King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

FEBRUARY 2022 • VOLUME 16, NUMBER 2 • $6.50

Travelogue

Aviating Arkansas

CHANNEL YOUR AIRFLOW FOR IMPROVED DIRECTIONAL STABILITY

Improve your King Air's directional stability with **RAISBECK'S DUAL AFT BODY STRAKES** for proven better pilot control and handling during takeoff, climb, cruise, and landing. By channeling airflow directly under the aft fuselage, Raisbeck's Dual Aft Body Strakes decrease drag, resulting in better cruise and climb performance, more comfort for your passengers, and reduced stress on aft fuselage stringers. Isn't it time for an upgrade and to add some stability to your investment?

(800) 537-7277 | sales@raisbeck.com | www.raisbeck.com

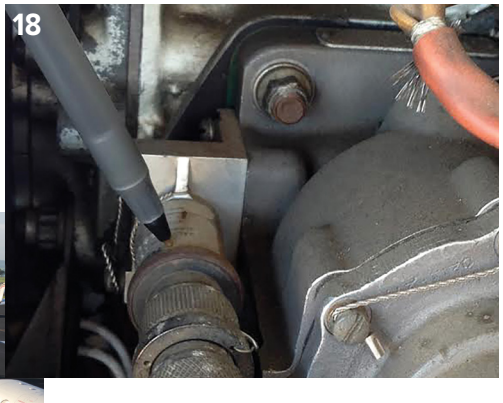
RAISBECK ENGINEERING
AN ACORN GROWTH COMPANY

King Air

February 2022 Volume 16 / Number 2

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

Contents



EDITOR
Kim Blonigen

EDITORIAL OFFICE
2779 Aero Park Dr.,
Traverse City MI 49686
Phone: (316) 652-9495
E-mail: editor@blonigen.net

PUBLISHERS
Dave Moore
Village Publications

GRAPHIC DESIGN
Rachel Coon

PRODUCTION MANAGER
Mike Revard

PUBLICATIONS DIRECTOR
Jason Smith

ADVERTISING DIRECTOR
Jenna Reid
King Air Magazine
2779 Aero Park Drive
Traverse City, MI 49686
Phone: 1-800-773-7798
Fax: (231) 946-9588
E-mail: jenna.reid@vpdcs.com

ADVERTISING ADMINISTRATIVE COORDINATOR AND REPRINT SALES
Betsy Beaudoin
Phone: 1-800-773-7798
E-mail: betsybeaudoin@villagepress.com

SUBSCRIBER SERVICES
Rhonda Kelly, Mgr.
Kelly Adamson
Jessica Meek
Jamie Wilson
P.O. Box 1810
Traverse City, MI 49685
1-800-447-7367

ONLINE ADDRESS
www.kingairmagazine.com

SUBSCRIPTIONS

King Air is distributed at no charge to all registered owners of King Air aircraft. The mailing list is updated bi-monthly. All others may subscribe by writing to: King Air, P.O. Box 1810, Traverse City, MI 49685, or by calling 1-800-447-7367. Rates for one year, 12 issues: United States $15.00, Canada $24.00 (U.S. funds), all other foreign $52.00 (U.S. funds). Single copies: United States $6.50, Canada/Foreign $9.00.

COVER PHOTO

Courtesy of Textron Aviation

Gazing up the Hot Water Cascade from Arlington Lawn as vapors rise toward Hot Springs National Park's Grand Promenade above.
(Photo Credit: Norah K. McDaniel)

Valley of Vapors

Flying to and touring Hot Springs National Park

Article and photos by Matthew McDaniel
(unless otherwise noted)

Seeking a smoother ride, we had descended out of our lofty cruising altitude before crossing the northern border of Arkansas. To increase arrival options, I'd canceled our instrument flight plan in favor of VFR flexibility. The first smooth altitude we found was relatively low. Thus, 10 miles northeast of Hot Springs, Arkansas, the airport was still out of view, obscured by the low-lying mountains which surround the city. But as the sun began hanging low in the west, the sky was quickly reddening and casting a magnificent glow across the shallow valley. As we overflew the airport and entered a left downwind leg for Runway 23, the cabin flooded with softening light and I heard one passenger say, "Wow, we should just circle right here and watch the sun set." His sister added, "It's so beautiful."

Aviating Arkansas

Flying to Hot Springs is in no way difficult, regardless of the direction from which you approach. Arkansas, in general, is anything but a flat state, but does not contain high elevations or mountainous terrain (at least not by the Federal Aviation Administration's definition). Nonetheless, much of the state is covered with rolling hills, high bluffs, low lying mountain ranges (2,000 vertical feet or less), sculpted river gorges and picturesque vistas. This is especially true in the northwestern half of the state. The southwest to northeast line that roughly bisects the state passes just south of Hot Springs and just north of Little Rock; southeast

> *"From an aerial sight-seeing standpoint, none of Arkansas is boring."*

of that line, Arkansas is a bit flatter. While northwest is where you'll find Arkansas' two largest mountain ranges, the Ozark Plateau with more dramatic views between the Boston Mountains to the northwest and the Ouachita Mountains to the southwest, is Arkansas' highest point – Magazine Mountain, topping out at 2,753 feet above sea level. From an aerial sightseeing standpoint, none of Arkansas is boring.

I cannot in any way consider myself to be an experienced Arkansas aviator or tourist, but my flying has taken me to the state many times over the years. In my days as a regional airline pilot, flying the Beech 1900D, my company had a Milwaukee to Kansas City to Little Rock route that I flew many times. Little Rock was well outside of our mostly Upper Midwest territory, so going there was always a nice change of pace, especially in the winter. That same airline used a facility in tiny Mena, Arkansas, located on the western border, for heavy maintenance on our 1900s. The few times that I was selected to operate those ferry flights gave me a deep respect for Arkansas' terrain. Mena Intermountain Municipal Airport (MEZ) is surrounded by rising terrain on all sides, some of it 1,500+ feet above the airport elevation. The area's valleys are prone to persistent fog and the terrain doesn't allow approach minimums consistent with low IFR conditions. I recall being shocked, upon breaking out below the overcast, to find rugged hills surrounding me and a valley airport ahead. I also recall sitting out multiple delays (sometimes hours, sometimes days) waiting for fog to dissipate from the valley to allow a legal departure. My airline adhered to our FAR-121 Operating Specifications, even on FAR-91 ferry flights.

