Raising the gear on the already slick six-place Victor brings cruise speeds up slightly to the 200-mph mark and increases efficiency.

Pilot Flight Check

PARTENAVIA P.68R

Retractable-gear version of Italy's Partenavia Twin prepares for introduction into U.S. market

by AL BLACKBURN / AOPA 356241

■■ It was not a case of love at first sight—well not exactly. The first time I saw the P.68 Victor was on the ramp at Reading in June 1972. It was something like the first time I saw a Volkswagen "beetle." Ugly, I thought. Then—maybe not ugly, but certainly different.

The P.68 Victor is indeed different, but to an aerodynamicist's eye it is beautifully different. First, examine the wing—straight, untapered and fully cantilevered, it is a model of clean simplicity in design. Take a closer look along the leading edge. Absent are those skin wrinkles and other deviations from a precision contour generally found on the wings of most light twins.

The leading edge of the P.68 wing appears more like that of a high-performance sailplane. The comparison is appropriate, for the first 25% of the Victor's wing chord is smooth, molded fiberglass. The rest of the wing is conventional aluminum alloy for reasons of cost and easy maintenance.

Now move away from the wing and stand in front of the airplane, a little bit to one side and look along the fuselage. Smooth—no bumps, just a clean body of revolution all the way from the fiberglass nose to the swept tail. Not even the windscreen offers a discontinuity in the streamlining. It's quite obvious the air wants to get around this bird; there's nothing to stop it, no abrupt angles or protrusions.

continued

PARTENAVIA P.68R

Specifications

Engines	Two Lycoming IO-360-AIB6, 200 hp each
Wing span	39.4 ft
Length	30.7 ft
Height	11.2 ft
Wing area	200.1 ft
Wing loading	21.6 lb/sq ft
Passengers and crew	6
Empty weight (IFR)	2,822 lb
Useful load	1,500 lb
Gross weight *	4,322 lb
Power loading	10.8 lb/hp
Fuel capacity (standard)	108 gal
Fuel capacity with optional tanks	153 gal

Performance (preliminary)

Takeoff distance (ground roll)	750 ft
Takeoff over 50 ft	1,130 ft
Rate of climb	1,650 fpm
Single-engine rate of climb	360 fpm
Maximum level speed	184 kt
Cruise speed (75% power, 5,500 ft)	174 kt
Cruise speed (65% power, 8,000 ft)	168 kt
Range at 65% cruise (max fuel)	930 nm
Service ceiling	22,200 ft
Single-engine service ceiling	8,800 ft
Stall speed (clean)	64 kt
Stall speed (flaps down)	56 kt
Landing distance (ground roll)	690 ft
Landing over 50 ft	1,400 ft

* Increase to 4,542 lb expected after certification.

The structure and actuating arms for the P.68R's main gear are housed in fairings much like those on the C-130, but the wheels nest under the rear seat. The nose gear folds aft into a well between the pilots' feet.

PARTENAVIA continued

Nothing sticks out into the windstream, that is, except the legs which, until now, have been fixed. Still, with clean fairings over the wheels and minimum-profile, spring-steel struts, the additional drag for the rigid gear is quite small. Indeed, with the same engines as the Piper Seneca I the fixed-gear Victor has a 164-knot cruise at 75% power (PILOT, December 1975)

The performance and simplicity of the fixed-gear Victor have helped market the aircraft, especially in the developing nations and among operators in remote areas where ease of maintenance is of paramount importance. Nevertheless, there is always the demand for greater speed and, in a world of growing energy costs, for greater efficiency. Consequently—the P.68R.

The retractable prototype, which first flew in December, is the result of patient development by the designer, Professor Luigi Pascale. The design of the retraction mechanism is unique and simple. The net weight increase for the switch from fixed gear is only 30 pounds. The structure and actuating arms for the main gear are housed in fairings much like those on the Lockheed C-130 Hercules, but the wheels themselves nest under the rear bench seat with doors fully enclosing the wheel wells. The nose gear folds aft into a well between the pilot's and co-pilot's rudder pedals. Actuation is electro-hydraulic. Emergency extension is by means of an air bottle.

