

**BEECHCRAFT KING AIR
B200GT
B200
200**

**EPIC PERFORMANCE FOR THE
ENTIRE KING AIR 200 FAMILY...**
...utilizing Swept Blade Technology



Simply more of what you bought your King Air for!



THE ELEMENTS OF RAISBECK'S 200-SERIES EPIC PERFORMANCE PACKAGE *(Elements available separately)*

SWEPT BLADE TURBOFAN PROPELLERS



BENEFITS

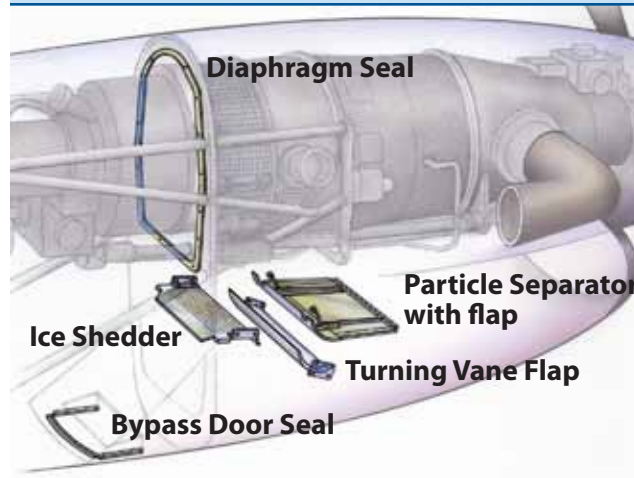
- Stunning ramp presence
- Quiet and virtually vibrationless operation from takeoff to touchdown
- Certified around the world to meet the most stringent regulations and noise requirements
- Inherently improved performance in all phases of flight
- Made of affordable aluminum
- Trouble-free operation between 6-year, 4,000 hour overhauls

TECHNOLOGY

- Swept-wing technology enables larger (96") diameter for more thrust while decreasing noise and vibration
- Unique combination of aerodynamic technology and computer-aided manufacture
- Lightweight aluminum hubs and blades
- Oversized hydraulic power piston for lock-in propeller synchrophasing
- Manufactured by Hartzell Propeller, Inc.

PREREQUISITE: Autofeather required

RAM AIR RECOVERY SYSTEM



BENEFITS

- Significantly increases climb and cruise performance in both normal and anti-ice operating modes
- Protects against FOD—deployable for all ground, takeoff and landing operations
- 18° cooler engine operating ITT at equal torque
- 8% increased available horsepower at altitude gives you a faster airplane
- Measurable decrease in fuel flow at equal engine torque, resulting in increased range
- Reduced torque loss with ice vanes deployed

TECHNOLOGY

- Developed and tested in conjunction with Pratt & Whitney of Canada, Ltd
- FAA-Certified for ice-vane deployment on the ground and in the air
- Utilizes coanda-effect aerodynamics for efficient airflow vectoring
- Full inlet plenum sealing through unique full-body diaphragms

ENHANCED PERFORMANCE LEADING EDGES



BENEFITS

- Cruise speeds and range are increased
- Stall speeds and characteristics are improved
- Air conditioning and cooling are more efficient
- Outboard wing fatigue life is inherently enhanced

TECHNOLOGY

- Drag-reducing advanced-technology airfoil
- All-composite construction for strength and weight-savings
- Recessed flush-mounted de-icing boots for minimum drag
- Fully-developed and optimized intercooler inlet for maximum efficiency

DUAL AFT BODY STRAKES



BENEFITS

- Passenger ride quality is improved
- Pilot control and handling qualities are enhanced
- Air Minimum Control Speed is inherently reduced
- Decreased drag results in increased climb and cruise performance
- Directional stability is increased, eliminating yaw-damper-inoperative altitudes
- Standard on new King Air 350 and C90GTx

TECHNOLOGY

- The shedding wing/body vortices are captured under the aft fuselage, pressurizing and reducing aft-body drag
- Resulting coanda-effect attaches the aft-body airflow
- Equivalent vertical tail area is increased

