# THE LITTLE KING AIR THAT REALLY CAN

*Lighter price and equipment list do not daunt the C90SE's capabilities*

BY THOMAS B. HAINES

Pilots transitioning from high-performance piston airplanes to turbine equipment learn many things. Among the first is that flying turboprops and jets is often easier than piloting piston airplanes, thanks in large part to the helpful automatic systems on the kerosene burners. At critical times, little can replace such oft-found turbine equipment as full deice, autofeather, and rudder boost. ■ The new Beech King Air C90SE does its part to welcome the turbine neophyte by stocking the cockpit with a familiar stack of panel-mount Bendix/King avionics from AlliedSignal and a host of unpre-

PHOTOGRAPHY BY MIKE FIZER

tentious electro-mechanical instruments. Gone are the remote-mount Collins avionics and the electronic flight instrumentation in the more expensive C90B and other King Airs—equipment that can make the transitioning pilot gulp upon entering the flight deck. The EFIS certainly offers some advantages over the electro-mechanical set, but at a significant cost difference—not to mention the steep learning curve faced by those new to the gear.

The simpler cockpit may make the new "Special Edition" King Air easier to fly than the C90B, but cost is the real factor the executives at Raytheon Aircraft, the new name of the company that produces Beech airplanes, focused on in developing the C90SE. The $1.69 million base price is about $625,000 less than the C90B's base price of $2.3 million. Throw in the SE's $170,000 "value incentive package" (VIP)—which includes such gotta-haves as autopilot, autofeather, weather radar, and strobe lights—and the price climbs to $1.87 million, still some half a million dollars less than the C90B's typical price at delivery.

Happenstance played no part in the "lite" version's debut last summer at the same time that the first Pilatus PC XII single-engine turboprop arrived in the United States. The SE's nicely equipped price compares favorably with the PC XII's base price of $1.95 million and very well with the fully equipped price of $2.23 million. The Swiss airplane cruises some 20 knots faster than the SE and pulls a larger cabin more akin to that of the King Air B200, but the 200 is typically flown by corporations. The PC XII and the SE are competing in the owner-flown turbine market, where price, ease of flying, and insurability play larger roles.

Another competitor in the personal turbine market is the Aerospatiale TBM 700 single-engine turboprop. Typically equipped, the TBM 700's price falls between the other two, but its cabin is smaller than the SE's. With a maximum cruise speed of about 290 knots, though, the French airplane wins the three-way speed race, beating the Pilatus by 20 knots and the King Air by 45 knots.

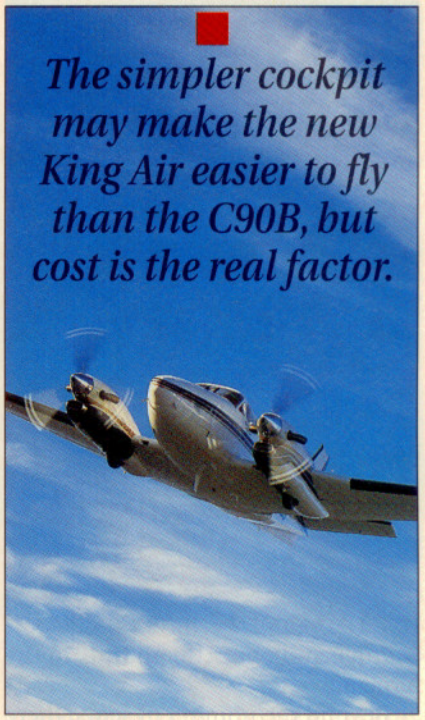
What the Beech has that the other two don't, at least in the United States, is greater name recognition, a vast service network, and 31 years of proven King Air reliability. In fact, the King Air


*Electro-mechanical instruments and panel-mount avionics differentiate the C90SE panel from its more expensive sibling, the C90B (below), which uses EFIS and remote-mount avionics. Interior fabrics, leathers, and color choices are the same for either model, but the SE comes standard with four instead of six cabin seats (right).*


line has outlived all its twin-engine turboprop competitors from Cessna, Piper, and others.

Likely buyers in the personal turbine market come from the ranks of the piston-twin owners, according to Kenneth R. Mikolajchak, Beech's manager of King Air and piston products marketing. The person flying a Piper Navajo, Beech Baron, 400-series Cessna, and maybe even those considering a Cessna CitationJet or used King Air are all being called upon by the SE sales team.

Mikolajchak perks up as he sees a family of six pile out of a handsome but elderly Navajo on the ramp of the Palm Springs (California) Regional




Airport. "Yeah, he owns that airplane. Look at how carefully he treats it," observes the King Air salesman from the right seat of the SE as we prepare for engine start. "He's a perfect candidate for this airplane. Good looking Navajo. He won't have any problem selling it," Mikolajchak continues, as if the deal's already done.

