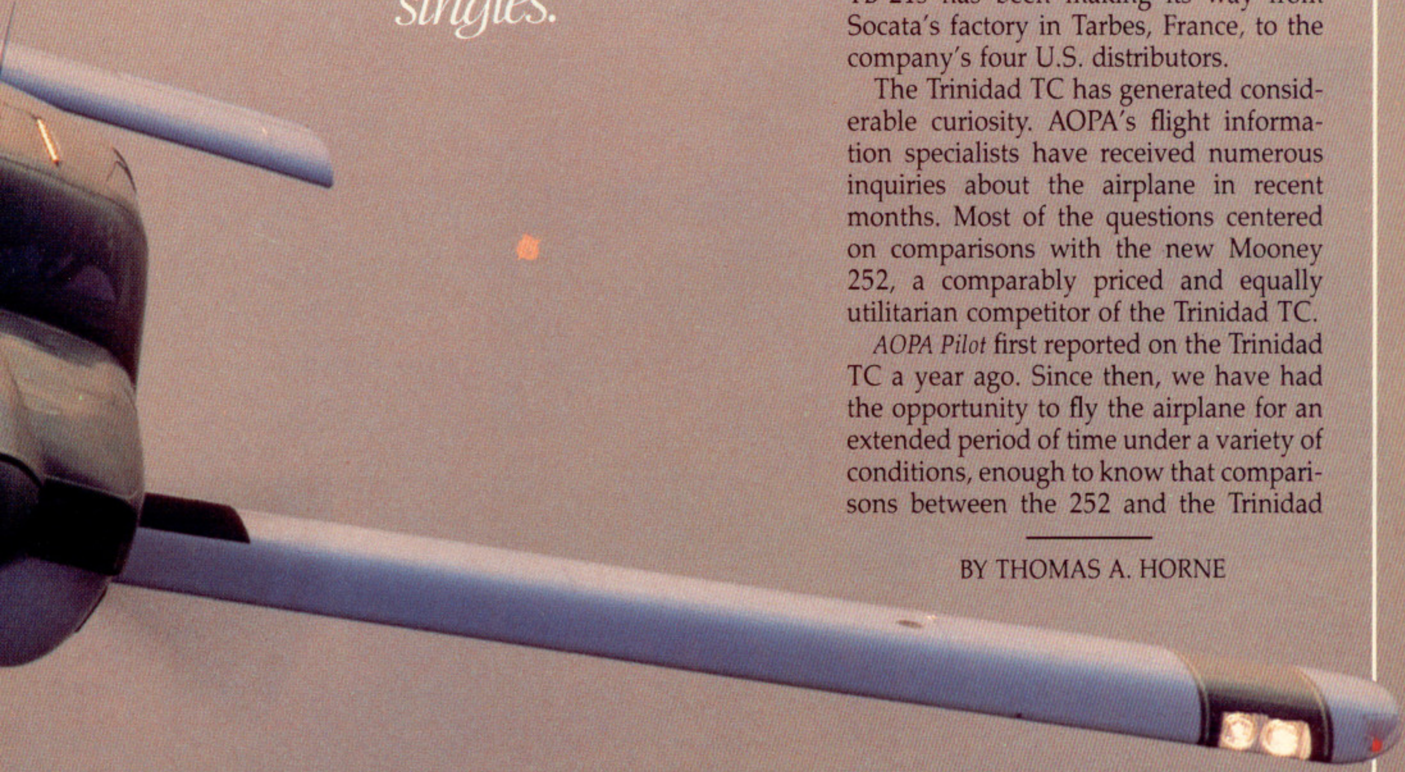
TRINIDAD TB-21

Going in style—in one of the more comfortable and capable turbocharged singles.



With American sales approaching 25 units, and a world-wide total of some 40 airplanes, the TB-21 Trinidad TC is becoming something of a success story. A product of Aerospatiale's light aircraft division—Socata—the Trinidad TC (a turbocharged version of the TB-20 Trinidad) received its U.S. certification in March 1986. Since then, a steady trickle of new TB-21s has been making its way from Socata's factory in Tarbes, France, to the company's four U.S. distributors.