HIGH FLOTATION GEAR DOORS



BENEFITS

- Climb and cruise performance of standard-gear King Airs is restored
- Cruise speed is increased 8 to 12 knots depending on altitude
- Wheel wells, tires and brakes are kept clean, warm and dry

TECHNOLOGY

- Fully encloses the protruding high-flotation gear, wheels and tires
- Aerodynamically area-ruled to maximize drag reduction
- Constructed of lightweight composites for maximum strength and minimum weight

OPTIONAL CROWN WING LOCKERS



BENEFITS

- FAA-certified to carry 600 pounds total cargo in 17 cubic feet of luggage space
- Returns your cabin to your passengers
- Handles skis, snowboards, camping and hunting equipment as well as golf bags and luggage
- Fully certified for FAR Part 135 Operations
- Provided with lock-and-key security
- OEM-installed on all new King Air 350s

TECHNOLOGY

- Lightweight composite construction provides infinite-life structural certification
- Aerodynamically area-ruled to minimize drag
- Fully self-contained for a clean and dry locker interior
- Removable in minutes for any airplane maintenance or inspections

RAISBECK B200GT EPIC

PT6A-52 ENGINES

EPIC PLATINUM

Includes Raisbeck/Hartzell 96" Swept Blade Turbofan Propellers for best performance

TAKEOFF (FLAPS UP, 12,500 lbs, SL/ISA)	B200GT EPIC PLATINUM	Basic B200GT	IMPROVEMENTS
Distance Over 50 ft	2,210 ft	3,300 ft	1,090 ft less runway
Part 25 Balanced Field Length (BFL)	3,990 ft	Not Certified	Airline Safety Standards
Accelerate-Stop Distance	3,250 ft	3,380 ft	130 ft less runway
Accelerate-Go Distance	3,450 ft	6,370 ft	2,920 ft less runway

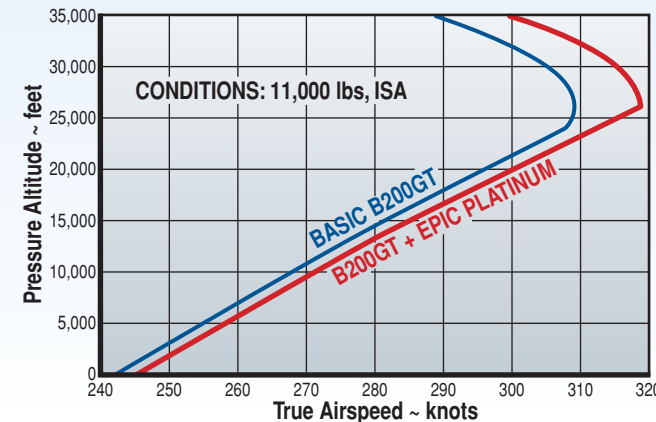
CLIMB (12,500 lbs, SL/ISA)			
Two Engine Rate-of-Climb	2,510 ft/min	2,420 ft/min	90 ft/min more
Time-to-Climb to 28,000 ft	14 minutes	16 minutes	2 minutes quicker
Time-to-Climb to 33,000 ft	18 minutes	22 minutes	4 minutes quicker

CRUISE (11,000 lbs, ISA)			
Max. Cruise Prop RPM	1,600 - 1,800	1,700 - 1,800	Quieter cruise and cabin
Max. Cruise Speed, 28,000 ft	318 ktas	307 ktas	11 knots faster
Max. Cruise Speed, 33,000 ft	307 ktas	296 ktas	11 knots faster

LANDING (FLAPS DOWN, 11,000 lbs, SL/ISA)			
Approach Speed (V _{REF})	90 kts	99 kts	9 kts slower approach
Landing Distance Over 50 ft (without prop reverse)	1,800 ft	2,500 ft	700 ft less runway

PROPELLERS	96" Raisbeck/Hartzell Swept Blade Turbofan 4-Blade	93" Hartzell/Beech 4-Blade	• Exceptional performance • Stunning ramp presence
------------	--	----------------------------	---

EPIC PLATINUM delivers the fastest, most versatile B200GT ever certified!



