Pilot Flight Check:

Piper Seminole

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The latest contender throws its T-tail into the ring of light twins

■■ Piper Aircraft Corporation's Seminole, a T-tail twin-engine aircraft sporting counter-rotating propellers, 180-hp engines and semitapered wings, is making its way into the light twin market as the machines are rolled out the doors of the company's Vero Beach, Fla. assembly plant.

The PILOT recently flew the number four PA-44-180 that came off the assembly line, along with Dale Curry, a corporate pilot for Piper. Curry made it plain that the Seminole was designed for the businessman-pilot and for multi-engine training operations. Items such as deicing boots will not be forthcoming for this airplane, since the company has a wide variety of twins to meet the requirements that call for such equipment.

The IFR-equipped Seminole flown by the PILOT, N36538, tipped the scales at 2,533.9 pounds at its basic empty weight (including oil, operating fluids and unusable fuel). It rang the cash register at $105,238; that included a full complement of Collins Microline avionics with a Narco DME 195 added to the stack, as well as an Altimatic IIIC autopilot.

The Seminole has two 55-gallon bladder tanks for fuel, one located in the aft section of each engine nacelle. When the tanks were filled (one gallon unusable each side), 606 pounds were available for payload—three 170-pound persons and 96 pounds of baggage. That allotment was consumed prior to the PILOT flight check, when three persons, along with baggage, boarded the demonstration airplane putting the craft at its maximum gross weight of 3,800 pounds.

Preflight inspection revealed some distinctive items. The two fuel sump drains were located just aft of the right wing and slightly forward of the step that protruded from the lower section of the fuselage. Piper supplied a small glass container, equipped with a removable nozzle that was to be inserted into each drain for collecting a fuel sample in the bottle. Proper alignment of the nozzle was required to prevent fuel from dripping on the checker's hands. Compared to crawling under wings and reaching beneath greasy cowlings, this is a rather innovative feature.

A fold-down fiberglass nose cone, while not intended as a regular preflight item, was lowered by the removal of four screws. The nose was allowed to droop at the end of plastic-covered, steel cables mounted one on each side of the inner fuselage. It

Above—left, the two-bladed propellers are counter-rotating and increase the airplane's flight performance; the Lycoming engines boast a 2,000-hour TBO. Below, trim changes are minimized, as power and flap settings are varied, because the T-tail is above the propeller slipstream and wing wash. Photos by the author.

provided easy access to the 45,000-BTU Janitrol heater, the 12-volt battery, the nose-gear mechanism and the landing light. The nose compartment is not an additional place to store baggage.

Initial check of the left wing's leading edge raised eyebrows; it was not double vision, but two separate stall-warning units, mounted side by side. Although identical, they were set up for different flight configurations. According to Curry, during testing it was discovered that, with full flaps extended, stall warning efficiency was degraded. So, a microswitch disengages one unit when the flaps are fully deployed and engages the second unit, which is calibrated for that configuration.

The cabin door, located above the right wing, provided easy access to the cabin, including the rear seats. The cockpit was comfortable and showed signs of careful attention paid to the upholstering, including the velour seats.

Reaching back for the pilot's retractable shoulder harness, which was hooked above the window well to the rear of the left front seat, was nearly an impossible task. The high, but comfortable, headrest made it very difficult to reach the hook that held the harness in place when it was stowed. Front seat occupants will be well advised to unhook the belts before settling into their seats.

The instrument panel was remarkably uncluttered. Most controls and gauges were conveniently positioned but there were some exceptions.

The tachometers were located on the lower side of the panel to the right of the pilot's yoke column and left of the throttle quadrant. During flight they were partially obscured by the right handle of the yoke control; it was a bit disconcerting and required some repositioning in the seat to see them clearly. The manifold pressure gauge, a single instrument with two needle indicators, was located to the right of the throttle quadrant on the lower section of the panel. It was necessary to lean to the right in order to accurately interpret the instrument. The distance between those important engine gauges required considerable eye movement and made simultaneous monitoring inconvenient.

