Beech Super King Air B200GT

All-time best-selling business aircraft now has 300-plus KTAS cruise speeds and jet-class avionics.

By Fred George

The day before we flew the Beech Super King Air B200GT in early January, crude oil prices reached $100 per barrel. That event soon could cause the price of jet fuel to soar to $5.00 or $6.00 per gallon, a price that could send shock waves through parts of the business jet community.

By contrast, that per-barrel benchmark rattled turboprop advocates considerably less. Their slower, but substantially more fuel-efficient aircraft long have been dismissed by fanjet advocates as "so yesterday," but with jet fuel prices now sky high, many business aircraft operators are taking a fresh look.

The timing is perfect for the introduction into service of Hawker Beechcraft's new Super King Air B200GT, the latest and fastest version of the firm's venerable Super King Air 200, which made its production debut more than three decades ago.

Powered by a pair of Pratt & Whitney Canada's new PT6A-52 engines, the B200GT can cruise as fast as 309 KTAS at mid-weights, enabling it to fly a 900-nm trip in just over three hours. It also can fly four passengers more than 1,150 nm at an average block speed of 270 KTAS.

The Super King Air B200GT is nine minutes quicker than its predecessor, the B200, on a typical 600-nm business trip. But the B200GT still takes 30 minutes longer to fly that trip than a comparably sized light jet, assuming both aircraft fly ideal vertical climb, cruise and descent profiles.

The light jet's speed advantage comes at the price of a 20-percent greater block fuel burn, even if both aircraft use perfect flight profiles. But how often can ATC accommodate an almost parabolic flight plan? In reality, controllers seldom authorize a direct climb to FL 390 or FL 410 on 600-nm missions in congested airspace. Such clearances are increasingly rare on trips between busy city pairs such as New York and Chicago, San Jose and Seattle or St. Louis and Washington, D.C.

Photography: Mandy Patterson, San Diego, Calif.

The result? If the B200GT and the light jet are restricted to cruising in the mid-twenties, the turbofan will burn more than 50 percent more fuel than the Super King Air on a 600-nm trip. That's because there's simply less of a fuel consumption penalty if the B200GT is restricted to flying at FL 250 instead of FL 350, its optimum cruise altitude, on such a mission. Fuel consumption increases 23 percent at maximum cruise power and about 11 percent when cruising at maximum range power. So the fuel savings achieved on everyday business trips may be considerable when flying the B200GT instead of a turbofan aircraft.

The B200GT also has much improved high-altitude climb and cruise performance because of its -52 engines, so it routinely can use FL 350 on trips longer than 500 nm, ATC restrictions permitting. In essence, the new engines transform it into a B300 Super King Air at altitudes of about 26,000 feet and above. Indeed, the B200GT can climb directly to FL 350 in 27 minutes at MTOW. That's nine minutes faster than a -42 powered B200, and the climb also requires about 12 percent less fuel. Cruise speeds are 30 to 43 knots faster at FL 350 than they would be in a B200. Climbing to FL 350 instead of FL 250 on a 600-nm mission, for instance, only costs another nine minutes en route, but you'll save about $200 at today's fuel prices.

The latest Super King Air 200 carries over the previous model's Rockwell Collins Pro Line 21 avionics package, including its quite capable FMS-3000 3-D navigation system. (Please see accompanying sidebar.) The standard package enables the aircraft to fly 3-D FMS approaches, providing vertical guidance on virtually all non-precision approaches. It also includes an automatic FMS to ILS transition feature. These two capabilities provide hands-off autopilot guidance on virtually any instrument approach until reaching procedure minimums.

Continuous product improvements, such as upgrading to -52 engines and Pro Line 21 avionics, among many others, have helped make the Super King 200/B200 the single best-selling turbine aircraft in the history of business aviation. Today's B200GT is far different from earlier models. It incorporates dozens of incremental, but low-risk, improvements that add value and utility without jeopardizing the aircraft's 99-plus-percent dispatch reliability. The ingredients that make up that formula are described in the remainder of this report.

Structure and Systems

Beech Aircraft started design work on the Super King Air 200 in 1970 as an evolutionary outgrowth of the 90-series King Airs that would fly faster, farther, higher and carry more passengers. Similar to earlier Beech monoplanes dating back to the 1947 V35, all models of the Super King Air have a semi-monocoque airframe constructed primarily from high-strength aluminum alloys.

