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King Air B100 in South Africa

(courtesy Byron Lutzke)

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### **COVER STORY**



# Taking a B100 to the other side of the world

by Joe Casey Photos courtesy of Joe Casey and Byron Lutzke



here aren't many King Air B100 aircraft in the world. I think it is one of the better King Air models, but others love the mighty 3XX, 2XX and the various 90 models. The little known B100 was designed and built in the mid-1970s when Beechcraft anticipated a Pratt & Whitney employee strike could impact the production of the venerable PT6 engines. That looming strike produced the B100, which I believe is viewed as the stepchild of the King Air family.

The B100 has fuel-efficient Garrett (Honeywell) TPE331-10 engines bolted onto the shortest wing ever mated to the larger fuselage used for King Air 200 and 300 models. It is the same wing found on the E90, which tells you how small it is. But, the differences don't end there. Beechcraft also used a horizontal stabilizer trimmed by moving the entire stabilizer. If that's not weird The most beautiful scenery flying out of Nuuk, Greenland.



enough, there's no physical trim wheel available to the pilot, only electric trim.

#### The Journey Begins

The end result is a short wing, large fuselage, incredibly efficient, fairly fast and loud-as-hell-on-the-ground King Air that behaves in flight like none of the other King Air aircraft. The King Air fleet is so ubiquitous that any properly trained King Air pilot of any model could jump in any of the other various models and feel right at home within a few laps around the pattern ... except for the B100.

Despite its differences, the B100 is one of my favorite airplanes to fly. Comparing it to the A100 that is identical to the B100 except that it has PT6 engines, the B100 betters the A100 by 20+ knots and uses less fuel. Many say it is like owning a 200 for half the price ... and they might not be far off. Because of its efficient numbers, the B100 has a loyal following, but those supporters are few and far between compared to the rest of the King Air fleet. It is not an airplane that is widely loved, but it is absolutely loved by those who know it best.

My company, Casey Aviation, has operated a King Air B100 for the last decade, so I've become one of its loyal supporters. I also have international flight experience and an adventurous spirit, which is how I became involved when a South African owner purchased a -10 powered B100 from Florida and needed it flown across three continents. In July 2023, I found myself in south Florida to pick up N136MB, a very nice B100 with low-time -10 engines. I met Byron Lutzke, the pilot for the new South African owner, at Fort Myers. Byron had never flown a B100 nor a multi-continent, international ferry flight, so I was PIC, but I quickly found Byron to be an excellent pilot, eager to gain flight experience in both the aircraft and the route. I sat in the left seat and Byron observed and ran the radios from the right.

We launched into an overcast sky and in short order had the nose pointed to Goose Bay, Canada (CYYR). We climbed at 150 KIAS while maintaining greater than 1,500 fpm during most of the climb. Cruise speeds averaged 264 KTAS, burning 280 pounds of fuel on each engine. Those are good numbers compared to other King Air models, in fact those are good numbers compared to just about any other airplane with a true 10-seat capacity. We had full fuel on every takeoff and were carrying a lot of additional gear on the trip. The B100 was not full of people, but we were heavy. The aircraft performed flawlessly with book numbers.

After stops in Virginia, Maine and Goose Bay, we flew on to Greenland. I expected my biggest challenge on the trip to be the stop in Nuuk, Greenland (BGGH). I normally use Sondestrom (BGSF) or Narsarsuaq (BGBW) on a North Atlantic trip, but Sondestrom is a bit out of



"I consider Greenland the most beautiful from both the ground and the air."



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the way to the north and Narsarsuaq has expensive fuel and frequently changing weather. Nuuk has cheaper fuel and more predicable weather though it also has a very short 3,000-foot runway. Normally short wings and a big fuselage is a bad combination for a short field, but the B100 also has direct-drive Garrett engines that allow for the props to go into reverse instantly after touchdown. On the three landings before Nuuk, I practiced my short-field landing and takeoff techniques, and Byron and I compiled accurate aircraft and weight specific calculations concerning our landing and takeoff lengths. I was consistently able to both land and depart in less than 2,000 feet, but practicing a short-field approach on a long runway is vastly different from actually landing on a short field.

There's no "pucker factor" on a long field, but there was definitely one when actually approaching Nuuk's 3,000foot runway. I flew the approach precisely, landed on the numbers and applied full reverse. The B100 responded wonderfully. There's a midfield taxiway that I could have easily turned off on, reminding me the B100 is such an impressive machine.

Loading up for the departure from Nuuk, my confidence was sky-high on the takeoff. The cooler temperatures at Nuuk (10°C) meant performance would be optimal, and the B100 was off the runway in about 1,600 feet, close to midfield. We were soon climbing into clear skies, taking in some of the most breathtaking views on the planet. I've stepped foot on more than 80 countries and flown over five continents. I consider Greenland the most beautiful from both the ground and the air.

