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Daniel Herr's 1996 King Air 350. Credit: MeLinda Schnyder

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#### **OWNER SPOTLIGHT**

# MEET THE HER FAMILY TRUCK

The Herr Family – left to right, Elizabeth, Kay, Dan and Wilmer – at KMMH Mammoth Lakes, California, in 2017. They explored nearby Yosemite National Park on their first family vacation in the 1996 Beechcraft King Air 350.

# R STER

## Their King Air 350 proves ideal for family vacations

by MeLinda Schnyder



hree weeks after purchasing a 1996 Beechcraft King Air 350 in the summer of 2017, Daniel Herr was off on the first of many grand family vacations. His family of four took off from their home airport of Lehigh Valley International Airport in Allentown, Pennsylvania, headed for a West Coast adventure. He had ideal weather for the challenging terrain at Mammoth Yosemite Airport (KMMH). After mountain biking at Mammoth and hiking at Yosemite National Park, they flew an approach to minimums at Areata, California, to stand among the giant redwoods (and to drive their car through one). On the eastbound return, they took in a rodeo and went white water rafting in Cody, Wyoming. The final stop was to spend time with close family in Watertown, South Dakota.

Ambitious and safe family vacations are the primary reason Herr, an 8,200-hour pilot, owns an airplane. In 2006, he had purchased his first airplane, a Cessna 421, after years of "freeloading" – flying his dad's Cessna Turbo Skylane RG and his friends' Piper Dakota. Herr's flying background includes flight instructing, night freight, charter and fractional.

The 421 came before he and his wife, Kay, had daughter Elizabeth and son Wilmer. It served them well until the kids got older and the vacations stretched farther afield. Herr felt that the frequency of trips



Daniel Herr flew his 1996 Beechcraft King Air 350 to the 2022 King Air Gathering at the Beech Heritage Museum in Tullahoma, Tennessee. He brought his family back to experience the museum when returning home to New Jersey after spending spring break 2024 in Texas.

"I'd say it's a dream come true, but it's something that my younger self never even dreamed of."

"I try to make it look easy but it's phenomenal how much time I spend on trip arranging and departure planning. Even with an Aircraft Performance Group subscription, I frequently have to print out approach plates to plot the engine-out route and then create GPS user waypoints for the route. The King Air 350 has Transport Category runway performance numbers: balanced field lengths just like a jet. As a single pilot, I can't match the safety level of a twopilot crew as a fractional operator, but I strive to take advantage of the level of safety offered by the 350. I pour a lot of effort into training and maintenance. Safety is further enhanced by the 350's enormous useful load. With full fuel, my family and luggage, I am more than 1,300 pounds below gross weight. As the pilot, I'm the weakest link in the equation. I work hard not to squander the safety that the 350 affords," he said.



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A few of the missions in seven years of operating FL-136 shown here include Daniel Herr flying his family to college visits including Manhattan, Kansas; vacations in Bar Harbor, Maine; Titusville, Florida; and Ketchikan, Alaska; and to visit extended family in South Dakota.









They'll spend the Fourth of July with family in South Dakota, then summer vacation will take them to the island of Newfoundland – "It's Maine on steroids," said Herr, who visited the eastern Canada vacation spot with his wife before kids.

This fall, they'll begin regularly flying to Manhattan, Kansas, where their daughter will start her freshman year studying Animal Science at Kansas State University.

"Flying our own aircraft is a great luxury and a blessing in my life and for my family," Herr said. "It's brought us a lot of experiences that we otherwise wouldn't have had. We've been able to get off the beaten path to see national parks, small towns, antique tractor shows, farm shows and cowboy music concerts. The King Air also makes it easy to visit family in South Dakota. Without the airplane, maybe we would only have a token South Dakota trip every year or every few years. The airplane enhances our quality of life and sustains family connections despite the 1,000 miles between us."

#### A lifelong interest in aviation

Herr grew up in New Jersey, where he currently resides, among a family of recreational pilots. He spent a lot of time in the family's Cessna Skyhawk alongside his father, a farmer and lawyer. Cost-cutting grounded the Skyhawk as well as the teenaged Herr. But when Herr was 16, his father's flight instructor Floyd Evans, who was also a dear family friend and TWA captain, volunteered to teach Herr if his dad would cover the airplane rental at Alexandria Field Airport in Pittstown, New Jersey.