The pilot moving up to the C90 will certainly be comfortable. The cockpit is wide and the headroom generous. In the back, the standard C90SE comes with four cabin seats, all facing forward. In the aft baggage compartment, a belted lavatory, another part of the VIP, can serve as a fifth seat. A buyer can also purchase an additional passenger seat to be installed opposite the airstair to bring the SE seating

capacity up to the C90B's, but the seat must be purchased from and installed by a Beech completion center. Raytheon limits the options from the factory to keep its SE production costs in check. Likewise, a buyer can opt to have the cabin seats arranged in a club fashion and have a folding table installed, but that too must come from a completion center.

The only SE factory options available beyond the VIP are engine fire detection and engine fire extinguisher systems which, combined, add almost

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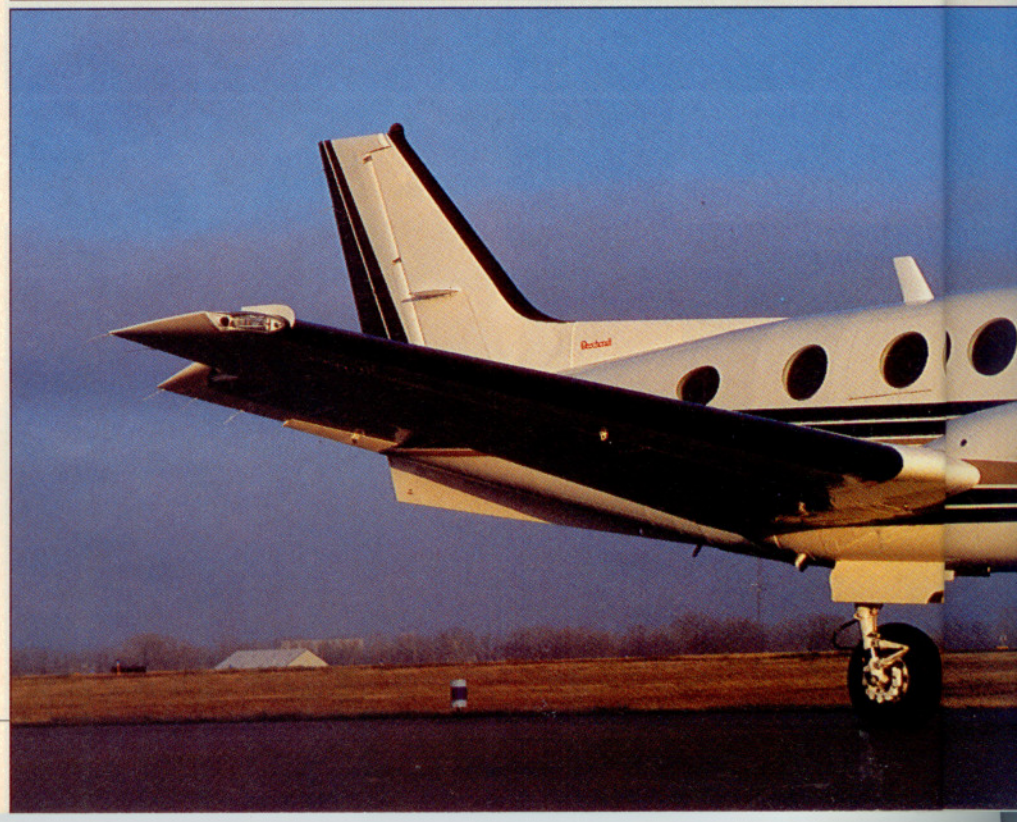
$17,000 and about 30 pounds to the airplane.

Beyond the number of seats, there are other differences between the SE and the B. The SE has no partition between the cockpit and the cabin, offering a curtain instead. The SE comes with tinted windows in place of the King Air trademark polarized portholes. The C90B's fabric-covered headliner and window frames give way to vinyl in the less expensive version.

Less visible is the lack of dynamic vibration absorbers tucked away in the walls of the C90B. The dampers are tuned to absorb vibrations from the four-blade McCauley propellers at cruise settings, and are an effective tool in reducing noise in the cabin—as we discovered when we flew the C90B three years ago (see "From A to B Quietly," February 1992 *Pilot*). The C90SE retains the extra insulation that



debuted in the C90B, but not the vibration absorbers. To be effective in the C90SE, the dampers would have to be re-engineered to absorb the vibrations from the lower-cost, three-blade Hartzell props standard on this airplane, a cost Raytheon could not justify at the SE price.

The three-blade props are about the only external change to the SE when compared to the B. The SE's panel-mount avionics free up the 11-cubic-foot nose compartment for baggage instead of housing boxes necessary for the B's avionics suite, a nice plus for those with lots of luggage.