The flight from Nuuk to Keflavik, Iceland (BIKF), was routine. We had a nice view of the Greenland ice cap; you feel very small and very alone over the vast, uniform landscape. The North Atlantic was calm and peaceful, a stark difference from what one can expect in other times of the year. As we approached Iceland, though, the wind picked up and the whitecaps became more plentiful. Our landing at BIKF was easy as the 30-knot wind was directly down RWY 01. We parked, refueled

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and went to bed with the sun still high in the sky at 10 p.m.

Departing Luxembourg (ELLX) for Heraklion, Greece (LGIR, on the Island of Crete), was refreshing, not only because we were leaving the oppressive security of ELLX, but two beautiful parts of the world were below us: the Swiss Alps and the Aegean Sea.

Of course, with older aircraft not everything works perfectly all the time. On this B100, the left propeller was likely not perfectly balanced (annoying, but not dangerous), there was a green ALT light on the autopilot that would not illuminate (more annoying), and the fuel gauges were off at certain levels. It was the fuel gauges that concerned me on the way to Greece.

The right fuel gauge was grossly inaccurate when full, it bounced around at the mid-quantities, and we had no idea what it would read when the tanks were near empty. The left tank had read perfectly so far, but we had not flown the gauges to less than 700 pounds/side yet and had no idea how accurate it would read at the lower quantity range.

We had 1,250 nautical miles of flying between ELLX and LGIR, five and a half hours of flight time with forecast winds, and we expected to land with about 400 pounds of fuel on each side (allowing more than an hour margin). It is woefully uncomfortable to stare at a gauge that bounces around when you've been flying for five hours. So, we did what seasoned ferry pilots are really good at doing: calculate, monitor and hope. I bet I punched numbers in my calculator 30 times on that leg, coming up every time with the same predicted landing fuel, so we pressed on.

The landing at LGIR was uneventful and we were then able to accurately calculate the volume of the fuel tanks by monitoring the refueling. The right tank read perfectly accurate and the left tank was within 4 gallons of the right. For tank volumes of nearly 200 gallons each that are only 8 inches deep, that's pretty accurate measuring. We then had an accurate data point at the lower fuel levels, giving us confidence for the longer legs that were upcoming over Africa. Within 45 minutes we were leaving Greece and flying to Hurghada, Egypt (HEGN).

We landed on the immensely long RWY 35R at HEGN and soon were dealing with another round of security. Thanks to our handlers and our pilot status, we were marched to the front of a line of about 200 people waiting to get through the long security line.

After leaving Egypt we had four more stops, with 4-5 hours of flying between each stop. We estimated 17 hours of flying to get from HEGN to South Africa in the King Air. There are a lot of places in Africa to avoid, and we picked our route down the east side because the west side of Africa is rife with corruption and the threat of extortion. We felt it safer to fly around war-torn Sudan than to fly through Mali, Nigeria or the Democratic Republic of Congo.

The flight route from Hurghada to Djibouti was southbound over the Red Sea, but in a zig-zagging course amongst international boundaries that made fuel calculations less accurate. We spoke with many different controllers, all with different ideas of the best routing through >



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### GARMIN



Joe (foreground) and Byron with the ground crew at Nairobi, Kenya (HKJK).



Flying south from Kenya, Mount Kilimanjaro peaked above the clouds at FL230.

their airspace, and none of them cared what our fuel gauge read. So, again, out came the calculators and a hope for favorable winds every time we got a new clearance.

The next landing was not exactly a nail-biter but landing with only 243 pounds of fuel on each side, technically an hour reserve, was a seriously low volume if we had to divert to another airport. We were told to hold at a fix on the approach to Djibouti, but I declined that request citing "minimum fuel" status. I think that was a good call considering we were in a foreign nation with limited options. We found Nairobi, Kenya (HKJK), around 8 p.m., at the end of a long flight day and eagerly ate dinner and sought much needed rest.

One of my favorite aspects of a big trip like this one is seeing different cultures; our handler at Nairobi was a guy named Wycliffe, who was happy to chat about his country. I think Kenyans have a better and more varied climate (sitting at a higher elevation), and they seem to live a better life than many Africans.







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Arriving into Lilongwe, Malawi (FWKI) for a fueling quick turn before the final stop at Lanseria.

It was cloudy in Kenya, but on the flight southbound we got an impressive view of Mount Kilimanjaro. The top of the clouds were at FL210, we flew at FL220, and Kilimanjaro stood majestically above FL230 with a trail of wind-swept clouds downwind of her.

I was cautious coming into our next stop, Lilongwe, Malawi (FWKI). During my last experience, I was forced to pay excessive fees. We had a completely different encounter on this trip because Byron – a local to the continent – called an associate to handle all of the fees for us. The \$133 was a fraction of the thousands I'd been asked to pay the last time I stopped at FWKI. We never left the airplane, were refueled in less than 30 minutes and effectively conducted a quick turn.