Also similar to earlier Beech models, the Super King Air 200 uses NACA 23000-series airfoils for the wing because of their excellent high lift characteristics and relative immunity to aerodynamic degradation caused by icing. Engineers chose a constant cross-section, 18-percent thick 23018 airfoil for the wing sections between the engine nacelles and fuselage modified with a drooped leading edge that stalls at a considerably higher angle of attack than the outboard sections. This is an unusual design feature because most wings are designed to stall at the root first so that the outboard section remains flying at the stall. This arrangement preserves aileron effectiveness. But Beech elected to stall the outboard section first, thereby keeping the inboard section flying at the maximum lift coefficient. This feature is intended to prevent deep stall by maintaining downwash over the horizontal tail at maximum angle of attack, thus preventing it from being blanked in the lee of the wing.

A refreshment center located behind the cockpit bulkhead has a water tank, heated beverage container with overboard counter drain, two cup dispensers, three storage drawers and a double ice chest drawer.

Each chair has an aisle-side armrest. The other armrest is built into the sidewall, resulting in 18 inches of net seat width. Seat cushions are 20 inches long, providing good thigh support. Seat backs are 28 inches tall, including headrests.

Sturdy 23-by-22.5-inch worktables are enclosed in side pockets between the facing chairs of the club seating section. AC power outlets are provided on both sides of the club section.

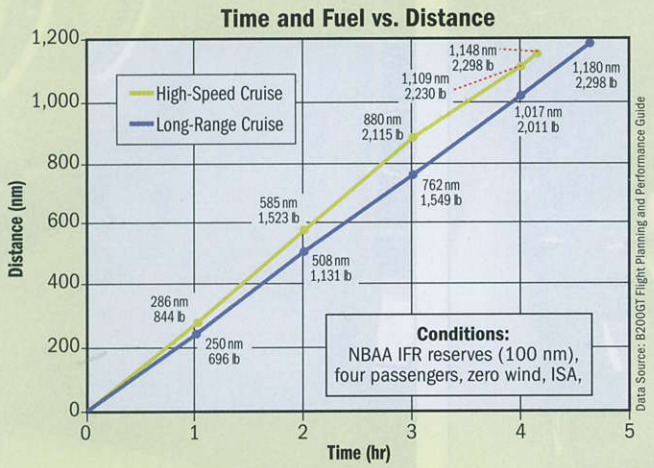
Beech Super King Air B200GT

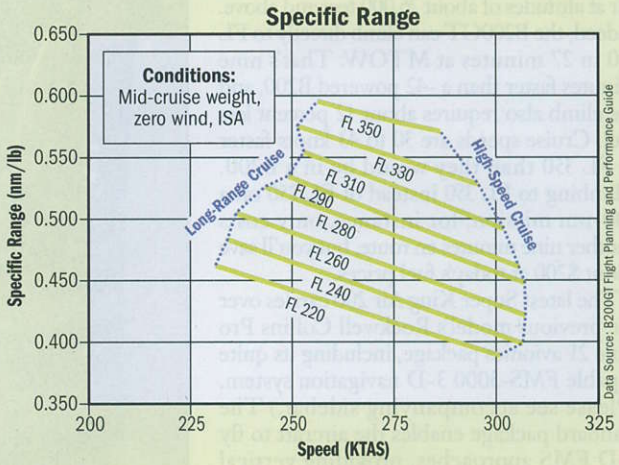
These graphs are designed to illustrate the performance of the Super King Air B200GT under a variety of range, payload, speed and density altitude conditions. Do not use these data for flight planning purposes because they are gross approximations of actual aircraft performance we computed or extrapolated using four-passenger payload numbers from the B200GT Flight Planning and Performance Guide.

Time and Fuel vs. Distance — This graph shows the relationship between distance flown, block time and fuel consumption for the B200GT. High-speed cruise is flown at maximum torque and 1,800 rpm, and long-range cruise is flown at best L/D. Both profiles use optimum altitude profiles.

Specific Range (Mid-Range Weight, ISA) — This graph shows the relationship between cruise speed and fuel consumption for the B200GT at representative cruise altitudes for an 11,000-pound aircraft, based upon data in the B200GT Flight Planning and Performance Guide. We believe Hawker Beechcraft's performance projections are accurate, if not slightly conservative, based upon our demonstration flight observations.

