

Pilot Flight Check

The Turbocharged Beech Baron

It can carry a ton
to 25,000 feet,
for flying in the highest
of style

by BERL BRECHNER / AOPA 466558

■ ■ Beech Aircraft Corp. makes five distinctly different airplanes labeled "Baron." The newcomer to the family is a turbocharged light twin that has now been plying the air lanes for just over a year.

What makes this Baron unlike all other Barons? Load carrying. An equipped B58 TC will carry about a ton of people, fuel, and cargo, and still be able to slice the air at over 220 knots.

Almost two years ago Beech brought out their Baron 58 P, a pressurized Baron that was equipped with (naturally) turbocharged engines. The 58 TC is virtually the same airplane, except it foregoes the pressurized airtight shell. The turbocharged Baron is pulled by two Continental TSIO-520-L engines, each rated for 301 hp. (If only one engine is developing power, there is an extra 100 rpm available to the operating engine, bringing the maximum horsepower to 310.)

Though the 58 TC was brought out as a new offering, Beech had once before marketed a turbocharged Baron. Eighty-four copies of that airplane, with 340-horsepower Lycomings, were issued between 1967 and 1971. But, according to a Beech marketing man now working with the Baron line, the early turbo Baron had simply too much engine. Though its performance was good, it burned inordinately large amounts of fuel to achieve its capabilities; its sales dropped off as buyers opted for the next larger plane in the Beech line, the Duke.

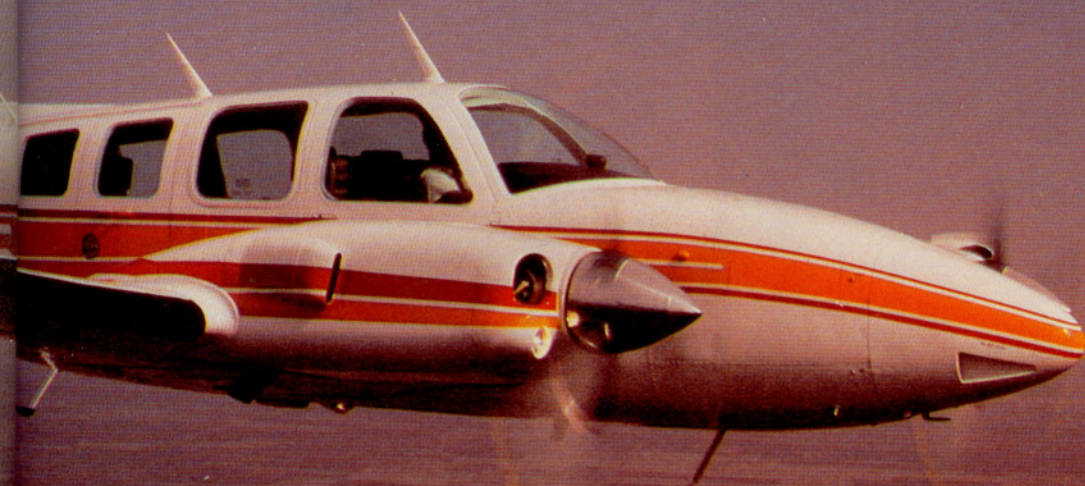


This latest turbocharged Baron is not a remake of the older airplane. It is, in effect, a new airplane. It has undergone recertification, and meets FAA approval standards set in FAR Part 23, amendments 1 through 12. Its engines are adopted from the pressurized Baron, fuel delivery systems have been simplified, and the wing structure and landing gear are stolen from the heavier Duke.

On the outside, only minor items help distinguish a turbocharged Baron from its counterparts. Its engines extend about a foot further forward than do engines on the unblown Barons. And on the front of each engine nacelle you'll find a landing light. On the other Barons the light is found in the wing leading edge. Also, the nacelle sports a large air intake on the side, rather than across the top.

On the inside, you can load six people and close-to-full tanks with the optional fuel load of 190 gallons. The airplane flown by PILOT, N4255S, tallied a basic empty weight of 4,149 pounds. With a 6,140-pound maximum ramp weight, the craft's load-carrying potential comes within nine pounds of an even ton.

As a luxury twin, its interior was graced with lush carpeting, buckskin cabin walls, face-to-face seating and a fold-out table for the four rear occupants. Beech doesn't craft its fine-tuned machines at bargain-basement prices, however. This demonstrator spec'd out at \$231,313. And though this price included most options wanted (and offered, for that



matter), the plane was not equipped with weather radar, a multi-thousand-dollar piece of gadgetry many pilots might like to have aboard this high flier.