The Trinidad TC has generated considerable curiosity. AOPA's flight information specialists have received numerous inquiries about the airplane in recent months. Most of the questions centered on comparisons with the new Mooney 252, a comparably priced and equally utilitarian competitor of the Trinidad TC.

AOPA Pilot first reported on the Trinidad TC a year ago. Since then, we have had the opportunity to fly the airplane for an extended period of time under a variety of conditions, enough to know that comparisons between the 252 and the Trinidad

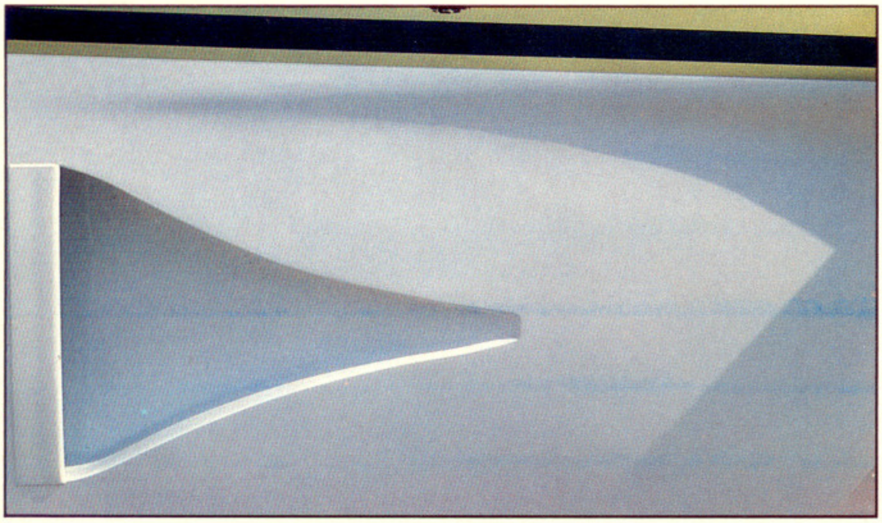
BY THOMAS A. HORNE

PHOTOGRAPHY BY ART DAVIS

TC are not so easily drawn and can boil down to highly subjective matters.

The Trinidad TC is designed with an attention to ergonomics that is absent in all but a few other current production single-engine airplanes (the PA-46 Piper Malibu comes to mind). The seats have lumbar support and infinitely adjustable backs. The lumbar support includes an inflatable bladder, which allows the seat back to conform to the shape of an individual's lumbar region. The sides of the seats are slightly raised, which provides lateral support. The seats closely resemble those found in many modern, well-designed automobiles. They *are* comfortable. I flew a Trinidad TC on a transatlantic crossing with five legs of approximately seven hours each. This was followed by a transcontinental flight with legs of 12 and seven hours. I believe I would have experienced back discomfort after sitting for so many hours in any other single-engine airplane, but in the Trinidad TC there was never any discomfort.

The automobile motif is also reflected in the center console. With the exception of the push-button electrical switches and the oxygen-outlet plugs, the controls are within easy reach. The push buttons can be confusing at first: One button activates a system, and a corresponding one turns it off. The switches are labeled, but the print is small. There is a trap for the unwary—the turn coordinator is not wired to the master switch. It must be turned on separately. Forget this item, and your only warning will be the miniature flag on the instrument face. The otherwise well-endowed annunciator panel will warn you of all other critical omissions.

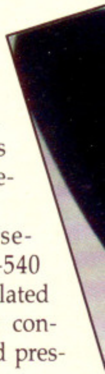


The Trinidad TC's handling characteristics are conventional, with a few exceptions. Most of the wing's trailing edge is taken up by flap. The ailerons are relatively small. Consequently, roll inputs may require more force than most pilots may anticipate. This can be troublesome when flying on instruments. Another point of concern is the effect of fuel imbalances. Should one wing tank contain as little as ten gallons more fuel than the other, the pilot will have to overcome the imbalance with considerable aileron input. In autopilot operations, the effect of a gross imbalance can cause the autopilot to disengage automatically. The only other major learning item for those experienced in complex lightplanes but new to the Trinidad is flap technique.

