

TRINIDAD

From France, with flourish

BY MARK R. TWOMBLY



When it comes to the airplanes they buy, pilots are an ironic mix of don't-change-a-thing traditionalist and attracted-to-the-new adventurer. It's okay for a new design to be different, as long as it doesn't stray too far from the tried and true. That is one reason most foreign-built light airplanes imported to the United States in the past haven't fared too well and, conversely, why the French-built Aerospatiale Trinidad is on its way to good success.

Aerospatiale, France's aviation and space manufacturing conglomerate,

took pains to consider American tastes when it was designing a new line of piston singles in the late 1970s. A U.S. pilot was invited to the factory in Tarbes in the south of France to evaluate a prototype. The visit resulted in about a dozen changes to the design, all intended to suit American pilots. The product is a four-place, 250-horsepower retractable single with conventional configuration and flying qualities, plus good performance and a welcome new approach to cabin comfort and design. The Trinidad is both reassuring in its conformity and refreshing in its uniqueness.

The TB-20 Trinidad is a handsome standout on the ramp. The design may be a decade old, but it retains a thoroughly modern look. In fact, the only other new-design general aviation piston single that has been certified since Aerospatiale introduced its TB series (the fixed-gear 160-hp TB-9 Tampico and 180-hp TB-10 Tobago; TB-20 Trinidad; and TB-21 turbocharged Trinidad TC, all of which share the same basic airframe) is the Piper Malibu.

Two of the Trinidad's distinguishing physical traits are its wide fuselage and generous window area. The cabin measures just over 50 inches across and appears even more spacious because of the visibility. The corners of the steeply raked windshield drop down to the mid-point of the fuselage, and the two door windows stretch from the top of the fuselage to waist level. The rear side windows also are oversize. Tinted windows are an option and a desirable one, considering the Trinidad's greenhouse-like expanse of glass.

One other unusual airframe feature is the placement of the tall vertical fin ahead of the large, one-piece stabilator. According to Aerospatiale, this was done both to simplify manufacturing and to prevent the stabilator from blocking airflow over the vertical fin and rudder. The rudder is effective at steep angles of attack and for spin recovery. (The Trinidad is certified in the Normal category and is not approved for spins.)

The 59-knot landing-configuration stall speed (70 knots with gear and flaps retracted) is on the high side for a four-place single, but stall characteristics are exemplary. The nose gently bobs, and a high sink rate develops. The only other clue that a stall has occurred is a blaring warning horn.

Cruise stability is at the top of the Trinidad's list of attributes. The wing has a generous 6.5 degrees of dihedral



and relatively high loading for a smooth ride in turbulence. Small-span ailerons would seem to be a tip-off to ponderous roll control, but the opposite is true. All of the flight controls are smooth and well-balanced, with comfortable pressures. The ailerons are aerodynamically balanced, and the stabilator has a large counterbalance hidden in the tailcone. Control surfaces are actuated with push rods, so there is no slop in the system.

The Trinidad's Lycoming IO-540 is not forced to work terribly hard. Its production is kept to 250 hp by limiting rpm to 2,575. Other normally aspirated versions of the IO-540 are rated at 300 hp. TBO on the Trinidad engine is 2,000 hours. Fully loaded, the airplane climbs at 1,250 feet per minute. We were about 625 pounds under gross on one short flight in N2535E, and the vertical speed





a consequence of the Trinidad's modular, monocoque construction.

Maximum landing weight is 143 pounds less than maximum takeoff weight. The difference becomes significant if you choose to cover all the contingency bases, including a precautionary landing immediately after takeoff. That would mean limiting takeoff weight to landing weight, which reduces the load by one passenger or a couple of hours of gas. Aerospatiale is correcting this by strengthening the main landing-gear wing-spar attachments to bring the landing weight up to max takeoff weight. The change will be incorporated on new Trinidades beginning this fall.

The visibility out the cabin is especially welcome in the traffic pattern. It is possible to scan above, below, and behind the airplane in level flight. The Trinidad's stability breeds confidence for hand-flying approaches in the clouds, and the trailing-link main landing gear contributes to soft arrivals.

The standard electric flap switch has infinite positioning. An optional flap preselect switch limits flap choices to fully retracted, 10 degrees for takeoff and approach, and fully extended. The flaps are long, and when fully extended, the drag is significant. A high sink rate can develop at slow approach speeds.

Most of the Trinidades sold in the United States have the optional vividly colored trim coat on the top half of the fuselage. The 1989 model we flew, a demonstrator borrowed from Frederick Aviation, Aerospatiale's Middle Atlantic states distributor, has a white base coat separated from attractive deep-burgundy trim by a swath of gold striping.

The two large hinged-at-the-top "butterfly" doors are attention-getters. When you pop them open, you can expect to attract people eager to ask questions about the airplane.

