlier models, were replaced with flush-mounted devices on the F model.

In 1980, dual hydraulic pumps became standard equipment, and the carbon dioxide emergency gear-extension system was eliminated.

Piper built more than 4,700 Aztecs before terminating production in 1981. (The most numerous model is the Aztec C, with about 1,435 built.) The Federal Aviation Administration has issued 26 airworthiness directives on the Aztec to date. Among the major directives are: 66-18-03, which required modification of the alternate air system to prevent induction system icing; 69-13-03, installation of stainless steel exhaust extensions to prevent carbon dioxide from entering the cabin; 70-22-05, modification of the electrical system; 72-11-01, replacement of cracked flap hinges to prevent a split flap condition; 74-13-03, replacement of corroded stabilator attachments; 77-01-05, insulation of strobe and navigation light wires to prevent arcing; 80-18-10, repair of jammed fuel tank selection systems; 80-26-04, modification of cabin step supports to preclude cracking; and 81-04-05, repair of cracked flap spar hinges.

Recent service difficulty reports from Aztec owners indicate other potential problems. The cabin boarding step, mentioned in AD 80-26-04, shares a mounting structure with a rudder cable pulley. Several service difficulty reports (SDRs) indicate that wear and tear on the aircraft's boarding step can cause stress on the pulley brackets, leading to fractures.

The Aztec, like many other aircraft, seems to be prone to vacuum pump failures. Included in a number of SDRs on such failures is one that noted the replacement of six vacuum pumps in one Aztec within 800 hours of flight time.

There are also numerous reports of fractured wheels and brake discs; cracked exhaust systems and engine mounts; broken alternator mounting brackets; and jammed and frayed stabilator trim cables.

Several Aztec owners reported split

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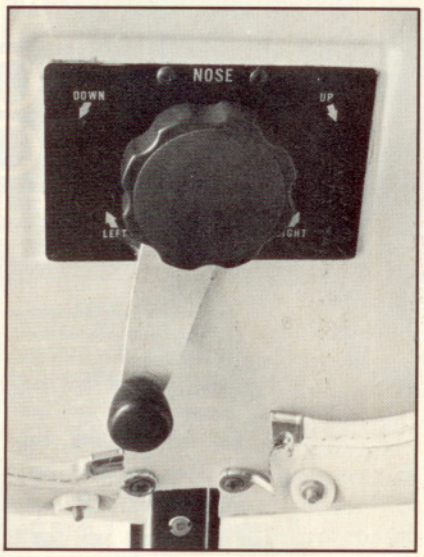
flap conditions due to broken torque shafts and bellcranks. The reports also include a variety of problems found in the fuel systems and the landing-gear mechanisms.

In addition, several reports cited landing-gear actuator handles that broke off during flight. The handle is subject to a lot of wear and tear. It protrudes from the control console and is easy to bump into when boarding. There also is a locking lever, almost invisible from the pilot's seat, that must be moved manually before the gear handle can be raised. Despite repeated instruction on the proper operation of the handle, one student pilot persisted in trying to ram the handle past the lever with brute force. Eventually, the handle responded to the abuse by coming off in the student's hand. Her instructor was successful in tripping the gear down with a plastic fuel sampler.

A number of modifications are available for Aztecs. J. W. Miller Aviation of Marble Falls, Texas, offers kits for nose extensions ($3,995 for the Aztec and Aztec B, $2,895 for other models), square wing tips ($1,360), nacelle auxiliary fuel tanks with a capacity of 45 gallons ($5,475), dorsal fin ($705), single-piece windshield ($605 or $725, tinted), and wheel-well doors also are available ($3,250).



Met-Co-Aire Aircraft Modifications of Fullerton, California, offers Hoerner-style, high-performance wing tips ($475 a pair) and 48-gallon tip tanks ($2,295).

