High Five

Piper stirs new technology into the Seneca V

BY THOMAS B. HAINES

Unfettered by cumbersome certification requirements, kitplane manufacturers have long offered high-performance aircraft with sophisticated electronic instrumentation. With a few exceptions, the ability to digitally display percent of power, for example, has been only a dream for those flying certified piston aircraft. Since 1986 JP Instruments has sold a system that displays percent of horsepower, but no airframe manufacturers have made the product standard equipment. ■ Rather than wringing their hands over the difficulty of certifying such advanced instrumentation in existing aircraft, officials at The New Piper Aircraft have forged ahead, updating their fleet with new technology. ■ Last year, the company introduced a set of slick new engine instruments for the Malibu Mirage. The Transicoil instruments provide both digital and

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analog displays and the ability to record and download individual exceedances (see "Digital Dilemma Solved," May 1996 *Pilot*). Use of the new technology was the first in a fixed-wing production aircraft since Mooney used a less-sophisticated version in the Mooney PFM in the late 1980s.

With the latest additions and improvements to its venerable turbocharged twin, the PA–34 Seneca, Piper becomes a leader in bringing new technology to production piston aircraft.

In updating the Seneca IV into the Seneca V, Piper took a slightly different route than it did with the Mirage. New engine instrumentation from Flight Line, Incorporated, brings much of the Transicoil capability to the panel but uses a dozen 2-inch-diameter turbine-style gauges to show the information, rather than the smaller faces found in the Mirage. In addition to the ability to show engine information in an easy-to-read analog format, the system will digitally display data at the top of the stack from any one set of instruments. A knob is used to select the desired digital display.

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One setting on the knob is "% Pwr." Turn to that position and the LEDs show the percent of power (to the nearest 5 percent) being used by each engine. Want to fly at, say, 65 percent power? Pick an rpm and the system will tell you what manifold pressure to use. The Flight Line system uses rpm, manifold pressure, outside air temperature, pressure altitude, and fuel flow to determine the percent of power.

In flight, the system drastically reduces pilot workload. No more consulting arcane and hard-to-read charts in flight, adjusting slightly for variances from standard conditions in hopes of arriving at something close to the desired power setting.

Further reducing pilot workload on the Seneca V, compared to the earlier renditions, are a new tuned induction

system and an AlliedSignal turbocharger system. The two combine to make setting power on the pair of 220-horsepower Continental engines much easier than in the older versions. Earlier turbo Senecas used a fixed-wastegate system that required the pilot to manage manifold pressure carefully to prevent overboosting the engines. Bright yellow Overboost annunciators admonished all but the most deft-handed pilot. Particularly at takeoff, the system demanded far too much pilot attention. In cruise, the slightest changes in conditions would cause significant power variations.

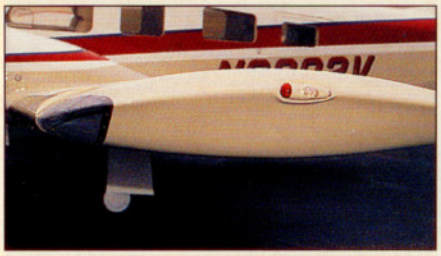
On the Seneca V, the turbo system's variable absolute pressure controller makes life easy for the pilot. For takeoff, push the throttles all the way forward

and let the system take care of itself all the way through the climb. Throttle adjustments result in predictable changes rather than wild swings of manifold pressure. The addition of pressurized magnetos allows the pilot to take advantage of the Seneca's ability to maintain sea-level power all the way up to 19,500 feet and to cruise at its service ceiling of 25,000 feet without concerns about ignition problems.

Pulling the new variant through the air is a pair of three-blade McCauley propellers. Two-blade Hartzell props are standard on the Seneca. However, no one at Piper can remember anyone's ever ordering the two-blade version.

