

The New



KING AIR 250

Confirmation that the King Air is Still Pulling its Weight in a Jet-Setter World

by Matthew McDaniel

Where the 250 truly outshines its predecessors is in the runway required department. Its performance capabilities show significant improvement in hot temperature and high altitude situations; along with that comes a big jump in short field capabilities.

I've never liked the term "flat rated" as it is applied to turbine engines; it sounds so unflattering. It seems to imply that the engine isn't even trying to reach its full potential. Should I, therefore, question its motivation to function at its maximum capabilities? In spite of the unflattering moniker, a flat-rated turbine engine can absolutely reach and sustain its full abilities. Like a finely disciplined, long-distance runner, the flat-rated engine does not reveal its true capabilities out of the starting gates. Instead, it paces itself, holding energy in reserve, knowing that its competition (which is already operating at its limits) will fall behind as the temperatures rise and the summit looms menacingly above. By pacing itself, the flat-rated powerplant will arrive at the summit both faster and less winded, allowing it to almost coast to the finish line with a healthy margin of victory. The flat-rated turbine works *smarter*, so it doesn't have to work *harder*; and that's a quality most anyone can both relate to and respect.

It was only in the very recent past that Hawker Beechcraft introduced the King Air 200GT, which incorporated the muscle-bound, but self-restraining, flat-rated Pratt & Whitney PT6-52 engines. The -52 variant of the PT6 remains an 850 shp engine (just as it has since the B200). However, those older PT6 variants (-42s) would lose their ability to maintain that 850 shp much sooner, because thermodynamically speaking, that's all it was able to maintain under standard conditions. The -52, on the other hand, is capable of maintaining 1,050 shp, but is held to a maximum of 850 shp (flat rated), so that it can maintain that 850 shp figure to much higher altitudes, temperatures, and humidity percentages. How, you ask? The gearbox of a -42 was interconnected with the power section of a -60A; the offspring became the -52.

Keeping the Star Shining Brightly

The venerable King Air 200 has been around a long time and has seen more enhancements than a Hollywood starlet basking in the afterglow of a long and successful career, yet is unwilling to completely fade into the background. Let there be no doubt that Hawker Beechcraft (along with Raisbeck, BLR, and others) have had some very talented "plastic surgeons" (engineers) creating some tantalizing King Air improvements over the years. Their ability to keep the basic design under a nearly perpetual state of enhancement is both impressive and admired. But, it does make one ask, "What more could they possibly do to 'gussy up' a King Air?" or "Why execute that particular modification now instead of five years ago?" Therein lies the appeal of a

truly timeless “classic.” Just like the Hollywood starlet whose light shone brightly even beyond her “prime,” the King Air design has proven for 45-plus years that it can weather the passage of time and still keep its audience satisfied and asking for more.

The latest and greatest of the 200 line is the 250, which carries on with the 200GT’s PT6-52 engines, also flat rating them at 850 shp. But, the 250 has a few other tricks up its sleeve to help it achieve some serious performance gains above its brethren. And, what is most interesting to this author about those tricks is that there is nothing at all tricky about them. In fact, they are neither new technology nor new ideas. You have surely read about them before in other applications, including many other variants of the King Air (available either on new production King Airs or via aftermarket STCs, or both). But, they are all truly performance enhancing additions that make up the major ingredients used in “souping up” the 200GT to create the new 250.

Three is a Charm

The least obvious modification is the incorporation of Raisbeck’s Ram Air Recovery System (RARS). In very basic terms, this system takes the PT6’s inertial separator and modifies it from the simple flat-plate shape that it has historically been, into a more complex airfoil shape. This allows far less ram air loss when the inertial separators (a.k.a., ice vanes) are extended, which greatly minimizes power loss. So, the pilots can be more liberal about when and where to use the separators because there is little or no performance penalty for doing so. This is not only good for performance, but is likely to be beneficial to engine life too, as pilots will be less reluctant to extend the separators and, thus, less likely to ingest ice chunks, ground debris, or other sources of FOD. It could easily translate into additional cost savings by simply preventing FOD-induced engine damage. The RARS is truly one of those very rare instances in aviation and aircraft design that is a win-win situation. Sure, they are probably a little bit more complex and expensive to build and install than the flat-plate design. But, thereafter, the mechanical operation is nearly identical to the older system, so no increased maintenance to speak of. What’s not to like about RARS, really?

