SENECA III

In this case, product improvement got more than lip service

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PHOTOGRAPHY BY ART DAVIS

If you want to assess the appeal of almost any aircraft, there are three distinct audiences whose reactions should be considered: pilots, passengers and accountants. There are quite a few aircraft that appeal to one group, but not to the others.

In my experience, the first Piper Seneca appealed to passengers more than it did to most pilots. The number crunchers were somewhere in the middle. And, though the Seneca II garnered more enthusiasm from the latter two groups, passengers still held the edge because of the airplane's interior refinements, such as club seating and better quality upholstery, as well as reduced noise level. (See "Seneca II," January 1980 *Pilot* p. 38.)

In revenue-producing operations, the Seneca has been a sometimes trying combination of relative economy (in terms of initial and operating costs); customer acceptance; operational simplicity and operating limitations; relatively high pilot work load; and maintenance concerns.

The Seneca III, introduced in Piper's 1981 model year, responds almost entirely to the concerns and squawks of pilots and accountants. At a time when very little is being done to develop products at the low end of the line, it is interesting to note that Piper lists 28 product changes, all of which address operating and maintenance concerns and almost all of which are substantive changes. The company did not even move the cigarette lighter or add an extra smidgen of simulated wood-grain plastic. However Piper did change the aircraft's paint stripe.

Some of the changes are obvious to people familiar with the Seneca, others are more subtle, and yet others are invisible. Some add to operational flexibility, while others reduce pilot work load. The two most readily apparent improvements are the one-piece windshield and the completely redesigned, metal instrument panel.

Some of the invisible changes are the most significant, particularly for the accountant. The zero fuel weight has increased 470 pounds, which improves the Seneca's utility substantially and gives the pilot/operator considerably more flexibility when determining payload and range. Empty weight has increased 16 pounds; maximum takeoff weight has increased 180 pounds; and maximum landing weight is 171 pounds higher than the Seneca II. The power rating has been increased to 220 hp for takeoff at 2,700 rpm and 40 inches of manifold pressure. There is a five minute limit on takeoff power; maximum continuous power is 200 hp at 2,600 rpm and 40 inches mp.

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Already a hit with passengers, the Seneca now aims to please pilots and accountants as well.

The increased operating weights are the primary performance improvements, but the combination of higher power plus the structural changes required to accommodate the one-piece windshield and the higher weights has resulted in slight improvements in all-around performance.

From the pilot's point of view, all the significant changes have been made in the cockpit. What he sees and what he works with are, as one pilot with experience in a variety of Senecas said, "the way it always should have been." Gone is the textured, vacuum-formed plastic, replaced by a panel of plain old, durable, black metal. Along with that change is a total reorganization of switches and gauges.

The main switch panel has been moved from the left side wall to the lower left of the main panel. The outside air temperature (OAT) gauge, which previously required a flashlight to read at night, has been moved to a new niche on the left side wall and is now lighted. The engine instruments have been grouped vertically to the right of the primary flight instruments instead of being strung along the bottom of the panel, left engine instruments to the left of the yoke; right, to the right. The yokes have been centered in front of the pilot and copilot seats, rather than being offset to the left and right. Power settings are much easier to establish and fine tune and require a great deal less head-in-the-cockpit time. Monitoring engine condition is much easier, as well.

Instrument-panel lighting has been improved dramatically; intensity is better balanced, with fewer annoying bright spots than in earlier Senecas. The improved glareshield reduces the amount of reflection in the windows during night flight.

This may seem to be a lot of talk about secondary concerns, but the Seneca was priced out of the family of personal aircraft for all but a rich few a long time ago. Now it must produce, which means night and IFR flying regularly. Anything that adds to pilot work load is more than a shortcoming or an annoyance; it can affect both utility and safety. Seemingly insignificant things during day VFR flights can become big problems when something goes wrong during rotten conditions.

A parallel set of considerations is serviceability and maintainability. An aircraft can have the greatest imaginable capabilities on paper but prove to have so many service problems that it just cannot do what it was purchased to do with sufficient dependability or at a reasonable cost.

When the Seneca was introduced in 1971, Piper ballyhooed the maintainability of its newest twin. The airplane was designed for comparatively easy access to important components, but a lot of them failed or wore out before they should have. Component access is still quite good, particularly to the engine and related accessories and to most of the avionics (although there are still too many screws and panels to be removed in order to get at the avionics components submerged in the nose of the aircraft).

Some of the changes to the Seneca should improve service life and maintenance, such as the change from a pressure to a vacuum system for the pneumatics, strengthened landing gear for higher landing weights, flush riveting the wing-walk area to improve adhesion of the no-slip surface and various other detail changes. Time, use and abuse will tell.

Two service problems exist that have not been addressed fully as yet. The first is shared by practically all turbocharged powerplants that are operated regularly at high altitude: a breakdown in the integrity of the ignition system. Quite a few operators and maintenance

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Gone are the windshield post and the plastic panel. The new metal panel has an improved arrangement of instruments and good lighting.

facilities think the problem (which shows up as an ignition miss or bump at altitude, particularly during high-power operation) could be resolved by installing pressurized magnetos; others think the entire ignition system must be redesigned to higher specifications because different components have been at fault at various times.