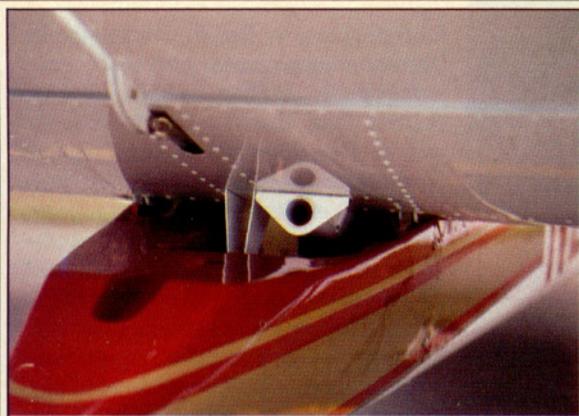
Small shock absorbers dampen the movement of the doors as they are opened and closed. Grasp a recessed grip in the door to pull it closed, but be careful not to leave a thumb exposed to the jamb. The doors are heavy and could easily crush a finger.

After engine start, an arm can be propped against the base of the door to keep it ajar and help ventilate the cabin. Each door is latched and unlatched by rotating a handle. Before taxiing onto the runway, you'll want to triple-check that the handles are in the locked position so those big butterfly wings won't suddenly start flapping.

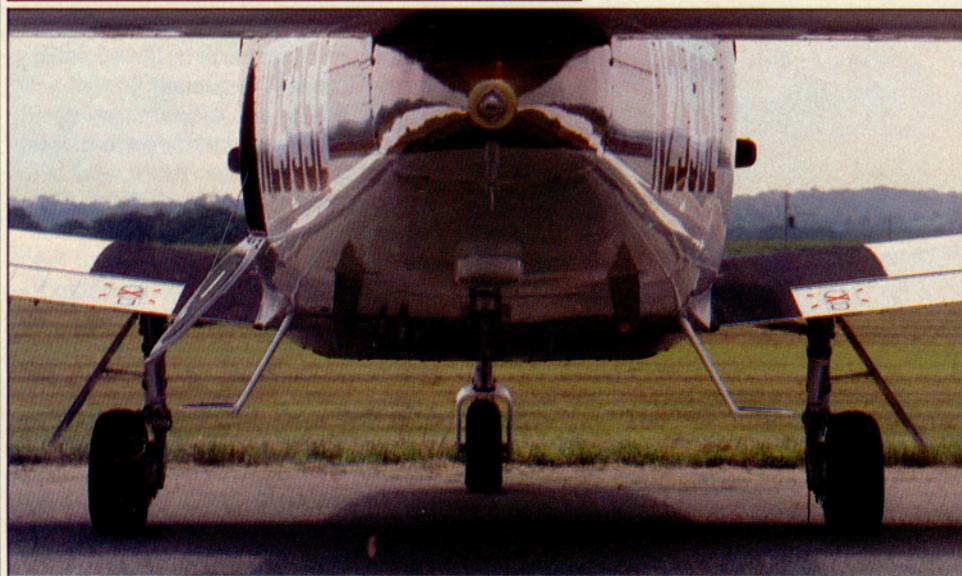


indicator held steady at about 1,500 fpm as we searched for the top of a thick blanket of hot, humid, midsummer haze. Once on top and level, the power was set at 23 inches of manifold pressure and 2,300 rpm for a true airspeed of 160 knots. Aerospatiale's specifications call for a 75-percent-power cruise true airspeed of 159 knots at 8,000 feet on 13.7 gallons per hour.

Fill the tanks to the brim with 88.8 gallons (86.2 gallons usable), and you can fly for five hours, have an hour's reserve, and still pack a full load. Standard empty weight is 1,764 pounds for a full-fuel payload of 804.8 pounds. N2535E weighed in at 1,888 pounds empty. Full fuel and a 170-pound person in each of four seats would bring the weight right up to the 3,086-pound gross. The oddly shaped baggage door is



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The attractive and functional cabin reflects an automotive heritage. The interior is the work of a designer from Renault, the French automaker, who teamed with Coggiola, a leading Italian automotive interior design firm.

The panel is divided by function into three distinct sections: primary flight and navigation instruments and indicators on the left, engine instruments and space for optional indicators on the right, and a tall stack of avionics separating the two. The panel is hinged at the bottom to allow the top to pivot out for quick access to wiring and hardware.

Pilot and passengers recline slightly in comfortable, deeply cushioned seats that provide support in all the right places. Front seats pivot forward to allow rear-seat passengers to climb in and out. A canvas flap behind the rear seats zips closed to isolate the baggage area.

The two front seats are separated by a center console. Push-button electrical switches (including a switch for the electric turn coordinator), engine power controls, flap switch, elevator trim, fuel selector, and headphone and microphone jacks are arrayed on the console from

front to back. The Trinidad pilot flies reclined and relaxed, left forearm perched on an armrest, left hand on yoke, and right arm resting on the console to tweak power and trim. If the yoke were shaped more like a steering wheel, it would be easy to imagine yourself in a luxury sports sedan cruising on the Peripherique around Paris at three miles a minute.

