



TB 20 Trinidad

Sceni-cruiser

Notes and insights on one prize airplane

BY THOMAS A. HORNE

Since the early 1980s, Socata has been steadily carving out market share in the piston-single arena. The French-based company (now under the umbrella of EADS—the European Aeronautic Defence and Space Company, makers of Airbus airliners, Eurocopter rotorcraft, Ariane rocketry, and military aviation hardware) got its first real toehold in the United States after the product liability crisis raised its head, big time, in 1986. That's when Cessna stopped building piston singles, and Beech and Piper cut their piston-airplane manufacturing way, way back. Suddenly, Socata's singles—the TB 9 Tampico, TB 10 Tobago, TB 20 Trinidad, and TB 21 Trinidad TC (a turbocharged version of the TB 20)—were the only new singles being produced in volume. Suddenly, there were more Socata airplanes on American ramps, and they no longer seemed so strange or exotic. They'd become accepted.

PHOTOGRAPHY BY MIKE FIZER



Of all the airplanes in the TB series (the TB stands for *Tarbes*, the French city where Socata has its manufacturing site), the Trinidad has proven the most popular. Its mating of a normally aspirated Textron Lycoming 250-horsepower engine with a roomy four-seat cabin, 86-gallon fuel tanks, and the airplane's 1,200-pound useful load makes it a nice cruising machine with true airspeeds just 10 or so knots below those of a normally aspirated Raytheon Beechcraft Bonanza.

Then there are the stylistic aspects of the TB series' design. The gull-wing doors are the first to catch your eye, and they let you and your passengers enter and exit the cockpit with ease. They're sort of the aviation equivalent of the famous Mercedes-Benz 300SL's gull-wing doors, with the way they're hinged at the top and swing open wide. Their huge window areas also give you great visibility. Caveats: Don't let a gust of wind yank the doors from your grip during ground operations, and be prepared for the greenhouse effect in hot, sunny weather.



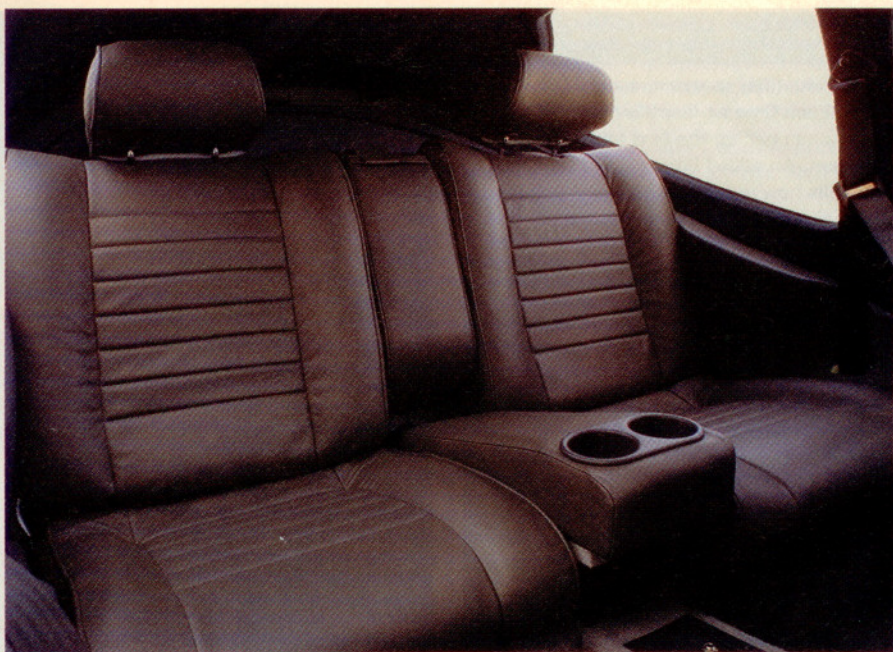
The seats are excellent. Designed by Recaro, a firm that provides high-quality seats for upscale automobiles, they are firm, ergonomically correct,

The Spirit of Liberty is the ultimate in safety, style, and comfort. A huge options package includes a second electrically powered attitude indicator and much more. The leather seats make long trips a breeze, and the paint scheme draws crowds wherever you land.

and come with side bolsters and really commendable lumbar support. All general aviation seats should be this well designed.