"Floyd liked to tell people that he soloed me in three hours, but it was really 103 hours. I had well over 100 hours of time flying with dad in earlier years in the family Skyhawk. Dad wasn't a CFI, so none of the time was loggable, but it was worthwhile time," said Herr, who started the lessons with Evans during the summer of 1982. Herr received his private certificate in 1983 and his instrument rating in 1984. With his IFR ticket in hand, he thought his training was wrapped up for a while. Floyd had other plans. During his two weeks of college spring break in 1985, Herr added a commercial certificate, as well as CFI and CFII ratings, all at the age of 18.

"Floyd had a profound impact on my life," Herr stated. "While it was impressive that he got me so many ratings so quickly, his biggest impact was convincing me to get my CFI. It is not that the CFI certificate itself was important, rather it was profoundly important how Floyd believed in me and saw that I could accomplish



Connecting with people is a big reason Daniel Herr bought his King Air 350. He flies it regularly for family gatherings, to spend time with friends as well as to meet business associates. He flew from his home airport (KABE in Allentown, Pennsylvania) to Wichita Dwight D. Eisenhower National Airport (KICT) in Wichita, Kansas, for an in-person interview with King Air magazine. (Credit: MeLinda Schnyder)

something that seemed, to me, so far beyond my reach. As a CFI, I was teaching people who were two or three times my age – and I was earning their trust and respect. My perception of my own capabilities, of what could be achieved if I worked at it, expanded tremendously."

Herr flight instructed through college, and after graduation he took a job as an underwriter for an aviation insurance company. He was able to fly the company's Beechcraft Bonanzas regularly and moonlighted as a night freight pilot flying Cessna 310s. In his next job, selling industrial equipment, he would often borrow his father's plane, by then upgraded to a Cessna Turbo Skylane RG, to capture aerial facility photos that he'd send to potential customers as a sales follow-up.

Next, he flew full time for a New Jersey-based charter company and was a captain for the fractional aircraft operator NetJets, flying Cessna Citation Ultras. The seed for his own business venture was first planted while working at the charter company. When not flying, he was talking to prospective owners of turboprops and jets about putting their aircraft on the charter certificate. Those owners would sometimes send him contracts from competing companies, including fractional operators. "I hadn't been to law school, but with a grandfather and two parents who were lawyers, I'd been around the family law practice and legal seminars all of my life," Herr said. "I read these fractional contracts and saw promises by the programs to cover costs that were highly variable. I knew these promises couldn't hold and that owners were going to be surprised."

In 2002, a friend's parents asked him to review the costs of their fractional shares and Herr was able to save them a substantial sum. He started consulting for fractional owners – and quickly figured out that to best protect his clients, he needed to be an attorney so that he could revise the contracts before his clients purchased their fractional shares. He completed his law degree in 2005 and morphed the consulting business into a law practice. His firm, FractionalLaw, works with fractional aircraft owners to help them minimize their hassles and expenses, protect their legal interests and optimize their fractional ownership.

"In one sense, I'm in this glamorous fractional industry, but in reality, I'm in my office with my spreadsheets working on residual values, downgrade ratios and Consumer Price Index adjustments," Herr said. "Much

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One of Daniel Herr's first upgrades after purchasing FL-136 in 2017 was to Garmin G1000 NXi avionics optimized by Stevens Aviation. (Credit: MeLinda Schnyder)

of it is tedious administrative work, but I do it because I love my clients and I like the overall package."

Of the 100 to 150 hours he flies the King Air each year, Herr said fewer than 15% are business hours. "But the business impact of those hours is outsized. Being an airplane owner and pilot provides many soft benefits, from credibility in the industry to insider knowledge. I was chatting with the line guys at Telluride one day. They mentioned which operators pay attention to the 10-knot tail wind limit and which don't. I use that intelligence when advising my clients on which fractional programs to use and which to avoid," he said. Herr's typical business trips are to Kansas City to meet with appraisers, to NBAA seminars, to OEMs to look at new airplane models headed into the fractional fleets and to fractional programs themselves. "When meeting with companies based at an airport, it is invaluable to show up by airplane."

#### A complicated upgrade from the Cessna 421C

The upgrade itch began in 2016, 10 years into Herr's ownership of the Cessna 421C. His two children were 10 and eight years old, and the expanding radius of family trips called for more performance. "I wanted turbine reliability, increased engine-out performance and the ability to fly higher and farther," he said. The upgrade dream switched into high gear when Herr received an unsolicited offer, relayed by his maintenance shop, to purchase his Cessna 421C. The offer was too high to pass up, so he sold it despite not having a replacement. A dry lease of a Pilatus PC-12 NG based at Herr's home airport filled the gap during his airplane search.