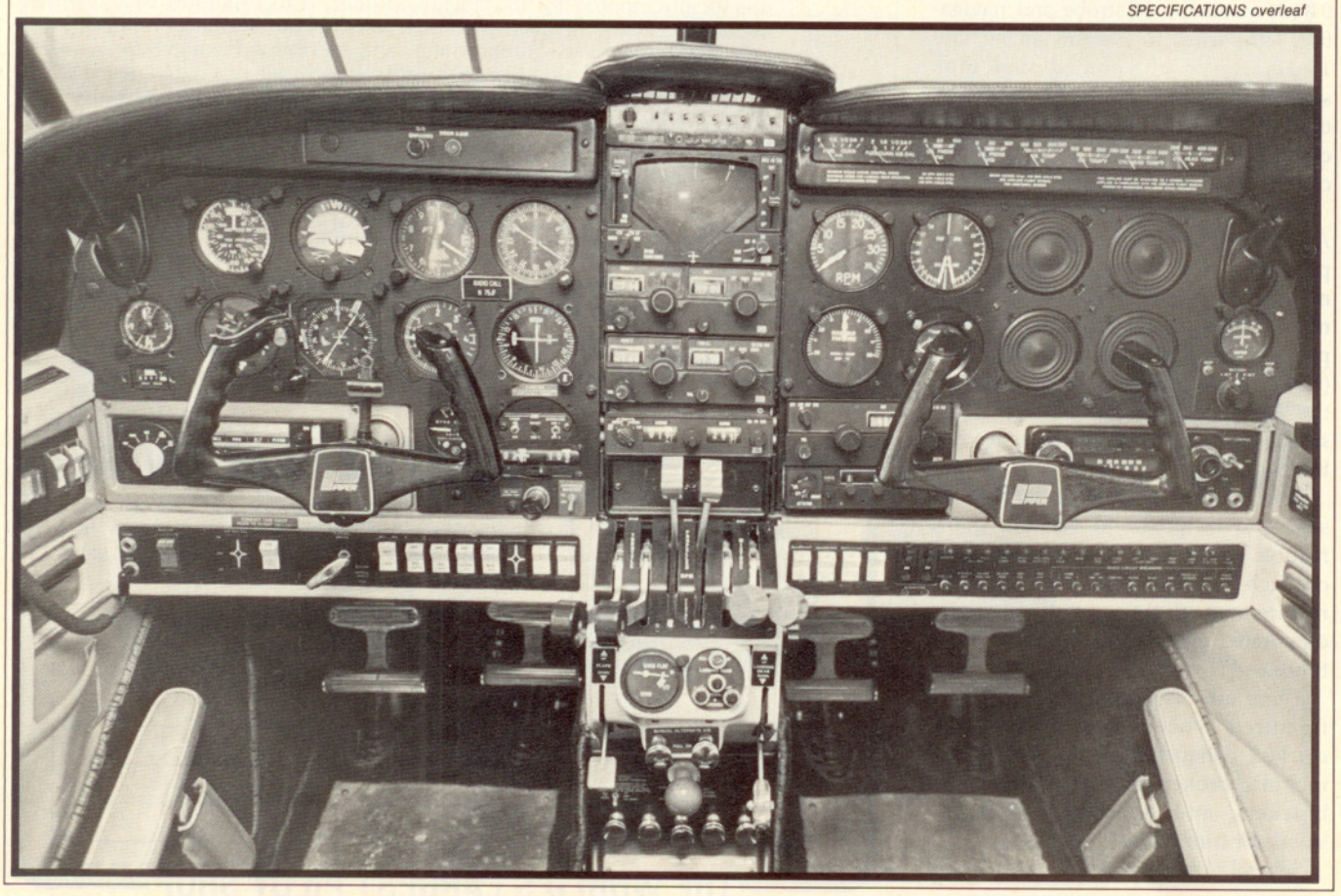
Robertson Aircraft Corporation of Everett, Washington, offers a Hi-Lift system for Aztecs. It includes Fowler flaps, drooped ailerons, inboard leading-edge cuffs, stall fences and a rudder anti-servo tab. The cost is $12,000. Robertson also will install a hydraulic pump on the right engine for $600.

Various autopilot and flight director systems are available from Astronautics in Torrance, California; Bendix in Fort Lauderdale, Florida; Century Flight Systems (formerly Edo Avionics) in Mineral Wells, Texas; and King Radio in Olathe, Kansas.

Prices for used Aztecs range from about $12,000 for a run-out early 1960s model to more than $100,000 for a well-equipped and well-maintained F model. Turbosupercharged models, which are about 10 knots faster above 12,000 feet and can be flown up to 24,000 feet, range from $22,000 to more than $140,000.

