Color photos by Carroll Seghers.

Pilot Flight Check:

piper's 1975 Seneca II

Engineering refinements and twin turbocharged powerplants add to performance and ease of handling

by ROBERT I. STANFIELD / AOPA 155494

■■ Piper Aircraft Corp. has done more than dress up its up-to-seven-place 1975 Seneca in a new coat of paint. It has given the new model—now dubbed the Seneca II—a new set of teeth, in the form of two six-cylinder, 200-hp, turbocharged Teledyne Continental engines.

New engineering also includes an extension of 12 more inches to each aileron, increasing the demonstrated crosswind component to 20 mph, as against 15 mph for the 1974 model. There is, in addition, a new anti-servo rudder tab aimed at increasing yaw control without any change in rudder dimensions.

The overall result is a smooth-handling light twin with a lot of bite—an aircraft that demonstrates a marked improvement in both performance and handling characteristics over its predecessor models, the first of which was introduced in September 1971 (and 915 of which had been sold as of the end of last October).

Top speed has increased almost 30 mph—to 225 mph. Service ceiling (and maximum operating altitude) has jumped 7,100 feet—to 25,000 feet. Single-engine service ceiling has been boosted a hefty 9,750 feet—to 13,400 feet. Gross weight has increased 370 pounds—to 4,570 pounds. And there's a jump of about 157 pounds in useful load—to 1,800 pounds.

All this means that the new Seneca II, with its TSIO-360-E powerplants including Rajay turbochargers, will—with full fuel aboard—carry five adults and 109 pounds of baggage 630 statute miles at 75% power, with 45 minutes' reserve fuel. The aircraft's certification under Part 135 (air taxi and commuter operations) also includes flight into known icing conditions.

The PILOT had the opportunity of flying the new model—produced at Piper's Vero Beach, Fla., plant—from the company's Lakeland, Fla., facility, which happens to be the production home of the Navajo. The Seneca II flown was the No. 4 production aircraft—N44642. Aboard during the flight were C. R. "Chick" Winship, schedule/delivery coordinator at the Vero Beach facility, and one passenger.

Undoubtedly the airplane is a sleek, good-looking twin. It conforms to a new corporate identity program worked up by Pulos Design Associates, Inc. (Syracuse, N.Y.), in conjunction with Piper, and in the case of the Seneca employs minimal fuselage striping with maximum paint emphasis on the vertical tail surface.

A walkaround inspection of the new model, which was fitted with the large utility door located aft on the left side, also showed some changes over that produced a year earlier. There is, for instance, no need to unlatch engine cowling for an oil check. The dipsticks


N41275

are now easily available through push-button "doors" on top of each nacelle. Adjacent are louvers that aid in engine cooling.

There's also a new inlet opening, on the right side under the fin, for coolant air to the new 30,000-BTU Janitrol combustion heater, a standard item. (A 45,000-BTU unit is offered as an option.) Mounted behind the aft cabin bulkhead, the heater consumes less than half a gallon of fuel per hour.

On either side of the dorsal fin triangular vents are placed for air entering the Janitrol to be warmed. On the bottom of the fuselage is the heater exhaust vent.

Within, the Seneca is still the Seneca —roomy and comfortable. Both Narco and King radios are available. This particular aircraft was fitted with King avionics: KMA 20 annunciator panel, KN 60C DME, KT 76 TSO transponder, KR 86 ADF, and two KX 170B nav/coms. The altimatic IIIC autopilot was present, with omni coupler, as were two portable Scott Executive Mk III oxygen systems (four masks can be plugged into a single unit).

New to the panel are overboost warning lights, which are activated when manifold pressure approaches 40 inches. A pressure relief valve protects the engine from inadvertently exceeding 42 inches mp. Also new is panel backlighting. Instrument and radio lights are controlled with separate rheostats. Two EGT (exhaust gas temperature) gauges are standard.

Another new item tied to this radically different Seneca is the basic price: $63,995. And this demonstration aircraft, with its varied options, lists at $84,836.