The final leg seemed relaxing. As heavy clouds started to wane, the beautiful mountains of eastern South Africa began to reveal themselves in all their glory. South Africa is a beautiful country and easily one of the most productive economies on the continent. Signs of civilization grew more numerous and soon we were "diving and driving" on a super-steep right downwind to Lanseria, South Africa (FALA).

At FALA, there were more friends to see us through. The brokers who helped purchase the B100 were there and had everything ready for us. Both the airplane and crew made it through customs with no delays. This was important because I had an airline flight to catch. Within an hour of landing at FALA, I was at Tambo International Airport (FAOR) awaiting my flight back to the U.S.

#### Looking back

I'm still amazed every time I move an airplane around the world. A one-mile hunk of asphalt really is a gateway to the entire world. It is a marvel that we can jump in a King Air in Florida and end up in South Africa five days later, having stepped foot on 12 countries and three continents, all in seamless, zipper-like fluidity. The trip was about 50 hours of flight time. We averaged 15 knots on the tail, I suspect a flight from South Africa back to Florida would take an additional 5-10 hours of flight time.

A few observations:

Two ways to make your ground experience go smoothly: have a friend or contact in country and tip well. A \$5 USD will get you out of many a jam. Tip more than that, they know you probably have more money onboard.

European airspace has 20 times the number of waypoints on a given route than what we experience in the U.S. Be prepared for ATC to change routes on you, we had it happen three times on one leg of this trip.

This flight couldn't have been done without Shepherd Aero, the flight management company that provides trip support on every international flight I take. There's a multitude of overflight permits, meal negotiations, customs events, hotel reservations, fuel uploads, ground transportation reservations and passport paperwork that can be overlooked by the untrained, with one small hiccup causing huge ripples downstream.

Airplanes are an amazing bridge to the rest of the world. I'm looking forward to the next trip and I hope this account will encourage you to let your airplane take you to places that are different and exciting, places that expand horizons and invigorate the soul.

Joe Casey is the owner of Casey Aviation, Inc. based at the Angelina County Airport (KLFK) in eastern Texas, which manages various King Air aircraft, a TBM, many PA46 variants and provides insuranceapproved flight training in many models of airplanes. He has over 17,500 hours of total flight time, over 4,000 of which are in King Air airframes. He is a certified ATP-ME/SE and Commercial Pilot Rotorcraft-Helicopter and Glider ratings. Casey is also a Designated Pilot Examiner (DPE) with BE-300 type rating issuing authority up to the ATP level, and also holds CFI, CFII, MEI, CFI-H, CFI-IH, CFI-G certificates. He has flown over 83 North Atlantic crossings in King Air aircraft.



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# **On the Shoulders of Giants**

Building on the Beechcraft and Cessna legacies inspire Textron Aviation leader Ron Draper

by MeLinda Schnyder



Ron Draper became president and chief executive officer of Textron Aviation in October 2018 at the age of 50. He first started with Cessna Aircraft Company in 1999 after his active service commitment with the U.S. Army. (Courtesy Textron Aviation) ive years ago, Ron Draper became president and chief executive officer of

Textron Aviation at the age of 50. Earlier this year, Draper talked to *King Air* magazine about what he calls his "not normal" career path from farmer to the C-suite, the importance of faith and family in his life and his enthusiastic return to flying, including getting in the left seat of a Beechcraft King Air 360.

When he stepped into the top role at the world's largest manufacturer (by units) of business jets and general aviation aircraft, including the Cessna and Beechcraft brands, Draper called company founders Walter Beech, Olive Ann Beech and Clyde Cessna his aviation heroes. Combined with the next generations of company leaders, including Frank Hedrick at Beech and Dwane Wallace and Russ Meyer at Cessna, Draper says he is in awe of the "perseverance, humbleness and incredibly, awesome legendary leadership" they exhibited in building the brands and influencing the Wichita community as well as the aviation industry.

Clyde Cessna formed his company in 1927, then his nephew Dwane Wallace led it for 40 years, followed by Russ Meyer. Walter and Olive Ann Beech started Beechcraft in 1932, and Olive Ann stepped into the role of president when Walter died in 1950, followed by her nephew Frank Hedrick becoming president in 1968. The companies merged in 2014 to form Textron Aviation, a subsidiary of industrial conglomerate Textron Inc.

"It's humbling to stand on the shoulders of those types of giants, and I feel it's my duty to continue to build on their success," Draper said. "How do we take care of our employees? How do we ensure that we have the right products, the right service, the right processes so that this company that's been here for 95 years will be here for another 95 years? My role is to keep that going and advance it." That history inspires him, he said, and also adds pressure to the job.

"But it serves as good pressure to me, because I respect where we came from, I respect that I do stand on the shoulders of giants. And that pressure is: I've got to do the right thing, long term, for this company, its employees, our brand reputation and our products. So how do we improve our facilities? How do we make the best airplanes in the world? How do we have the best customer service in the world? That's what I wake up every day thinking about."