Overall, an Aztec is a solid, honest airplane that is worthy of consideration by anyone looking for a used twin, with load-carrying ability and friendly flying characteristics preferable to speed and a sleek exterior. □

SPECIFICATIONS overleaf



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AZTECS

Aztec C	Model	Turbo Aztec F
$54,990 (1964) to $57,990 (1968)	Base price, new	$115,600 (1976) to $192,120 (1981)
$22,000 to $40,000	Current market value	$72,000 to $140,000
	Specifications	
Avco Lycoming IO-540-C4B5 250 hp ea @ 2,575 rpm	Powerplants	Avco Lycoming TIO-540-C1A 250 hp ea @ 2,575 rpm
1,200 to 2,000 hr	Recommended TBO	1,800 hr
Hartzell, two-blade, constant-speed 77 in dia, full-feathering	Propellers	Hartzell, two-blade, constant-speed 77 in dia, full-feathering
30 ft 2.4 in	Length	31 ft 2.6 in
10 ft 3.6 in	Height	10 ft 1 in
37 ft 1.7 in	Wingspan	37 ft 3.8 in
207.56 sq ft	Wing area	207 sq ft
25.05 lb/sq ft	Wing loading	25.1 lb/sq ft
10.4 lb/hp	Power loading	10.4 lb/hp
6	Seats	6
5,200 lb	Gross weight	5,200 lb
2,933 lb	Std empty weight	3,319 lb
2,267 lb	Max useful load	1,881 lb
1,427 lb	Max payload	1,059 lb
5,200 lb	Max takeoff weight	5,200 lb
4,940 lb	Max landing weight	4,940 lb
864 lb (840 lb usable) 144 gal (140 gal usable)	Fuel capacity, std	864 lb (822 lb usable) 144 gal (137 gal usable)
—	Fuel capacity, opt	1,104 lb (1,062 lb usable) 184 gal (177 gal usable)
300 lb, 40.6 cu ft	Baggage capacity	300 lb, 40.6 cu ft
	Performance	
920 ft	Takeoff distance, ground roll	990 ft
1,600 ft	Takeoff distance, over 50-ft obst	1,980 ft
2,200 ft	Accelerate/stop distance	2,000 ft
1,490 fpm	Rate of climb, sea level	1,470 fpm
240 fpm	Single-engine ROC, sea level	225 fpm
178 KTAS, 27.4 gph, 5 hr/—	Cruise speed, fuel flow, endurance std/opt fuel @ 75% power, 8,000 ft	181 KTAS, 34.2 gph, 4 hr/5.2 hr
165 KTAS, 23.8 gph, 5.9 hr/—	Cruise speed, fuel flow, endurance std/opt fuel @ 65% power, 12,000 ft	175 KTAS, 30.4 gph, 4.5 hr/5.8 hr
—	Cruise speed, fuel flow, endurance std/opt fuel @ 65% power, 20,000 ft	183 KTAS, 30.4 gph 4.5 hr/5.8 hr
19,800 ft	Service ceiling	24,000 ft
5,000 ft	Single-engine service ceiling	18,700 ft
960 ft	Landing distance, ground roll	760 ft
1,780 ft	Landing distance, over 50-ft obst	1,585 ft
	Limiting and Recommended Airspeeds	
70 KIAS	Vmc (Min control w/critical engine inoperative)	64 KIAS
93 KIAS	Vx (Best angle of climb)	89 KIAS
104 KIAS	Vy (Best rate of climb)	103 KIAS
89 KIAS	Vyse (Best single-engine rate of climb)	88 KIAS
131 KIAS	Va (Design maneuvering)	131 KIAS
139 KIAS	Vfe (Max flap extended) initial	141 KIAS
109 KIAS	approach	108 KIAS
130 KIAS	Vle (Max gear extended)	132 KIAS
N/O	Vlo (Max gear operating)	132 KIAS
175 KIAS	Vno (Max structural cruising)	175 KIAS
221 KIAS	Vne (Never exceed)	221 KIAS
64 KIAS	Vs1 (Stall clean)	61 KIAS
59 KIAS	Vso (Stall in landing configuration)	55 KIAS

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, at sea level and gross weight, unless otherwise noted. N/O, not obtained; —, not applicable.