Initially, King Airs were not on Herr's list of prospects. One of his first experiences flying the famous line of turboprops was as a charter pilot in the mid-1990s. He regularly transported a family from New Jersey to Florida in the charter company's B200. With full fuel and two pilots (per charter policy), there was just 400 pounds of useful load left. Herr perceived the B200 as a wonderful airplane for 500-mile corporate legs, but not well suited for long legs hauling his family and luggage.

While he came to love the build quality and reliability of the Pilatus during the dry lease period, the PC-12 did not make Herr's short list. With his low utilization, the PC-12's savings in fuel did not come close to offsetting the high capital cost. In addition, Herr and his wife disliked how the Pilatus rides in turbulence. "With its engine mass located inline with the fuselage, the Pilatus has a low rolling moment of inertia."

In the lower capital cost category, Herr considered the Cessna 441, Twin Commander 1000, Fairchild Merlin IIIC and Fairchild Merlin 300 – making multiple offers on the latter two but never landing a deal.

"During the depths of my Merlin funk, I had a fortuitous encounter with a corporate pilot who had flown both Merlins IIICs and another SFAR 41 aircraft, King Air 300s. He told me to investigate King Air 300s. I was impressed with what I found: great useful load, a relatively liquid market, eligible for a Garmin 1000 upgrade and shops everywhere that know how to work on them. Compared to a Merlin IIIC, the King Air 300 has better runway numbers, better single-engine performance, better speed but less range, more fuel burn and a lower cabin differential of only 6.6 psi. Every airplane is a compromise. I decided that the King Air 300 offered a reasonable set of compromises for my mission."

He hired John Murphy of Murphy Acquisitions to help. "I am a hands-on guy who is good at educating myself," Herr said. "I had plunged into the Merlins and learned an extraordinary amount, but I did not feel comfortable wading into the King Air market without assistance." Herr describes John as a gentleman of the highest caliber who knew the King Air market inside and out. Over the course of nine months, Herr said he made offers on six 300 models: two offers were rejected, one seller changed his mind as he flew to the inspection facility, two deals died in contract negotiation, and Herr rejected one plane during the inspection phase. Meanwhile, in October 2016, Herr got his type rating from Potomac Flight Training, which had a King Air 300 simulator as well as a real King Air 300 equipped with a Garmin G1000.

"At this stage, John suggested I take a look at the 350 market," Herr said. "When I had hired John, I told

him explicitly that I didn't want a 350: the 300 cabin is already bigger than I need, the 300 has better runway numbers because it isn't hauling around an extra 700 pounds in empty weight that does me no good and the larger 350 will cost me more to hangar. Despite my anti-350 bias, I did some research. I discovered that 350 models FL-111 and later had improved runway numbers thanks to a lower Vmc and an Federal Aviation Administration (FAA) waiver to use transport rules rather than commuter rules. These later 350s - or earlier ones that have been retrofitted - can have better runway numbers than a 300: the 350 can have balanced field length where the 300 doesn't even have acceleratestop. But the 300 does have the flexibility to depart Telluride (KTEX) or Mammoth Yosemite Airport (KLXV), both in Colorado, at 12,500 pounds (no accelerate-stop required), whereas the 350 needs cool temps and to be reasonably light. Other plusses for the 350 are improved annunciator panel logic, a slightly-improved electrical system and a little more useful load."

Murphy found FL-136, a 1996 model 350 with only two previous owners (both U.S.), complete logs and a worthy maintenance history. The airplane was priced accordingly for having engines 400 hours from overhaul, as well as paint and interior that would eventually need attention.

"The 1996 King Air 350 cost me no more to buy than a comparable 1988 King Air 300 with its price bumped





for eight model years," Herr said. "In other words, I paid more because it was newer, but I didn't pay anything extra for it being a 350 rather than a 300. That was my rationalization. Even better on the value scale, back in 2017, there wasn't much demand for used King Air 350s. Companies avoided them because they didn't want the hassle and expense of hiring type-rated pilots. I paid less for my 350 than I would have paid for a comparable B200 with Blackhawk engines. For an owner-pilot willing to get a type rating, the 350 was a compelling bargain back in 2017."