To accommodate requests from airframe manufacturers for lighter, lower cost avionics, AlliedSignal has repackaged many of its popular individual panel-mount avionics into the Bendix/King CNI-5000 System. Like Raytheon, Cessna has seen the advantage of panel-mount avionics and has installed a similar package in the CitationJet.

In the SE, the package includes dual navs, coms, and transponders, an audio panel, DME, and ADF. The VIP upgrade brings along altitude preselect and the aforementioned radar and autopilot. Though it's not required on this class of airplane, a cockpit voice recorder is standard. All that's missing is some area navigation gear, a shortcoming that your local avionics shop can fix in a hurry with an IFR GPS receiver.

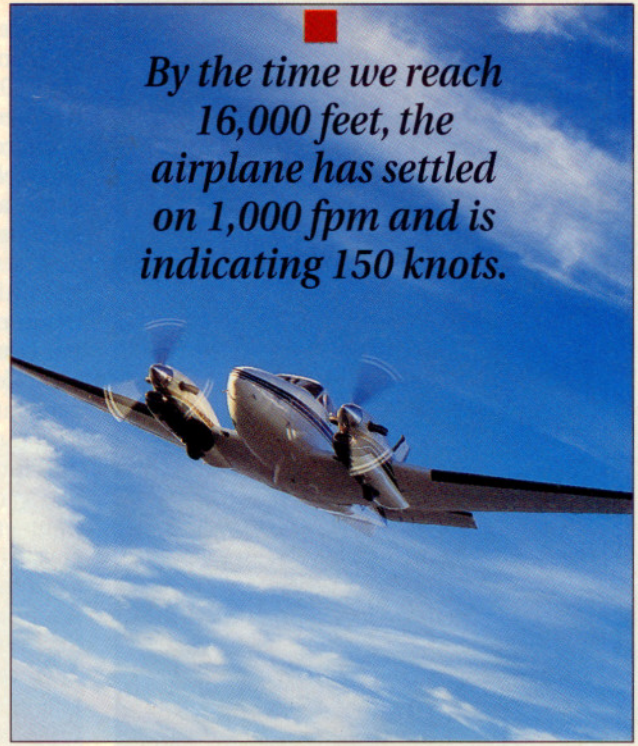
Out on the wings, the 550-shaft-horsepower Pratt & Whitney PT6A-21 engines are identical to those on the C90B.

I always find starting turbine engines a bit daunting, but, when compared to a piston engine, there are really no more steps or procedures. On the SE, for example, it's just a matter of turning the Right ignition and engine start switch On, waiting for the $N_1$ or gas generator RPM to hit 12 percent and then moving the Right condition lever to the Low Idle position. The interstage turbine temperature (ITT) must be monitored to assure it doesn't exceed the limit of 1,090 degrees Celsius. Assuming oil pressure rises appropriately, the condition lever is moved to High Idle. The ignition and start switches can be moved to the Off position once $N_1$ climbs past 51 percent. Select right generator On. Once the battery recharges, starting of the left side follows the same routine. It's

not so many more steps than one goes through when priming and starting a piston twin.

Taxiing to Palm Springs' Runway 31L, the King Air feels big. You sit up high and look down on even the biggest piston airplanes.

The SE and the B models have the same maximum gross takeoff weight of 10,100 pounds, but the SE with the value package weighs 267 pounds less than the standard B, according to Mikolajchak. The weight savings means versatility for the pilot. The SE carries the same 384 gallons of fuel (2,573 pounds) as the B, allowing the SE pilot to take off with full fuel, five passengers, and nearly 100 pounds of baggage. The B driver would have to leave a passenger and all the bags behind, or offload 40 gallons of fuel.




Climbing through 7,000 feet msl just east of Palm Springs and still maintaining 1,500 fpm and 145 knots indicated on a warm October morning, it's easy to understand the allure of horsepower. By the time we reach 16,000 feet, the airplane has settled on 1,000 fpm and is indicating 150 knots.

At Flight Level 230, we level off for a check of high-speed cruise. Nine hundred pounds of torque and 1,900 rpm yields 161 KIAS on this day, 10°C warmer than standard. True airspeed works out to 232 knots. Burning 210 pounds a side yields an endurance of 5.4 hours with a 45-minute reserve, or about 1,250 nm, no wind. We could make Wichita in time for an early dinner.

Instead, we slow down to maximum range power. At 680 pounds of torque and 1,900 rpm, the King Air rolls along at 201 KTAS on 160 pounds a side, jumping endurance to 7 hours and range to 1,400 nm.

Needles, California, soon appears in the windshield. Anxious to see if we can spot Snoopy's brother Spike relaxing under a cactus, we enter the pattern. Everyone says a King Air "flies just like a Bonanza." It's trite, but true. Add about 10 knots for the higher gross weight and the King Air will approach much like its smaller cousin. Two decent landings at deserted Needles are preparation for touch-

down back at Palm Springs where AOPA Expo is in full swing, complete with dozens of operations every hour.