Piper debuted the round cooling inlets for the PA–34 when it introduced the Seneca IV in late 1993 as a 1994 model (see "Piper Seneca IV," March 1994 *Pilot*). Back then, Piper engineers admitted that the change to the inlets was mostly for cosmetic reasons but said that they did improve cooling a bit. However, the Seneca V inlets have been slightly revised in a way that really does reduce drag, according to the engineers. That, along with the induction change and an engine upgrade, allows the new variant to cruise slightly faster than the IV. At 25,000 feet, for example, the V is claimed to cruise at 204 knots true, compared to 195 knots for the IV.

New to the V are the Continental (L)TSIO-360-RB engines that continuously produce 220 horsepower each. The version of the engine used on the IV could produce 220 hp for 5 minutes. After that, 200 hp was the maximum. Mostly as a result of the more even distribution of induction air and a new fuel injection system, allowing the pilot to lean more aggressively, the V's cruise fuel burn is reduced to about 13 gallons per side per hour, compared to the IV's 14.5 gph.



Want to fly at, say, 65 percent power? Pick an rpm and the system will tell you what manifold pressure to use.

Changes all around

Most of the dozens of improvements to the Seneca V are far less noticeable than the recontoured cowl and the snazzy new engine instruments. For example, new recognition lights adorn the wing tips; and the light, ignition, and start switches have been moved from the main panel to an overhead—decluttering the panel and perhaps impressing the passengers a bit.

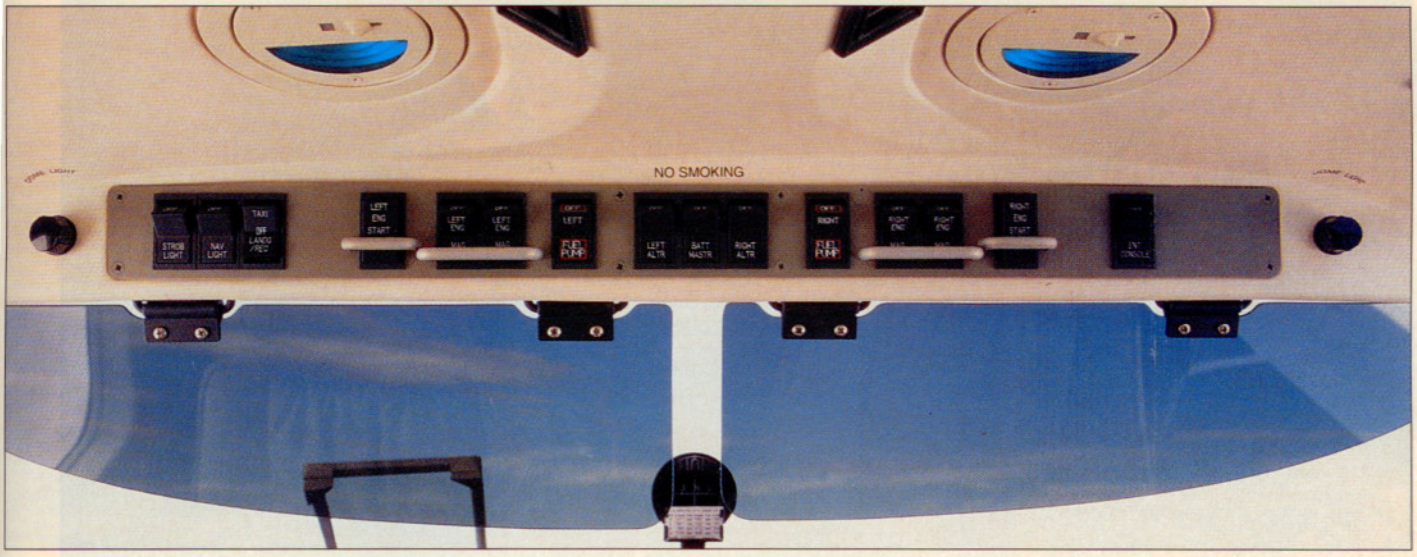
Throughout, the panel and interior have been rearranged to improve ergonomics and comfort. Most significant inside is the switch from the standard six-seat configuration to a five-place all-leather interior. The space once occupied by the seat directly behind the copilot has been filled with a new "Executive Console." The desktop slides open to reveal a storage area and power supplies for a laptop computer. The center also contains places for cups, ice, and stowage of small items. Some operators, particularly those flying charters, may take advantage of the optional entertainment components for the console. Buyers can elect to equip it with an AM/FM/CD system or the music components plus a videocassette player and color LCD video screen—a first for this class of aircraft. Also optional is a flight phone.