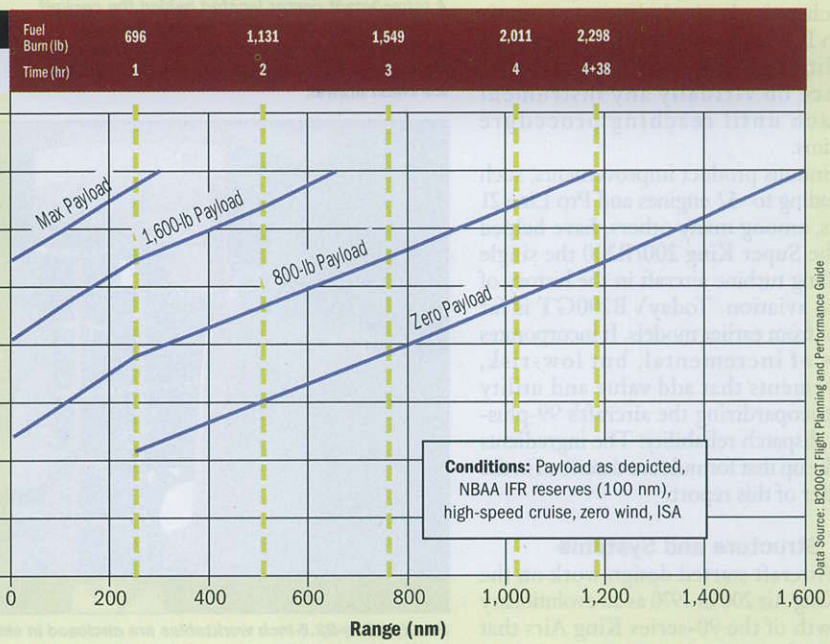
Range/Payload Profile — The purpose of this graph is to provide simulations of various trips under a variety of payload and two airport density altitude conditions, with the goal of flying the longest distance at long-range cruise. We plotted each of the four payload/range lines from multiple data points based on interpolating or extrapolating four-passenger cruise performance published in the B200GT Flight Planning and Performance Guide. Each line ends at the maximum range for each payload condition. Only the four-passenger or 800-pound payload line is representative of actual aircraft performance. FAR Part 23 all-engine 50-foot obstacle takeoff field length distances are shown for sea-level standard day and for our standard 5,000-foot elevation, ISA+20°C airport.





Range/Payload Profile

Takeoff Field Length (ft)		
SL ISA	5,000 ft ISA+20°C	Gross Takeoff Weight (lb)
		13,000
2,579	3,875	12,500
2,550	3,725	12,000
2,450	3,558	11,500
2,350	3,390	11,000
2,250	3,253	10,500
2,150	3,115	10,000
2,075	1,408	9,500
2,000	2,815	9,000



The outboard section aero contours are almost identical to those of a Bonanza. There is 4.55 degrees of geometric twist, a Beech-modified 23016.5 airfoil near the nacelle and NACA 23012 airfoil at the tip. Overall, the wing has six degrees of dihedral, 303 square feet of area, a 9.8:1 aspect ratio and no sweep.

The legacy wing's aerodynamics are well-suited to the B200GT because there is plenty of margin between the aircraft's higher cruise speeds and the wing's critical Mach number, the speed at which drag increases sharply on unmodified 23000-series airfoils.

Beech opted for a T-tail empennage with swept vertical and horizontal surfaces. The configuration keeps the horizontal stab out of the prop wash to reduce vibration and its high, aft position improves aerodynamic effectiveness. Hawker Beechcraft marketers also admit the arrangement improves ramp appeal as well.

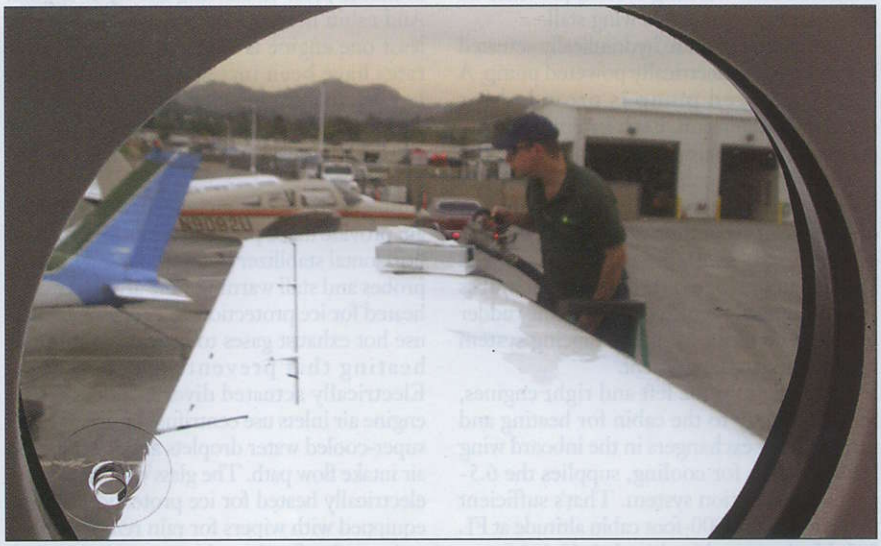
The airframe is sturdy, having no published life limits. The resale value of King Airs, though, is considerably lower for aircraft that have flown more 10,000 hours.