Since 2000, new Trinidades have the GT suffix added to their names. This stands for *Generation Two*, meaning that the airframe can be endowed with a number of noteworthy improvements. These include:

- Larger windows, made possible by elimination of the external, vertical aluminum window pillars on the gull-wing doors and aft windows. The windows are now tinted plexiglass inserts, which blend more naturally into the airplane's lines at the same time they provide greater visibility.
- Retractable footsteps. Retract the gear and the steps retract too, reducing drag.



- Propeller anti-ice. This is an optional TKS system that uses a glycol fluid reservoir (accessible through a dedicated access door in the cowl) and routes fluid to the propeller via small tubes. Cockpit instrumentation for the system includes a rocker switch for the two-speed fluid pump and a low-fluid indicator light.
- An optional three-blade Hartzell propeller, which is necessary if the TKS propeller anti-ice is ordered.
- More headroom, thanks to expanded cabin dimensions and a redesigned headliner.
- A faired-in vertical stabilizer and upswept wing tips. Earlier models had squared-off wing tips and a vertical stabilizer that jutted up from the fuselage at a clumsy angle.

- A larger luggage door than prior models.

The ultimate Trinidad GT

Now that we've established the Trinidad GT as one unique, capable airplane, it's time to take the concept several steps beyond.

As part of the AOPA Air Safety Foundation's Online Auction effort, Socata, ASF, and a number of corporate par-

ticipants have come together to create the supreme GT, one that's packed with safety equipment, just about every option on the price sheet, and one remarkable paint job. This prize airplane even has a name: *The Spirit of Liberty*.

The name sets the theme of the paint job, though calling it a "paint job" is a misuse of the term. Maaco does paint jobs; this is a work of art.

The art is a creation of Oxford Aviation, of Oxford, Maine. Long renowned for the quality of their work, *The Spirit of Liberty* proves that Oxford's president, Jim Horowitz, and his crew of experts are fully capable of rising to any challenge.

The scheme symbolizes Franco-American patriotic unity. The inspiration, of course, was a response to the September 11 terrorist attacks. From the right wing flows the French tricolor. From the left, the Stars and Stripes. They intertwine mid-fuselage—best viewed from above, as you can in the cover photograph. Oxford designer Margaret Larlee came up with the flag layout's look and dimensions, and the extensive airbrushing was the work of Thomas Williams.

The exterior alone is enough to make this airplane noteworthy. The avionics package, which includes practically every option available on the TB 20, is the icing on the cake.

The panel's pièce de résistance is its Honeywell Bendix/King IHAS 5000 avionics suite. The IHAS (Integrated Hazard Avoidance System) consists of a moving map—of course—plus traffic-, terrain-, and weather-avoidance information, all displayed on a 6.2-inch-wide, 4-inch-high display unit that Honeywell Bendix/King calls the KMD 550.

Traffic and terrain advisories are provided via the KMH 880 sensing unit, which incorporates an enhanced ground proximity warning system (EGPWS), complete with aural advisories. Also included in *The Spirit of Liberty* is a Honeywell Bendix/King KLN 94 GPS receiver, KFC 150 autopilot and

Let the bidding begin

Like to get your hands on N708TB? It's easy. Just make your bid on the AOPA Air Safety Foundation's Online Auction Web site. Bidding is open to everyone—you don't have to be an AOPA member to participate. Bidding officially began on May 1, and the winning bidder will receive *The Spirit of Liberty* this October at AOPA Expo 2002 in Palm Springs, California. For more details, or to place your bid, visit the Web site (www.aopa.org/asf/auction).

—TAH

Life with an IHAS 5000

Push-button safety

One flight in a Honeywell Bendix/King IHAS-equipped airplane and you're spoiled forever. I know, because I just logged five hours or so with an IHAS 5000 system. This is the system that includes TCAS-like traffic advisories, terrain information and ground proximity warnings, and uplinked



weather information—all on a central display unit, the KMD 550.