Piper still offers a six-place interior for the Seneca V (below), but the standard airplane comes with five seats and an Executive Console (above and above, right). Dedicated doors allow easy access to the aft (right) and nose baggage compartment.

Those desiring the sixth seat can opt for it instead of the console, at a $1,990 savings.

Few will need the sixth seat, though. Like most light twins, the Seneca becomes rather range limited when all the seats are filled. The full-fuel payload of the typically equipped Seneca will be about 455 pounds, or two of the FAA's 170-pound standard adults and lots of bags. However, with an hourly fuel burn of 24 gallons and 122 gallons to draw upon, the pilot can cruise for more than 4 hours with a 45-minute reserve. Trade some fuel for payload, however, and the Seneca V offers plenty of flexibility. Fill all five seats and you can make a regional trip of nearly 300 miles and still land with reserves. In between the two extremes are lots of options.

The standard airplane with the two-



blade Hartzells, a panel full of Bendix/King avionics from AlliedSignal, and a PS Engineering PMA 6000 audio panel/intercom lists for $472,900. For a typically equipped aircraft, however, the price climbs to $552,060, which includes weather radar, flight-into-known-icing capability, the three-blade McCauley props with synchrophaser, air conditioning, copilot instruments, oxygen, and the AM/FM/CD system.

By contrast, a similarly equipped new Beech 58 Baron, the only other piston twin still in production, will set you back about $870,000. The Baron, with its normally aspirated 300-hp engines, also cruises at about 200 knots but burns significantly more fuel in the process. Nonetheless, the Baron's 166-gallon fuel capacity gives the Beech longer legs than those of the Piper. A 5,500-pound max gross weight gives a similarly equipped Baron about a 200-pound useful load advantage.

In an effort to make the Seneca as affordable as possible, Piper has arranged a unique financing program. Through Piper Finance, buyers can purchase a Seneca V for 7.5 percent down and then pay an interest rate of 7.5 percent for the first year, 8.5 percent the second year, and 9.5 percent in years three through 15. The Seneca also qualifies for Piper's new Step-Up Program, whereby owners can trade up the model line every 18 months, with a guaranteed buy-back price (see "Pilot Briefing," p. 32).

If the V follows the path of earlier models of the Seneca, it will prove particularly popular with Brazilian and other South American customers who appreciate the twin's turbo capabilities in the region's hot-and-high conditions. Of the 17 Seneca IVs produced last year, 11 went to foreign countries.

The overhead panel is new to the Seneca V (above), but most significant are the Flight Line engine instruments and their accompanying digital displays (below). It's the best of both worlds: digital and analog.

Piper is confident that the product refinements will significantly impact sales. It has upped the 1997 production of Senecas to 36. Overall, Piper plans to build 217 aircraft this year, up from last year's 186. Many dealers apparently feel the same way. Several we spoke with already had potential customers waiting to fly the new model.

The driver's seat

I've always thought that you don't so much fly a Seneca as wrestle it. It's a big airplane and it flies (and taxis) that way. To an even greater degree than the earlier models, the V seems very stable in flight. Control forces are still heavy but more responsive in the new model.

I earned my multiengine rating flying a Seneca I, the original nonturbo version of the twin that debuted in 1971 as a 1972 model. *Earned* is a good word, because flying a Seneca I is a lot of work. You manhandle the thing through the sky and hope during a crosswind that you have enough flight control authority to put the thing down somewhere near the center line.