Aside from those occasions, my experiences with Arkansas has been limited to fuel or training stops on general aviation cross-country flights at airports such as Pine Bluff (PBF), Jonesboro (JBR), and West Memphis (AWM). Of course, overflights of portions of Arkansas have been common over the years, as well. If visual conditions prevail, the state never fails to draw my nose to the glass to watch the beautiful countryside go by. Yet, it was not until recently (after 31 years and nearly 20,000 hours of flying) that I had a reason to visit Hot Springs. The reason was twofold: to check another national park off my list and a family escape from our Wisconsin home climate during the chilly last days of autumn. While some trees had already become barren and brown at home, they were still in the

Hot Springs as seen from the exterior viewing platform atop Hot Springs Mountain Tower (looking southwest). On the right side is West Mountain, while the foreground displays Hot Springs Mountain. Between them is Central Avenue and Bathhouse Row.

One of the many public thermal water jug fountains within Hot Springs and HSNP. This one is situated at the base of the Grand Promenade staircase, on the south end of Bathhouse Row.

early stages of fall color in central Arkansas.

Hot Springs Memorial Field (HOT) is a pilot-controlled airport yet is one of only six FAR-139 conforming commercial airports in Arkansas. It has approximately 100 based airplanes and scheduled airline service via the small Southern Airways. They operate nine-passenger Cessna Caravans daily to Dallas-Ft. Worth (DFW). For us general aviation operators, the City of Hot Springs FBO offers a full array of standard services, including full-service Jet-A and both full and self-service 100LL fuel. Their facility is small, but well maintained and comprehensive. On the field, Hertz car rental has a small facility that will leave your rented vehicle right at the FBO (inside the perimeter fence) during off-hour pickups. During normal business hours, the Hertz facility is only a two-minute walk across the FBO parking lot. Enterprise rental cars can also be arranged.

The "air side" of HOT is adequately equipped for most operations. The main runway (05/23) is 6,595 x 100 feet, with Runway 5 being primary. Its three Instrument Approach Procedures (IAPs) consist of a standard ILS, an RNAV/GPS approach for LPV-equipped aircraft, and an old-school VOR approach. The opposite end (Runway 23) is VFR only, mainly due to the terrain on that end making IAPs impractical. VFR traffic patterns to this runway need to be flown fairly tight to maintain a standard glide path inside the surrounding terrain. Runway 13/31 serves as the secondary or crosswind runway. While it is not served directly by individual IAPs, circling procedures exist from both the ILS and VOR approaches to Runway 5. At 4,098 x 100 feet, Runway 13/31 is sufficiently long for most King Air operations but beware of the surrounding terrain/obstructions and the required descent slopes to clear them. Runway 13's "slope to clear" is far steeper than the standard 10:1, while Runway 31 has a whopping 24:1 slope. All runway surfaces are in excellent condition with clear markings and parallel taxiways. Transient parking space is plentiful and parking/overnight fees are quite reasonable. Like with any single FBO airport, calling ahead to allow the staff to anticipate your arrival and needs will likely make your visit both smoother and more pleasurable. When time comes to depart, be sure to check HOT's Obstacle Departure Procedures (ODPs). While the terrain isn't extreme, much of it is up to 1,000 feet above field elevation and rises in every direction from the airport. Non-standard takeoff minimums and ODPs are published for every runway.

If you are seeking out a larger airport with more infrastructure and service options, Little Rock's Bill & Hillary Clinton National Airport/Adams Field (LIT) is only 45 miles northeast of HOT (closer to 55 ground miles). This makes it a great primary choice if visiting Arkansas' capital city is on your agenda. LIT can also simply serve as an excellent alternate airport if, for any reason, arriving directly into HOT is not ideal. LIT is equipped with multiple ILS approaches (including Cat. I, II, and III), as well as several RNAV/GPS approaches with LP or

INCREASE ZERO FUEL WEIGHT

HALO 250

OPTION 1

KING AIR B200, B200GT, 250 & 260

11,500 POUNDS

MAX ZERO FUEL WEIGHT LIMIT

HALO 250 OPTION 1 BASIC KIT - INCREASE ZERO FUEL WEIGHT

THE FOLLOWING SYSTEMS MAY BE ADDED:

- **TAKEOFF TRIM WARNING SYSTEM**
- **STALL WARNING SYSTEM ICE MODE**
- **EMERGENCY CABIN LIGHTING SYSTEM**

Eligible serials include BB-1439, BB-1444 & after, BL-139 & after, BY-1 & after, BZ-1 & after.

IN GOD WE TRUST

CENTEX AEROSPACE INCORPORATED

"Making Aviation Better!"

254-752-4290 • www.centex.aero

The Fordyce was the premier bathhouse in the early 1900s and now serves as the HSNP Visitor Center. It is an excellent example of the glory years of these facilities, filled with fine tile work and historic medicinal bathing equipment.

"Many public drinking fountains and bottle filling stations, plus the historic bathhouses, all utilize the roughly 700,000 gallons of spring water collected per day by the park."

LPV minimums for aircraft so equipped. Two large FBOs at LIT offer all the amenities and services any pilot or passenger might require.

The Heat is On

Of course the primary attraction to Hot Springs National Park (HSNP) is water. Naturally heated, mineral rich, plentiful spring water. While two of the natural springs in the area are actually cold, most are not just warm, but genuinely hot. This heating process is accomplished as rainwater descends through porous rock, percolating via gravitational compression. When the water eventually surfaces through the lower west slope of Hot Springs Mountain, it flows out at an average temperature of 143°F (62°C). Many public drinking fountains and bottle filling stations, plus the historic bathhouses, all utilize the roughly 700,000 gallons of spring water collected per day by the park. Historically, the hot water (and the minerals it contains) were thought to have healing properties. This attracted bathhouse patrons from all over the U.S. for more than a century. Included among those

travelers was my grandmother, who under doctor's orders, spent time in Hot Springs in the 1930s and early 1940s to treat what ailed her.