An optional set of lap restraints turns the Trinidad into a five-seater. The shortest person in the party will draw seat number five atop a small hump in the middle of the rear bench seat.

Lack of headroom was a complaint heard when the Trinidad first appeared. The main spar runs under the front seats, which limits the amount of legroom for rear-seat passengers and headroom for the front seats. Aerospatiale redesigned the seats to gain about an inch of headroom. Now the interior is undergoing a second round of improvements. New seat frames and fabric will be used, along with more carpeting and fabric in place of plastic trim.

Other changes include upgrading from a 14-volt to a 28-volt electrical sys-

tem, a switch from acrylic paint to polyurethane for better protection against ultraviolet deterioration, a new stripe design on the tail for the standard paint scheme, and a more durable muffler and brake lines.

Base price of the Trinidad is \$133,640. N2535E is equipped with Bendix/King IFR avionics, including an HSI and KAP 150 two-axis autopilot, built-in intercom, tinted windows, flap preselect, fifth-seat restraint, and optional paint design. It retails for \$184,043.

A U.S. company, Aerospatiale General Aviation (AGA), is responsible for marketing and supporting TB-series airplanes in this country. A few Trinidades are ferried from France to the United States, but to avoid extra flight time, most are now shipped in containers and assembled at AGA's headquarters at Aerospatiale Helicopter Corporation's facility in Grand Prairie, Texas, south of the Dallas-Fort Worth airport.

All retail sales are handled through dealers and distributors. AGA is responsible for technical and customer support. Parts are stocked and shipped by Aviall. Much of the Trinidad is made in the



United States: engine, avionics, instruments, and wheels and brakes. Two-day service is promised for any part that must be ordered and shipped from the factory in France.

Despite having U.S. pilots in mind from the beginning of Trinidad production, Aerospatiale has had to negotiate a costly five-year learning curve in introducing the airplane to this country. Early problems in setting up retail sales outlets appear to have been solved, however, and AGA is expanding its distributor/dealer network.

This fall, Aerospatiale will build its 1,000th TB-series airplane in Tarbes. It will be a Trinidad. Of the 192 airplanes exported to the United States, 117 have been Trinidads.

The Trinidad's virtues—its climb and cruise performance, endurance and payload capability, and the comfortable, modern cabin—are helping to lay to rest the notion that foreign-manufactured airplanes are just a little too quirky, homely, or poorly supported for American tastes. Traditionalists listening for the sound of something new are discovering it may have a French accent. □

Aerospatiale TB-20 Trinidad

Base price: \$133,640

Specifications

Powerplant	Lycoming IO-540-C4 D5D, 250 hp @ 2,575 rpm
Recommended TBO	2,000 hr
Propeller	Hartzell two-blade, constant-speed, 80-inch diameter
Length	25.25 ft
Height	9.33 ft
Wingspan	32.5 ft
Wing area	128.1 sq ft
Wing loading	24.1 lb/sq ft
Power loading	12.3 lb/hp
Seats	4-5
Cabin length	8.4 ft
Cabin width	4.2 ft
Cabin height	3.67 ft
Empty weight	1,764 lb
Empty weight, as tested	1,888 lb
Max ramp weight	3,097 lb
Useful load	1,333 lb
Useful load, as tested	1,198 lb
Payload w/full fuel	804.8 lb
Payload w/full fuel, as tested	680.8 lb
Max takeoff weight	3,086 lb
Max landing weight	3,086 lb
Fuel capacity, std	88.8 gal (86.2 gal usable)
	532.8 lb (517.2 lb usable)
Oil capacity	13.3 qt
Baggage capacity	143 lb
Performance	
Takeoff distance, ground roll	1,250 ft

Takeoff distance over 50-ft obstacle	2,100 ft
Max demonstrated crosswind component	25 kt
Rate of climb, sea level	1,250 fpm
Max level speed, sea level	167 kt
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption)	

@ 75% power, best economy	159 kt/5.65 hr
8,000 ft	(82.2 pph/13.7 gph)
@ 65% power, best economy	149 kt/6.4 hr
8,000 ft	(72.6 pph/12.1 gph)
@ 55% power, best economy	138 kt/7.3 hr
8,000 ft	(63.6 pph/10.6 gph)

Service ceiling	25,000 ft
Landing distance over 50-ft obstacle	1,740 ft
Landing distance, ground roll	820 ft

Limiting and Recommended Airspeeds

Vx (best angle of climb)	75 KIAS
Vy (best rate of climb)	95 KIAS
Va (design maneuvering)	129 KIAS
Vfe (max flap extended)	130 KIAS
Vle (max gear extended)	139 KIAS
Vlo (max gear operating)	
Extend	129 KIAS
Retract	129 KIAS
Vno (max structural cruising)	151 KIAS
Vne (never exceed)	187 KIAS
Vr (rotation)	68 KIAS
Vs1 (stall, clean)	70 KIAS
Vso (stall, in landing configuration)	59 KIAS

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. □