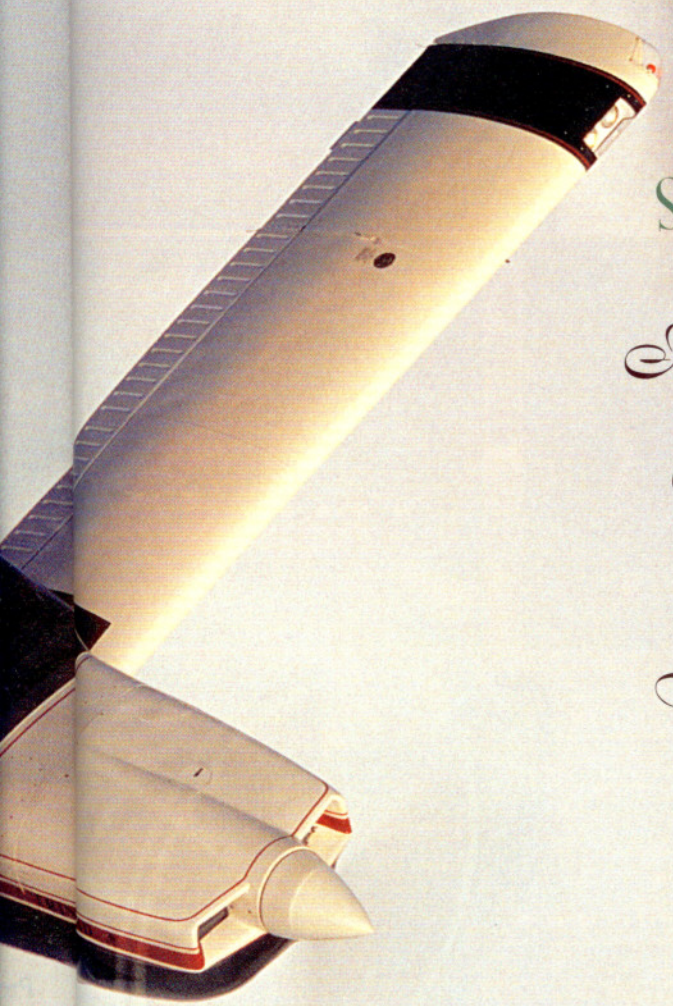


French Revival

Socata Trinidad

Reawakening American pilots to the Tarbes-built singles

By Marc E. Cook

Aerospatiale's Socata subsidiary is on a mission. For about the last five years, the company has emphasized so-called institutional sales—that is, cranking out fleets of training aircraft for consumption by big schools and hardy, training-intensive FBOs. As a result, sales of the high-end airplanes have languished. ■ Socata's Caribbean line—now comprising five models from the fixed-gear TB9 Tampico, and TB10 and TB200 Tobagos, to the retractable TB20 (normally aspirated) and TB21 (turbocharged) Trinidads—grew from a late-1970s design and achieved modest success early on. As the trainer sales took off, the Trinidads, in particular, became victims of limited production capacity. Partly because of this, few new Trinidads have come to this country in the last half-decade. ■ Starting now, says Socata's American arm, the emphasis will return to promoting and selling the Trinidad models. Demonstrator aircraft are being placed throughout the country, and a

PHOTOGRAPHY BY MIKE FIZER

new sales force is being readied. There is increased commitment from the home office responsible for money to fuel the sales and marketing endeavors. Its U.S. headquarters has moved from Grand Prairie, Texas, to Pembroke Pines, Florida. There are, once again, high hopes that the company can sell its share of high-performance airplanes here.

More of interest to prospective Trinidad buyers is that the equipment list has been expanded tremendously, making many previously optional items standard. In fact, the basic price of the airplane reflects a well-appointed package. Together with more aggressive pricing—the standard TB21 lists for about $375,000, while a nonturbo TB20 lists for $344,000—the Trinidads have really stepped up in the bang-for-the-buck category. The TB21 demonstrator we flew, N397TB, which had a handful of options, including leather seats, carried a list price of $382,000. Aside from the engine specification, the TB20 and TB21 are identical airplanes, with the same maximum gross weight, cabin accommodations, and equipment; the turbo -21 is about 100 pounds heavier.