You call up the different advisories by simply pressing on one of three keys. The WX key brings up textual weather information and color

ground-based Doppler weather radar imagery. The TERR key shows a color-coded display of terrain elevations; anything in red indicates terrain or obstructions that are at or above your altitude. The TRFC key brings up symbols that represent other aircraft in your vicinity—along with their altitude relative to yours, and whether the nearby traffic is climbing, descending, or flying level.

Another key—MAP—gives you color moving-map imagery. The map shows symbolic, color-coded terrain elevations as part of the base map, plus your flight-planned route. Obstruction symbols for towers also appear on the default moving-map display. Other overlays are also possible, simply by pressing the OVLY line-select key at the display's right edge.

For example, you can elect to show the moving map with your route overlaid on it, plus traffic information. Or you can declutter the moving map and make the 550 show nothing but terrain and traffic. Other display combinations are also possible, such as traffic, Stormscope, and terrain.

Perhaps most impressive is the weather-reporting capability. Press the WX key, and uplinked METARs and TAFs for your route of flight can be selected, along with those for the six airports nearest your departure and destination airports. The joystick at the top right of the 550 can be used to shuttle from airport identifier to

airport identifier as you make your way en route. Each time an identifier is highlighted, you can call up the text information you want. An added bonus is the readout that tells how old the METAR or TAF is, in terms of minutes or hours. There's no wondering, "Is that an old report, or did it just come out?" You know in an instant.

The Nexrad Doppler radar imagery is another valuable en route flight-planning tool. Use the joystick to slew a cursor to an area of uplinked radar returns, zoom in or out using the RNG arrows, and voilà—there are the thunderstorm cells' contours, unattenuated and only somewhat diminished in clarity and resolution by the pixellated imagery. To see how storms may affect your route, you can even see it projected on the Nexrad page.

The TAS (traffic advisory system) is a

real eyeopener. On one demonstration flight, I came in high on an approach path to a runway, then dumped the nose of the airplane to prompt an EGPWS callout. It didn't take long for the voice in the box to calculate my clo-

sure with the Earth, then firmly tell me to "pull up, pull up." As for TAS, well, let's just say that there can be plenty to see when it comes to nearby air traffic. Fly near any moderately well-traveled airspace and a sea of traffic returns can materialize on the display. And while the TAS in this IHAS doesn't give resolution advisories—commands to climb or descend to avoid a collision, à la the TCAS II equipment mandated in airliners—it's very easy to interpret the TAS symbology and take corrective actions on your own.

IHAS' best feature is its transparency of operation. The information sent to the IHAS sensors comes in constantly. The only pilot workload is pushing buttons, and the system's operation and information datasets are intuitive and easy to interpret. Though a fairly complete system—the only thing missing is airborne weather radar—it's important to remember that this is one of the first in what is sure to become a small avalanche of in-cockpit hazard-awareness equipment. The dawn of satellite broadcast technology will be next, for example, which will offer wider coverage (IHAS' uplinked weather uses terrestrial stations that are affected by line-of-sight limitations). But for the foreseeable future, systems like the IHAS 5000 will reign as the top of the line. For most of us, it's all we could ever ask for.

—TAH



flight control system, KY 297 altitude preselect unit, KDR 510 digital datalink receiver, and Goodrich Avionics WX-500 Stormscope. The KMD 550, with its large color liquid-crystal display, is the panel's centerpiece. By pushing dedicated function and line select keys around the display's periphery, you can make the 550 show:

- A moving map, based on GPS inputs, which shows terrain features, airports, and an alphanumeric readout of your present position described in latitude/longitude or range and bearing from the nearest airports or VORs. Track and groundspeed information is also presented.
- Traffic information from the KMH 880's traffic advisory system sensors.
- Aural terrain advisories from the 880's EGPWS ("pull up, pull up") functionality, plus height-above-ground callouts.
- Stormscope lightning plots from the WX-500.
- Uplinked textual weather (such as METARs, TAFs, area forecasts, and pireps) and ground-based Nexrad color weather radar imagery, beamed up from Honeywell's network of terrestrial stations and sent through the ship's datalink receiver. This system uses Flight Information Systems-Broadcast (FIS-B) technology, meaning that the information is broadcast continuously.