Right now the situation is covered by a service letter for Teledyne Continental's TSIO-360 series engines, which also are used in such aircraft as the Mooney 231 and the Piper Turbo Arrow. The ignition system requires considerably more frequent servicing than aircraft regularly flown above 12,000 feet and more frequent maintenance, which results in higher costs.

The other service problem was a surprise to me. While preflighting a Seneca II that I had not flown before, I noticed that the protective rubber coatings on the propeller deicing boots were split on all but one of the blades.

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It looked as though someone had left the system on while on the ground and had melted the boots. The operator, who keeps three Senecas running in charter operations, said that it was a continuing problem in normal operations affecting Senecas with three-bladed propellers. Unfortunately, I was unable to determine the extent of the problem by press time. (If other Seneca operators are encountering the same problem or other service difficulties that are not making the Federal Aviation Administration's reports, AOPA would appreciate hearing from them.)

One other area of the Seneca merits careful attention, particularly on aircraft equipped with full avionics and the deicing package: electrical loads. The 65-amp alternators are pushed to the limit with all systems on. A marginal battery or power surge could overload the system, an indication that larger capacity alternators should be one of the next improvements.

The tough part of the changes and improvements really hits at check-writing time. The base price of the Seneca II in 1980 was $112,230. The Seneca III started at $138,250 and will be increased to $156,220 in 1982. The average-equipped price for a nearly all-weather Seneca will come close to a quarter of a million dollars next year. A minimally equipped one easily will exceed $200,000.

Of course, we at *Pilot* are in the habit of hedging a lot of remarks with a lot of qualifiers. You always must measure something against something else. With the Seneca, it is now very much a case of "compared to what." Cessna's Turbo Skymaster is gone. So is its 310. So too, most likely, is the Aztec. The equipped prices of turbocharged Aztecs and 310s soared past $250,000 more than a year ago. Even a normally aspirated Baron 58 lists at $300,000 or more, and Cessna's latest, the Model 303, starts at $230,000. So compared to what, the Seneca III is a pretty competitive airplane.

A friend of mine was complaining about the $50,000 price tag of the original Seneca a decade ago, when a Cessna 150 did not cost $25,000, bare bones. Perhaps a more meaningful measure of the competitiveness of the Seneca would be to compare sales of it and other twins during the past two years, a period of renewed disaster for general aviation manufacturers. Seneca sales fell from 534 in 1979 to 361 in 1980 and 253 through August of 1981. But in the same period, the Seneca outsold all other light twins by a margin of at least three to one. So in the marketplace of users, the Seneca has established its value.

Oh yes, I nearly forgot. Several of us still fly these things, even for all the overwhelming pressures from operational capability compared to cost, and from the options selection exercise and from negotiations with the bank. For the pilot, it flies just like any other Seneca, aside from the reduced hunting and pecking in the cockpit thanks to the much improved panel. Visibility out the front is improved because the center post has been removed, which helps during operations in high-traffic areas and during approaches; there is less structure for traffic and the runway to hide behind.

It gets off and back onto the ground in short, unruffled order. Procedures are quite straightforward for a sophisticated twin. On long trips, it is just as comfortable for the pilot as it is for the passengers, particularly if there is a good autopilot installed to remove the annoyance of constant attention to

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pitch changes and divergence. The old lateral instability, especially at low airspeed, is still there. This becomes most apparent when a transitioning pilot is at the controls. In fact, it can be quite unsettling until a pilot becomes familiar with the characteristic.

The gear and flap speeds are still too low for comfortably mixing it up with jets. But you can sail down an ILS at 160 knots with lots of room to slow down, get the gear out and land with ease, or slow approach speeds to a comfortable rate to mix with light trainers or short fields. That is, you can if you are proficient in the airplane and have practiced the sequence of actions. The engines must be treated with care, and throttle jockeying is out.

The Seneca has flexibility now more than ever. The III makes life more pleasant for the pilot and just may make it better for the accountant, too. And the passengers still love it. □

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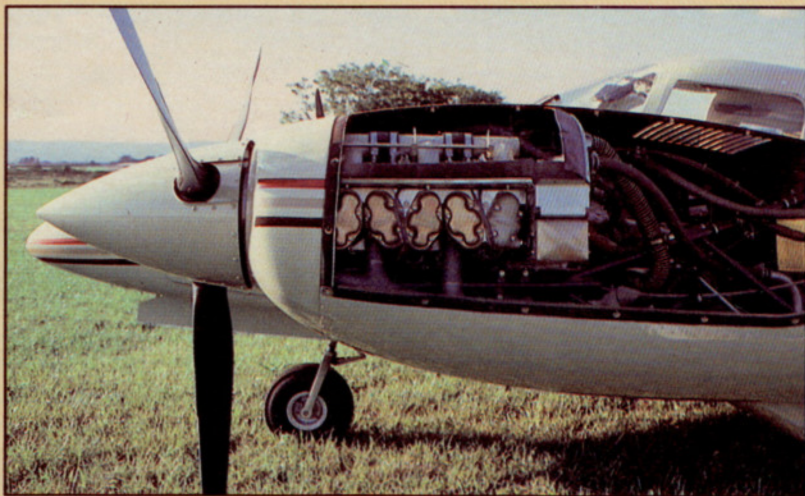
PIPER PA-34-220T SENECA III
Base price: 1981 $138,250
1982 $156,220
Price as tested $209,090 (1981 est)
Current market value $185,000
AOPA Pilot Operations/Equipment Category: IFR*