Then there are the external factors that affect the company and its customers, and require his attention. Pressed to name a few, he said regulations influencing the industry, the FAA's ability to keep pace with modernization and support certification of airplanes, climate change and the pressure on aviation as well as the rising costs of insurance for aircraft owners.



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Foremost, though, he said he has spent his first five years as CEO focused on cultivating a healthy and engaged workplace for Textron Aviation's 13,000 employees worldwide, 10,000 in Kansas. Tough economic times starting in 2008 took a toll on the culture that Draper said made him fall in love with Cessna and Wichita early in his career.

#### His path to CEO

Draper grew up on a farm in Idaho, a third-generation farmer whose ambition to learn and lead took him to the U.S. Military Academy in West Point, New York, where he earned a degree in engineering management. He selected aviation from the U.S. Army officer branch options and went on to lead soldiers across the globe as a UH-60 Blackhawk helicopter pilot and company commander.

Following his active service commitment, he entertained offers from John Deere, General Electric and many others before choosing to move to Wichita in 1999 to work at Cessna Aircraft Company. He was thrilled to be working in aviation, though didn't have immediate aspirations to eventually holding the top position.

"That's not what I set out to do," Draper said of becoming CEO. "I did want to be a leader, I did want to have influence, and I did want to be successful. But I wanted to do it in a way that balanced my family and my work. I worked hard and I was fortunate I had the right opportunities. Textron kept developing and investing in me, and I had a supporting family who was game for all this."

After five years in Wichita, where he earned an MBA from Wichita State University, Draper moved to fellow Textron company Bell Helicopter in North Texas. There he would lead procurement during a critical development phase on the Bell Boeing V-22 Osprey, a tiltrotor military aircraft capable of vertical takeoff and landing.

Next, he accepted a move to Georgia for his first executive role as vice president of Integrated Supply Chain for Textron Specialized Vehicles, the maker of golf cars and other commercial and industrial utility vehicles.

In 2011, the company gave Draper the choice for his next executive role between the two largest of the Textron businesses: Cessna or Bell. "It was Cessna 100%, because I fell in love with the culture here, the people of this company and our products."

Back in Kansas, he oversaw the manufacturing operations for all Beechcraft and Cessna commercial products as senior vice president of Integrated Supply Chain. Under his leadership, Textron Aviation brought seven different products to market.

"Textron has a number of leadership development classes as you progress through every level, and that's all

very helpful," he said, "but in my opinion, that's maybe 10 or 20% of thinking about getting ready for big jobs. The remaining 80 or 90% is the school of hard knocks, learning by doing. I've been very fortunate that the career path I had prepared me by stretching me, from being a farmer to going to West Point – which I think is the best leadership school in the nation – to leading soldiers in the Army and then having a new job every 24 months within Textron, some of them very difficult, some with challenges, through upcycles and downcycles in business and within different industries.

"Without that, I would not have been as ready to be in this role. It stretched my ability to handle stress, my ability to balance work and life and prioritize what's important."

It wasn't until 2016 that he started to understand he was on the path to be president and CEO.

#### **Returning to the left seat**

Throughout his career, Draper said, he was unwilling to compromise on balancing his commitment to his faith and family with advancing his career. To make room for work assignments often with long hours and raising four sons with his wife, he gave up his two favorite hobbies - golfing and flying - for nearly a dozen years.

Three sons are now in college and one is in high school, and he's back to flying as a fixed-wing multiengine commercial rated pilot – because he loves it and for the familiarity it gives him with customers, suppliers and working alongside the company's customer service and engineering departments on product design and development.

"Getting inside the cockpit of one of our aircraft is always a privilege for me," he said. "One highlight of this job has been reinvesting in my own pilot journey by starting with the iconic 172 and progressing through my Citation 525 type rating. Every aircraft has a unique place in our product line, but no other aircraft rivals the King Air in the turboprop market.

"I've had the pleasure of being a passenger on countless King Air flights, but I have been even luckier to have flown the King Air 360 myself. Talking about its power and agility does not compare to actually being in the cockpit and feeling its steady handling and dependable speed control. It's straightforward to navigate through crowded airspace."

Draper said he's put an emphasis on learning to fly for other Textron Aviation executives, as well as employees



Ron Draper returned to flying starting in 2016 and in roughly two years he flew the Textron Aviation product line, from the Beechcraft Baron G58 (shown here) and Cessna 172 to the Beechcraft King Air 360 and progressing through the Cessna Citation 525 type rating. (Courtesy Textron Aviation)



at all levels by increasing the amount the company reimburses for earning a private pilot certificate. "I'm trying to infect everybody with this aviation passion," he said.

That's just one way he's working on the company's culture, which is centered on four values: be human, be trustworthy, be collaborative and be legendary.