The flaps are electrically powered and are selected to one of two deflections—"Takeoff" (10 degrees) and "Landing" (40 degrees)—by a guarded preselect switch. Flap retraction after takeoff presents no pitch changes worthy of mention. Extension of flaps during the landing sequence is another matter.

Many pilots are taught to extend flaps incrementally as they progress from downwind to short final. According to this philosophy, selection of full flaps is delayed until the pilot knows he would be able to glide to the runway should the engine stop. This point is usually encountered on the final leg of the approach, close to the runway threshold.

A pilot applying this technique in a Trinidad will be in for a big surprise as he extends flaps from 10 to 40 degrees. First, the airplane balloons. Then airspeed rapidly dissipates as the airplane sinks, forcing the pilot to lower the pitch attitude to regain the target airspeed. The best method of flap management is simply to land with 10 degrees of flap, or to deploy full flaps on base leg and adjust the final approach speed and profile using power.

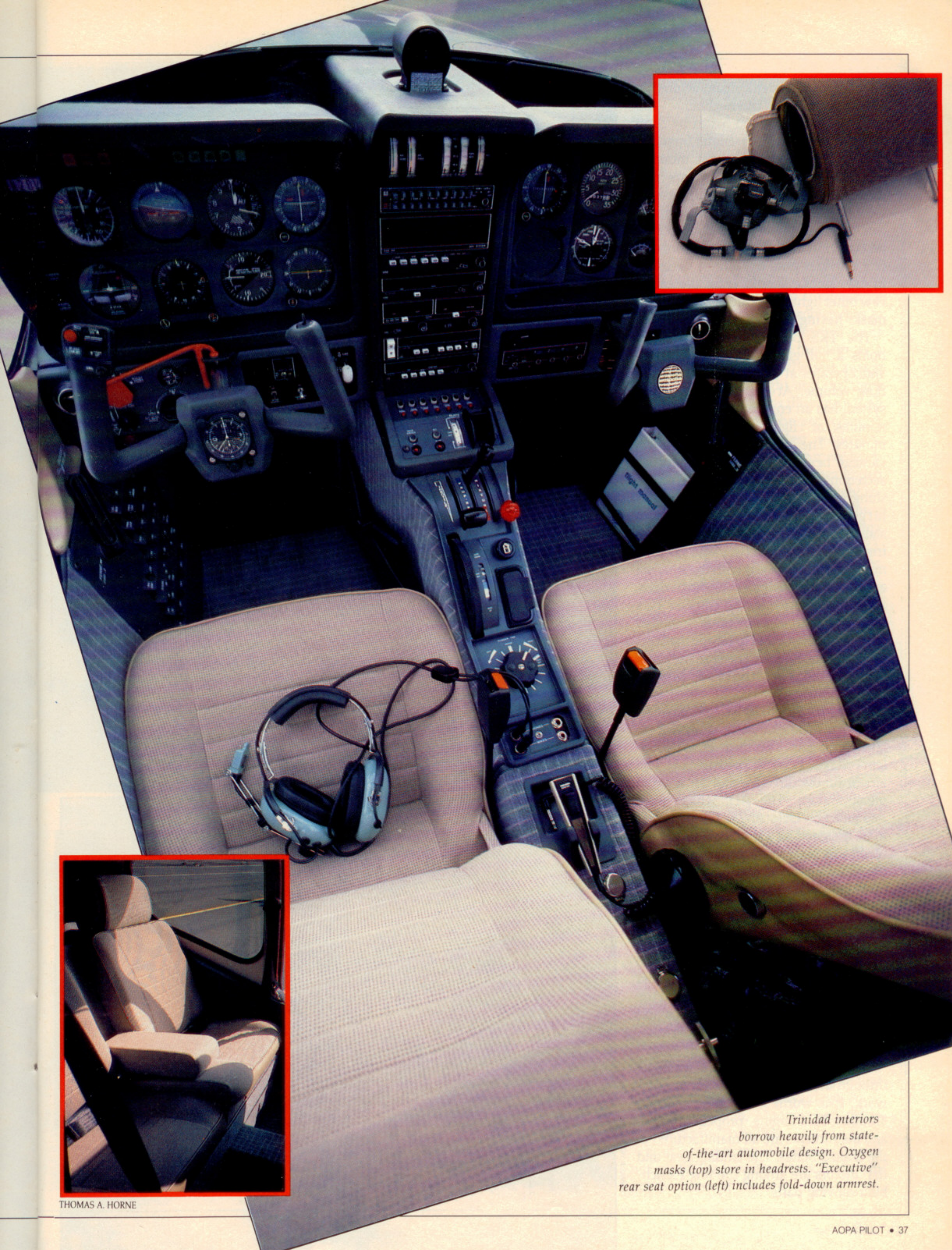


It is in the traffic pattern that one most appreciates the Trinidad's excellent cockpit visibility. Window area—front and rear—is large, affording a nearly unrestricted view.

The Trinidad TC's 250-horsepower, six-cylinder Lycoming IO-540 engine has an automatically regulated Garrett turbocharger. A density controller senses air temperature and pressure at the turbocharger's compressor outlet. It regulates turbocharger output at full throttle and is designed to minimize the chances of an overboost. It also helps reduce work load during takeoff. Normal procedure is simply to apply full throttle. While it is wise to monitor the manifold pressure gauge for indications of an accidental overboost, the pilot's operating handbook does not specifically call attention to this. The other part of the turbocharger's automatic regulating system is a differential pressure controller. This compares the pressure differential between ambient and intake manifold air, regulating turbocharger output at intermediate power settings.