By the 1960s, therapeutic and medicinal bathing had fallen out of vogue. This put nearly all of the historic (and often grand) bathhouses out of business. They became ramshackle and by 1985 only one (The Buckstaff) remained operational. With more recent appropriations of funds, many of the historic bathhouses have reopened as day spas, hotels, and even art museums (most with attractive décor restored from their original heyday and palate-pleasing dining options as well). Today, the HSNP Visitor Center is housed in the fully restored Fordyce Bathhouse. The Fordyce was considered the best bathhouse in Hot Springs in the first decades of the 1900s and has not only been returned to its former splendor but remains historically accurate with furniture and medicinal bathing equipment from that era. Today, Bathhouse Row in downtown Hot Springs is a National Historic Landmark District and contains several bathing and dining facilities open to the public (Note: COVID limitations may apply, please inquire in advance). Bathing and spa services at the various bathhouses are regulated and inspected by the National Park Service (NPS), including the only remaining traditional therapeutic bathing experience offered at The Buckstaff, now in its 110th year of continuous operation. Modern medicine has little place in the thermal springs today, but there is little doubt that some relaxation and a nice hot soak rarely does harm to one's health and disposition.

> ***"Today, Bathhouse Row in downtown Hot Springs is a National Historic Landmark District ... "***

The author's children take a moment to relax and take in the views from atop North Mountain. This vantage point, accessible from Goat Rock Trail, overlooks the southeastern portions of Hot Springs and Indian Mountain.

Getting Out of Hot Water

While small, HSNP is far from one dimensional. Unlike most U.S. national parks, Hot Springs is a blend of urban and natural settings. The heart of the park is Bathhouse Row, which links the north and south sectors of the city of Hot Springs. This small section of the park has a decidedly urban feel and only the historic nature of the bathhouses hint at being anywhere other than a typical small U.S. city. Otherwise, the city is divided by Hot Springs Mountain and West Mountain, which both lie within the park boundaries. Clockwise around the compass, Sugarloaf Mountain lies west and north of the city and Stonebridge Mountain (north and east) closes the ring-shaped layout of the park. While this ring completely encircles Hot Springs, it is within these modest mountains that the more traditional national park feeling takes hold.

Hot Springs Mountain and North Mountain are the more touristy of the natural areas. The Hot Springs Mountain Drive is a loop. We began by driving up its switchbacks to reach its namesake tower, but one can also climb to the tower from town via Shortcut Trail. For a small fee, you can take the elevator to the top and get a 360-degree view of the park and city. This really brought the layout of the park into focus, allowing more targeted explorations later. A level below the exterior viewing area, an interior area provides the same views, combined with a great little museum detailing the history of the park.

Continuing the drive to the northern most point of the loop, we parked in one of the small parking lots and headed out onto Goat Rock Trail. If you are a hiker used to more expansive national parks, HSNP is refreshingly easy to hike. The trails are well marked and filled with beautiful vistas of both the city and the surrounding mountains and valleys. The hikes are not long and we ended up stringing several of them together before eventually returning to our car. After returning to Bathhouse Row for lunch, we decided to explore West Mountain on foot. We walked Central Avenue (Bathhouse Row) to Whittington Avenue, which we followed west through an urban park area that connected with Mountain Top Trail. From there, we made connections with the West Mountain and Canyon Trails.

Due to time constraints, we had to skip the only truly long trail in the park. Sunset Trail heads west to Music Mountain and the highest point in the park (1,405 feet) and then turns northeast, loops through Stonebridge Mountain and eventually returns to North Mountain. Sunset Trail covers the most remote areas of the park, allowing hikers to take in wildflowers during three seasons and wildlife year around. The full trail is slightly over 10 miles, however if combined with other trails to

The Grand Promenade is a popular strolling area within HSNP. Located along the western base of Hot Springs Mountain, where the many natural springs erupt from the ground, it is both peaceful and a launching point into the trail system covering the eastern half of the park.

Hot Springs Mountain Tower: First opened in 1983, this 216-foot observation tower offers 360° views of HSPN, from 1,256 feet above sea level.

make it a complete loop, it would stretch 15-17 miles and include some strenuous sections. Doing so (in one thorough hike or broken into smaller day hikes), would take you through nearly all of HSNP's natural areas. Truly, HSNP can be easily taken in entirely on foot, for any moderately fit and motivated tourist.

Back in town, don't forget to casually stroll the Grand Promenade. This low-key walk provides nice views of the back side of Bathhouse Row from the hills above, where most of the hot springs originate. You'll walk past many of the 27 individual springs that have covers (each bearing the spring's name) to protect their water quality. Several small side trails can be taken up the hillside, but most walkers take the Tufa Terrace Trail down past the gurgling Hot Water Cascade to Tufa Rock and Arlington Lawn. This public park area at the north

end of Bathhouse Row is a popular relaxation spot. On the way back to your hotel, don't forget to fill a water bottle or jug from one of the thermal fountains. Be careful though, the water is often hot enough to make you jerk your hand back in surprise.

Whether your visit to Hot Springs is planned in advance or is more of a last-minute trip, you'll find plenty to do there to fill the time. A wonderful destination year around, Hot Springs can be a welcome escape to warmer weather for more northern dwellers during the fall through spring seasons. Even during summer, when Arkansas can get quite warm, it can also be a nice retreat for deep south dwellers looking to escape their area's extreme heat. It's the perfect sort of park for a weekend sojourn, as it is diminutive enough to be explored in just a couple of days. Even day trips lend themselves well to HSNP, as the heart of the park can be enjoyed in just a morning or afternoon. If an overnight stay (or two) are on your agenda, I highly recommend picking a day to rise early and be out enjoying the natural aspects of the park as the sun rises. The Grand Promenade and the lower elevation hiking trails are where this experience is most striking. This is when and where you are most likely to be shrouded in the Valley of Vapors as the hot steam rising from the many springs collides with the cool morning air and gives the entire area an almost mystical feel. KA

"Whether your visit to Hot Springs is planned in advance or is more of a last-minute trip, you'll find plenty to do there ... "

Matthew McDaniel is a Master & Gold Seal CFII, ATP, MEI, AGI, & IGI and Platinum CSIP. In 30 years of flying, he has logged over 19,500 hours total, over 5,600 hours of instruction-given, and over 2,500 hours in various King Airs and the BE-1900D. As owner of Progressive Aviation Services, LLC (www.progaviation.com), he has specialized in Technically Advanced Aircraft and Glass Cockpit instruction since 2001. Currently, he is also an Airbus A-320-Series Captain for an international airline, holds 8 turbine aircraft type ratings, and has flown over 90 aircraft types. Matt is one of less than 15 instructors in the world to have earned the Master CFI designation for 9 consecutive two-year terms. He can be reached at: *matt@progaviation.com* or (414) 339-4990.