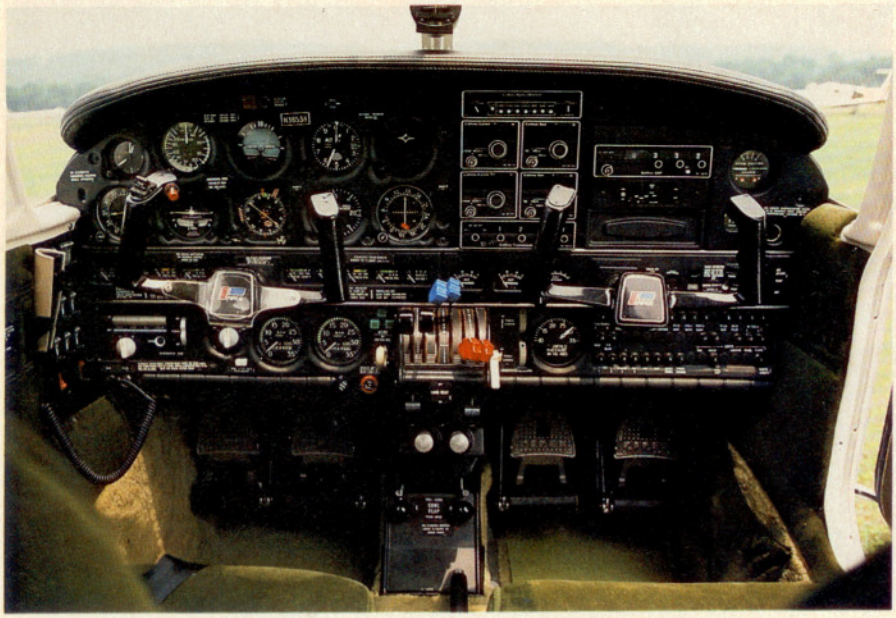
Considering that this airplane is aimed in part at the training market, it was surprising not to find a mike jack on the right side of the cabin. An instructor will have to pull a mike cord across the control column and keep a sharp eye out to prevent it from becoming tangled in the throttle console.

A feature pointed out by Curry—the static system drain, located to the left of the pilot's seat just above the cabin floor was operated by pressing two small buttons—allowing any trapped moisture to exit onto a person's fingers.

The fuel system controls were conveniently located on the floor between the front seats and, according to the rear-seat passenger, safe from accidental movement by his feet. There were two levers located side by side (one for each tank), which slid into three positions—forward was on, center was off and aft was crossfeed. The system was simple but the lack of a detent or lock on the levers, once they were positioned, was unsettling; they depended on friction to remain in place.

An array of rocker switches—electrical and ignition—was recessed in a plastic waterfall panel. Although the arrangement was located close to the pilot's left knee, the design precludes any inadvertent activation.

A fold-down fiberglass nose cone makes some of the Seminole's systems readily accessible.



An instrument panel that is standardized with Piper's single-engine Cherokees should aid in multi-engine transition.

Cowl flaps are located under the engine and barely affect airspeeds even when they are fully open.

Taxiing was effortless and visibility was very good from the pilot's seat. A two-speed fan forced air through the ventilation system; the cabin was comfortable even in the 29°C. (85°F.) temperatures during ground operations.

After an uncomplicated runup, the aircraft was rolled onto Runway 27—a 3,300-foot blacktop strip (elev. 555 feet) at Piper's Lock Haven facility—and a smooth application of power quickly accelerated the Seminole to 65 knots (75 mph) where rotation was initiated. Once a positive rate of climb was established, the hydraulic landing gear was retracted (in about 8 seconds) and the climb rate increased from 500 fpm to 1,100 fpm, while maintaining 88 knots (101 mph)—best rate of climb for single- or multi-engine operation—at 2,700 rpm and 25 inches manifold pressure.

Power was reduced to 2,500 rpm and 20 inches for flying the pattern, a combination that netted an indicated airspeed of 100 knots (115 mph). Once the gear was extended and the first notch of the manually operated flaps (10 degrees) was dropped, speed settled down to 90 knots (104 mph). The flaps were lowered by raising a handle that was located between the seats. They operated effortlessly.

We reduced manifold pressure to 15 inches and added the second notch of flaps (25 degrees) on base leg; the Seminole maintained a 400-fpm rate of descent at 90 knots (104 mph). On final approach, the third notch of flaps (40 degrees) was lowered and power reduced to 12 inches, bringing airspeed down to 80 knots (92 mph). The aircraft consumed less than 1,500 feet of runway on normal approaches with limited use of the brakes.

Short-field departures were impressive, even with a rolling takeoff. With two notches of flap and back pressure held on the yoke, the Seminole was rotated at 65 knots (75 mph). Once the gear was retracted, the craft quickly accelerated to 82 knots (94 mph)—best angle of climb for single- and multi-engine operations. The airplane was more than 200 feet above the ground as it reached the departure end of the runway.

Short-field landings were equally admirable. With the final approach at 70 knots (81 mph), full flaps and immediate use of the brakes, touchdown to stop consumed less than 600 feet. Although the brakes were a bit spongy, they were effective.

Especially evident during the series of landings and takeoffs were the small trim adjustments that were required to reduce control pressures.

Stalls were found to be straightforward, even when recovery was delayed and the airplane held in the stall regime. No heart-stopping moments were encountered while the elevator was held full aft, power back to 15 inches, gear down and full flaps extended. A noticeable buffet at 57 knots (66 mph) preceded the stall, a gentle pitchdown at 53 knots (61 mph). Holding back pressure, the ailerons required brisk movements with progressively more deflection as the Seminole wallowed in the stall, until roll was beyond the corrective reach of the controls. Generally, the aircraft tended to fall off on the right wing with a positive pitchdown. Recovery was surprisingly simple and effortless, compared to the energy spent playing with the ailerons.