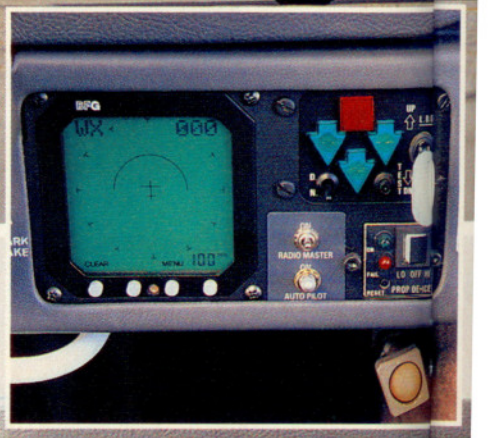
As part of the standard package, the TB20 and TB21 get the same comprehensive AlliedSignal Bendix/King avionics suite including dual nav/coms, DME, ADF, transponder, encoder, KFC 150 flight director/autopilot with altitude preselect, KCS 55A HSI, and KLN 90B IFR-approved GPS. A backup electric attitude indicator, located in the copilot's panel, is standard, while an electrically powered backup vacuum system is a $3,400 option.

Weather-avoidance gear is on the options list, too. The WX900 Stormscope in N397TB is a $4,800 option, but you can also specify a WX1000+ for $12,000 extra. You can also get a full-house EFIS system, a 75-cubic-foot oxygen system (standard on the TB21), and air conditioning. A TKS weeping-wing deicing system is a $40,000 option that is not, however, FAA-approved for flight into known icing. A glycol-deiced prop is standard on the TB 21 and optional on the -20; in operation, the wet prop slings enough glycol onto the windshield and wings to provide supplementary anti-icing.

While the equipment list and price have changed with the latest Trinidad, the airplane itself has received just minor tweaks. By 1987, Socata had moved the fuel selector from the panel to the center console—in the process eliminating the need to switch through Off when choosing tanks—and addressed shortcomings in the fuel system that made the early airplanes prone to vapor lock and water contamination. (All of the pre-1987 airplanes were required to have the tank drains moved so that all ingested water could be emptied.) At about the same time, the seats received slightly thinner bottom pads to help salvage some headroom. A 28-volt electrical system replaces the 14-volt setup that was the norm for the early airplanes.

Beginning with the 1997 models, the thin metal instrument-panel overlay disappears—many owners have complained that the overlay looks cheap and is hard to keep secured—to be replaced by smart, simple metal panel segments. Otherwise, the instrument layout is unchanged, with three separate binnacles that can be tilted forward for easier access to avionics. Also, ahead of the windshield there are two removable external panels that greatly simplify repairs. One ergonomic miscue that we noticed was the placement of the Stormscope in the small subpanel to the left of the radio stack; the display largely is blocked by the yoke.

All Caribbean models share the same basic airframe. The metal-and-composite fuselages are uncommonly wide, providing an expansive 50-inch-wide cabin that affords shoulder room to spare; even in the back, thanks to a fuselage that continues to widen behind the front row of seats. (Socata calls the Trinidads five-placers, but the three in the back need to be children to be comfortable.) Tall side windows and a wing position that's far enough back



Trinidad's expansive instrument panel is generally well laid out and accommodating of goodies. The Stormscope (lower left) hides behind the pilot's yoke. Trailing-link main landing gear smooths touchdowns.

Firm, supportive seats and distinctive automotive styling are hallmarks of the Trinidad. A triangular baggage door foils attempts to load bulky luggage. Rear seating is said to fit three abreast without the optional executive center console.

to allow for a view over the leading edge help add to the sense of airiness. As far as the passengers are concerned, the Trinidad rates highly as a comfortable ride.

When the line was introduced, Aerospatiale and Socata made a big deal of the TB series' novel construction features that help to cut assembly time and make routine maintenance easier. Indeed, maintenance gripes are relatively few, but owners are critical of Socata for failing to upgrade the quality of parts that fail in service. Routine inspections are made easier by an ample number of access panels and by the robust simplicity of the airframe. In addition, many of the critical high-wear items—engine, prop, brakes, hydraulics—are sourced from American companies, so spares and technical assistance are no more a problem than for your typical domestic airplane.

Adhering to French engineering tradition, the Trinidad departs from light-airplane custom at many an intersection. The constant-chord wing, for example, uses a single milled spar that runs from tip to tip. Like a Mooney's, the Trinidad's fuselage sits atop a continuous wing structure. The wing's substantial thickness enabled the designers to fit into a relatively small airfoil sufficient fuel (86.2 gallons usable on the TB20 and TB21), the main landing gear, and supporting structure. Spend much time working on a Trinidad and you'll realize that the production engineers and accountants had more say-so in the final product than did the aerodynamicists—there just aren't many of the small drag-reducing touches you'd see on, say, a Mooney.