Herr took possession of FL-136 July 31. The following week he completed two days of training in his airplane with his type rating instructor. "It felt good to get put through the paces and to review some intricacies of the systems," he said. "I am proud of my decision to seek training that wasn't required. I knew I needed it and I felt much better about my capabilities afterward."

He put those capabilities into action quickly: it was mid-August when he departed for Mammoth Lakes with the family for their first grand adventure in the King Air.

He's since had many adventures and replaced his older serial number engines with a used set of the PK series of the Pratt & Whitney Canada PT6A-60A. Other improvements include Raisbeck dual aft body strakes, Raisbeck swept props and Garmin G1000 NXi avionics installed by Stevens Aviation. Still on the wish list: CenTex saddle tanks to ensure nonstop legs on 1,000nm trips with winter headwinds, new paint and an interior refurb. In the pie-in-the-sky category, Herr would love to be able to replace the engine-driven air conditioning compressor with an electric compressor. "Being able to cool the cabin before engine start has been a common feature in other planes since the 1980s. Even my 421 had it. I'm astounded that Beech failed to incorporate this improvement decades ago."

Seven years into ownership of FL-136, Herr is happier than he ever imagined being in a King Air. Herr is content with his decision to opt for the King Air's lower capital cost and higher operating expense. "When I was flying the King Air 200 for charter, lugging a family and their luggage around, I never would have pictured flying my family around – with every bit as much luggage – in a King Air," the 57-year-old said. "I never thought I'd own a Cessna 421, much less a King Air or any airplane of this magnitude. I grew up in a Skyhawk. I'd see a Bonanza or a 210 and they seemed unobtainable, like there was a moat between my world and those airplanes. I'd say it's a dream come true, but it's something that my younger self never even dreamed of."

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# **IN REVIEW**

by Sara Katherine Waller

he 2024 King Air Gathering (KAG), held May 15 - 18, was unforgettable, bringing together King Air owners, operators, pilots, mechanics and enthusiasts from around the globe. Hosted by King Air Nation and co-host BLR Aerospace at the historic Greenbrier resort in White Sulphur Springs, West Virginia, this year's Gathering was a success and possibly the most memorable KAG to date.

I In the



### **KAG** at a Glance

- 129 Attendees (Owners/Operators/Pro Pilots/ Mechanics)
  - **47** Companions
  - **51** Sponsors
- **143** Sponsor attendees
- **80+** Aircraft represented
  - **34** Aircraft flown into LWB





Thursday night was a fan-favorite as attendees gathered at Kate's Mountain Lodge for an evening of cocktails and dinner sponsored by Blackhawk Aerospace. The venue, with its stunning views of the Allegheny Mountains, created a captivating atmosphere further enhanced by the warmth and hospitality extended to all attendees.

During Thursday's dinner, the inaugural King Air Awards were presented. Earlier in the day, attendees visited the airport where they voted for their favorite aircraft in several categories, including Best Overall 90, Best Overall 200, Best Overall 300, Best Exterior, Furthest Flown and Dirty Bird (the dirtiest aircraft). The awards added an element of excitement and friendly competition, celebrating the dedication and pride that King Air owners, operators and pilots have for their aircraft, and believe it or not, the competition is already heating up for next year's event!

Hasard Lee, U.S. Air Force fighter pilot and author of "The Art of Clear Thinking," was welcomed onstage Friday as keynote speaker. Lee took his audience on a journey through his life stories, revealing powerful decision-making principles, all of which left the audience inspired and better equipped to handle high stress in aviation and life.







## Upgrade your King Air 350 / 360



#### HALO 350 Information Chart

Increase Max Ramp Weight	15,000 to <b>16,050</b>
Increase Max Takeoff Weight	15,000 to <b>15,950</b>
Max Landing Weight	No Change <b>15,000</b>
Max Zero Fuel Weight	No Change <b>12,500</b>
Payload Increase	950

### HALO 350 STC Kit:

The Halo 350 STC kit includes the STC, installation drawings and instructions, AFM Supplement, instructions for continued airworthiness documents, and the required parts and components (except common hardware items) for converting and operating a King Air 350 series airplane at a maximum takeoff weight of 15,950 pounds.

New safety systems installed are takeoff trim warning & ice mode stall warning. Estimated installation labor hours: 20 hours

Weight and payload shown in pounds.