With the Seneca II, III, and IV—all turbocharged models—Piper made continuous improvements to the flight control system and gradually upped the maximum gross weight and fuel capacity, adding to the airplane's versatility. What hasn't changed is the size of the long and wide cabin—the most comfortable one in the light twin market. The Seneca V is a tough and honest airplane that provides reasonable performance on not a lot of fuel. The two Continentals provide the redundancy many operators demand. Counterrotating and fully feathering propellers ease workload if an engine does pack it in. With a single-engine climb rate of 253 feet per minute,

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the Seneca does as well as most light twins; the turbo system provides a comforting single-engine service ceiling of 16,400 feet, up from the IV's 12,000 feet.

Piper could have fixed the IV's major shortcomings simply by installing a new turbo system. Instead, the company elected to spend some 2 years and the time of 40 engineers and manufacturing specialists to create the Seneca V by truly upgrading the twin.

Eighteen months ago, in an interview with *AOPA Pilot*, The New Piper's CEO and president, Chuck Suma, predicted that there was a lot of life left in the company's product line. "I think our destiny lies in upgrading the technology in the existing platforms and setting the foundation for a new series of airplanes," he said.

The Seneca V certainly fits the mold, and its technology will surely find its way into the company's next airplane design. □

Piper PA–34-220T Seneca V

Base price: $472,900
Price as tested: $552,060

Specifications

Powerplants	Two Continental (L)TSIO-360-RB 220 hp @ 2,600 rpm
Recommended TBO	1,800 hr
Propellers	Two Hartzell two-blade, 76-in dia (three-blade McCauley, 76-in dia, optional)
Length	28 ft 7 in
Height	9 ft 11 in
Wingspan	38 ft 11 in
Wing area	208.7 sq ft
Wing loading	22.7 lb/sq ft
Power loading	10.8 lb/hp
Seats	5/6
Cabin length	10 ft 4 in
Cabin width	4 ft 9 in
Cabin height	3 ft 6 in
Empty weight	3,377 lb
Empty weight, as tested	3,563 lb
Maximum gross weight	4,750 lb
Useful load	1,373 lb
Useful load, as tested	1,187 lb
Payload w/full fuel	641 lb
Payload w/full fuel, as tested	455 lb
Zero fuel weight	4,479 lb
Fuel capacity, std	128 gal (122 gal usable) 768 lb (732 lb usable)
Oil capacity, ea engine	8 qt
Baggage capacity	Nose 100 lb, 15.3 cu ft Aft 85 lb, 17.3 cu ft

Performance

Takeoff distance, ground roll	1,143 ft
Takeoff distance over 50-ft obstacle	1,707 ft
Accelerate-stop distance	2,065 ft
Max demonstrated crosswind component	15 kt
Rate of climb, sea level	1,455 fpm
Single-engine ROC, sea level	253 fpm
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption)	
@ high-speed cruise 25,000 ft	204 kt/3.9 hr (150 pph/26 gph)
@ normal cruise 25,000 ft	200 kt/4.3 hr (144 pph/24 gph)
Max operating altitude	25,000 ft
Service ceiling	25,000 ft
Single-engine service ceiling	16,400 ft
Landing distance over 50-ft obstacle	2,196 ft
Landing distance, ground roll	1,407 ft

Limiting and Recommended Airspeeds

V_{MC} (min control w/one engine inoperative)	66 KIAS
V_{SSE} (min intentional one-engine operation)	85 KIAS
V_X (best angle of climb)	72 KIAS
V_Y (best rate of climb)	88 KIAS
V_{YSE} (best single-engine rate of climb)	88 KIAS
V_A (design maneuvering)	139 KIAS
V_{FE} (max flap extended)	113 KIAS
V_{LE} (max gear extended)	128 KIAS
V_{LO} (max gear operating)	
Extend	128 KIAS
Retract	107 KIAS
V_{NO} (max structural cruising)	164 KIAS
V_{NE} (never exceed)	204 KIAS
V_R (rotation)	81 KIAS
V_{S1} (stall, clean)	67 KIAS
V_{SO} (stall, in landing configuration)	61 KIAS

For more information, contact The New Piper Aircraft, Incorporated, 2926 Piper Drive, Vero Beach, Florida 32960; telephone 561/567-4361; fax 561/778-2144; or on the Internet (www.newpiper.com).

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.