EPIC GOLD

Retains 93" OEM Propellers

93" Hartzell/Beech 4-Blade Propellers (HC-E4N-3G/D9390SK-1R)

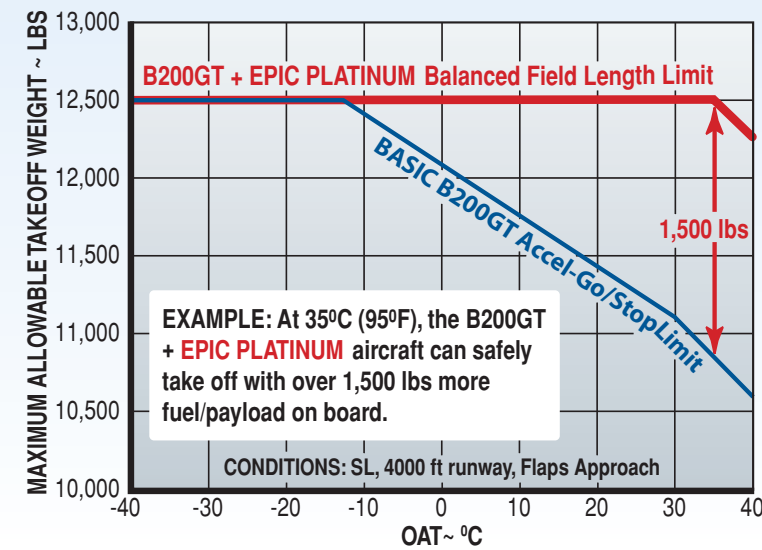
TAKEOFF (FLAPS APPROACH, 12,500 lbs, SL/ISA)	B200GT EPIC GOLD	Basic B200GT	IMPROVEMENTS
Distance Over 50 ft	2,400 ft	2,600 ft	200 ft less runway
Part 25 Balanced Field Length (BFL; no prop rev.)	3,500 ft	Not Certified	Airline Safety Standards
Accelerate-Stop Distance	—	3,380 ft	—
Accelerate-Go Distance	—	4,700 ft	—

CRUISE (11,000 lbs, ISA)			
Max. Cruise Speed, 28,000 ft	318 ktas	307 ktas	11 ktas faster

LANDING (FLAPS DOWN, 11,000 lbs, SL/ISA)			
Approach Speed (V _{REF})	90 knots	99 knots	9 knots slower approach
Landing Distance Over 50 ft (without prop reverse)	1,800 ft	2,500 ft	700 ft less runway

- includes Blackhawk-equipped aircraft

Take off with additional passengers and fuel.



RAISBECK B200 EPIC

PT6A-42 ENGINES

EPIC PLATINUM

Includes Raisbeck/Hartzell 96" Swept Blade Turbofan Propellers for best performance

TAKEOFF (FLAPS UP, 12,500 lbs, SL/ISA)	B200 EPIC PLATINUM	Basic B200	IMPROVEMENTS
Distance Over 50 ft	2,210 ft	3,300 ft	1,090 ft less runway
Part 25 Balanced Field Length (BFL)	3,990 ft	Not Certified	Airline Safety Standards
Accelerate-Stop Distance	3,250 ft	3,380 ft	130 ft less runway
Accelerate-Go Distance	3,450 ft	6,370 ft	2,920 ft less runway