Maintaining the dirty configuration, but adding full power, there was a slight buffet at 59 knots (68 mph) that was followed by a stall at 55 knots

(63 mph). When the elevator was held back, the wings began to oscillate but well within limits of the ailerons. However, the airplane developed a 2,000-fpm rate of descent. Once again recovery was uncomplicated and rapid—within 200 feet in this instance. (The flight manual advises that an excessive sink rate may occur after a power-on stall.)

Stalls in the Seminole were well defined but easily manageable. It should be a good airplane for pilots transitioning to multi-engine machines and it did not appear to hide any gremlins in the regime beyond immediate recovery.

Once established in level cruise at 3,500 feet, the cowl flaps were closed by pulling upward on two knobs located on the lower section of the throttle pedestal. There was a slightly noticeable bump as each of the rear facing ducts under the engine nacelles was closed. Indicated airspeed increased a total of two knots. However, the last inch or so of travel required to move each knob into a slight detent demanded an excessive amount of muscle.

Power for the right engine was adjusted for zero thrust and the left engine was set for full power during a demonstration of minimum control speed (VMC). Full opposite rudder was necessary to keep the ball in the center, without using rudder trim. As the aircraft was slowed, the heading began to slip away at an indicated airspeed of 60 knots (69 mph).

After the right engine was feathered, the Seminole handled well even during 25-degree banks. It was able to climb slightly from 3,500 feet until it settled down at 3,800 feet. Period. Performance specifications called for a single-engine service ceiling of 3,200 feet and an absolute ceiling of 4,500 feet. The Seminole met those specifications considering that the density altitude was slightly below 5,000 feet and the airplane was operating near its maximum gross weight. Reestablishing a normal cruise with both engines was routine.

Piper Seminole PA-44-180

Basic price $73,900

Specifications

Engines	2 Lycoming O-360-E1AD 180 hp @ 2,700 rpm
Propellers	2 Hartzell constant-speed 76-in dia
Wing span	38 ft 7 in
Length	27 ft 7 in
Height	8 ft 6 in
Wing area	180 sq ft
Wing loading	21 lb/sq ft
Passengers and crew	4
Cabin length	8 ft 1 in
Cabin width	3 ft 6 in
Cabin height	4 ft 1 in
Empty weight	2,406 lb
Useful load	1,394 lb
Payload with full fuel	746 lb
Gross weight	3,800 lb
Power loading	10.55 lb/hp
Fuel capacity (standard)	110 gal (108 usable)
Oil capacity	8 qt
Baggage capacity	200 lb (24 cu ft)

Performance

Takeoff distance (ground roll)	1,185 ft
Takeoff over 50 ft	1,550 ft
Rate of climb	1,220 fpm
Single-engine rate of climb	217 fpm
Maximum level speed	192 mph (167 kt)
Normal cruise speed (75% power, 7,000 ft)	189 mph (164 kt)
Range at normal cruise (with 45-min reserve)	819 sm (712 nm)
Service ceiling	16,000 ft
Single-engine service ceiling	3,200 ft
Stall speed (clean)	72 mph (63 kt)
Stall speed (gear and flaps down)	68 mph (59 kt)
Landing distance (ground roll)	830 ft
Landing over 50 ft	1,700 ft

Engine noise did not interfere with cockpit conversation between the front seat occupants. It did demand attention and slightly raised voices. The rear-seat passenger, however, complained that he could not hear conversation unless it was directed specifically to him, a situation aggravated by the overhead ventilation system.

The ventilation system, fed by ram air entering a screen-covered opening on the leading edge of the empennage, was activated by a push/pull knob located overhead between the front and rear seats. When activated, there was a definite and continuous "whoosh" from the vents directly over the rear seats. It was clearly audible from the front seats. The vents directed toward the forward cabin occupants produced no interference. Aside from the noisy rear vents, the system did an excellent job of providing a comfortable flow of air, which was easily directed with the adjustable vents.

Cruise speeds were determined at 3,500 feet, an altitude dictated by marginal weather. With an outside air temperature of 19° C. (66° F.), the Seminole indicated 150 knots (173 mph) at 2,400 rpm and 25 inches for a true airspeed of 161 knots (185 mph) at 75% power; maintaining 2,400 rpm, but reducing manifold pressure to 22.5 inches, netted an IAS of 138 knots (159 mph) for a TAS of 148 knots (170 mph) at 65% power; and dropping manifold pressure back to 20.5 inches brought the airspeed down to 128 knots (147 mph) that computed to 138 knots (159 mph) true at 55% power.

Piper specifications indicate that a 75% power cruise should result in a fuel consumption of 21 gallons an hour with a range of 712 nautical miles (818 statute miles) including 45-minute fuel reserve, as well as allowance for taxi and climb. A 55% power setting calls for a fuel consumption of 15.6 gallons an hour and a range of 834 nautical miles (959 statute miles) with reserve.

Frankly, when all was said and done, Piper's Seminole proved to be no more complicated to become familiar with than most sophisticated single-engine craft. Its performance was respectable during ground handling, as well as flight operations. The simplicity of the airplane was refreshing and most pilots will probably agree that it meets the mission that Piper intended to fill. □