Textron Aviation's Diamond sponsorship brought engaging companion activities, such as wine tasting and charcuterie building, a walking tour of the Greenbrier grounds, planting with succulents and more! These events provided a wonderful opportunity for attendee companions to relax, enjoy the beautiful scenery and delight in great conversations.

Another show highlight was the live auction Friday evening. There, Bill Alberts (of Bill Alberts Consulting) acted as auctioneer and kept the audience entertained as he led the auction to new heights. Auction items were graciously donated by KAG sponsors and highlights included Whisper Props and Winglets with LEDS from BLR, Crown Wing Lockers by Raisbeck, two separate LED Caution/Warn/Advisory panels and Gear Status Lights from Luma Technologies and more! A portion of the proceeds go to scholarships for King Air mechanics and pilots to ensure growth and a strong future in our beloved King Air models, as the organization as a whole moves toward a safety foundation and association. More details in the upcoming months on the safety foundation and association with member benefits.

On Saturday afternoon, attendees enjoyed vendor-sponsored Greenbrier experiences, which included Bourbon and Birdies with BLR Aerospace, Bourbon and Shotguns with Winner Aviation, Fly Fishing with BLR Aerospace, and Croquet and Cocktails by Textron Aviation for attendee companions.

This event would not be possible without the support of event attendees and our generous sponsors, especially our 2024 cohost, BLR Aerospace!

Mark your calendars for March 19-22, 2025, for next year's Gathering, which will take place in downtown Phoenix, Arizona. Whether you are a longtime attendee or interested in joining us for the first time, next year's Gathering promises to be nothing short of spectacular, filled with learning, networking and enjoyment. We look forward to welcoming you to Phoenix for what is sure to be another memorable Gathering!

Sara Katherine Waller is a marketing coordinator for King Air Nation located in Brandon, Mississippi. New to the aviation world and King Air Nation team, she says she has "absorbed knowledge that fuels her passion for the fast-paced field." Sarah looks forward to continuing to contribute to the King Air community.

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#### GARMIN

# **Grease is Good**

by Dean Benedict

ake a look at the wheel bearing in Figure 1 (below) – it's dry as a bone – there's not a speck of grease or lubrication to be found. It looks like it sat in a solvent tank for a month, then tossed on a junk pile. The crazy thing is this wheel bearing came off a King Air during a Phase inspection in my shop years ago.

Back in the day, I had maintained this particular King Air for six or seven years when this happened. It flew about 100 hours per year and was on an annual schedule of two phases per year to ensure all four phases were completed every 24 months as stipulated in the maintenance manual.

This particular maintenance visit was for two phases, a handful of calendar items coming due, and a few customer squawks. It was looking like a very routine visit until my crew tried to remove the wheels in order to grease the bearings (as happens at every phase). They found the wheel bearings on the main gear were drier than dust. They were practically fused to the axles! My crew had to beat the wheels with a mallet to jog them loose enough for removal.

I was in disbelief. The previous year we had performed the sixyear landing gear inspections. The wheel bearings were lubed properly at that time – no question about that. The aircraft flew about 100 hours since the gear was done; there was no reason for those bearings to be utterly devoid of lubrication. They were so dry they were about to seize up. Thank goodness that didn't happen because they would have scored the axles. I don't want to think about the repairs necessary to remedy that situation!

#### The Mystery Unfolds ...

I couldn't imagine how this happened. The pilot of this King

Air was a no-nonsense, by-the-book type of guy. Conscientious to a fault, he never let any detail escape his attention. Prior to coming to my shop, he'd had some bad experiences with maintenance. As a result, he was very cautious about where he took the King Air for service. He happily flew from Denver to Southern Nevada for Phase inspections. If he got stuck somewhere, he wouldn't have anything done without consulting me first. So, I was mystified as to how those bearings dried out so fast.

The owner of this aircraft was in the pipeline business and owned a lot of equipment. He was meticulous about the maintenance



Figure 1: The totally dry wheel bearing, taken from the King Air referenced in the article.

and appearance of all his equipment, including his King Air. Accordingly, his diligent pilot made darn sure that King Air was in pristine condition at all times.

It turns out the pilot happened upon a new, fantastic degreaser. It was perfect for getting grease off everything, and he used it on the King Air to great success or so he thought. This happened right after the gear inspections were done, so of course the landing gear got regular treatment. Liberally applied on a repeated basis, this degreaser worked its way into the wheel bearings and stripped them of all lubrication. You can see the result in the photo. The pilot's perfect find wasn't so perfect after all.