Key performance characteristics demonstrated during this flight and on a short IFR cross-country to Fort Lauderdale, Fla., were as follows:

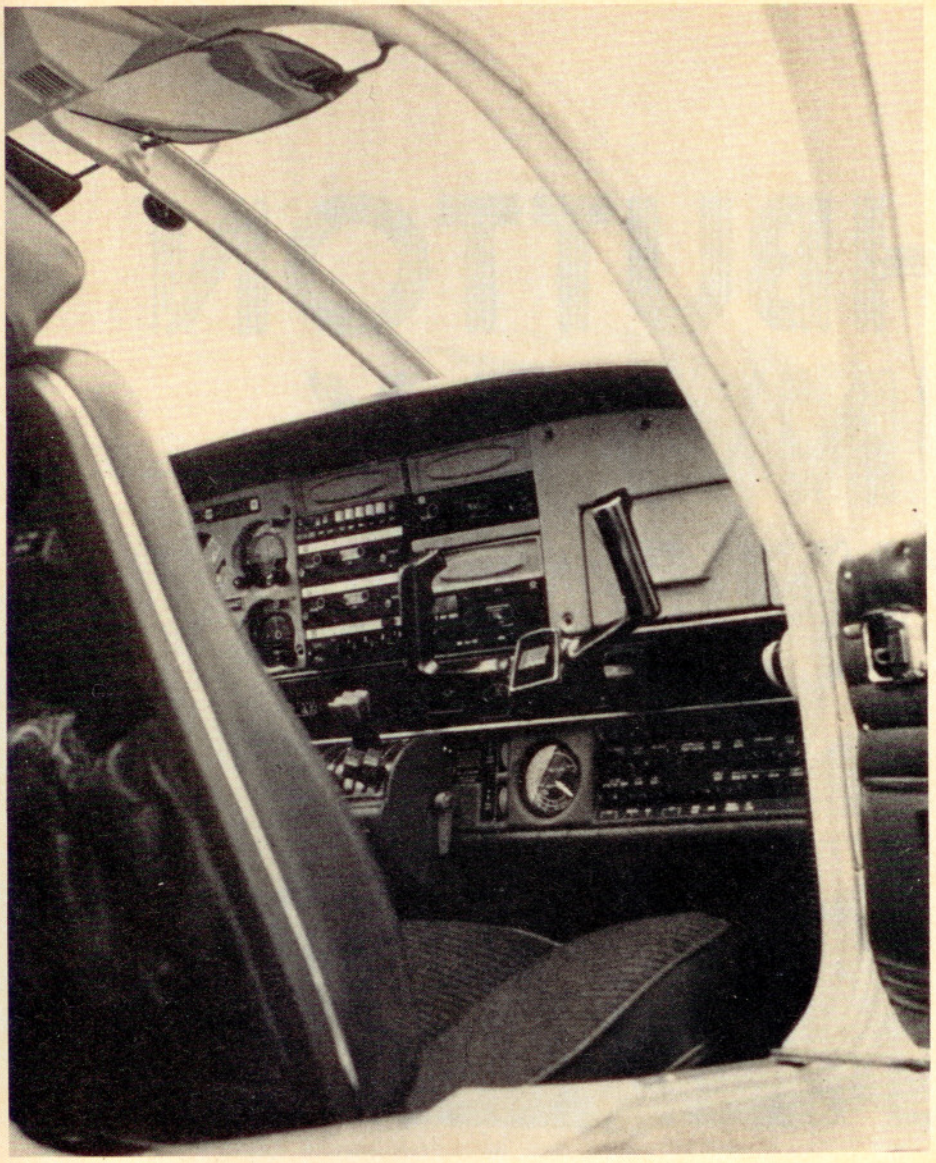
• Takeoff and climb. Normal takeoff run is specified as 1,100 feet at sea level. (Field elevation at Lakeland is 144 feet.) With brake pressure applied, throttles were advanced to 35 inches mp, then held while "settling" up to 39 inches—takeoff power. On brake release, the aircraft accelerated fast, and at a gross weight of about 4,149 pounds was airborne—at 90 mph—in less than 1,000 feet, into a 15-knot quartering wind.

With airspeed held to 120 mph and climb power reduced to 35 inches mp and 2,500 rpm, the Seneca II moved through 1,000 feet at a climb rate of 1,300 fpm. At 6,000 feet, rate of climb was 1,100 fpm, and at 10,000 feet the airplane was angling up at 1,000 fpm.

• Cruise speeds. At 12,000 feet the outside air temperature was 6°C. Manifold pressure was reduced to 32 inches; rpm to 2,450. At this 75% power setting, the aircraft indicated 174 mph, for a true reading of 216 mph. Reducing to 65% power—31.5 inches mp and 2,375 rpm—the indicated speed was 165 mph, for a true reading of 204 mph.