All of these features make this TB 20 one of the most well-equipped piston singles in the world. With everything but airborne weather radar (which is not yet available in the TB series), the pilot of



tinged with chaos and last-minute scurrying, and this was no exception. The Oxford crew was still buffing the airplane's paint as I got in the cockpit. It was as if they didn't want to let it go: The plane was gassed up, Horowitz brought two boxes of goodies for cleaning the paint properly and some touch-up paint, all of Oxford's shop workers were out on the ramp taking pictures, and it was, "OK, let's do one with the doors open; OK, now let me get a ladder for a high shot; OK...hey, what's that streak on the windshield? Let's rub that wax off; OK, now you

stand in front of the plane...now you...and you..." You get the idea.

After I finished the runup and began entering the flight plan into 708TB's KLN 94, I noticed several people coming toward the airplane, waving and pointing to a riveter in one man's hand. They motioned for me to open the door. Seems they forgot to install the data plate and Oxford Aviation's decal on the aft fuselage. Probably distracted by the picture taking.

Anyway, the first leg of the trip was fairly uneventful. For takeoff you dial in some right rudder trim (there's a takeoff

this airplane will have unparalleled situational and weather awareness. And don't let the lack of airborne weather radar make you think this airplane's been shortchanged. The uplinked Nexrad imagery can give a truer picture of any storm cells than any airborne radar. That's because powerful ground-based radars like these use monstrous antennas that produce powerful, narrow beams that are attenuation-free. Their radar signals can penetrate deep into storm cells, unlike airborne radars that can bounce their energy back prematurely and give false returns when heavy precipitation is near.

East Coast cruising

To get a good sense of any airplane, it's important to live with it and fly it on different types of missions. It was my good fortune to fly N708TB—*The Spirit of Liberty*—from the Oxford County Regional Airport in Oxford, Maine (Oxford Aviation's home base), all the way to Lakeland, Florida's Lakeland Linder Regional Airport. The purpose of the trip was to deliver the airplane to the Sun 'n Fun EAA Fly-In, where it would grace the Socata static display area. I made the trip in three legs—from Oxford to AOPA's home field at Maryland's Frederick Municipal Airport; from Frederick to Georgia's Savannah International Airport; and from Savannah to Lakeland. Total flight time was nine hours, 15 minutes. In one day.

The departure from Oxford was humorous. Delivery flights are always




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setting on the rudder trim scale, just to your right on the center pedestal), put the flaps to the takeoff setting, line up on the runway, floor it, rotate at 68 knots, and climb away at 75, then 95 to 100 kt. I leveled off at 6,000 feet, then set power at 22 inches manifold pressure and 2,500 rpm, then leaned the mixture to about 100 degrees rich of peak EGT. The result was a 75-percent power setting and a 16-gph fuel burn. The airplane had but 12 hours on it, so it was important to run it hard to help seat the piston rings and otherwise break in the shiny new Lycoming.

There was some light icing in the clouds from Massachusetts to central Connecticut, so I turned on the TKS propeller anti-ice. I used the low-speed pump setting—the anti-ice position, and one that would use glycol at one-fourth gph. At this rate the half-gallon tank of glycol would last for two hours, 10 minutes, according to the pilot's operating handbook. At the high-flow setting, the glycol would last for one hour, 35 minutes.

True airspeed on this leg worked out to 157 kt, which was very close to book predictions. Periodically I checked the

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SPECSHEET

EADS Socata TB 20 Trinidad GT
Equipped price, Honeywell
"Premium Limited" Edition: \$357,150
Price as tested: \$420,000

Specifications

PowerplantTextron Lycoming IO-540,
250-hp @ 2,575 rpm
Recommended TBO2,000 hr
PropellerHartzell three-blade,
constant speed, 76-78-in dia
Length25 ft 5.1 in
Height9 ft 4.2 in
Wingspan32 ft 3.8 in
Wing area128 sq ft
Wing loading24.1 lb/sq ft
Power loading12.3 lb/hp
Seats4
Cabin length8 ft 4 in
Cabin width50 in
Cabin height3 ft 11 in
Standard empty weight1,814 lb
Empty weight, as tested2,009 lb
Max gross weight3,086 lb
Max useful load1,272 lb
Max useful load, as tested1,077 lb
Max payload w/full fuel755 lb
Max payload w/full fuel, as tested560 lb
Fuel capacity, std88.8 gal
(86.2 gal usable)
Baggage capacity143 lb