Visually, the most obvious modification on the 250 is the winglets, which have been around for decades. Even Hawker Beechcraft has carried them on its larger King Air variants for many years, so they are almost considered “old hat.” Nonetheless, they can still do for nearly any wing, what they were designed to do all those years ago. That is, they increase effective span, lift, and aspect ratio, while decreasing induced drag, and, thereby, increasing range, speed, rate of climb, and fuel efficiency. So, what could possibly be the downside of such magical devices? Primarily, they just



The spacious King Air 250 interior provides a productive work space with integrated work tables and 115V AC outlets for laptop use, but also touts luxury and comfort when you’re ready to relax.

add some weight and cost. Secondarily, they do add about three-and-a-half feet of wingspan over the 200GT, which possibly could be a factor for hanging and parking the aircraft.

Lastly, the third big difference between the 200GT and the 250, Hawker Beechcraft has added composite props to their new model. Composite props have been on some of the King Air variants for 20-plus years and the change seems to have trickled slowly down the King Air line over those years from the 1900D, to the 300/350, and now to the 250. Why this process has taken so long seems odd to me (the current 90GTx still uses more traditional metal props). Regardless, there is no doubting the benefits of these new four-bladed composite props on the 250. They are 60-plus pounds lighter than their metal counterparts, and the weight loss is used (at least in part) to offset the weight gain of the winglets and other minor modifications added to the 250. But, because they also provide greater thrust, they translate into measurable performance gains in the areas of takeoff distance, climb rates, and cruise speeds. My personal experience would seem to indicate they are a bit quieter too, but that is not backed up by any specific manufacturer claims.

Vision Quest

The 250 is also the first in the 200-family to receive the option* of adding an Enhanced Vision System (EVS) infrared camera system. Mounted on the upper nose of the 250, the EVS camera’s picture is displayed on the Multi-Function Display (MFD). As with most EVSs the use of the camera’s enhanced images of the outside world cannot be used to lower instrument approach minimums or in lieu of actual visual contact

with the runway environment. It can, however, be a tremendous augmentor to the naked eye in any number of circumstances. Its introduction into the 250 is yet another indicator that King Airs are continuing to evolve and adapt to stay relevant in the world of single-pilot light jets and other competitive forces.

Synthetic Vision Systems (SVS) are another form of avionics-produced visual augmenters that have become very popular in high-end piston aircraft and light jets. The new glass cockpit technologies have allowed SVS to be incorporated into high resolution screens and provide synthetic versions of what might otherwise have been seen out the window, but with striking accuracy and safety enhancements that practically offset the visual illusions that have put many pilots in imminent danger. Unfortunately, the ProLine 21 system in the 250 does not currently support SVS and no announcements have been made of when or if it might in the future. But, if Rockwell Collins and Hawker Beechcraft want to stay competitive in these technological offerings, I would certainly think they really have no choice but to jump on the SVS bandwagon soon.

A Day at the Office

At this point, most pilot reports would head off describing the 250's flight characteristics, performance numbers, and various amenities. However, since no one



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routinely uses a King Air for maneuvers practice, I was more interested in how the 250, like generations of King Airs, earned its keep in the daily grind of corporate and charter aviation, or as personal transportation machines. So, big metropolitan airports were out; as were long, maximum range legs, and flights at the service ceiling. Instead, I wanted to explore a far more typical one-hour flight in the 250, from airports that represent the vast majority of airports in the United States, at altitudes where King Airs often live and co-exist with high performance piston aircraft. So it came to pass that the day after Oshkosh AirVenture 2011 wrapped up, I found myself on the ramp of the Baraboo, Wis. airport (KDLL) shaking hands with Hawker Beechcraft demo pilots and staring at identically painted King Airs (the new 250 and a new 90GTx). ▶

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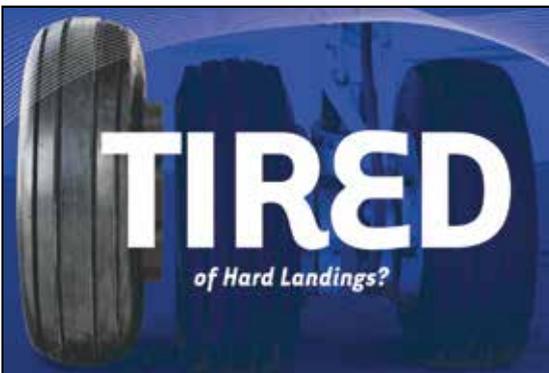
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I'd chosen a destination that was 150 miles away, through special-use airspace, and its only paved runway was 4,000 feet long with only the lowest level of WAAS/RNAV approach available (an LNAV+V). The weather was not ideal either, with rain already falling on the destination, IMC across most of the route and thunderstorms forecast for later in the day. But, the idea was to treat it as a real-world mission and to operate as if the boss or client were in back. In this scenario, the 250 is a very capable platform. The weather radar and datalink weather both feed directly into the Rockwell Collins ProLine 21 avionics suite, providing the pilots with both real-time weather (radar) and satellite weather information distributed between the two PFDs and the central MFD. As with all modern glass cockpit aircraft, there is never a lack of information available to the pilot.