• Single engine. With the aircraft at the 12,000-foot level, and still being flown at 65% power, the left engine was shut down. Only light rudder pressure was necessary to counter the almost negligible yaw. Speed bled off to 140 mph indicated, for a true reading of 173 mph. Moderate to steep banks, both left and right, posed no control problems. Controllability was excellent, as were single-engine climb characteristics

Seneca II refueling during an introductory tour. New turbocharged engines, longer ailerons, and a new anti-servo rudder tab add up to substantially improved handling and performance for the '75 model as compared with its predecessors.



Panel on N44642, the flight-checked aircraft, had King avionics; Narco radios are also available. Inside, the Seneca remains the same: roomy and comfortable. Photo by the author.

—in excess of 150 fpm at this altitude.

• Descent and landing. The Seneca II will move down to the pilot's taste: fast or slow. We could have dropped the gear for a slower-speed descent and at 150 mph could have produced a good sink rate. But we chose, instead, to hold 25 inches mp, and at an indicated speed of 170 mph the airplane was flown down at a comfortable 500 fpm. The stability of the new model was much in evidence during low-speed approach and flare: better roll control because of the longer ailerons; increased rudder effectiveness because of the anti-servo yaw control.

The subsequent flight, roughly one hour IFR to Fort Lauderdale, again allowed us to sample the effectiveness of N44642 and its new powerplants.

We were cleared to cruise at a flight altitude of 7,000 feet. With an outside air temperature of 14°C, the aircraft—power set to 29 inches mp and 2,400 rpm—indicated 165 mph, for a true reading of 188 mph. Advancing to 31 inches mp, the indicated speed gained 3 mph, for a true reading of 191 mph.

Most noticeable during this flight was the quietness within. N44642 was fitted with Piper's optional soundproofing package, which includes thicker windshield and windows, foam-backed carpeting, and additional acoustical material for better sound control. The company claims a four- to five-decibel noise reduction.

Flying the turbocharged twin is relatively simple. There are no extra throttle controls, and readjustments are no different from those for a nonturbocharged engine. One key difference in performance is that power output increases as the aircraft gains in altitude. Thus, at 12,000 feet, power output is 215 hp, as against 200 hp at sea level.

Piper should make heavy gains with this airplane. Its increased performance, stability, and load-carrying capability open the door to new market segments for the Seneca II. □

PIPER SENECA II

Specifications

Engines: Two Teledyne Continental 6-cyclinder TSIO-360-E counterrotating turbocharged powerplants, each rated at 200 hp at sea level and 215 hp at 12,000 ft, at 2,575 rpm	
Max takeoff weight	4,570 lb
Max landing weight	4,342 lb
Empty weight (standard)	2,770 lb
Useful load (all in excess of 4,000 lb must consist of fuel)	1,800 lb
Fuel capacity (5 gal unusable)	100 gal
Fuel grade (minimum octane)	100/130
Oil capacity (per engine)	8 qt
Forward baggage comp't	100 lb
Rear baggage comp't	100 lb
Wingspan	38.9 ft
Wing area	208.7 sq ft
Length	28.5 ft
Height	9.9 ft
Wheel base	7 ft
Wheel tread	11.1 ft
Turn radius	33.2 ft
Seating	Up to 7
Basic price	$63,995

Performance

Speeds:	
Max, sea level	197 mph
Max, 12,000 ft	225 mph
Max, 20,000 ft	218 mph
Takeoff run (sea level)	1,100 ft
Takeoff distance (over 50 ft, sea level)	1,460 ft
Takeoff run (short field, 25° flaps)	900 ft
Landing roll	1,380 ft
Landing distance (over 50 ft)	2,090 ft
Rate of climb (sea level)	1,340 fpm
Rate of climb (sea level, single engine)	225 fpm
Best-rate-of-climb speed	105 mph
Minimum controllable single-engine speed	80 mph
Service ceiling	25,000 ft
Service ceiling (single engine)	13,400 ft
Cruise speeds (best power mixture):	
65% power, 25,000 ft	208 mph
55% power, 25,000 ft	189 mph
Range (best power mixture):	
75% power, 16,000 ft, 45-minute reserve	645 sm
55% power, 16,000 ft, 45-minute reserve	670 sm
Stall speeds:	
Gear and flaps extended	69 mph
Gear extended, flaps up	76 mph
Fuel consumption:	
75% power, both engines	24 gph
65% power, both engines	21.6 gph