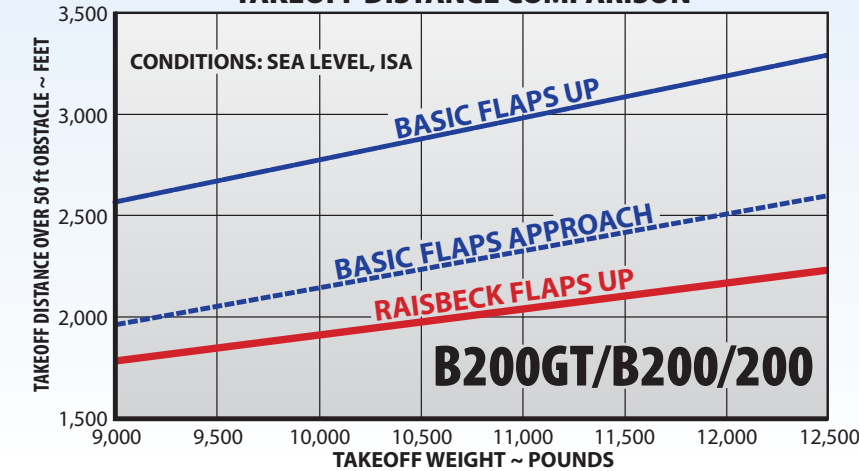
CLIMB (12,500 lbs, SL/ISA)			
Two Engine Rate-of-Climb	2,510 ft/min	2,420 ft/min	90 ft/min more
Time-to-Climb to 28,000 ft	15 minutes	19 minutes	4 minutes quicker
Time-to-Climb to 33,000 ft	22 minutes	29 minutes	7 minutes quicker

CRUISE (11,000 lbs, ISA)			
Max. Cruise Prop RPM	1,600 - 1,800	1,800	Quieter cruise and cabin
Max. Cruise Speed, 28,000 ft	295 ktas	285 ktas	10 knots faster
Max. Cruise Speed, 33,000 ft	286 ktas	273 ktas	13 knots faster

LANDING (FLAPS DOWN, 11,000 lbs, SL/ISA)			
Approach Speed (V _{REF})	90 kts	99 kts	9 kts slower approach
Landing Distance Over 50 ft (without prop reverse)	1,800 ft	2,500 ft	700 ft less runway

PROPELLERS	96" Raisbeck/Hartzell Swept Blade Turbofan 4-Blade	93" Hartzell/Beech 4-Blade	• Exceptional performance • Stunning ramp presence
------------	--	----------------------------	---

TAKEOFF DISTANCE COMPARISON



EPIC GOLD

Retains 93" OEM Propellers

93" Hartzell/Beech 4-Blade Propellers (HC-E4N-3G/D9390SK-1R)

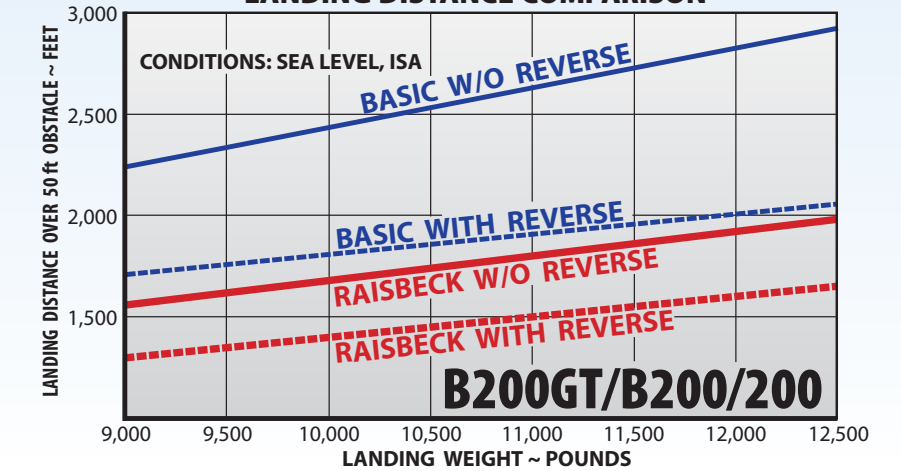
TAKEOFF (FLAPS APPROACH, 12,500 lbs, SL/ISA)	B200 EPIC GOLD	Basic B200	IMPROVEMENTS
Distance Over 50 ft	2,400 ft	2,600 ft	200 ft less runway
Part 25 Balanced Field Length (BFL; no prop rev.)	3,500 ft	Not Certified	Airline Safety Standards
Accelerate-Stop Distance	—	3,380 ft	—
Accelerate-Go Distance	—	4,700 ft	—