Avionics that were installed included a full complement of Collins Micro Line radios, King DME, and Edo-Aire Century IV autopilot. With the center-mounted control column and power controls above the column, weather radar would have made the panel layout in 55S uncomfortably cramped.

Besides the avionics, the other big options on this Baron TC were de-ice boots, and anti-ice prop and windshield heaters. Ice protection alone for the craft costs over \$12,000.

Additional extras included extended range tanks (\$3,795 for 24 more usable gallons), three-light strobe system (\$1,365), 115-cu-ft-capacity oxygen system (\$2,650), prop synchronizer (\$1,845), the club seating (\$2,460), and the little fold-out desk (\$565). Higher power 100-amp alternators were also installed on 55S, for an exchange price of \$1,155. Air conditioning is not currently available.

Normally, only a single throwover-type control yoke is found on the Baron, therefore dual controls are an option. So are brakes on the copilot side, external power plug, internally lighted instruments, prop unfeathering accumulators and "super soundproofing." Combining all this gives a heavily equipped light twin that offers some exceptional capabilities, slightly tempered by its higher cost and a couple of performance limitations.

The turbo Baron, with its blowers built by Garrett AiResearch, is certified for flight up to 25,000 feet. For a check of its performance at altitude, I departed Hutchinson, Kan., where the temperature was 65 degrees F. The oxygen bottle was full, and masks ready for use. From a dead stop at the end of HUT's runway 13 (airport elevation 1,542 ft msl), a maximum performance climb to 17,500 feet took 9 minutes 51 seconds. Best rate-of-climb speed for the craft is 115 knots, and the climb dial showed the craft initially heading skyward at 1,800 fpm, and 1,400 fpm passing through 17,000 feet. During this full-throttle climb, which was initiated with the aircraft lightly loaded (about 120 gallons of gas and two people aboard), the fuel flowed to the engines at a rate of 64 gallons per hour.

At 17,500 feet, an efficient cruise setting is 65% power, or 30 inches mp and 2,200 rpm. Fuel burns at about 31 gph. An interpolated speed from the aircraft manual for 65% power is 204 knots. The indicator read 166, which with the -12°C . temperature, converted to 220 knots true. The difference between the book speed and actual performance likely reflected the light loading of the airplane during the flight check.

Higher power settings are attainable up high. For instance 75% power is easily within the airplane's grasp. But at these lightplane super speeds, it will offer only about seven knots more, in trade for a fuel consumption increase of five

BEECHCRAFT BARON 58TC

Basic price \$170,750

Specifications

Engines	2 Continental	
	TS10-520-L each 301 hp	@2,600 rpm
Propeller	Hartzell	
	constant-speed, three blade	78 in dia
Wing span		37 ft 10 in
Length		29 ft 10 in
Height		9 ft 6 in
Wing area		188.1 sq ft
Wing loading		32.4 lb/sq ft
Passengers and crew		6
Cabin length		12 ft 7 in
Cabin width		3 ft 6 in
Cabin height		4 ft 2 in
Empty weight		3,780 lb
Maximum zero fuel weight		5,700 lb
Useful load		2,360 lb
Maximum ramp weight		6,140 lb
Maximum take-off weight		6,100 lb
Power loading		10.1 lb/hp
Fuel capacity (standard)	172 gal (166 usable)	
Fuel capacity		
	with optional tanks	196 gal (190)usable)
Oil capacity		12 qt/engine
Baggage capacity		470 lb (28 cu ft)
	(nose and extended rear compartments)	

Performance

Takeoff distance (ground roll)	1,556 ft
Takeoff over 50 ft	2,495 ft
Rate of climb	1,461 fpm
Single-engine rate of climb	204 fpm
Maximum level speed	249 kt
Normal cruise speed (74% power, 20,000 ft)	223 kt
Economy cruise speed (55% power, 20,000 ft)	194 kt
Range at normal cruise (with 45-min reserve)	1,032 nm
Range at economy cruise (with 45-min reserve)	1,231 nm
Service ceiling	above 25,000 ft
Single-engine service ceiling	14,400 ft
Stall speed (clean)	96 mph (83 kt)
Stall speed (gear and flaps down)	91 mph (79 kt)
Landing distance (ground roll)	1,471 ft
Landing over 50 ft	2,498 ft