Few pilots will discover surprises in the Trinidad's handling qualities. The primary control system uses pushrods exclusively, which lends a solid feel to the controls. Cables are relegated to moving the pitch- and rudder-trim tabs. As a result, the yoke rotates only about 90 degrees from stop to stop—which, combined with short-span, deep-chord ailerons, makes for heavy roll forces. At lower airspeeds, the roll

forces are reasonably well matched to the light stabilator forces, but at cruise and, particularly, in yellow-arc descents, the ailerons feel uncomfortably heavy. The ailerons have good authority, though, and along with the marvelously powerful rudder, give you a package that handles even nasty, gusting crosswind landings with aplomb—the demonstrated crosswind component is a whopping 25 knots.

With a span of 32 feet, the Trinidad's wing area is a mere 128 square feet. As a result, the Trinidad needs substantial flaps—about two-thirds of the span—to just squeak under the mandated 61-knot landing-configuration maximum under FAR Part 23. Two main characteristics stem from this small wing: An excellent ride in turbulence, thanks to the high wing loading—24 pounds per square foot, compared to the usual 16- to 20-psf loading of most high-performance singles—and relatively high approach speeds for a 3,086-pound airplane. Fortunately, with full flaps out, the Trinidad's drag profile allows inattentive pilots to shed any extra speed over the runway.

Socata has given the upper-division TBs a preselect flap switch—up, 10 degrees (takeoff), and 40 degrees (landing)—with no way to use any of the angles in between. Given the powerful nature of the single-slotted flaps, this setup is, in many ways, less than ideal. In particular, the transition from takeoff to landing flaps in the pattern causes the airplane first to balloon, requiring a power reduction to stay on the glideslope. Then, as the flaps reach full, the airplane pitches nose-over, begins to sink, and needs a shot of power to return the descent to the desired slope. It's not that the preselect flap concept is flawed, but it doesn't work as well with the Trinidad's powerul flaps as in other applications. Incremental settings would greatly ease the pilot's work load during configuration changes.

Narrow-track gear makes for an agile airplane on the ramp. Rectangular cooling-gill panel vents some of the turbo's heat out of the cowling.

Once you've got the approach sorted out, however, the Trinidad is a delight to land. The trailing-link landing gear is mercifully supple and able to handle unimproved strips. Power off and dirty, the Trinidad can develop fantastic sink rates and amazingly steep approaches—a good thing for getting into tight strips or when you get the call from tower that unless you can make a short approach, you'll be number five after a line of 757s.

As part of its simpler-is-better motif, Socata designed the TB's landing gear to be robust; an electrohydraulic power pack lifts the gear into the wells. If the pump should fail, simply release the pressure in the up side of the system through a button in the cockpit and the wheels will free-fall down. There are no separate gear doors; in fact, the nosewheel does not even fully retract into the belly.

Despite the wide cabin and clear preference on Socata's part for a simple airframe without much drag-reducing detailing, the Trinidad's cruise perfor-

mance is good. The standard TB20, with a 250-horsepower IO-540-C4D5D engine, will do 163 knots at 8,500 feet on about 15.5 gph. Its turbocharged brother, the TB21, powered by a similar TIO-540-AB1AD, will do 164 knots at 9,000 feet and 187 knots at 25,000 feet—both at 75-percent power and 16.4 gph.

To put it in perspective, the TB20 is marginally slower than a 250-hp Bonanza on about 2.1 gph more fuel, and on par with a Mooney MSE/201 that's burning just under 11 gph. Where the Trinidads falter is not in speed, but in efficiency—these parallel-valve Lycomings require a lot of fuel to get the job done. For example, the TIO-540's specific fuel consumption of 0.52 pounds per horsepower per hour is a league away from some other turbo powerplants.

Nor are the big gray engines particularly smooth. In both Trinidads, the 540s are mated to two-blade Hartzell

Socata TB21 Trinidad TC
Base price: $375,000
Price as tested: $382,000

Specifications

Powerplant	Textron Lycoming TIO-540-AB1AD
Recommended TBO	2,000 hr
Propeller	Hartzell two-blade, constant-speed
Length	25 ft 4 in
Height	9 ft 4 in
Wingspan	32 ft 1 in
Wing area	128 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	50 in
Cabin height	44 in
Empty weight, as tested	2,074 lb
Maximum gross weight	3,086 lb
Useful load, as tested	1,012 lb
Payload w/full fuel, as tested	494 lb
Fuel capacity, std	88.8 gal (86.2 gal usable)
	533 lb (517 lb usable)
Oil capacity	12 qt
Baggage capacity	143 lb