All fuel is stored in the outboard main and inboard auxiliary wing tanks and engine nacelle tanks, aft of the firewalls. Refueling is accomplished through over-wing ports in each wing. Fuel to oil heat exchangers eliminate the need for anti-icing fuel additives. But many operators occasionally use such additives to purge small accumulations of water from the tanks.

The left and right main wing tank groups each consist of four bladders and a wet wing tank that straddle the main wing spar. The main wing tank group gravity feeds into the nacelle tank, which acts as a feeder tank for each engine. Total main tank capacity is 2,586 pounds.

The left and right aux tanks hold an additional 1,059 pounds of fuel. If the auxiliary tanks contain fuel, jet pumps in the tanks automatically transfer the contents into the nacelle tanks, preempting gravity transfer from the main tanks until the aux tanks are completely empty. Electric boost pumps supply differential pressure for cross-feed, act as a backup for the engine-drive boost pumps and assure adequate fuel pressure if avgas is being used as an emergency fuel.

The 28-VDC electrical system is supplied by a 42-amp/hour lead-acid battery mounted in the inboard right wing and a 250-amp starter-generator on each engine. Ground power may be connected by means of an external power jack in the right engine nacelle. Most electrical equipment is fed by left and right main DC buses, four sub-buses and a hot-battery bus. There is a 60-Hz, 115-VAC inverter in the inboard right wing section that supplies power outlets in the cabin. No other avionics equipment or electrical components require AC power.



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All the primary flight controls are manually actuated, with three-axis manual trim and electric pitch trim. The horizontal stab position is fixed. Pitch trim is provided by trim tabs on each elevator. The single-slot, trailing-edge, four-section Fowler flaps are electrically powered and the system incorporates asymmetry protection. A pneumatically powered rudder boost system uses differential bleed-air pressure from the engines to provide proportionate power boost to reduce rudder effort in the event of an engine failure or large-scale difference in engine power output. An angle-of-attack

Beech Super King Air B200GT

***BCA* Equipped Price:** $5,268,800

Characteristics

Seating	1+7/15
Wing Loading	41.3
Power Loading	7.35
Noise (EPNdB)	81.1

Dimensions (ft/m)

External	
Length	43.8/13.4
Height	14.8/4.5
Span	54.5/16.6
Internal	
Length	16.7/5.1
Height	4.7/1.4
Width (Maximum)	4.5/1.4
Width (Floor)	4.1/1.2

Power

Engine	2 P&WC PT6A-52
Output (shp ea.)	850
Flat Rating	ISA+37°C
TBO (hr)	3,600

Weights (lb/kg)

Max Ramp	12,590/5,711
Max Takeoff	12,500/5,670
Max Landing	12,500/5,670
Zero Fuel	11,000c/4,990c
BOW	8,760/3,974
Max Payload	2,240/1,016
Useful Load	3,830/1,737
Executive Payload	1,400/635
Max Fuel	3,645/1,653
Payload With Max Fuel	185/84
Fuel With Max Payload	1,590/721
Fuel With Exec. Payload	2,430/1,102

Limits

MMO	0.520
VMO	260
PSI	6.5

Climb

Time to FL 250	14 min.

Ceilings (ft/m)

Certificated	35,000/10,668
All-Engine Service	35,000/10,668
OEI Service	24,200/7,376
Sea Level Cabin	15,293/4,661

Certification

FAR Part 23, 2007

triggered stall warning system provides an aural alert prior to actual wing stall.

The landing gear are hydraulically actuated by means of an electrically powered pump. A hand-operated pump is provided for emergency extension. Each landing gear has dual wheels. Spring bungees actuate the nosewheel steering through the rudder pedals, with 14 degrees of left and 12 degrees of right steering authority. Up to 49 degrees of steering is available using differential braking and power. The main wheel brakes are hydraulically actuated through the rudder pedals. The bleed-air brake deicing system now is standard equipment.

Bleed air from the left and right engines, routed directly to the cabin for heating and through heat exchangers in the inboard wing leading edges for cooling, supplies the 6.5-psid pressurization system. That's sufficient to maintain an 8,000-foot cabin altitude at FL 297. Maximum cabin altitude is 10,400 feet at FL 350.

A conventional, analog pneumatic pressure controller uses vacuum control air to modulate the normal outflow valve to achieve the desired pressurization differential. A separate safety outflow valve, also actuated by vacuum, depressurizes the cabin on the ground and also when the crew manually actuates the dump valve. Both the normal and safety outflow valves automatically open to prevent over-pressurizing the cabin.