THE TURBOCHARGED BEECH BARON continued

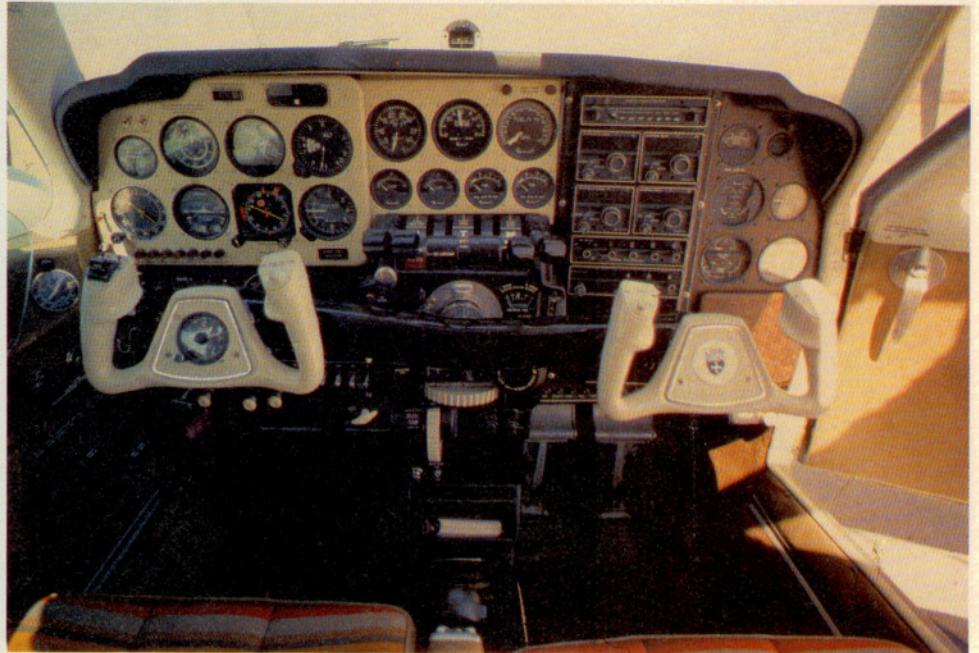
or six gallons per hour. Any way you look at it, one mile-per-hour-per-gallon is an expensive way to travel a tiny bit faster.

By placing the power levers at 26 inches and 2,200 rpm, the engines developed 55% power, which provided a true airspeed of 208 knots. That's about 18 knots above the speed the book says can be expected for this power setting, which burns about 26 gallons per hour. Range at such a speed and altitude would be over 1,200 nautical miles (assuming the plane starts with the optional fuel load of 190 gallons) including fuel for taxi and takeoff, and a 45-minute reserve.

The turbochargers that make all this performance possible are the automatic wastegate type that theoretically cannot be overboosted. On takeoff you slowly advance the throttles to 30 inches mp, pause momentarily for the turbos to wind up, then continue advancing the throttles to the stops. Throttles could be left full forward from that point to final approach at the destination, if a pilot desired. More realistically, however, he will look to the aircraft manual for recommended cruise power configurations.



Turbocharged Continental engines extend about a foot further forward than the engines on non-turbo Barons. Taxi light on nose gear is optional.



Baron 58 TC comes standard with a King nav/com and ADF, and complete set of flight instruments. The full Collins radio package in this craft, plus Edo-Aire autopilot, adds over \$23,000 in avionics options. Panel appears full, without radar, area navigation, or copilot-side gyros.

Optional club seating arrangement and the "executive writing desk" on the sidewall create a business-like atmosphere in the back of this light twin.



With both engines operating, they will peak at 301 hp. But special two-stage prop governors allow an operating engine, as mentioned earlier, an extra 100 rpm (nine horsepower) if the other engine shuts down. The reason for limiting rpms when both engines are running, says Beech, is to permit this airplane to meet 1980 noise limits imposed by the Environmental Protection Agency.

The engine/turbocharger combination carries a time-between-overhaul of 1,400 hours.

Ruggedness of the Baron TC is apparent from its gear and flap speeds. Gear and half flaps can be lowered at 177 knots, or over 200 mph. The rest of the flaps may go down at 144 knots. To slow from 170 indicated to 100, I dropped gear, pulled power back, dropped half flaps, then full flaps. Total time for the slowdown in level flight took 15 seconds.

Gear and fowler flaps are fully electric. The only hydraulic system found in the aircraft is for braking.

The undercarriage acts like a big speed brake, causing almost no pitch change with extension. Lowering of 15 degrees of flaps has no pitch effect, but the final 15 degrees causes a substantial nose-up movement. Pitch adjustments are fast and easy with the manual trim wheel; the electric trim installed in 55S was slow. It was slow enough, in fact, that its switch could be constantly held in the "up" position during roundout and flare.

The Baron is a mild-mannered single-engine craft. At 10,500 feet Gary Brigham, Beech's assistant marketing manager for the Barons, pulled back the left engine to zero thrust. The published minimum safe single-engine speed (V_{sse}) is 86 knots. At that speed there was still good control over the one-engine twin. A 5- or 6-degree bank into the good engine, plus light rudder pressure, kept the plane lined up on course, and banks of 15 degrees either direction provided no surprises. With full power on the operating engine (36 inches mp and 2,700 rpm) the turbo Baron climbed at 100 knots at about 300 fpm.