Aircraft Tax Planning When Selling a Business

by Daniel Cheung and KJ McCarter

Amidst a vibrant mergers and acquisitions landscape, many clients have approached Aviation Tax Consultants (ATC) in recent months to discuss aircraft tax planning strategies relating to the sale of their companies. Whether the aircraft is part of the current business going through a sale, or a business aircraft purchase is contemplated after the sale of the business, the following considerations are critical in ensuring the deductibility of an aircraft as a business asset.

Stock versus Asset Sales

If your company owns a business aircraft, a stock sale will likely require the restructuring of the existing aircraft ownership or the spinning off of the aircraft entity prior to the sale. This may result in the recapture of previously taken tax depreciation and immediate gain recognition.

If an asset sale is negotiated, the business owner can maintain the existing corporate entity and enjoy minimal disruption to the tax treatment of the aircraft.

Employee (W2) versus Independent Contractor (1099)

It is common for the owner to stay on board with the new company to help with the transition or to continue to run the company. Whether the owner stays on as an employee or an independent contractor will create very different income tax implications.

Internal Revenue Service regulations are not favorable to employees. There is very little income tax benefit for

an employee who uses an aircraft for the employer's business. On the other hand, the tax code treats business owners very favorably. Generous tax deductions are available when a business aircraft is utilized in a profitable business. Therefore, if an independent contractor or consulting arrangement can be negotiated with the buyer and the new company, it can facilitate the continued deductibility of a business aircraft.

Deal Structure – Earnouts

To further the independent contractor discussion, the founder of the company can negotiate to stay on to provide management or consulting services. A portion of the sales price of the business can be categorized as earnouts, payable as consulting fees, providing revenue that can be used to justify the operation of a business aircraft.

Final Thoughts

While a business aircraft may be an afterthought to a multimillion-dollar business acquisition, thoughtful planning at the transaction stage can allow a business owner to continue to enjoy significant income tax benefits from use of a business aircraft after the sale of the business. KA

" ... the tax code treats business owners very favorably."

Daniel Cheung, CPA is the principal of Aviation Tax Consultants. He is based at ATC's Scottsdale, Arizona office.

KJ McCarter, CPA is an advisor at Aviation Tax Consultants. He is based at ATC's headquarters in Columbus, Indiana.

ATC assists aircraft purchasers in acquiring aircraft in a tax efficient manner. Its services include the elimination or reduction of sales and use tax, maximizing income tax savings, controlling the cost of personal use of the aircraft, and complying with Federal Aviation Regulations. Cooperation with client's tax and legal advisors is welcome and encouraged.

King Air Gathering

May 12-15, 2022

by Kim Blonigen

An overhead view of the Beechcraft museum's campus, adjacent from the Tullahoma Regional Airport (THA). (Photo credit: Bob Burns)

KAG SPONSORS

Platinum

Blackhawk Aerospace
Raisbeck Engineering
Textron Aviation

Gold

AvFab
BLR
CenTex
Collins Aerospace
Covington Aircraft
Davis Aviation
Garmin
Genesys Aerosystems
Hartzell
Ice Shield
International Parts Network
KADEX Aero Supply
King Air Academy
Lee Aerospace
Luma Technologies, LLC
MidContinent Instruments
Pratt & Whitney Canada
PWI
RAPCO Fleet Support
Sierra Trax
StandardAero
Stevens Aerospace and Defense Systems
ThrustSense
Trace Aviation
Whelen Aerospace Technologies
Yingling Aviation

Event

KingAirDOM
MORE Company Inc.
Wenk Aviation Insurance

Hopefully third time's the charm for this event and we will be able to hold the King Air Gathering that unfortunately had to be rescheduled twice due to health concerns with COVID. If you haven't already registered, there is still time to do so. The King Air Gathering (KAG) is being held May 12-15 at the Beechcraft Heritage Museum adjacent to the Tullahoma, Tennessee, Regional Airport (THA).

If you arrive early enough Thursday, May 12, starting at 1 p.m. and running every hour until 5 p.m., there will be guided museum tours from "special" tour guides – four people who have personal knowledge of Beechcraft history. That evening enjoy meeting other King Air owners and pilots at a Welcome Cocktail Reception sponsored by Blackhawk Aerospace with heavy hors d'oeuvres provided compliments of the King Air Academy.

Friday and Saturday will be filled with educational seminars including informational insight from NTSB and Beechcraft air safety investigators, pilot operations, maintenance intel and a look at the history of the King Air. Breakout sessions will focus on avionics, tips for pilots

using EFBs with ForeFlight or Garmin Pilot, and technical topics regarding King Air engines or autopilots.

There will also be time to meet with King Air-specific vendors who will have exhibits in the conference area for face to face time during breaks.

Friday night will commence with the inaugural "King Air Hall of Fame" awards followed by cocktails and Nashville barbecue cooked on the premises with local entertainment hosted by Stevens Aerospace & Defense Systems. You won't want to miss celebrating those who helped make the King Air what it is today while enjoying the tastes and sounds of Nashville.

To register and for more information, go to *kingairgathering.com* or call (601) 724-5013. KA

The ramp at the Gatherings is populated with King Airs, some that the vendors have brought to show their products installed.

The Overspeed Governor and the Test Solenoid 2.0

by Dean Benedict

An overspeed governor on a King Air B200, with the solenoid pointed out (at left).

The Before Takeoff checklist includes a test of the overspeed governors. You know that switch on the sub-panel? When you hold it up, it sends a current to a test solenoid which opens a valve and dumps some of the oil going to the prop into a channel going to the engine case. The reduction of oil to the propellor holds the prop RPM down 150 RPM below takeoff RPM. You release the switch, the valve closes, the oil flow returns to normal and your prop RPM should go back up to takeoff level.

Many pilots, once they see the drop in RPM, release the switch and pull the power lever back and move on with the checklist. BUT, if the solenoid sticks in the open position after the switch is released, that prop won't reach takeoff RPM. That gets your attention when you're rolling out!

A customer of mine with a B200 was heading home at the end of a weekend trip. He started to roll on takeoff but noticed the prop RPM on one side was hanging up about 150 RPM shy of takeoff requirements. The aircraft started to yaw because the torque on that side was now disproportionately high. He aborted the takeoff and gave me a call.