CRUISE (11,000 lbs, ISA)			
Max. Cruise Speed, 28,000 ft	295 ktas	285 ktas	10 ktas faster

LANDING (FLAPS DOWN, 11,000 lbs, SL/ISA)			
Approach Speed (V _{REF})	90 knots	99 knots	9 knots slower approach
Landing Distance Over 50 ft (without prop reverse)	1,800 ft	2,500 ft	700 ft less runway

- ALMOST AS FAST AS A B200GT WITHOUT THE COST!
- includes Blackhawk-equipped aircraft; takeoff and landing also generally applies to King Air 200 aircraft with PT6A-41 engines

LANDING DISTANCE COMPARISON



CUSTOMER OBSERVATIONS

JEAN SAGOUSPE

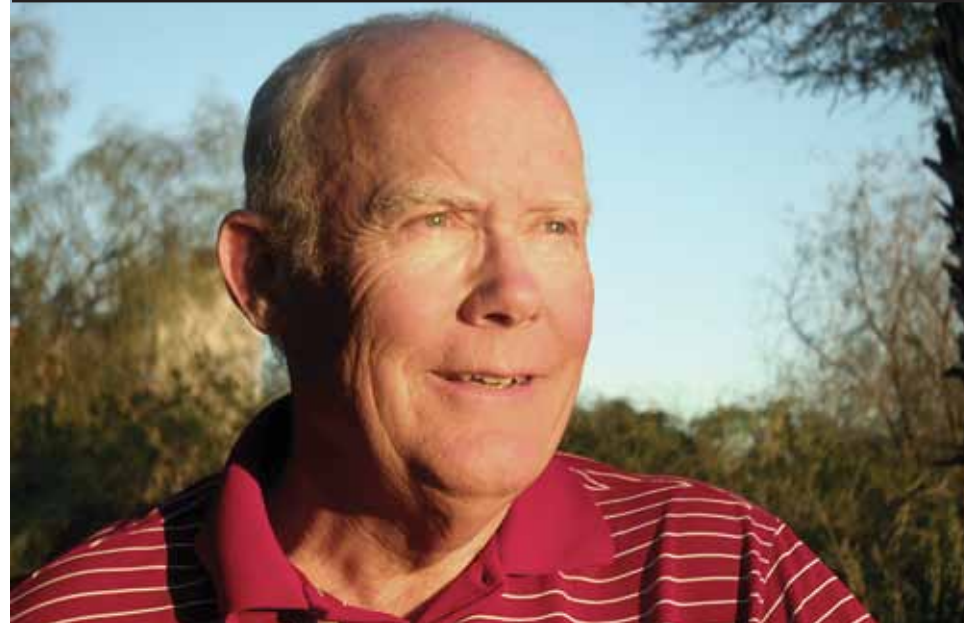


“The new Swept Props and the Raisbeck EPIC Package have solved my high-hot takeoff concerns, at or near gross.”

“Flying high and hot out of Steamboat Springs at or near gross really got my attention. Raisbeck’s EPIC Performance Package with Swept Props has solved my high-hot takeoff concerns. My B200 King Air accelerate-go distance has shrunk from almost 11,000 feet to a bit over 6,000 feet on warm days there. Very reassuring.”

Jean Sagouspe
Pilot, King Air BB-1504
Sagouspe Enterprises

TOM CLEMENTS



“I am a big fan of Raisbeck’s EPIC improvement package.”

“My compliments to Raisbeck Engineering for recertifying the 200-series’ takeoff performance and publishing FAA-approved data that permits FAR Part 25 levels of safety. When this is mated with the aerodynamic improvements of the full Raisbeck EPIC upgrade package, the results are significantly reduced runway requirements and more takeoff safety. I am a big fan of Raisbeck’s EPIC improvement package.”

Tom Clements
Pilot and Author of *The King Air Book*

CHRISTI TANNAHILL



“Raisbeck Engineering shares our commitment ... by providing high quality products....”