The harried controllers work us in with all the other traffic. We fly a wide right base for Runway 31L. I'm high and fast on final, and, naturally, bounce the landing in front of the crowds waiting for takeoff.

It's tough to find a way to blame the airplane. The King Airs, especially the 90 series, are among the most forgiving and docile turboprops around. In stalls, the SE's nose just bobs and falls over into a descent. Minimum control speed with one engine inoperative is an easy 90 knots. Autofeather makes single-engine operations a relative non-event. Complete deice equipment and approval for flight in known icing conditions assures at least some chance of exiting safely from all but the worst icing encounters.

The King Air line has withstood three decades of market ups and downs because Beech, now Raytheon, has been able to capitalize on the design's versatility. This new lower cost iteration is just one more of what will probably be many more variations on the proven King Air theme. □

**Beech King Air C90SE**
Base price: $1.69 million
Price as tested: $1.87 million

**Specifications**

| | |
|---|---|
| Powerplants | Two Pratt & Whitney PT6A-21, 550 shp ea |
| Recommended TBO | 3,500 hr |
| Propellers | Two Hartzell three-blade, full-feathering, constant speed, reversing, variable pitch, 93-in diameter |
| Length | 35 ft 6 in |
| Height | 14 ft 3 in |
| Wingspan | 50 ft 3 in |
| Wing area | 293.94 sq ft |
| Wing loading | 34.4 lb/sq ft |
| Power loading | 9.2 lb/hp |
| Seats | 6 (7 as tested) |
| Cabin length | 17 ft |
| Cabin width | 4 ft 6 in |
| Cabin height | 4 ft 9 in |
| Empty weight | 6,225 lb |
| Empty weight, as tested | 6,408 lb |
| Useful load | 3,875 lb |
| Useful load, as tested | 3,692 lb |
| Payload w/full fuel | 1,302 lb |
| Payload w/full fuel, as tested | 1,119 lb |
| Max takeoff weight | 10,100 lb |
| Max landing weight | 9,600 lb |
| Fuel capacity | 2,573 lb (384 gal) |
| Nose baggage capacity | 350 lb, 10.9 cu ft |
| Aft baggage capacity | 350 lb, 53.5 cu ft |

**Performance**

| | |
|---|---|
| Takeoff distance, ground roll | 1,900 ft |
| Takeoff distance over 50-ft obstacle | 2,714 ft |
| Accelerate-stop distance | 4,050 ft |
| Accelerate-go distance | 4,500 ft |
| Max demonstrated crosswind component | 25 kt |
| Rate of climb, sea level | 1,950 fpm |
| Single-engine ROC, sea level | 550 fpm |
| Max level speed, sea level | 214 kt |
| Max level speed, 14,000 ft | 245 kt |
| Cruise speed/endurance w/45-min rsv, 9,500 lb (fuel consumption, total) | |
| @ Max cruise power 14,000 ft | 245 kt/830 nm/3.4 hr (622 pph/93 gph) |
| @ Max range power 29,000 ft | 204 kt/1,390 nm/6.8 hr (340 pph/50.7 gph) |
| Max operating altitude | 30,000 ft |
| Single-engine service ceiling | 10,300 ft |
| Landing distance over 50-ft obstacle | 2,200 ft |
| Landing distance, ground roll | 1,100 ft |

**Limiting and Recommended Airspeeds**

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|---|---|
| $V_{MC}$ (min control w/one engine inop) | 90 KIAS |
| $V_{SSE}$ (min intentional one-engine ops) | 97 KIAS |
| $V_X$ (best angle of climb) | 107 KIAS |
| $V_Y$ (best rate of climb) | 112 KIAS |
| $V_{XSE}$ (best single-engine angle of climb) | 107 KIAS |
| $V_{YSE}$ (best single-engine rate of climb) | 108 KIAS |
| $V_A$ (design maneuvering) | 169 KIAS |
| $V_{FE}$ (max flap extended) | 184 KIAS |
| $V_{LE}$ (max gear extended) | 182 KIAS |
| $V_{LO}$ (max gear operating) | Extend 182 KIAS<br>Retract 163 KIAS |
| $V_{MO}$ (max operating) | 226 KIAS |
| $V_R$ (rotation) | 98 KIAS |
| $V_{S1}$ (stall, clean) | 88 KIAS |
| $V_{SO}$ (stall, in landing configuration) | 78 KIAS |

*For more information, contact Raytheon Aircraft Company, Post Office Box 85, Wichita, Kansas 67201-0085; telephone 316/676-7007, fax 316/676-8808.*

*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.*