As soon as he outlined the scenario, I immediately suspected the solenoid on the overspeed governor (OSG). No maintenance personnel were available, so I had him flick the test switch several times to see if it would release the solenoid, but it wouldn't budge. We decided that if he pulled the other prop back to match the lower prop RPM, he would be able to take off safely and get home so I could have a look at it. His location that day was not much above sea level so I knew he would get enough horsepower for takeoff. Good thing he wasn't in Telluride.

Of course, I have to insert a caveat for safety here, because I'm a "by the book" kind of guy. I'm the last

person to recommend a cavalier approach in the cockpit. However, *IF you know the capabilities and limitations of your aircraft well,* you can gently bend a rule here or there to find a safe way out of a less-than-optimal situation. That's a big "IF" and I trust you readers are getting my intention here.

Skipping the Test

When my customer brought his B200 over to my shop, that solenoid was still stuck open. I cured it with a whack of a mallet and suggested he skip the overspeed governor test from now on. All it does is test the solenoid. It doesn't, in my opinion, directly test the function of the overspeed governor itself. Some may disagree with me on this, but there are many seasoned King Air pilots with thousands of King Air hours who agree wholeheartedly with omitting the OSG test before takeoff.

The same thing happened to the pilot of an E90 down in Alabama. He was picking up the aircraft following a Phase Inspection. The shop had just finished checking all the systems (pressurization, autofeather, auto-ignition, overspeed governors, etc.) so the pilot wasn't expecting anything to be amiss. But as he was about to take off, he noticed one prop RPM lagging below the other.

He had my number in his cellphone and gave me a call right then and there. He described the problem, and I knew right away that the OSG solenoid was stuck open. I told him to taxi back to the shop, tell them he had spoken to me about the problem, and have them smack the OSG solenoid with a mallet. That did the trick!

I gave the E90 pilot the same advice to quit testing the overspeed governor because you're just asking for a stuck solenoid.

The Power Lever Double-check

Back in the '70s and '80s, we had a chronic problem with those solenoids sticking open. We would execute the final ground runs on a King Air and everything would be fine … but when the owner went to leave, one prop wouldn't come up to takeoff RPM. It happened frequently and it was maddening.

In response, I formed the habit of releasing the OSG test switch and running the power levers back up through the test zone. This way, if the solenoid stuck open after the test, I could catch it on my ground run and fix it before the owner picked up his aircraft. To this day, if I touch that OSG test switch, I do a double-check with the power levers afterward.

In the old days, those solenoids failed so frequently that we kept them in stock. I don't know if it was a vendor problem or a change in design, but the tendency for stuck solenoids on the overspeed governors seemed to lessen over time. It still happens, however, and always at an inopportune time. Being able to identify and fix the problem is very handy.

Malletization Beats Beaucoup Bucks

So why didn't I replace the solenoid in that B200 or tell the E90 pilot to have his replaced? Once you look up the price, you'll see why. They have become absurdly expensive. Five years ago the price at Beech (Textron) was close to $7,000.

Malletization, or hitting something with a soft-blow hammer, is a time-honored solution to lots of mechanical hangups. Years ago, the term "malletization" was an inside joke among savvy mechanics. It was a sophisticated way to say they fixed it with a couple whacks of a mallet. I was amused to find "malletization" listed in the Urban Dictionary on the internet. Solenoids, valves, certain switches, etc. respond beautifully to malletization, provided you know what you're doing. And it sure beats (pun intended) the heck out of the exorbitant cost of replacement.

The E90 Conundrum

Years ago, I ran into a puzzling situation with the owner of an E90 who complained that his OSGs had never been tested in the time he owned the airplane. It's important to know that E90s are the only King Air model with two torque limits marked on the torque gauges: 2200 RPM (TQ value of 1315) and 1900 (TQ value 1520).

As soon as this E90 showed up at my shop, I went straight to those pesky OSG test solenoids. I verified they both had power, I removed them for bench check and they both passed with flying colors. That wasn't what I expected. My lead mechanic was convinced the OSGs were bad, but I was doubtful. It was highly unlikely that both would fail. Then I had my "Aha" moment – this E90 had 4-blade Raisbeck props!

The takeoff RPM on an E90 with 3-blade props is 2200, so the OSG setting should be 150 RPM below that (1950-2050 RPM is typical). But the takeoff RPM for 4-blade props is 1900, and the corresponding OSG setting should be around 1750 RPM. I checked the prop governors first and found them set correctly for takeoff RPM at 1900. But the overspeed governors had not been adjusted. Bingo! They were still set at 2050 to align with the 3-blade takeoff RPM of 2200. Those OSGs would never test at that setting. We adjusted them properly to 1750 RPM, aligning with a takeoff RPM of 1900. Finally, the OSGs tested properly and everything worked as advertised.

In Conclusion

If skipping that OSG test altogether sounds a tad radical to you, let me tell you where I'm coming from: The overspeed governor is a backup to the prop governor; in the 45-plus years I've been working with King Airs I have yet to hear of a prop governor failure. I'm not saying it has never happened, I'm just saying I've never run across it or heard it from anyone else. Prop governors on King Airs have proven to be extremely reliable.

In the unlikely event that one should fail, you have the overspeed governor to keep the propeller in check. It does this via a complex series of counterweights that open up the oil channel going back into the engine case. Actual OSG function cannot be effectively tested on the ground. Therefore the OSG test solenoid *simulates* oil reduction to the prop by opening a valve that allows oil to drain into the channel. When you perform the test, and see the prop RPM drop by 150 RPM, the OSG is responding to oil reduction triggered by the solenoid.

In summary, the OSG check is testing a secondary system that backs up an extremely reliable primary system. The test solenoid involved, although greatly improved from 25 years ago, is still subject to failure. When it stays open, you can't make full power for takeoff. Worse yet, it leads you to believe you have a bad OSG. Sometimes a stuck solenoid can be coaxed to close with a few deft strokes of a soft-blow hammer.

There's one more point I want to make: Let's say you perform an OSG test and get a failure, i.e., you pull the switch but the prop RPM doesn't stop and goes all the way to takeoff RPM. So you have that OSG removed, you pay $3,500 for an exchange unit (with a $15,000 core deposit). After your core unit is evaluated, you get a $7,000 bill-back on your core *for a bad solenoid*. Your OSG was fine but the solenoid failed to actuate! So, again, this OSG test speaks more about the test solenoid than the OSG itself. For this reason, many seasoned King Air pilots skip the OSG test altogether.