“Raisbeck Engineering shares our commitment to more than 6,500 King Air operators by providing high quality products that continue to make the King Air ownership experience the best in the industry.”

Christi Tannahill
Senior Vice President
Textron Aviation

JONATHAN CORCORAN



“This is one upgrade we feel on every flight.”

“After reading the performance data on the new Swept Blade Props, I knew I had to have them. It was hard to give up the Power Props we fell in love with, but we were able to easily find a buyer for them. I knew we made the right choice when on our first takeoff, I realized we had our hands on a new level of performance for a turboprop. This is one upgrade we feel on every flight.”

Jonathan Corcoran
Owner & Pilot, King Air BB-1723
Corcoran Aviation LLC

THE RAISBECK/HARTZELL SWEEP BLADE TURBO FAN PROPELLER FOR THE KING AIR 200 FAMILY

Developed jointly by Raisbeck Engineering and Hartzell Propeller

TECHNICAL OVERVIEW

By James D. Raisbeck

WHY SWEEP THE PROPELLER BLADES?

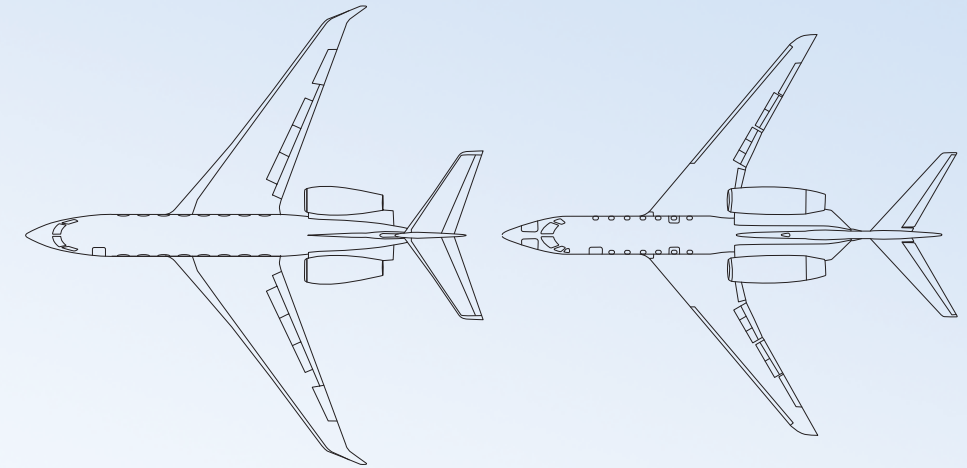
In short, it reduces noise while at the same time increases performance.

The newer King Air 200s can only cruise as fast as .52 Mach (M_{MO}) at 28,000 feet. However, at a propeller RPM of 1800, the propeller tip Mach number is over .9 at cruise. This same high-Mach phenomenon is also very much present during takeoff at low forward airspeeds but higher prop RPM. As an example, at 120 knots during initial climb at 2000 RPM, the propeller tip Mach is an astonishingly high .8.

These takeoff, climb and cruise conditions are encountered on almost every King Air 200 flight, and they push the propeller blades significantly into the transonic drag rise for airfoils and unswept wings.

As a comparative example, commercial airliners and business jets typically fly around Mach .79 to .82, and some of them are pushing .90 (747) and even as high as .92 (Gulfstream 650 and Cessna Citation X). The wing sweep on these airplanes varies from 30 to 40 degrees. The top view of any of these aircraft shows how dramatic the sweep is (see figures above right).

With a jet airplane, its entire wing is at the same Mach number. However, with a propeller blade, the farther out on its diameter, the higher the Mach number. Adding additional diameter to a propeller adds to its tip



Gulfstream 650

Cessna Citation X

Mach number, which in turn adds unwanted additional transonic drag and noise. This of course detracts from the other desirable performance increases resulting from such an increase in diameter.

Air over an airfoil doesn't know if that airfoil is part of a wing going straight through the air, or a propeller blade being whirled around in a circle. The air reacts the same to increasing Mach number.