There is a 77-cubic-foot capacity, supplemental oxygen system with quick-donning masks mounted in the ceiling of the cockpit; passenger oxygen masks automatically drop down in the cabin at cabin altitudes above 12,500 feet.

The Super King Air B200GT has dual zone cockpit/cabin temperature control, but both thermostats are in the cockpit. A vapor-cycle air-conditioning system, powered by the right engine, provides supplemental cabin cooling. Notably, air-conditioning is not available prior to starting the right engine. And cabin heating is not available unless at least one engine is running. Bleed-air flow rates have been increased to boost cabin heating. Standard equipment also includes a 20,500-BTU aux forced-air electric heating system, that uses either aircraft or ground power.

Pneumatic boots, supplied by engine bleed air, provide deice protection for the wing and horizontal stabilizer leading edges. The pitot probes and stall warning vane are electrically heated for ice protection. The engine intakes use hot exhaust gases to provide continuous heating that prevents ice accretion. Electrically actuated diverter doors in the engine air inlets use centrifugal force to expel super-cooled water droplets and ice from the air intake flow path. The glass windshields are electrically heated for ice protection and are equipped with wipers for rain removal.

An engine fire detection system is standard, but halon engine fire extinguishing is a 23-pound, $6,700 option.

Passenger and Baggage Accommodations

The B200GT is equipped with a passive cabin sound suppression system that the firm developed in the early 1990s (see *Business & Commercial Aviation*, November 1992, page 48), providing considerably lower cabin sound levels in cruise. Thirty-two tuned, mass vibration dampers sop up sound at 1,700 prop rpm, thereby reducing noise levels by 3.4 to 5.43 dBA in the center of the cabin and up to 16 dBA in the cockpit. Bagged fiberglass insulation and skin-stiffening sound blankets also help quiet the cabin. Actual interior noise levels were not available, but cabin sound levels were quite comfortable during cruise according to a third-party observer on our demo flight.

Cabin furnishings, leathers, upholstery fabrics and carpet all were top notch. The cabinets are covered with satin-finish wood veneers. The seats use high-grade leather and offer excellent lumbar support.

The fuselage's squared oval cross-section makes the most of the available cabin width because of its relatively flat sidewalls. Hawker Beechcraft advertises overall B200GT cabin length as 16.7 feet, but the main seating area in the cabin is 10.4 feet and it's shared by six chairs. We measured cabin height at 4.7 feet and width at 4.4 feet, about one inch shy of Beech's quoted numbers for each dimension. Each chair has an aisle-side armrest. The other armrest is built into the sidewall, resulting in 18 inches of net seat width. The seat cushions are 20 inches long, providing good thigh support. The seat backs are 28 inches tall, including the headrests. The forward two seats are aft facing and they have 35-inch pitch to the next row of seats in the center club section. The four club chairs offer 54 inches of seat pitch shared by facing passengers.

AC power outlets are provided on both sides of the club seating section to supply laptops and cell phone chargers, among other office equipment.

Sturdy 23-by-22.5-inch worktables are enclosed in side pockets between the facing chairs of the club section. Each seat in the cabin has two cup holders built into the sidewall armrest, along with overhead reading lights, adjustable overhead air outlets and drop-down oxygen masks.

A refreshment center is located on the left side of the cabin, just behind the cockpit bulkhead. It has a water tank, heated beverage container with overboard counter drain, two cup dispensers, three storage drawers and a double ice chest drawer. Standard equipment also includes a slim-line, right-side pyramid storage cabinet that can be mounted behind the right aft club seat or in the forward right section of the cabin, directly across from the refreshment center. An aft, left-side slim-line

pyramid storage cabinet is a 30-pound, $10,300 option.

The lavatory is 2.1 feet wide and it's located directly across from the left-side main entry door at the rear. It features a belted seat, fully certified for takeoff and landing, along with fully closing pocket doors that assure privacy from the main cabin.

Aft of the lavatory, there is a 55.3-cubic-foot, 550-pound luggage compartment with a cargo net. Being inside the fuselage, the compartment is fully accessible during flight with no restrictions. If you want to trade extra seating capacity for baggage volume, two aft-cabin fold-down jump seats are available as a 57-pound, $20,400 option. Notably, Hawker Beechcraft officials claim the aircraft has a wide center of gravity envelope, thus most loading configurations won't put the aircraft outside of its aft c.g. limit.

Flying Impressions

The aircraft we flew for this report was BY-4, the fourth production B200GT. It was equipped with the standard package, except for minor options such as leather-covered control yokes. The single-pilot BOW was 8,761 pounds, just one pound more than Hawker Beechcraft's quoted weight for an aircraft equipped to our specs.