I realize that some pilots are not comfortable skipping the OSG test on the Before Takeoff checklist. *If you want to test your OSGs, by all means do so.* You are the pilot. Just consider completing a double-check with your power levers after you release the test solenoid switch … and maybe stash a mallet somewhere … just in case! KA

Dean Benedict is a certified A&P, AI with nearly 45 years' experience in King Air maintenance. He's the founder and former owner of Honest Air Inc., a "King Air maintenance boutique" (with some Dukes and Barons on the side). Now, with BeechMedic LLC, Dean consults with King Air owners and operators on all things King Air related: maintenance, troubleshooting, pre-buys, etc. He can be reached at *dr.dean@beechmedic.com* or 702-773-1800.

Flying with the IS&S ThrustSense Autothrottle System

by Tom Clements

The control and display panel for the ThrustSense Autothrottle System is referred to as the ISU: Integrated Standby Unit. It replaces the normal ESIS (Electronic Standby Instrument System) display that comes standard with the Collins Pro Line 21 and Pro Line Fusion systems.

On Saturday, Dec. 11, 2021, I had the pleasure of trying out the ThrustSense Autothrottle system for the first time. IS&S is the abbreviation for Innovative Solutions and Support, the company that designed, tested and certified this system that adjusts power lever position to maintain a torque value or an airspeed value that the pilot desires.

Textron Aviation has made this system standard equipment on all King Air 260s and 360s, the only civilian King Air models currently being manufactured. I expect that with this factory "approval" we will be seeing many more ThrustSense systems installed in the retrofit marketplace.

At KAG IV – the fourth King Air Gathering – held at Fredericksburg, Texas, in 2019, I rode in the right seat while the system was being demonstrated. I was favorably impressed but felt that I knew very little about the system based on this one brief flight.

As most of you know, I have been involved in numerous King Air training videos that may be found on the King Air Academy (KAA) channel of YouTube. Kevin Carson, manager of KAA, does the hard work of filming and editing while I get to have fun flying and teaching about various King Air particulars. Based on these videos, IS&S Director of Sales Larry Riddle approached Kevin with the idea of making a video of us using the ThrustSense system. Kevin and I thought it was a great idea since it would expose the system to a wider audience, would serve as one more endorsement for the King Air Academy, and be a useful training aid for all future ThrustSense users.

Larry offered a time at which the IS&S demonstrator and flight test King Air B200GT (N313BM, serial no. BY-60) would be available to arrive at Deer Valley Airport (KDVT) in Phoenix where KAA is located. He also emailed us the Pilot's Guide and Quick Check Reference for the system so that I could be somewhat prepared before starting the flight phase. Eric Smedberg, the IS&S test and demonstration pilot, would be the PIC in the right seat, I would fly the airplane and experiment with the IS&S system from the left seat, while Kevin would be filming from the seat behind the co-pilot. We were happy to discover that, since this airplane is their demonstrator, Kevin's seat was now installed in a forward-facing position and the cockpit/cabin divider had been removed. Both changes made his filming considerably easier.

I created a flight test plan for what I wanted to accomplish in the airplane. The plan was to fly from KDVT to Winslow (KINW), then to Flagstaff (KFLG) and finally return to KDVT. As it turned out, we decided to refuel at KINW and canceled our leg to KFLG. As is so typical of Arizona, the weather was perfect and we made the entire flight in visual conditions without an IFR flight plan. (You can examine our tracks on the FlightAware site.)

The control and display panel for the ThrustSense system is referred to as the ISU: Integrated Standby Unit. It replaces the normal ESIS (Electronic Standby Instrument System) display that comes standard with the Collins Pro Line 21 and Pro Line Fusion systems. That's where the "Standby" part of the name comes from. Like the original ESIS, there is a switch for power on the pilot's left subpanel and it has a backup internal battery. The ISU is mounted just above the radio tuning

unit near the center of the instrument panel. It includes both an AI and HSI display as well as a power button, menu button and rotary select knob.

In my opinion, one of the best features of the ThrustSense system is that the potential for PLM (Power Lever Migration) is eliminated. Yay! The actuators that move the power levers provide their own friction and it never needs to be adjusted or changed by the pilot.

The ThrustSense system noticeably reduces pilot workload with engine limitations protection, overspeed and underspeed airspeed protection, VMCA mitigation and having no worry about Power Lever Migration.

Because of this, I had a concern that when I was using the power levers manually, not using the autothrottle system, they would be too stiff for my taste. I found that not to be the case: they moved quite easily and very similar to the non-modified levers with medium friction.

As I have written in the past, when one or both power levers spring back as the pilot reaches for the landing gear handle after takeoff, the result is usually rather funny: The pilot sees what has happened, pushes the levers back to where they belong, tightens the friction knobs properly and continues the flight. But woe be to the airplane and its occupants if the power lever movement is not observed and the pilot assumes an engine failure. The retardation of the power lever turns off autofeather and the windmilling propeller, usually combined with reduced power on the right engine as well as the left, will see the airplane reaching stall speed quite rapidly when the pilot maintains the +10° pitch he was taught to use in a takeoff engine-loss situation.

With the engines not yet started but with the airplane's battery and the ISU turned on, the system performs two internal tests. The first of these takes about 30 seconds and there is nothing for the crew to observe. But when the 30 seconds elapse, the second self-test causes the system to move both power levers from idle to full forward and then back to idle. You can see why this test cannot be done with the engines running, eh?!

Once the engines are started, the autothrottle system basically is out of the picture during the normal taxi and run-up procedures. The power levers are moved forward as needed and into and out of the Beta range as normal. To arm the system for takeoff power application, the pilot hits the power button on the ISU and the ISU indicates that the system is armed. Once lined up on the runway, hitting the GA button puts the system in the takeoff mode and the power levers evenly and smoothly advance. "Look, Ma! The levers have an invisible hand moving them!"

The unit receives the inputs that tell it OAT and airport elevation and the torque is adjusted to ensure that the "Minimum Takeoff Power" requirement is met for those conditions. The -52 PT6s on the B200GT are

so flat-rated that there is almost no takeoff situation in which the full 2,230 ft-lbs of torque is not used.

One minute after liftoff, the system changes from Takeoff to Climb mode, ensuring that the climb ITT limit is always observed. I found it easy to get somewhat complacent in watching the torque and ITT engine instruments since the ThrustSense system always took care of them perfectly for me.