Performance

Takeoff distance, ground run1,329 ft
Takeoff distance over 50-ft obstacle2,150 ft
Max demonstrated crosswind component
25 kt
Max rate of climb1,200 fpm
Cruise speed/range w/45-min rsv, std fuel
(fuel consumption) 6,500 ft
@ 75% power, best power160 kt/
740 nm (16.2 gph)

airplane's Shadin fuel totalizer—another option—to see my fuel status. By the time I reached Delaware I was in and out of snow showers, mesmerized by the way snow seems to speed by in masses of unbroken streaks. After three hours, 15 minutes and 500 nm of flying, I was in the pattern at Frederick. It was bumpy, windy, and gusty for the arrival, and I landed in a 25-kt crosswind that the Trinidad handled without the slightest bit of drift or other complaint. Believe me, it wasn't my technique. This is the airplane's maximum demonstrated crosswind component, so once again the book seems not to have lied.

The leg to Savannah was distinguished by steady, light turbulence and tailwinds that pushed groundspeeds to the 182-kt mark. The leg to Lakeland was the same at first, but when night fell the turbulence disappeared. Flying in and out of clouds between Jacksonville and Ocala, I could look down and see miles-long traffic backups on

@ 65% power, best economy,
10,500 ft153 kt/935 nm
(12.6 gph)
Service ceiling20,000 ft
Landing distance over 50-ft obstacle1,820 ft
Landing distance, ground roll.....825 ft

Limiting and Recommended Airspeeds

V_R (rotation)68 KIAS
 V_X (best angle of climb), gear and flaps down....
.....67 KIAS
gear and flaps up.....81 KIAS
 V_Y (best rate of climb), gear and flaps down
.....73 KIAS
gear and flaps up.....95 KIAS
 V_A (design maneuvering)129 KIAS
 V_{FE} (max flap extended), takeoff setting
.....129 KIAS
landing setting103 KIAS
 V_{LE} (max gear extended)139 KIAS
 V_{LO} (max gear operating)
Extend129 KIAS
Retract129 KIAS
 V_{NO} (max structural cruising)150 KIAS
 V_{NE} (never exceed)187 KIAS
 V_{S1} (stall, clean)70 KIAS
 V_{SO} (stall, landing configuration).....59 KIAS

For more information, contact Socata Aircraft Inc., North Perry Airport, 7501 Pembroke Road, Pembroke Pines, FL 33023; telephone 954/893-1400; fax 954/964-0805; 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.

Florida's highways, long ribbons of red taillights. How lucky to be zooming by at 200-plus mph. Cabin lighting is excellent, by the way, with overhead and yoke-mounted map lights, internal instrument lighting, and glareshield flood lighting. It reminds me of Bonanza lighting setups.

I really should mention that the seats were vital to this mission's success. You

see, owing to an unfortunate encounter involving sonic rodent-repellent equipment and a disrespect for proper lifting techniques, I royally screwed up my back before the trip began. But the Trinidad's seat design let me fly in comfort the whole day long.

It's always gratifying to finish a long trip, and especially satisfying to make a delivery flight on schedule. So it was at Lakeland. I'd flown nearly the entire length of the eastern seaboard in style and comfort, IFR and VFR, unburdened by hubs and spokes, invasive security checks, or long waits. I'm

i Links to additional information about EADS Socata aircraft may be found on AOPA Online (www.aopa.org/pilot/links.shtml).

looking forward to more flights in 708TB, and looking forward to making more reports on AOPA's and the AOPA Air Safety Foundation's Web sites as I fly here and

there. Going to AOPA's Fly-In and Open House on June 1? Me too. Stop by and we'll shoot the breeze.

AOPA

E-mail the author at tom.horne@aopa.org

IMPROPER BALANCE CAN LEAD TO EARLY RETIREMENT.

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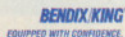
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