"I hear from employees and customers that we are moving the needle," Draper said. "We still have work to do but customers are saying they see a difference when they bring in their airplane for service or when they interact with employees. It doesn't mean we don't trip up or that we don't make mistakes, but they are seeing a difference in how we react when we do."

Draper said he "appreciates the passion King Air operators have for the product." When asked what he hears most frequently from King Air owners and operators, he said, "We knew that upgrading the cabin environment was a priority for owners and were pleased to accomplish that with the recent King Air 260 and 360 upgrades. The new autothrottle capabilities are a plus for the pilot sitting up front. When you sit inside, you see that the cabin includes a stunning new look with craftsman-built cabinetry, partitions and side ledges, upgraded materials and finishes, and all new interior schemes. "Other upgrades include a lower cabin altitude at the aircraft's certified ceiling of 35,000 feet – more than 10% lower when compared to the King Air 350i. From my experience, the improved cabin altitude level makes long flights much more comfortable."

#### A commitment to the King Air

When asked for specifics about continued investment in the King Air family and the likelihood of seeing the King Air 90 series return to production (the C90GTx was discontinued in 2021), the public relations team noted that they have to be careful with forward looking statements. Draper offered this:

"Our renewed product upgrade strategy kicked off in earnest with our recent investments in the Beechcraft King Air 260 and King Air 360. Being able to give King Air operators benefits like reduced pilot workload with autothrottles and redesigned, luxurious cabins that enhance the passenger experience is as important as delivering the same versatility and reliability that has made the King Air so iconic. We are always considering new technological advances, performance enhancements and cabin refinements as we plan for future development. And, we do all of this based on the feedback we hear from our customers.

"In the last few years, we have stayed true to our product development strategy, combining clean sheet designs with regular upgrades to existing products.

"Our two newest programs have introduced fresh ideas to the turboprop market. Most recently, we released the new Cessna SkyCourier and it has been met with great enthusiasm worldwide.

Next in development for clean sheet aircraft is the Beechcraft Denali, expected to certify in 2025. As with all our product investments, customer input has been at the forefront of the Denali's development. Recently, we announced that Textron Aviation is bringing the revolutionary Garmin Emergency Autoland system to the program. The Denali program has been making great progress, and we are confident that it will revolutionize the single-engine, high-performance turboprop segment. I was fortunate enough to fly the aircraft earlier this spring and couldn't be happier with its performance and capabilities. Our customers are going to love flying the Denali."

Finally, Draper, commented on the company's commitment to supporting the existing fleet of Beechcraft King Air aircraft. The 60<sup>th</sup> anniversary of the iconic family of twin turboprops is next year; first flight was in January

1964 and the first unit rolled off the production line in September 1964. More than 7,600 King Air aircraft have been delivered with more than 6,000 still flying.

"One of the differentiators of Textron Aviation is our vast aftermarket offerings. With 250,000 aircraft delivered over more than nine decades, we remain dedicated to supporting the life of our legendary fleet. With a global network of authorized service centers staffed by skilled technicians, our commitment to comprehensive aftermarket support aims to maintain high levels of customer satisfaction while enhancing operational efficiency.

"We also recognize that having the right part at the right price is vital to our customers' flying experience. To ensure this, we are expanding our parts distribution at our headquarters in Wichita, Kansas, by adding roughly 180,000 square feet. This upgrade will enable us to keep investing in inventory to support both new and out-ofproduction aircraft models.

"With pre-owned inventories at record lows, this is also a good time for customers to consider enhancing their aircraft with a variety of upgrades such as avionics, connectivity, autothrottle and ground cooling. I've seen very impressive cabin interior refresh options that transform the passenger experience and extend the life and enjoyment of legacy aircraft."



# Cold Weather Ground Operations

by Tom Clements



The vast majority of King Airs now use bleed air as their source of incoming cabin air – eliminating the supercharger that is found on 90s, A90s and B90s – and supplement this source of heated air with an electric heater of some type. Let's discuss the options.

There are still pilots who are somewhat lazy in their approach to bleed air ... leaving the left and right switches on at all times, summer and winter, including during startup and shutdown. I am happy that this lazy technique is disappearing and being replaced with a much more correct and scientific approach. It has been found that bleed air flow control packages (flow packs) tend to experience some oil mist contamination when they are *on* at startup and shutdown. This is because the labyrinth-style bearing seals in PT6 engines do not seal well until the engine is running and producing internal air pressure; so now most King Air pilots are turning off the flow packs before shutdown and not turning them on until the next start is completed. Realize this: If you want heat, turn on the flow packs right after starting. For those of us living in climates that are generally warm, it becomes standard practice that the bleed air switches remain off until *runway lineup*. But when faced with cold weather operation that is no longer optimal. Instead, as soon as the engines are running, the bleed air switches are moved to the *up*, *open* position. Granted, at *idle* compressor speed, the air is not as compressed and the bleed air is therefore not as hot as when lots of power and compressor speed are experienced. However, the bleed air entering the cabin, even at idle, will be warmer than the trapped, frigid, cabin air, so allow it to enter and start providing warmth right away.