I intentionally departed a bit northwest of KDVT to keep us under the Class B airspace for a longer period of time. As the autopilot leveled us at 4,500 feet (Class B started at 5,000 in this area) I switched the system into speed mode by pushing the knob on the ISU and dialed in a speed of 195 knots, mindful of the 200-knot "below Class B" restriction.

Now about setting the speed: Golly, what a slow learner I was! The Pilot's Guide that had been sent to me and which I had studied quite thoroughly told me that the knob on the ISU would be used to set speeds just as it is used to set desired torques: The two modes available. However, in the time after the manual had been written and before this demonstration flight, a software change had been made. Now, instead of setting airspeed using the ISU's knob, it was done using the speed knob up on the Pro Line 21 autopilot control panel near the glareshield. I think this makes a lot of sense and is a better, more intuitive, way to go. But, damn, I must have reached for the wrong knob 90 percent of the time! Eric was very understanding and patient with me, but I am sure he was less than impressed with my fumbling.

Once I finally had the 195 knots dialed in (using the correct knob!) the power levers moved back and set the proper value that kept us legal under Class B. When clear of the Class B overhang, I then put the autopilot into Pitch mode, dialed +8° nose up, and returned the autothrottle system to Climb mode. I could also have used IAS or FLC (Indicated Airspeed or Flight Level Change) mode, but I find that a constant pitch attitude mimics the POH's climb speed schedule from Sea Level to the limit … FL350 in the case of this B200GT! Depending on aircraft weight and engine power, this attitude, for *all* King Airs, is between 7 and 10 degrees.

Those who have read my books, viewed some videos, or took training from my old Flight Review company or KAA, know the importance of "magic numbers." It is quite surprising how certain torque values will yield certain indicated airspeeds for different configurations, regardless of altitude or OAT. The only thing that has a noticeable effect on the torque value is aircraft weight. We leveled off at 13,500 feet and I dialed in 1,000 ft-lbs of torque, the number that usually yields 160 KIAS, clean configuration. As the autopilot held altitude, we

came out about 10 knots fast but then realized that there were only four of us onboard and about 1,000 pounds of fuel so we were quite light.

Next, I extended approach flaps and landing gear. As expected, we slowed to 120 KIAS. Then, simulating a precision approach, I dialed in a 600 fpm descent, which told the ThrustSense system to hold 120 knots. As expected, the resulting torque came out to near 700 ft-lbs, the magic number for this situation. I found there was very little "searching" and that the power levers made small corrections smoothly and accurately, just as a human pilot would.

We cleaned up gear and flaps, dialed in a torque of about 2,000 ft-lbs, went back to the +8° pitch, and climbed up to near 15,000 feet. Next, keeping that high torque value, I aggressively selected a pitch attitude of about -5° and we started into a rapid dive. Sure enough, as expected, when we got close to V_{MO} (Maximum Operating Velocity), the power levers moved aft and our speed stabilized a few knots below redline.

I have not yet mentioned propeller speed. As is typical for members of the King Air 200-series, takeoff is at 2,000 RPM, climb is at 1,900 and cruise is at 1,700. (Climb and cruise are usually 100 RPM less with the Raisbeck props.) I was pleased to discover that when transitioning from takeoff to climb, I could manually bring the prop levers back while automatically the power levers came aft a touch to prevent torque from exceeding the limit. Without the autothrottle system, we always have to ensure that we have a bit of a torque "cushion" below redline by reducing the power levers a tad, before pulling the prop levers back. That's not necessary any longer with ThrustSense.

Eric programmed the FMS for the VOR or GPS RWY 11 at Winslow and we tracked to the IZSAH IAF to begin. I "played" with the autothrottle system, dialing in various torque and airspeed values as the autopilot flew the arc that took us from IZSAH to DMJCH where we turned inbound. The INW vortac is the FAF for this approach so as the autopilot leveled us at the FAF altitude of 6,200 feet I dialed in a speed of 120, with approach flaps and gear down. I then used the autopilot to control the descent from the FAF to MDA while the autothrottles held the speed. Even though it was severe clear, we pretended that we were still in IMC on the approach and at the MAP I depressed the GA button on the left power lever. There's that invisible hand again! Both power levers came up smoothly to takeoff power as I pitched up into the flight director's command bars, advanced props to full forward and retracted flaps and gear. (GA mode disconnects the autopilot, as you know.)

We decided to remain in the left traffic pattern for this runway so I hit the A/T (autothrottle) button on the right power lever which disconnects the ThrustSense system and I proceeded to manually fly and make the landing. We went in for fuel and a break.

On the way back to KDVT – after filming the power levers move through the self-test before start and making a circle around the famous Arizona meteor crater for Eric to have his first look – I checked the underspeed protection. I dialed in a torque – 300 ft-lbs – that was too low for us to hold altitude at a safe airspeed. As expected, as the airspeed neared stall speed, the power levers moved forward and held us 3 knots above "Stall Speed plus 10"… a nice comfort margin. I decided not to "play with" the V_{MCA} power mitigation safety built into the ThrustSense system. Why? Because in every V_{MCA} demonstration I have ever conducted in a King Air, the stall is always encountered before V_{MCA}. If we have stall protection, we have V_{MCA} protection also. Yes, if we execute a rejected landing from 50 feet above the runway with gear down and full flaps AND we have an engine flameout at the same time, then a loss of directional control could be encountered before stall. The fact that the ThrustSense system will reduce the good engine's power so as to allow directional control to be maintained is a good thing … although we may touch down on or near the runway at least we will be right-side up!

Back at Deer Valley we requested and received permission for the RNAV (GPS) RWY 7R. We began from over BANYO intersection following the transition to the AZNUP IAF. I dialed in the various speeds that I wanted and did not turn off autothrottle until after selecting full flaps at about 500 feet AGL. It worked well.

I came away from this demonstration and practice with a high level of confidence in and respect for the ThrustSense system. Of course, pilots can manage their own power lever movement as they have been doing for eons. But this invisible hand certainly does reduce pilot workload noticeably. Engine limitations protection, overspeed and underspeed airspeed protection, V_{MCA} mitigation, and having no worry about Power Lever Migration … what very nice icing on the cake this system provides.

Like me, I believe that if you try it, you will like it … a lot! KA

King Air expert Tom Clements has been flying and instructing in King Airs for over 46 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*.