Tom Sifford, senior demonstration pilot for Hawker Beechcraft, flew in the right seat for the demonstration flight. With three passengers in the main cabin, the computed zero fuel weight was 9,561 pounds. The main tanks were filled to 2,550 pounds, resulting in a 12,111-pound ramp weight.

We computed takeoff performance based on a 12,000-pound takeoff weight, San Diego-Montgomery Field's 423-foot field elevation, 14°C OAT, 30.12 in/Hg barometer setting and flaps-up takeoff configuration.

Takeoff speeds were 94 KTAS for V_1/V_R and 119 KTAS for the V_2 one-engine-inoperative takeoff safety speed, according to the AFM. However, the Pro Line 21 system indicated a 112 KIAS V_2 speed for that takeoff weight.

Our all-engine takeoff ground roll was 1,850 feet, takeoff distance was 3,100 feet and accelerate-stop distance was about 3,300 feet. The takeoff field length, using FAR Part 25 rules, would have been 5,775 feet, according to the AFM. Notably, if we had elected to use 40 degree flaps for takeoff, the Part 25 TOFL would have been 4,300 feet.

Sifford commented that the B200GT, being a Part 23 aircraft, doesn't have to be operated in accordance with Part 25 rules. But it's helpful to know that the aircraft would have been able to depart safely from Montgomery Field's 4,600-foot-long Runway 28R with one engine inoperative and flaps set to the approach configuration.

In preparation for departure, Sifford switched on the ground mode for the radios, enabling us to use a comm transceiver for clearance delivery while conserving battery power. After we copied the clearance, we switched on the main battery and then the L-3 Emergency Standby Instrument System. The ESIS needs four minutes to align, so we had plenty of time to run through the prestart checks. Turning on the battery also supplies power to the navigation display, which provides engine instrument indications for start. Hawker Beechcraft elected to retain the B200's existing annunciator light system when it upgraded the aircraft to Pro Line 21 about four years ago, so the EFIS has no CAS functionality.

Most other switches and systems are carried over from legacy Super King Air 200 models, so few functions are automatic. There are lots of items to accomplish on the start and taxi checklists, including manipulating the three engine control levers — power, prop and condition. Start and ignition switches must be turned on and off, generator switches must be turned on at the appropriate time and the condition levers must be adjusted.

With both engines operating, we began to taxi to the active. There was plenty of thrust at idle power, so we used the "ground fine" position of the props to help modulate taxi speed. Sifford advised keeping the engine inlet ice diverter doors open on the ground to

Rockwell Collins Pro Line 21 Avionics

The B200GT's standard avionics package is impressively complete. The system uses hub-and-spoke architecture with an Integrated Avionics Processing System (IAPS) as the hub unit. Easily replaceable LRUs inside the IAPS provide flight guidance, flight management and data concentration capabilities, among other functions.

Three 10- by-eight-inch, portrait-configuration adaptive flight displays dominate the instrument panel. Other standard equipment includes a single FMS-3000 3-D navigation system that uses both VOR/DME and GPS position inputs, dual RVSM-capable digital air data computers, dual AHS-3000 AHRS, dual Pro Line 21 CNS radio systems and dual audio panels, plus dual Mode S transponders, a single ADF receiver, DME, radio altimeter, solid-state TWR-850 Doppler turbulence detection radar and 12-channel GPS receiver, along with an L-3 Communications TCAS I and a Honeywell Enhanced GPWS. The radios may be tuned either with the tuning page of the FMS CDU in the center console or by means of a radio tuning unit in the instrument panel.

The standard package also includes a solid-state L-3 Emergency Standby Instrument System (ESIS), an RJ45 jack for FMS database updates, a digital CVR, an ELT and a laptop computer.

Options include a second FMS (16 pounds, $87,200), second DME (nine pounds, $14,900), second ADF receiver (one pound, $15,300), HF transceiver with SELCAL (46 pounds, $76,900), Rockwell Collins TCAS II (15 pounds, $148,700) and XM satellite radio weather receiver (two pounds, $30,600), among other equipment. An electronic chart display capability is included, requiring an annual subscription for activation. Loading the chart database into the standard laptop computer provides the redundancy required for paperless chart approval, according to Tom Sifford, senior demonstration pilot for Hawker Beechcraft.

minimize the chance of FOD. He said it's as not much of a problem as on King Air 300/350 aircraft, which have larger diameter props, but it's still good practice.

Stopped in the run-up area, we accomplished the first-flight-of-day autopilot and electric pitch trim checks, prop over-speed governor, engine inlet diverter door checks, rudder boost and normal governor checks, and then auto-feather checks, noting there are many more required procedures than one would need to accomplish in a turbofan aircraft.