Specifications

Powerplants	Teledyne Continental TSIO-360-KB and LTSIO-360-KB
Max takeoff (5 min limit)	220 hp @2,700 rpm, 40 in mp
Max continuous	200 hp @2,600 rpm, 40 in mp
Recommended TBO	1,800 hr
Propellers	Hartzell 2 blade, constant speed, full feathering, 76 in (opt: 3 blade)
Wingspan	38 ft 10.8 in
Length	28 ft 7.2 in
Height	9 ft 10.8 in
Wing area	208.7 sq ft
Wing loading	22.8 lb/sq ft
Power loading	10.8 lb/hp
Seats	6
Cabin length	10 ft 5 in
Cabin width	4 ft 1 in
Cabin height	4 ft 1 in
Empty weight	2,857 lb
Empty weight (as tested)	3,224 lb
Useful load	1,916 lb
Useful load (as tested)	1,549 lb
Payload w/full fuel (std tanks)	1,358 lb
Payload w/full fuel (as tested)	811 lb
Max ramp weight	4,773 lb
Max takeoff weight	4,750 lb
Max landing weight	4,513 lb
Zero fuel weight	4,470 lb
Fuel capacity, std	588 lb/98 gal (558/93 usable)
Fuel capacity w/opt tanks	768 lb/128 gal (738/123 usable)
Oil capacity ea engine	8 qt
Baggage capacity	
forward	100 lb/15.3 cu ft
aft	100 lb/17.3 cu ft

Performance

Takeoff distance (ground roll)	920 ft
Takeoff over 50-ft obst	1,210 ft
Accelerate/stop distance w/heavy-duty tires and brakes	2,088 ft
Max demonstrated crosswind component	15 kt
Rate of climb, sea level	1,400 fpm
Single-engine ROC, sea level	240 fpm
Max level speed, sea level	170 kt
Max level speed, 14,000 ft	196 kt
Cruise speed, 75% power	
10,000 ft	179 kt
17,000 ft	193 kt
Fuel consumption, ea engine	174 pph/ 29 gph
Cruise speed, 65% power	
10,000 ft	175 kt
17,000 ft	187 kt
Fuel consumption, ea engine	139.8 pph/ 23.3 gph
Cruise speed, 55% power	
10,000 ft	159 kt
17,000 ft	174 kt
Fuel consumption, ea engine	112.2 pph/ 18.7 gph
Range @ 75% cruise w/45-min rsv, opt fuel, best economy	
10,000 ft	640 nm
17,000 ft	665 nm
Range @ 65% cruise w/45-min rsv, opt fuel, best economy	
10,000 ft	760 nm
17,000 ft	780 nm
Range @ 55% cruise w/45-min rsv, opt fuel, best economy	
10,000 ft	860 nm
17,000 ft	895 nm
Max operating altitude	25,000 ft
Single-engine service ceiling	12,300 ft
Landing over 50-ft obst	2,160 ft
w/heavy-duty tires and brakes	1,978 ft
Landing distance (ground roll)	1,400 ft
w/heavy-duty tires and brakes	1,218 ft



Limiting and Recommended Airspeeds

Vmca (Minimum control w/one engine inoperative)	66 KIAS
Vsse (Minimum intentional one-engine inoperative)	85 KIAS
Vx (Best angle of climb)	76 KIAS
Vy (Best rate of climb)	92 KIAS
Vxse (Best single-engine angle of climb)	78 KIAS
Vyse (Best single-engine rate of climb)	92 KIAS
Va (Design maneuvering)	140 KIAS
Vfe (Max flap extended)	115 KIAS
Vle (Max gear extended)	130 KIAS
Vlo (Max gear operating)	
extend	130 KIAS
retract	108 KIAS
Vno (Max structural cruising)	166 KIAS
Vne (Never exceed)	205 KIAS
Vs1 (Stall clean)	67 KIAS
Vso (Stall in landing configuration)	64 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. Operations/Equipment Category for aircraft as tested: see June 1981 Pilot, *p. 103;*

**Seneca III capable of all-weather operations category with addition of weather detection/avoidance equipment and with anti-icing, deicing package. However, the icing package, available for $13,770 in 1981, limits the aircraft to light to moderate icing conditions.*