Performance

Takeoff distance, ground roll	825 ft
Takeoff distance over 50-ft obstacle	1,953 ft
Max demonstrated crosswind component	25 kt
Rate of climb, sea level	1,126 fpm
Max level speed, 25,000 ft	198 kt
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption)	
@ 75% power, best economy	187 kt/4.5 hr
25,000 ft	(98 pph/16.4 gph)
@ 65% power, best economy	160 kt/6.2 hr
15,000 ft	(74 pph/12.4 gph)
Max operating altitude	25,000 ft
Landing distance over 50-ft obstacle	1,770 ft
Landing distance, ground roll	925 ft

Limiting and Recommended Airspeeds

V_X (best angle of climb)	81 KIAS
V_Y (best rate of climb)	95 KIAS
V_A (design maneuvering)	129 KIAS
V_{FE} (max flap extended)	103 KIAS
V_{LE} (max gear extended)	139 KIAS
V_{LO} (max gear operating)	
Extend	129 KIAS
Retract	129 KIAS
V_{NO} (max structural cruising)	150 KIAS
V_{NE} (never exceed)	187 KIAS
V_{S1} (stall, clean)	70 KIAS
V_{SO} (stall, in landing configuration)	59 KIAS

For more information, contact Socata Aircraft, North Perry Airport, 7501 Pembroke Road, Pembroke Pines, Florida 33023; telephone 954/893-1400; fax 954/964-0805; or visit the Web site (www.socata.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.

constant-speed props, and there's a persistent shaking in the cockpit, discernible in the seats and visible on the instruments' needles. Mooney had much the same problem with the TLS/Bravo's similar TIO-540—which now turns a three-blade prop—but ongoing development got much of the shaking out of that installation. Socata, to get competitive on this performance point, could do the same.

At least the Lycomings are known quantities, robust and easily understood, so getting basic service should not be a problem anywhere in this country. Moreover, Socata went the extra mile in equipping the Trinidad TC with a superb turbo system. The Garrett turbocharger is mated to a sophisticated density controller to make boost management simple. Set manifold pressure during the climb, and the Garrett system will hold it faithfully right up into oxygen altitudes. Pilots accustomed to less-sophisticated turbo systems will love the TC's.

With a built-in oxygen system, good sustained climb performance, and improved true airspeeds, the TB21 encourages flying in the high teens and low 20s. In that range, the turbo system is stable—it's capable of maintaining full power to 20,000 feet—without any of the throttle sensitivity that afflicts some other turbo installations.

Socata chose not to fit the TC with an intercooler, though, so induction-air temperatures routinely run 150 degrees Fahrenheit down low, and 180 degrees in the flight levels. The upshot is this—you need to be watchful of engine temperatures at high power settings in the flight levels. The pilot's operating handbook calls for leaning to maximum turbine-inlet temperature (1,650 degrees) at all altitudes and

power settings. Unfortunately, the standard engine instrumentation fails to disclose why this might not be a great idea. Owners who have fitted multiprobe analyzers report that the stock, single-point CHT gauge does not always tell you about the hottest cylinder. At high power settings and high altitudes, it's possible to run the cylinder heads above 425 degrees, often with the stock gauge reporting 375. (It's become good operating practice to keep the heads as cool as possible, with many pilots considering 400 degrees as the upper limit.) As you'd expect, the nonturbo Trinidad runs comparatively cool. And speaking of gauges, the standard capacitance fuel gauges are prone to innaccuracy, so a fuel computer is a worthwhile add-on.

If you were the last one on your block to drive a Peugeot or you think that the 99 was the best-looking Saab made—that is to say, your tastes run toward the unusual—then you are Trinidad material. The model's European panache and American components offer buyers the best of both continents. Now that Socata is committed to producing the Trinidads, pilots yearning for something completely different will have another choice. Socata's decision to rejoin the market comes at a good time. The TB20 slots neatly in between Mooney's Allegro (nee MSE and 201) and Ovation, while the turbo Trinidad goes up against the faster but smaller TLS/Bravo. Until Cessna replaces rumors of a 210 successor with metal and the Lancair Columbia and Cirrus SR20 become realities, the Trinidad has open road ahead of it. □

Links to all Web sites referenced in this issue can be found on AOPA Online (www.aopa.org/pilot/links.shtml). E-mail the author at marc.cook@aopa.org