The airplane's maximum certificated operating altitude is 25,000 feet, as long as oxygen and other necessary equipment are installed. At this altitude, a 75-percent power setting (24 inches manifold pressure and 2,400 rpm) will produce a true airspeed of 187 KTAS while burning 16.4 gallons of fuel per hour. Most of our flying was conducted at lower altitudes—12,000 to 18,000 feet—at a 70-percent power setting. Cruise speeds ranged from 164 to 170 KTAS, and fuel burn was a consistent 13.6 gph, just as published in the pilot's operating handbook.

Pilot's evaluation airplane, N20LV, is typical of most U.S.-bound Trinidad TCs in that it was fitted with a nearly full complement of factory-optional equipment. This included King avionics (a KNS-80 VOR/RNAV receiver, a second navigation receiver, dual communications radios, automatic direction finder, KAP 150 autopilot with altitude hold, and a Mode C, altitude-reporting transponder), built-in interphone, second altimeter, oxygen system and propeller alcohol anti-ice. The only options missing were a horizontal situation indicator, a compass slaving system and a 3M Stormscope.



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Trinidad interiors borrow heavily from state-of-the-art automobile design. Oxygen masks (top) store in headrests. "Executive" rear seat option (left) includes fold-down armrest.


N20LV
TRINIDAD
TC

The oxygen system, manufactured in France by EROS Intertechnique and marketed in the United States by Scott Aviation, comes with a diluter/demand mask for the pilot's station (for more information on oxygen systems and masks, see "Pilot Advisory: O_2 Basics," December 1986 *Pilot*, p. 72). This mask can be set to either a Normal or 100-percent flow rate. The 100-percent setting provides pure oxygen—a necessity in case smoke should enter the cabin. Few other lightplanes are equipped with masks having this feature.