Merely adding propeller diameter doesn't necessarily add proportionate performance improvement, and it can be measurably noisier because of high Mach effects at the outer parts of the blades.

Introducing blade sweep to the blades overcomes these drawbacks. Blade sweep allows you to increase diameter and performance while simultaneously reducing noise.

- **QUIET**
- **POWERFUL**
- **STUNNING RAMP PRESENCE**

BRIEF HISTORY OF WING AND BLADE SWEEP

The swept wing has been around since Willy Messerschmitt put it on the ME 163 in 1943, so why hasn't anybody designed swept propeller blades until now?

Actually, there have been some successful attempts to design and build true swept propellers. The European A400M cargo plane has swept wings and swept propellers (at right). It cruises at Mach 0.72. The propeller has 8 blades and is very costly for general aviation consideration.



Airbus A400M

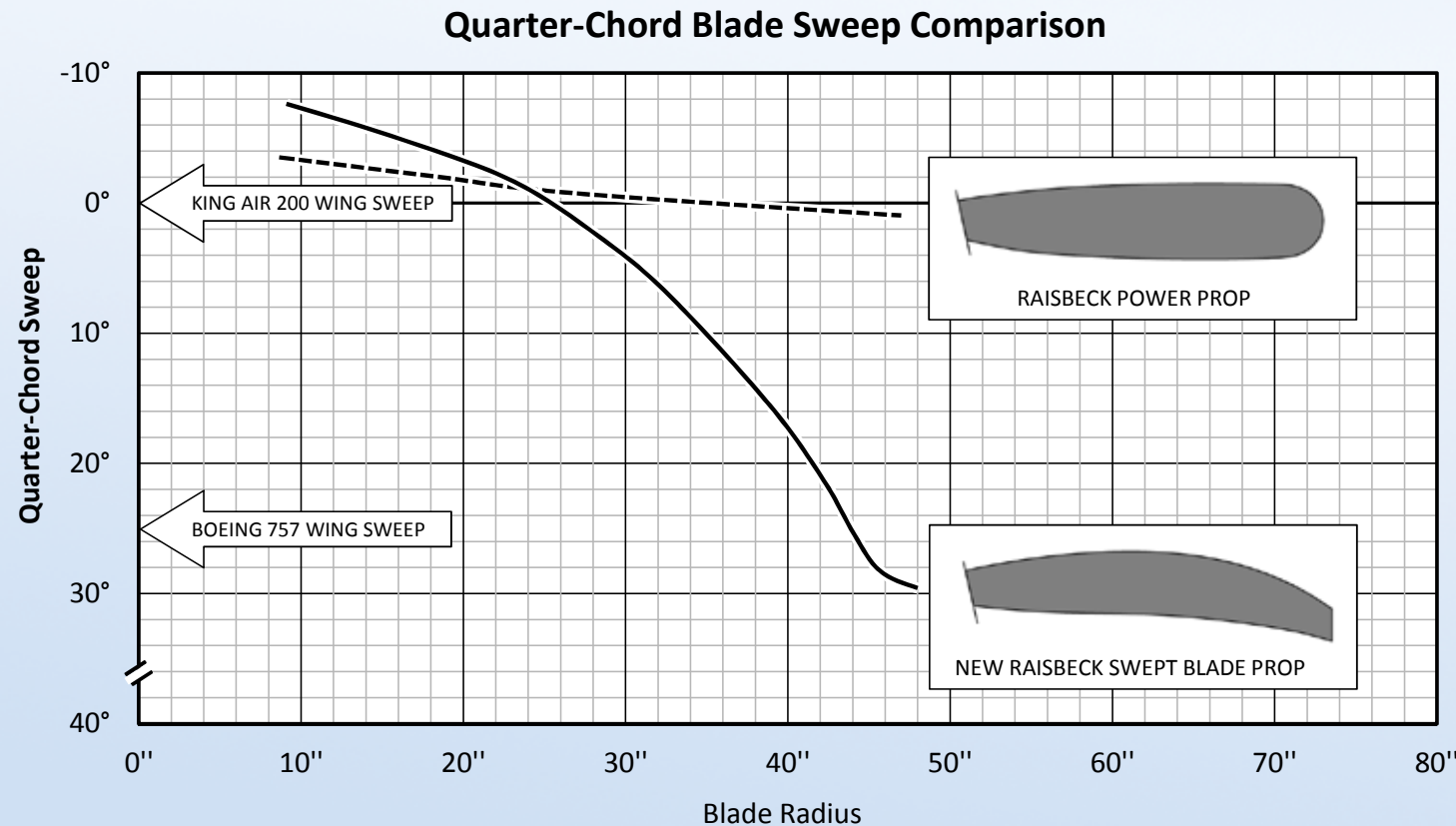


Lockheed C130J

There are other examples such as the C130J (at right), but they are all very expensive and usually on military airplanes. As such, they inherently don't qualify for markets such as the King Air.

But to the layman, it is not obvious that sweeping the blades of a propeller installed on a King Air that incorporates no wing sweep itself and flies at cruise Mach numbers well below the transonic drag rise, makes any sense. Since no one has gone there in propeller design for airplanes like the King Air, no market has ever been developed. Market is what drives research—new products which satisfy a new market need.

Hartzell Propeller and Raisbeck Engineering have partnered for the last three decades to extend the dual boundaries of technology and market. The latest of these efforts is the Raisbeck Swept Blade Turbofan Propeller (SBTP).



APPLICATION OF WING SWEEP TO THE KING AIR PROPELLER

Surveying a number of recent general aviation airplane propellers, they at first appear to have swept blades. But they don't. Several examples exist like the Hartzell Scimitar propeller (below).



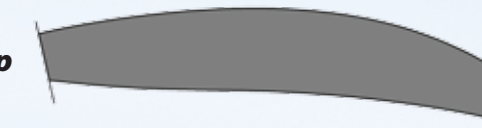
Unswept Scimitar Propeller