After being cleared onto the runway, we elected to perform a rolling takeoff. As part of the line-up checks, we closed the engine inlet ice diverter doors. During the takeoff roll, we initially set about 2,000 foot pounds of torque because we expected inlet ram recovery to increase the torque to the 2,230-foot-pound maximum limit.

Prop sound was quite prominent during takeoff at 2,000 rpm, but the cockpit has dual Bose active noise reduction headsets that slash at least 10 dBA from the sound that reaches the crew's ears. Sound levels in the cabin during takeoff were typical of what one expects in a high-performance turboprop.

Rotating at 94 KIAS, we immediately were reminded why the Super King Air has such a loyal following among operators. Initial pitch forces were light, but pitch response was not overly sensitive. Control harmony in all three axes was excellent.

Shortly after takeoff, we reduced torque slightly and pulled the props back from 2,000 rpm to 1,700 rpm, resulting in generating prop noise right in the heart of the 113 Hz resonant frequency of the tuned vibration dampers. Cabin sound levels dropped dramatically, according to one of the passengers.

Aft of the lavatory, there is a 55.3-cubic-foot, 550-pound luggage compartment with cargo net.

Our intention was to climb directly to FL 270 for a cruise speed check. Using the flight level change mode of the Pro Line 21 system, the PFD's airspeed bug automatically adjusts to the recommended climb speed for altitude. However, we maintained the 1,700-rpm cruise setting instead of the 1,900-rpm climb setting for passenger comfort, thus somewhat reducing climb performance.

SOCAL Approach and Los Angeles Center, attempting to assist us with our request for an unrestricted climb to FL 270, issued several amendments to our route clearance. These changes easily were accomplished using the FMS-3000. Sifford pointed out that proposed route changes are depicted as dashed white lines on the navigation display, thereby providing a graphic indication that the amended clearance has been programmed properly into the FMS.

During the climb, we also noted that it's best to use the autopilot to reduce workload, if you're flying the aircraft as a single pilot. Hand flying, adjusting power and programming the avionics can push the limits of many pilots. The -52's hydromechanical fuel controls, for instance, require frequent adjustments to maintain the appropriate torque and temp limits. Programming the FMS also requires a lot of attention.

However, the Pro Line 21 has an excellent autopilot and the glareshield-mounted flight guidance control panel enhances situational awareness.

After several re-routes and intermediate level-offs, we reached FL 270 some 24 minutes after takeoff. Using maximum torque at 1,700 rpm, the aircraft accelerated to 305 KTAS at a weight of 11,600 pounds in ISA+9°C conditions (28,000-plus feet density altitude) while burning 770 pph. We had no direct basis for comparing these numbers with published flight planning data. But the B200GT Flight Planning and Performance Guide indicates that an 11,000-pound B200GT should cruise at 307 KTAS at 1,800 rpm at FL 280 while burning 686 pph.

We also intended to check cruise performance at FL 350, but Hawker Beechcraft didn't have an RVSM Letter of Authorization for this specific aircraft, so we were restricted to FL 280 and below.

Next, we elected to proceed directly to Big Bear City Airport (elevation 6,748 feet) with the goal of evaluating high elevation one-engine-inoperative takeoff performance. We flew the RNAV (GPS) Runway 26 approach using the FMS-3000. It provided 3-D navigation during the procedure, including 3.69-degree glidepath guidance down to the 8,690-foot LNAV minimum descent altitude.

After landing, we rolled 5,250 feet to the end of the runway using only ground-fine prop pitch and light braking for moderate deceleration to enhance passenger comfort. Maximum effort braking, though, could have stopped the aircraft in about 3,100 feet, factoring in the airport's 7,700-foot density altitude that day.

We taxied back for the simulated OEI takeoff. Big Bear City Airport's Runway 26 is 5,850 feet long, the density altitude still was 7,700 feet and the wind was out of the west at eight knots. With 1,700 pounds of fuel, aircraft takeoff weight was 11,261 pounds. Plotting these numbers into the B200GT AFM indicated that the OEI Part 25 takeoff field length was 5,800 feet, assuming a flaps-approach takeoff configuration.

However, we elected to increase our safety margins during the demonstration by departing with a no-flap configuration to improve second-segment OEI climb performance and delaying the simulated engine failure until after takeoff, with gear retracted and above the 119 KIAS V_2 takeoff safety speed. Using the flaps-up configu-

Pratt & Whitney Canada PT6A-52 Turboprop Engines

P&WC created a special parts-bin-engineering variant of the PT6A-42 engine for the Super King Air B200GT by mating the -42's 850-shp gearbox to the 1,181-shp gas generator of the -60A. The result is a highly flat-rated 850-shp engine that retains full power up to 24,000 feet.