It is exactly because the PT6 does not produce an overabundance of hot bleed air at idle that King Airs contain a supplemental electric heater. The electric heat system varies quite a bit depending upon the King Air model being discussed. I will start my discussion with the electric heat system that is contained in C90s, E90s, F90s, 100s, A100s and B100s. This includes all later C90 variants: the C90A, C90B, C90SE, C90GT, C90GTi and C90GTx. For these models, the first thing to do is to ensure the engine speed is high enough to support the very large electrical demand that the heater system requires. This means we must have a minimum of 57% N1. Since Low Idle for the standard three-blade propeller models in this group is about 50%, you will need to adjust both condition levers forward to attain about 60% N1. On the other hand, the four-blade propeller models already idle near 60% – to avoid the "reactionless vibration" mode that can be harmful to these props – so further tweaking of the condition levers may not be required.

Make sure the N1 speed is near 60% and now select *auto* or *man heat* with the mode selector. Next, reach over and position the electric heat switch to the up, "Grd Max" position ... and standby for heat! Running all eight electric heat grids – four for the normal heater and an identical four for the ground maximum system – really puts out the BTUs!

Three important comments need to be made here. First, with that much electrical load – about 300 amps total heater demand – it is common to see that the Fuel Control Unit (FCU) has permitted some sag in N1 speed. This may be great enough that the four-blade prop models



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"The vast majority of King Airs now use bleed air as their source of incoming cabin air and supplement ... with an electric heater of some type." have even allowed their idle Np to drop below the limit. If this has happened, simply move the condition levers forward enough to get the necessary propeller speed.

Second, make your final condition lever adjustments to match propeller speed, Np, not compressor speed, N1. By doing so, the airplane sounds better – less out-of-sync drumming – and tends to track straighter while taxiing. Requiring a 1 or 2% split in N1 speeds to match Np speeds is common. If much more than that is required, it indicates that the maintenance shop needs to do a better job of setting the propellers' low pitch stops to the correct and same, left and right blade angle.

The third comment concerning the use of the heater on the ground is to remember that certain, more important, in-flight users of electricity take priority over the comfort provided by heater operation. These "heater lock-out" items are windshield heat, prop deice and engine lip boot heat, if installed. The pitot cowls fitted to the C90A and after models use exhaust gases to heat the inlet lip, but previous C90s, B90s and A90s – as well as 100s, A100s and F90s – use an electric heating boot on the cowling inlet lip.



When any of these lock-out items is operating, all heater operation is prevented. (Lip boot heat will not operate on the ground since the boots can get too hot without sufficient, in-flight airflow over them. Thus, the lip boot lock-out function should only occur when airborne.)

If you are departing immediately into icing conditions, you will want all anti-ice and deice systems on before takeoff. But wait until runway lineup before doing so unless you wish to forgo electric heater operation as you taxi out and conduct your equipment checks.

It is common that full heater output is so effective that the cabin begins to get too warm while still taxiing. If this occurs, move the



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Left: Chris Crisman/TNC/LightHawk; Right: Lincoln Athas/WCC/LightHawk



electric heat switch from the top, "Grd Max" position down to the center, "Normal" position. Doing so kills the extra four heat grids and allows the normal four grids to continue to be available ... operating if manual heat is selected and standing by to operate as needed if in the auto mode.

It is rare that electric heat is needed when flying since bleed air heat should be sufficient. However, there are a couple of situations in which in-flight use of electric heat is desirable. The first of these is caused by a very weak or totally dead flow pack. One pack alone should be able to provide full pressurization, but with cold OATs at altitude a single pack won't provide enough heat to keep the cabin at a comfortable temperature. So, when the cabin is chilly, even with the cabin temperature rheostat cranked up fully clockwise, make sure the electric heat switch is in the center, "Norm" position and turn off the lock-out items. Now the four normal heat grids can come on to add to the total heating capacity.

"But what if I am flying in clouds and need to keep all of the ice protection activated, including the lock-out items?" In that case, hand out the blankets; the cabin will remain chilly.

The second situation in which supplemental electric heat is desirable in flight occurs when engine power remains low for a lengthy period. The lower the power, the less the compressor speed, the cooler the bleed air. During a prolonged low-power descent or while drilling holes in the cold sky in a holding pattern, let the normal heat grids help in keeping the cabin comfortable. As discussed above, you must be out of icing conditions so that the lock-out items may be turned off.