The blades on these propellers have cut-back leading edges, but the trailing edges remain unswept. The graph on page 10 compares the quarter-chord sweeps of the blades on our current Raisbeck Turbofan Power Prop with our new Swept Blade Turbofan Propeller. When viewed side by side (see below), the visual effect of the blade sweep stands out in a crowd.

Raisbeck Power Prop



New Raisbeck Swept Blade Prop



DEVELOPMENT AND FAA CERTIFICATION FLIGHT TESTING

First conforming propellers with the new blades were delivered to Raisbeck's flight-test facilities in June 2012, following 2½ years of CFD analyses and resulting studies and trade-offs.

Three different propellers were evaluated on a fully instrumented King Air B200: the current Hartzell OEM propeller for the B200GT (93" diameter); the current Raisbeck Turbofan Power Prop (94" diameter); and the new Swept Blade Turbofan Prop (96" diameter). Incremental increases in performance between these three were documented, and fell as expected, with performance following increased diameter.

FAA flight testing was completed in August 2012, with STC granted in January 2013. Combined with the other elements of the EPIC Performance Package, Swept Blade Turbofan Propellers provide unparalleled performance increases across the entire flight envelope for every King Air 200 ever built. They are uniquely certified with alternate FAR Part 25 Balanced Field Lengths for true Airline levels of operational safety.

MANUFACTURING CONSIDERATIONS

The large sweep on the new propeller has required new aluminum forgings for quantity production.

With all this in mind, the Raisbeck/Hartzell team opted for aluminum construction for the four-blade Swept Prop in the King Air 200 series. The benefactor of this choice is the customer—affordable new technology.

Development and certification programs for the King Air C90 Series (certified in 2014) and the 350 have followed.

RAISBECK'S 200 EPIC PACKAGE: THE BEST PERFORMANCE *for your* KING AIR B200GT/B200/200



info@raisbeck.com
(800) 537-7277
(206) 723-2000
www.raisbeck.com



INTERNATIONAL
PROPELLER
SERVICE

bob@ipsl.aero
(402) 858-6346
www.ipsl.aero