The prototype airplane had flown less than 10 hours and was still in bright aluminum and white fiberglass. It was scheduled for some alignment of the

gear doors and seals and then into the paint shop immediately after our flight.

The flight was made with Professor Pascale, who in addition to being founder, chief executive and chief engineer for Partenavia, is also chief pilot. Ian Forbes, veteran European aviation executive and pilot who heads Partenavia's world-wide marketing effort, and Mario Damelio, who is the company's engineering and acceptance test pilot, rode with us. The main purpose of the flight was to compare performance differences between the fixed- and retractable- gear versions of the P.68.

Climbout from the Capodichino Airport at full power on both engines yielded only a slightly greater rate of climb over the fixed-gear P.68 (roughly 1,500 fpm vs 1,400), and a 110-knot climb speed gave a more comfortable deck angle than the optimum speed of 90 knots, with very little effect on climb rate. However, with one engine feathered, the rate of climb was more than 350 fpm, substantially better than the 300 fpm with fixed gear.

Flying over the water south of Naples between the Island of Capri and the lovely coast town of Sorrento, we had a look at maximum speed at full power. At 500 feet above the waves, the airplane settled out at 178 knots indicated. Outside air temperature was 12°C. This corresponded closely to the maximum sea level speed of 179 knots true airspeed which had been calculated for this particular airplane after correcting to standard conditions.

At 4,000 feet and 10°C OAT, the indicated airspeed was 158 knots (169 knots true) with 75% power. A reading of 149 knots indicated (159 knots true) was attained under the same conditions with 65% power.

Pascale estimated that some further refinements to the wheel doors and seals and a good paint job would add three knots to the indicated airspeed figures. If this is so, the P.68R should cruise at 172 knots true airspeed with 75% power at 8,500 feet, which is the maximum altitude for obtaining this power in the unsupercharged configuration without exceeding the continuous rpm limitation of 2,450. Maximum speed at sea level will be very close to 183 knots.

As for other flight characteristics of the P.68R, the span of the counterbalance tab on the trailing edge of the all-moving stabilator has been reduced by 10%. This means that stick force per G has been slightly decreased at lower airspeeds but is about the same at normal cruise speeds as those found on the P.68B because of the higher performance of the retractable model. This reduction in the size of the stabilator tab also means lower control force changes in the full-power go-around situation (in the P.68B, fairly substantial push forces are required during a go-around). In rerouting the longitudinal control cables to make room for stowage of the main landing gear, a tighter control system has been achieved which gives the P.68R a more solid feel.

In stall maneuvers, there are no perceptible differences between the two configurations. Certainly there is no evidence of any interference or adverse effects from flow distortions over the landing gear either extended or retracted at or near the stall in any configuration. Handling qualities with one engine out remain excellent with only light rudder forces required to keep the ball centered even in the worst condition with the shut down engine windmilling.

Professor Pascale expects to have the P.68R certified in Italy by the end of May. Noting the relatively small increase in cruise performance, he points to the much larger gains to be realized by still further development in the P.68 line, which will be turbocharging. Also he believes that even small increases in efficiency will be sought with increasing eagerness in a world of growing energy consciousness.

But for right now, the big question is whether the light twin buyer will go for greater complexity (and slightly greater empty weight) to gain 8 to 10 knots in true airspeed. If so, how much will he be willing to pay for it? These questions are soon to be tested in the U. S. marketplace. The P.68 in both landing gear configurations will be offered in the United States starting this summer by a team composed of Jack Riley, Jr. and Amos Buettell who have formed Partenavia North America, Inc., located at James Connally Airport, Waco, Tex.

Under an agreement reached in Naples this January, green (unpainted) P.68s will be flown to Waco where interiors and avionics will be installed and a custom paint job applied. If the U. S. market proves propitious, a U. S. type certificate will be sought with a view to assembling Naples-built components and, eventually, perhaps producing the aircraft entirely in the United States under license. Although prices have not been announced, they are expected to be competitive with the Piper Seneca II.

The new company intends to have both P.68B and P.68R models on hand for the Reading Air Show next month. □