Now addressing the supplemental electric heat system on the 300-series (300s and 350s) and the later 200-series, those produced in 1993 and after. (This discussion does not apply to the Keith Environmental Control System found on 200s and 350s since about 2006.) Instead of normal and ground maximum heating grids, there are two separate heaters installed in the floor air distribution ductwork - one forward and one aft. On the ground, a solenoid latches the electric heat switch in the up, on position when that position is selected while the rotary mode selector is either in the "Auto" or "Man Heat" mode. At this time, only the forward heat grid begins to operate. But in 100% of the cases, you will probably also want the aft heater to operate. By merely moving the aft blower switch to the up, on position, you have achieved that. The heater would get too hot rapidly were there not sufficient airflow over it, so only when the aft blower is running will the aft heater start to operate. Ah, I feel the cabin getting warmer quickly!

The engines installed on the 200- and 300-series have a higher compression ratio than those engines on the smaller King Airs and, because of that, they put out hotter bleed air in flight at typical power settings. Recognizing this, the designers concluded that there would never be a need for supplemental electric heat in flight. Therefore, the electric heat we are discussing now is definitely a ground-only system. The latching solenoid will not work in flight and even if the crew physically held the electric heat switch up, neither forward nor aft heater will operate.

During the runway line-up procedure, we are directed in these models to position the electric heat switch to the "Off" position. This reduces generator load, allowing the engine to be more likely to meet takeoff power requirements. If we ever forget this step (of course we never would!), it's not a big deal because (1) the engines will have plenty of power capability due to the cold OAT, and (2) when the strut extends, the switch will turn itself off anyway since the holding magnetic solenoid latch releases.

Temperature sensors installed in the heater ductwork protect the system from getting too hot. The temperature at which the heater shuts off due to this over-temperature protection, about 115°F, is much higher than the temperature at which the system will permit the heater to reset and start to operate again, near 60°F. The practical result of this? Suppose the cabin reaches a comfortable temperature while taxiing out and the crew decides to switch the heater switch off. Unfortunately, there is a lengthy ATC delay, so the King Air must hold short of the runway. Dang! The cabin is getting chilly again, so it's time to turn the electric heater back on. There is a good chance that it won't come on, the switch will not latch. Why? Because of that "allow to operate" temperature limit in the ducts. Conclusion? Make darn sure you have a toasty cabin before switching the heater off since there is a high probability you won't be able to get it back on.

I will conclude this article by discussing the last of the supplemental electric heat systems, the one that was an option on the 200-series from the model's start in 1974 through 1992. This system is comprised of radiant heat panels in the cabin's headliner. (Just in the actual cabin; not in the cockpit nor in the toilet and baggage areas.) In my opinion, the systems that we have previously covered – the ones in the 90-, 100-, later 200- and all 300-series – are real winners that do indeed put out the heat! But the radiant heat panels? What a joke!

The single time that the panels can indeed prove useful and effective is when an external power unit can be plugged in an hour or more before the intended flight and then the heat panels can be switched on for an extended period of time. Slowly, the frigid cabin will be warmed nicely.

In the relatively short time between engine start and takeoff on a typical flight, there is not enough time for the radiant heaters to do much. Expect to remain chilly until takeoff power is applied and finally the bleed air gets nice and hot.



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If you decide to switch on the panels while taxiing, it's a good idea to leave the mode selector in the "Off" position. There are two reasons for this. First, leaving the mode selector off means that the vent blower can also be left off. If it is running, all it does is blow cold air out the various vents. Second, the cabin temperature sensor that feeds information to the control board when in the "Auto" mode is, for almost all serial numbers, located in the cabin ceiling. It can get an erroneous indication that the cabin is warmer than it is due to its proximity to the heated panels.

The only way to really get a lot of heat energy into an early 200 is via the bleed air input, but of course the temperature of the bleed air depends upon the speed of the engines' compressors. I certainly do not recommend taxiing around in the winter at high idle or even more N1 speed – since the aircraft wants to roll so fast – but, while stopped in a run-up area, selecting high idle will indeed contribute to better heating.

A commonly reported annoyance with the radiant heat panels is that, in use, the heat weakens the glue that is holding the panel to its Velcro strip, so one or more panels begin to sag down from the ceiling. That does *not* contribute to warm and fuzzy feelings in the passengers! Thank goodness it has been rare, but there are also some reported cases of a radiant heat panel catching on fire! As I wrote earlier, this system is kind of a joke! One last bit of advice before I bring this article to a close: It is never desirable to turn off a powerful duct heater at the same time that airflow through the heater ceases. Not being blown downstream, the residual energy in the heater elements can cause excessive, localized temperatures to result. So never switch off a heater while the vent and/or aft blower is stopped. Instead, switch off the heater while ensuring the blowers remain on for *at least* 15 seconds more. This important step is actually stated in the 300 and 350 POHs, but it is the proper technique for all models with heating elements buried in the ductwork.

I hope this information helps you King Air aficionados stay nice and warm during your winter flying!