Improved metallurgy, among other detail improvements, enables the -52's gas generator to operate at 20°C hotter ITT limits and about 2.4 percent higher speeds with no decrease in durability. The -52's TBO remains 3,600 hours, the same as for the -42.

The -52 engines are mated to 93-inch diameter, four-blade Hartzell propellers, the same props used in the latest version of the B200. As with all PT6A-powered civil aircraft, the -52 has separate controls for power, pitch and condition. The powerplant is an ideal candidate for a single power lever FADEC upgrade, but there is no timetable for such a product improvement.

Beech opted for a T-tail empennage with swept vertical and horizontal surfaces. The configuration keeps the horizontal stabilizer out of the prop wash to reduce vibration and its high, aft position improves aerodynamic effectiveness.

ration, the all-engine takeoff distance over a 50-foot obstacle was 4,350 feet.

Safely above the runway with both engines operating and landing gear retracted, Sifford briskly reduced power on the left engine to approximate zero thrust. To maintain balanced flight, we needed only moderately forceful right rudder pressure because of the aircraft's effective rudder boost system. Using the standard five degrees wing-down attitude and flying with one-half ball displacement into the operating engine, we achieved a 350- to 400-foot simulated OEI climb rate.

During the simulated OEI climb over Big Bear Lake, we noted that most of the control forces may be trimmed out to ease handling chores. The Super King Air B200GT has docile handling characteristics at 120 KIAS with asymmetric power and its considerably more robust -52 engines provide substantially better hot-and-high OEI airport performance than the -42 powerplants of its processor, the B200.

After the OEI takeoff demonstration, we used both engines to climb VFR to 15,500 feet eastbound to an area above the high desert west of Twenty Nine Palms where we performed basic air work maneuvers, such as steep turns and stalls. The Pro Line 21 PFDs have relatively large attitude indicators that make it easy to detect small attitude changes during steep turns. But this configuration still retains the truncated attitude indicator used by legacy EFIS displays. We much prefer full-width, edge-to-edge attitude indicators, such as those provided by Garmin's G1000 and Gulfstream's PlaneView systems, because they make it even easier to detect small attitude changes.

We then picked up an instrument clearance from L.A. Center, with a handoff to SOCAL approach, to fly to San Diego-Gillespie Airport. The purpose for changing destination airports was to show the aircraft to a few potential sales leads, including friends of a former Super King Air 300 operator.

Total flight time for the mission was 1.8 hours and overall fuel burn was 1,300 pounds.

Price and Value

The B200GT truly is in a class by itself, having no direct competitors. No other production turboprop has the Super King Air's combination of cabin volume, ability to operate from unimproved airports, short-field performance, OEI takeoff performance and ability to tanker fuel. That's why we elected not to include a Comparison Profile chart as part of this report.

The B200GT retains all the rough-and-tumble, airborne-SUV utility of the Super King Air 200 family, including the availability of a model with a 4.3-by-4.3-foot aft cargo door. However, the latest version has much improved hot-and-high airport performance resulting in higher OEI safety margins, along with a large-scale increase in high-altitude climb performance that makes it practical to operate routinely in the mid-thirties.

The latest version also incorporates Super King Air 350 cabin features, such as passenger chairs, bulkheads and cabinetry. The formerly optional aux electric heating system now is standard fit, improving cabin comfort in cold climates. The cabin also has a composite headliner and cold-cathode fluorescent wash lighting. However, an upgrade to LED wash lighting would further increase reliability.

Pilots will find the cockpit roomy, the Super King Air 350-type crew seats comfortable and the Pro Line 21 avionics package as capable as offered by any turboprop. The B200GT's legacy systems, procedures and "switchology," though, are a fall-back to an earlier era when pilots were expected to be part-time flight engineers. The Super King Air B200GT, similar to other production business aircraft turboprops, is due for a digital systems upgrade that would reduce pilot workload to contemporary light jet standards, in our opinion.

The Super King Air 200's unmatched blend of qualities is why it has had an uninterrupted 34-year production run while virtually all other makes of business-class turboprops have died off, except for Hawker Beechcraft's other models and the Piaggio Avanti. The Super King Air 200 production run isn't likely to end anytime soon, as long as Hawker Beechcraft continues to make regular product improvements.

As the price of fuel continues to climb, the Super King Air 200 will remain an attractive alternative to turbofan aircraft unless there are large-scale improvements in light jet fuel efficiency. That's not going to happen in the near term, so market demand for the B200GT is likely to remain strong. ■