While a good portion of the trip was in Instrument Meteorological Conditions (IMC) and an RNAV approach was required at the destination airport, the trip was very routine and totally uneventful. We were able to keep a close eye on both the weather immediately around us and the more severe weather moving towards the destination. This made the weather decision making very straightforward and allowed us to neither put too much nor too little focus on the weather questions, while giving the pilot ample free bandwidth to focus on the other cockpit duties. A good portion of the flight was flown with the ice vanes extended. Just as advertised, thanks to the RARS, there was almost no torque drop or ITT rise with their use – a terrific improvement over what I and many other King Air pilots used to refer to as "the torque robbers."

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With the ProLine 21 avionics suite, as with all modern glass cockpits, there is never a lack of information available to the pilot.

with that comes a big jump in short field capabilities. Historically, King Air pilots have always been able to count on being able to utilize airports that small bizjet operators would avoid due to runway distance requirements, which is one of the major reasons the King Air has had its staying power. It fills a significant niche in personal and business flight operations that require visiting smaller communities that only have smaller airports. All too often, those community airports are too small to accommodate even small bizjets, but can accept King Airs with room to spare. The 200GT is certainly no slouch in this department, touting published takeoff distances of 2,579 feet at a

sea-level airport on a standard day, and 3,800 feet from a 5,000-foot density altitude airport on a 25°C day. But, impressive as that might be, there are a lot of airports under 2,500 feet in length that up until now would be off limits to 200-series King Airs. Enter the 250, with its three big performance boosters and its unadjusted 12,500 pound max gross weight. For the same airport scenarios mentioned above, the 250 would require only 2,111 feet and 3,099 feet, respectively. That is a whopping 22% boost in takeoff performance, in terms of runway required! Of course, it would be remiss not to point out that all these figures are purely in reference to runway required for takeoff and do not address the far more safety minded accelerate-stop distance that most prudent turbine aircraft pilots would likely adhere to (or would be required to adhere to under most charter, fractional, and management operations).

I find it telling that only a week after I got acquainted with the freshly certified King Air 250, during and after AirVenture, an announcement was made concerning the still nearly-new 200GTs. BLR Aerospace, in partnership with Hawker Beechcraft, has developed and STC'd their Ultimate Performance Package upgrade for the 200GT. What does it consist of? You guessed it ... the same three major performance enhancements that set the 250 apart from the 200GT (winglets, ram air recovery, and four-bladed composite props). Obviously, the folks at Hawker Beechcraft know that recent purchasers of a new 200GT are unlikely to trade it in on a new 250. However, those same customers might be very interested in making their 200GTs perform like the 250 via these modifications, without taking the depreciation hit required to sell a one-year-old airplane in favor of a similar, but brand new, model.

Market Forces

Without question the King Air line of aircraft have had an amazingly successful history. The line as a whole is the most widely produced twin-turboprop in the world and its safety and reliability records are impressive to say the least. But, the longer a design endures, the harder it is to keep it relevant in an ever-evolving market. Combine that with the economic turbulence that has shaken up much of the world over the past few years and Hawker Beechcraft really has its work cut out for it. While every new King Air has been an improvement

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over its predecessor, some have been much more so than others. The 250 is a big jump in performance over its immediate fore-runner and I think will prove to be a big success for its manufacturer. However, Hawker Beechcraft is still holding off on a number of potential improvements. I don't think the King Air line has hit the developmental wall yet and I think you are likely to see many more incremental improvements in years to come. So, don't be surprised to be reading about the 250GT or some such "latest and greatest" King Air in the future. Like the starlet that everyone counted out even while she was still wowing audiences, the King Air line likely has another great act (or two, or three) left in its career. **KA**

*According to Hawker Beechcraft, the EVS is an option available for installation at Hawker Beechcraft Services.

About the Author: Matthew McDaniel is a 20-plus-year professional pilot with a background in airline, corporate, and charter operations. He's owned and operated Progressive Aviation Services, LLC (www.progaviation.com) since 2002, specializing in Technically Advanced Aircraft and Glass Cockpit training. Matt has been actively instructing for 19 years, has logged over 11,500 hours total, 4,500 hours of instruction-given and over 2,500 hours in the King Air and BE-1900. He holds five turbine aircraft type-ratings and is one of only 26 instructors in the world to have earned the "Master Certified Flight Instructor" recognition five consecutive times. He can be contacted at (414) 339-4990 or matt@progaviation.com.

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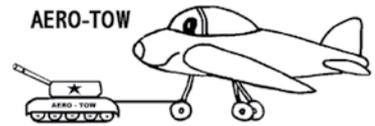


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