Latest Garmin Pilot app update adds

Garmin® International Inc. recently announced the addition of new features to the Garmin Pilot™ app for iPad® or iPhone® mobile devices. The new enhancements include expanded NOTAM display options for field condition (FICON) and fuel unavailable NOTAMs on the moving map, which can be also viewed on the redesigned Airport page. The updated Airport page offers an improved layout and intuitive menus that provide easy access to airport information, including access to the most commonly reviewed facts and info about an airport, without having to access additional submenus.

Field condition (FICON) NOTAMs

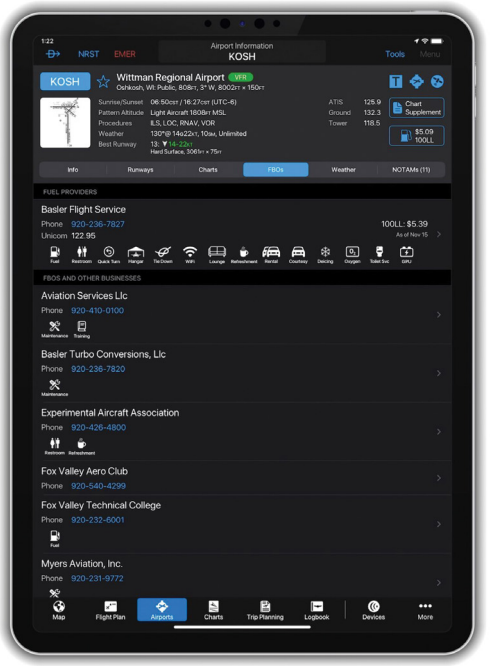
When a FICON NOTAM is issued, Garmin Pilot now displays a badge at the end of the runway with the numeric value of the surface condition and braking action for each third of the runway; touchdown, midpoint and rollout. Users can view a decoded description of the FICON code by using the radial menu to access the raw NOTAM and clicking on the info icon.

Fuel unavailable NOTAMs

Fuel unavailable NOTAMs are presented throughout Garmin Pilot including in the fuel overlay on the dynamic map*, the Airport page, SafeTaxi® diagram, along with the NOTAM widget in split screen mode. When fuel prices* are enabled on the dynamic map, the fuel unavailable NOTAM is displayed as a badge with a red warning triangle and a strikethrough on the reported price. This makes it easy to identify airports where fuel is unavailable without individually reviewing NOTAMs for airports. On the airport page, fuel unavailable NOTAMs can be viewed by tapping the warning banner displayed across the top of the page, as well as within the FBO tab.

Airport page updates

Garmin Pilot users will benefit from the redesigned Airport page with improved layouts and menus to provide easy access to airport information. Additional airport information has been added to the header, including the type of procedures available for the airport, weather conditions, as well as frequencies – making commonly reviewed information available without needing to access submenus. The new horizontal navigation bar simplifies the menu options: information, runways, charts, FBOs, weather and NOTAMs. Within those options, a revised side-bar menu intuitively organizes information. The FBO listings within the Airport page have also been enhanced to provide more information at-a-glance, and the FBO



services are now displayed with easily recognizable icons. Further, FBO data has been substantially expanded outside the U.S., with more than 10,000 FBO listings added.

Additional enhancements

The latest Garmin Pilot update features additional enhancements, including:

- The distance measuring tool now includes estimated time en route (ETE), fuel burn and altitude for both directions of flight. It will also update the flight profile view with the area being measured.
- Garmin Pilot now supports the Appareo Stratus 3 ADS-B receiver[1]. When connected to a Stratus 3, Garmin Pilot can display ADS-B weather and traffic information, back-up attitude and GPS position.

The newest release of Garmin Pilot on iOS® mobile devices, version 10.6, is available immediately. For new customers, Garmin Pilot is available in the Apple App Store as a free download for the first 30 days. After the 30-day trial period, customers may purchase an annual subscription of Garmin Pilot starting at $79.99. Garmin Pilot is supported by Garmin's award-winning aviation support team, which provides 24/7 worldwide technical and warranty support.

Visit *www.garmin.com/aviation* for additional information. KA

*Only available in the United States

[1] Must be used in GDL 90 mode; Target Trend not supported

From Multi-Engine Turboprop Communiqué ME-TP-0028

ATA 00-Cabin and Cockpit Noise Levels

The typical cockpit and cabin noise levels for certain model King Airs is as follows:

350i
The average cabin noise 81 dBA, average cockpit noise is 85.5 dBA at FL250 KIAS, 75% engine torque and 1500 propeller rpm.

B200/B200GT
Four blade propeller, average cockpit 83.3 dBA, average cabin 79.1 dBA at FL250 and 75% torque. Three blade propeller, average cockpit 88.7 dBA, average cabin 82.5 dBA at FL250 and 75% torque.

C90A, C90B
The average noise level is 83 dBA, at FL250 at 75% torque and propeller at 1900 rpm.

C90GT
The average noise level is 86 dBA, at FL250 at 75% torque and propeller at 1900 rpm.

ATA 00- Over Fly Noise Levels

Effectivity: All

The takeoff and landing noise levels for the King Air are in the airplane's respective Pilot's Operating Handbook Section 4 under Noise Characteristics.

Please be aware that Pilot's Operating Handbooks on the older King Airs do not have this information as this information was not required by the FAA when these airplanes were certified.

The information provided in this column may be abbreviated for space purposes. For the entire communication, go to ww2.txtav.com/.

CORPORATE ANGEL NETWORK

Cancer Patients Fly Free

Filling Empty Seats With Hope

Corporate Angel Network arranges free travel on corporate aircraft for cancer patients traveling to and from treatment. Business jet travel makes it possible for patients, especially those in locations with minimal airline access, to travel to specialized medical centers.

Contact us today to learn more about patient travel services or to donate space on your aircraft.

"It's wonderful that organizations like the Corporate Angel Network are able to help connect those most in need of flights to those who are flying."

-Henry Maier, President and CEO, FedEx Ground

corpangelnetwork.org | Westchester County Airport – White Plains, NY | (866) 328-1313

ADVERTISING INDEX

SERVICING KING AIRS SINCE 1964

3 Authorized Service Centers
10 King Airs Serviced Every Month
30,000 Airframe Parts in Stock
380+ G1000/G1000NXi Installations
3,000 Aftermarket Avionics Parts

WWW.ELLIOTTAVIATION.COM | 800.447.6711