The TKS propeller anti-ice system holds a half-gallon of ethylene glycol and operates at either a Low or High flow volume. At the Low setting, the system has an endurance of 2 hours 10 minutes; at High volume, 1 hour 35 minutes. The system can have an advantage beyond that of preventing ice accretions on the propeller. As glycol is slung from the propeller arc, it strikes large portions of the wings and stabilator, helping to keep those areas free of ice. Even so, the airplane's performance suffers radically with the smallest accretions on the wings' leading edges. As with any airplane, the Trinidad TC's ice protection equipment is intended solely for use as a tool to escape inadvertent icing encounters. The airplane is not certificated for flight in known icing conditions.

So far, the Trinidad TC has encountered few maintenance- and service-related problems. The most recent problems have been addressed by one airworthiness directive and an internal memorandum. The AD, which went into effect on October 24, 1986, had yet to be assigned an identification number when this issue went to press. It orders the modification of the battery tray to blank off tooling holes and an inspection for damage due to leaking battery electrolyte. The memorandum advised an inspection of the turbocharger oil reservoir's mounting bracket for possible cracks. The mechanic who inspected N20LV found no cracks but replaced the original mounting hardware's nuts and bolts with those that could be more securely fastened.

Parts for the airplane are available through the Van Dusen Air Service network. It is worth mentioning that the Trinidad TC's engine, propeller, brakes and instruments are all manufactured in the United States. The landing gear and flap motors are among the few French-built moving parts.

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TRINIDAD TB-21

Between May and September, Socata lightplanes bound for the United States are ferried across the Atlantic. A 53-gallon auxiliary fuel tank permits ocean legs (left) that end with a crossing of Greenland's ice cap (above).

Our overall feeling about the airplane was positive. All who flew N20LV remarked on the airplane's good looks, comfort, visibility and the ease of operation. Pilots without much complex airplane time had little trouble learning the TC's ways.

I would change only two things. One would be the landing gear indicator lights. The three green Gear Down indicator bulbs have a fixed installation; the bulbs cannot be exchanged in their sockets. A pilot attempting to troubleshoot an in-flight landing gear problem has to push a testing switch to learn if he is faced with an extension problem or a burned-out bulb. Press the test switch and a red warning light and the three green Gear Down bulbs illuminate if all bulbs are operative. The red warning light illuminates during test, while gear are in transit or when one or more landing gear fail to extend. An unextended gear is indicated if the warning light remains on at the same time a Gear Down bulb is out. Socata has faith in the design and points out that it meets FAR Part 23, but most Americans would be more comfortable with exchangeable bulbs.

The other item would be the post lights on the right side of the instrument panel. They are installed so that they cast shadows over the instruments. Most annoying is the shadow on the turbine inlet temperature (TIT) gauge. Since cruise mixture is set at the TIT's red line, night flying involves a lot of neck-craning to make certain that the mixture remains properly adjusted.

As the competition between the Mooney 252 and the Trinidad TC continues, time will tell which airplane is most popular. For most prospective customers, the purchase decision is bound to be dictated by financial and tax concerns as well as the airplanes' comparative performance advantages. All 252s and some other U.S.-manufactured aircraft built and purchased before the end of 1986 might qualify their owners to take all or part of the 10-percent investment tax credit provisions of the revised income tax rules (see "Pilot News: ITC Temporarily Retained in Tax Reform," December 1986 *Pilot*, p. 27). This, and Mooney's head start in certificating and manufacturing the 252, helped give that airplane an early sales advantage. As of October 31, 1986, Mooney had delivered seventy-three 252s.

From now on, the ITC advantage will not apply; the investment tax credit will not be allowed for any airplane purchase, be it foreign or domestic. This should help even the sides.

Another major variable that will affect Trinidad TC sales is the fluctuating international monetary exchange rate. In recent months, the dollar's performance against the French franc has deteriorated, hovering near seven francs to the dollar. Three years ago, a dollar was worth approximately 10 francs. If the dollar remains weak, U.S. purchasers of French goods will automatically face higher prices, another factor in Mooney's favor. On the other hand, if the dollar strengthens, a pricing advantage most likely will pass to Socata.