King Air expert Tom Clements has been flying and instructing in King Airs for over 50 years and is the author of "The King Air Book" and "The King Air Book II." He is a Gold Seal CFI and has over 23,000 total hours with more than 15,000 in King Airs. For information on ordering his books, contact Tom direct at *twcaz@msn.com*. Tom is actively mentoring the instructors at King Air Academy in Phoenix.

If you have a question you'd like Tom to answer, please send it to Editor Kim Blonigen at *editor@blonigen.net*.





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### **VALUE ADDED**



#### BLR STC and AFMS Approved for Higher Performance on KA200 series and earlier model KA200s with High Float Gear

BLR Aerospace recently announced it received Federal Aviation Administration (FAA) certification of a King Air 200 series STC increasing maximum takeoff weight (MTOW) up to 14,000 lb when the aircraft is fitted with BLR Winglets, High Flotation Landing Gear and a Centex Halo 275 STC (SA11103SC). The same STC increases maximum takeoff weight to 13,420 lb if the aircraft has a Centex Halo 250 STC (SA11103SC) applied.

The advantages of the STC for aircraft include significant reductions in ground-roll and takeoff distances, improvements in stall speeds and general improvements in low-speed handling for the higher weight. BLR winglets with their FAA-approved King Air Airplane Flight Manual Supplements (AFMS) have always provided performance improvements that significantly improve takeoff and climb performance.

With this STC, operators with PT6A-42 and PT6A-52 engines can now take advantage of certified performance up to the Centex Halo STC-certified gross weight limits. Performance data is published in the new accompanying AFMS.

Additionally, a new AFMS received FAA approval that extends BLR winglet performance to include B200 and B200C aircraft operating with High Float Landing Gear. This move expands the winglet performance benefit currently enjoyed by King Air 250/260 models to earlier models of the aircraft. This change gives operators the full range of available benefits in the form of certified performance charts, maximizing the value of their winglet investment.

For more information, please visit BLR's website at *BLRaerospace.com*.

#### PWI LED "Logo Light" Gains FAA PMA Certification for King Air

PWI recently announced the recent FAA PMA approval for the LED Logo Light for the Beechcraft King Air 90, 200, 300, B300/350 models.

Illuminating the vertical tail surface of the King Air aircraft, this new LED floodlight highlights a company logo and/or slogan, often painted on

the tail. The powerful 5,000K color temperature LED improves night visibility, provides long life, accurate color illumination and improved light output with lower heat.



The LED Logo Light is also helpful in highlighting markings for charter aircraft, special missions such as AirMed, as well as commercial and cargo aircraft. It enhances safety by providing more visibility during taxi maneuvers as well as during takeoff and landing. It also helps ATC personnel identify an aircraft on the ground, and then supply directional instructions to other aircraft in proximity.

Replacing the 160-hour life halogen bulb, the PWI LED light offers 100,000 operational hours – saving 625 bulb replacements over the life of the LED. The 3-LED design also produces 1600 Lumens, which is 600 more than the 3,000K halogen bulb. The PWI LED requires only 11 watts while the bulb uses 50.4 watts and draws 4.5 times less amps, generating less than half the heat and preserving the floodlight lens.

**Specific PMA-Approved Beechcraft King Air aircraft are:** C90, C90A, C90GT, C90GTi, E90, 200, 200T, 200C, 200CT, B200, B200T, B200C, B200CT, B200GT, B200CGT, 300, 300LW, B300 and B300C.

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Specific information about the LED Logo Light can be bound at: https://pwi-e.com/product/led-logo-light.

For more information, contact PWI at +1 316-942-2811 or sales at: *sales@pwi-e.com*.

#### BLISSAIR Opens State-of-the-art Flight Simulation Centre in Bocholt

German aviation company BLISSAIR opened a new flight simulation centre in the city of Bocholt near the Dutch border. The company can now offer professional type trainings, recurrent and safety trainings, as well as check flights for the Beechcraft King Air BE90/99/100/200 series on a Level D full-flight simulator from CAE.

The new equipment simulates a King Air B200 with integrated Pro Line 21 avionics. This makes it possible to realistically simulate critical flight situations, such as those caused by very violent turbulences or stalls, as well as emergency scenarios or system failures, without endangering human lives or aircraft.





BLISSAIR's services are also offered to aviation companies and private owners, as well as flight schools (ATOs) and Type Rating Examiners (TRE). The fullflight simulator is certified according to CS-FSTD(A) Issue 2 (approach-to-stall) for Upset Prevention Trainings (UPRT) and Recovery Trainings.

The company has constructed its own building for the full-flight simulator. The entire cockpit moves in all conceivable directions with the help of powerful electric actuators and also sometimes shakes quite a bit to simulate actual flight movements to be as realistic as possible.

For more information, contact: Franz-Hermann Enk, CEO BLISSAIR GmbH Mobile: +49 171 2116070 • email: enk@blissair.de • Web: https://blissair.de



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