Published climb rate at maximum gross weight, single-engine, is 204 feet per minute. That's an unimpressive



Gear down speed of the B58 TC is 177 knots. Access to the rear cabin is through a double door at the trailing edge of the wing.

THE TURBOCHARGED BEECH BARON continued

figure, compared with some light twins, but with the turbochargers aboard, the B58 TC will maintain that rate up through 5,000 feet, and—particularly welcome news for mountain fliers—its single-engine service ceiling is 14,400 feet.

Gear and flaps down, power off, and gentle nose up pressure brought this lightly loaded Baron into a stall at 70 knots indicated. Its published stall speed is 79 knots (91 mph). As the stall arrives there is good buffeting, but with firm control of the airplane you can hold it in a wings-level stalled descent falling 1,600 feet per minute. In a clean configuration the stall arrived at 81, and the buffeting quickly increased to a point where the wing dropped sharply. Nose down and a little power brought about a speedy recovery.

The Baron's healthy sized vertical stabilizer gives a hint of potentially potent yaw characteristics. At cruise speed, a shove of rudder brought about a six-oscillation yaw cycle. Beech has recognized this characteristic in the airplane, and offers a chance to fight back with optional yaw dampers. The Mitchell damper installed in 4255S, when switched on, reduced the yaw cycle to only one or two swings with an equivalent kick of rudder, but costs an extra \$2,190.

The big tail/rudder configuration gives the Baron an edge when confronting a crosswind: it carries a demonstrated crosswind component of 30 knots.

The autopilot itself, a Mitchell Century IV, was controlled by an array of internally lit push buttons on the far left side of the instrument panel. The autopilot worked efficiently enough, but the push buttons were impossible to read in direct sunlight. A hand had to be held up as a sunshade during selection of autopilot functions.

The turbocharged Baron can offer a lot of features—quiet, speed, and hauling capability. But it can't offer short-field operation as a major strength. A takeoff into a 12-knot headwind at Hutchinson consumed over 1,000 feet of pavement, while a short-field landing (approach with full flaps at 90 knots) utilized about 1,500 feet of runway. Both takeoff and landing distances over a 50-foot obstacle are reported by Beech at just a few feet under 2,500.

During takeoffs and landings the craft's relatively high gross weight stall speed, 79 knots, must be kept in mind. Also, the airplane's wing area measured against its 6,100-

pound gross weight creates heavy wing loading—32.4 pounds per square foot. Its actual landing characteristics, however, are quite pleasant, offering a good chance at a light touchdown, as long as the pilot remembers to use lots of up trim to ease back-pressure on the yoke.

On the ground the Baron's bungee nosewheel steering is sluggish. The rudder pedals can be pushed either direction to the full stop during taxi, with no immediate turn apparent. Differential braking is a necessity to aid in turns.

Power controls follow a traditional Beech pattern—from left to right, prop, throttle, mixture—different from the order found on planes from other manufacturers. On the turbo Baron, also, you find the gear lever to the left of the center control column, and the flap lever to the right. This is exactly the reverse of the position of these two controls on the non-turbo Baron, which was certified several years earlier with the gear switch on the right side.

Though the B58 TC will carry a lot of weight, the space where cargo can be stowed is a bit less accommodating. Assuming all seats are in place and left available for people, then baggage must go in the nose, or in a compartment behind the last two seats. The nose compartment is allowed 350 pounds of stuff, and offers 18 cubic feet for it. The rear compartment has 10 cubic feet and a 120-pound capacity. Clearly, if hauling is the mission, the quick-release rear seats must be dispensed with. Overall, 1,370 pounds of cargo may be carried.

Ample doors, including cabin door and double cargo doors, make loading of people or things into the aircraft a pleasant task. The inside, though comfortable and nicely finished, cannot quite be called roomy, for the cabin width is 42 inches.

Since its introduction last year, sales of the turbocharged Baron have been steady with an average production rate of slightly more than three a month. From April of last year through March 1977, 37 turbo Barons charged forth from Beech's Wichita plant.

Baron marketing manager Brigham says that the bulk of the Baron TCs delivered so far have gone to buyers east of the Rockies. They are looking for an airplane, he said, that can carry a load on a long-haul trip—like New York to Florida nonstop. And they want an airplane that will get them up through weather and ice expeditiously.

With the proper combination of financing and flying skills, the turbocharged Baron will do either—in high style. □