However, there are other factors. Airplane purchases are driven by practical as well as emotional elements. Although the 252 is faster (202 KTAS cruise versus the Trinidad TC's 187 KTAS), can fly higher (28,000 feet maximum operating altitude versus the TC's 25,000) and is more economical (12.7 gph at 78.6-percent power as opposed to the TC's 16.4 gph at 75-percent power), the Trinidad TC has its strengths, too. Similarly equipped for instrument flight rules, the purchase price of a TC can be less because of its lower base price. Also, a Trinidad TC can carry a payload with full fuel of nearly 200 pounds greater than the 252. This, together with the styling and ergonomic features, will no doubt sway more than a few customers wanting to try something new—if not just for themselves, then for the airplane's appeal as a leaseback option.

Judging by its reception at airports we have visited across Europe and the United States, there are plenty of pilots waiting to put the Trinidad TC to use. They will not be disappointed, and neither will their passengers. □

For further reading in *AOPA Pilot*:
"Mooney 252," May 1986, p.40.
"Bienvenue Trinidad TC," December 1985, p. 77.
"Socata Trinidad," September 1984, p. 44.
"Pilot Precis: Socata Trinidad," March 1984, p. 115.

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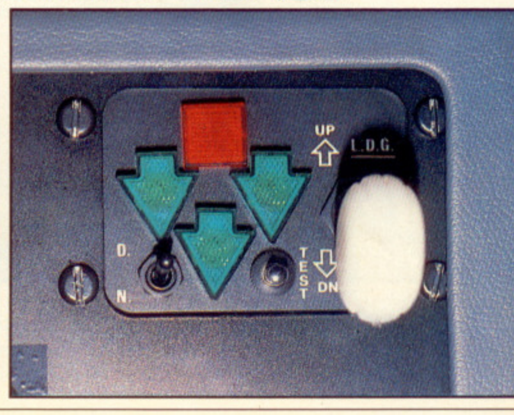

Aerospatiale (Socata) TB-21 Trinidad TC
Base price: $121,900
Price as tested: $173,325

Specifications	
Powerplant	Lycoming TIO540-AB1AD, 250 hp @ 2,575 rpm
Recommended TBO	2,000 hr
Propeller	Hartzell HC-C2YK-1BF-F8477-4 80-in dia
Length	25 ft 4 in
Height	9 ft 4 in
Wingspan	32 ft 6 in
Wing area	128.1 sq ft
Wing loading	24.1 lb/sq ft
Power loading	12.3 lb/hp
Seats	4
Cabin length	8 ft 4 in
Cabin width	4 ft 2 in
Cabin height	3 ft 8 in
Empty weight	1,795 lb
Empty weight, as tested	2,006 lb
Gross weight	3,083 lb
Useful load	1,288 lb
Useful load, as tested	1,077 lb
Useful load w/ full fuel	560 lb
Payload w/full fuel	857.2 lb
Max takeoff weight	3,083 lb
Fuel capacity, std	533 lb (517 lb usable) 89 gal (86 gal usable)
Oil capacity	13.2 qt
Baggage capacity	143 lb
Performance	
Rate of climb @ 2,000 ft	1,090 fpm
Max level speed, sea level	200 kt
Cruise speed/Endurance w/no rsv, std fuel (fuel consumption)	
@ 75% power, best economy 25,000 ft	187 kt/890 nm (99.4 pph/16.4 gph)
@ 65% power, best economy 25,000 ft	170 kt/1,030 nm (74.4 pph/12.4 gph)
Service ceiling	25,000 ft
Limiting and Recommended Airspeeds	
Va (design maneuvering)	129 KIAS
Vfe (max flap extended)	103 KIAS
Vle (max gear extended)	139 KIAS
Vlo (max gear operating)	129 KIAS
Vne (never exceed)	187 KIAS
Vno (max structural cruising)	150 KIAS
Vs1 (stall clean)	70 KIAS
Vso (stall in landing configuration)	59 KIAS
Vx (best angle of climb)	81 KAIS
Vy (best rate of climb)	94 KIAS

Specifications are based on manufacturer's calculations. Performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions, unless noted.