#### What to Use?

All maintenance manuals must identify the greases to be used on an aircraft. There are a few places on a King Air where very specialized greases are specified in the manual. The oxygen shut-off valve is one example. In this article I'm talking about general lubrication items and the manual calls out various mil spec (military specification) greases to be used for these applications.

For wheel bearings, I always favored a wonderfully thick grease that is red in color. Many shops use a yellow grease, but I just loved this red stuff for wheel bearings. I like its consistency and resilience, and it conforms with maintenance manual specs. This is the grease my shop used for the wheel bearings at every six-year gear inspection. Although the wheels and gear are on the 200-hour lube item list, I greased them at every Phase, even if the airplane only flew 40 hours since its last inspection. You can't grease something too much, but you sure can fail to not grease it enough, and the consequences of doing so are never cheap.

#### **A Fine Mess**

I took a lot of flak from my customers about the mess created by my red grease in the months following a Phase inspection. Traces of this grease would appear on the gear after every flight. But no matter how much they complained, I knew darn well they'd rather wipe up a little mess than risk major damage due to insufficient or no lubrication. Now that would be a real mess!

The right grease, properly applied, minimizes friction and promotes longevity of the parts involved. Furthermore, proper lubrication offers protection against corrosion. I cannot emphasize this strongly enough. So, keep a rag handy for those little messes.





Figure 2: Fresh grease is pushed through the bearing with a bearing packer.



Figure 3: Wheel bearing packed with grease and ready for reinstallation.

#### **Clean Freaks Restrain Yourselves**

The maintenance manual specifies that the grease used on your aircraft be water resistant. Obviously, you need something that will survive the rain and routine washing of the aircraft. As most of you know by now, I do not recommend pressure washers in the cleaning of aircraft. If one is used on your King Air, you should personally ensure it is used sparingly.

Never use a pressure washer to clean the wheels or landing gear. Doing so just hastens corrosion, and that equals big, big maintenance bills. Unfortunately, the wheels and gear are exactly where people want to use a pressure washer the most, to remove brake dust in the wheels and grime in the gear. Pilots and owners need to think past a little grease and grime to the cost of exchange wheels after your cores are condemned for corrosion.

If you are an obsessive clean freak – restrain yourself. That is an order! Pressure washers push the grease aside and inject water where it doesn't belong. Solvents or degreasing cleaners are even worse as they dissolve the grease entirely. When water gets where it should not go, corrosion follows. Please, I am begging you ... leave the grease to do its job.



If a mobile detail operation is cleaning your King Air, you must make absolutely certain they do not use a pressure washer on the gear. This is easier said than done. It's the dirtiest area and they think they won't get your continued business unless they make your aircraft look ready for the showroom floor. If you can't be there to supervise their work, consider getting it in writing: "No pressure washing the landing gear."

#### **Lubrication Schedules**

The maintenance manual has very specific directions on what to lube and when. There are lists of things to be lubed every 200 hours, every 400 hours, also every 600, 800 and 1,200 hours. I'm not going to regurgitate the maintenance manual here, but there are a lot of moving parts that need to be greased regularly.

Here's a short list:

- Flaps flap tracks, flap actuators and flap gear box
- Ailerons trim tab hinge and aileron quadrant
- Cable seal elevator, rudder and aileron
- Rudder pedal attach points
- Down lock hooks

The lube item checklists are thorough and sometimes repetitive. But again, you can't over-lubricate something. These checklists are a vital part of your King Air maintenance.

Lubrication may seem boringly basic, but it's absolutely essential in the maintenance and preservation of your King Air. I ran a version of this article 10 years ago in this magazine. At the time, I wondered if it was too simple of a subject since lubrication is so elementary. On the other hand, lubrication is so consequential to the proper function of any airplane, it makes me think I should mention it in every issue.

Anyone that has ever worked with me knew not to skimp on any lube item. If my customers didn't hassle me after inspections about red grease splatter, then I didn't do my job. Your job (and you should choose to accept it) is to kick the pressure washer and the degreaser to the curb and adopt a new slogan: Grease is Good!

Dean Benedict is a certified A&P, AI with 50 years' experience in King Air maintenance. He was an inaugural inductee to the King Air Hall of Fame. He owned and ran Honest Air Inc., a "Beechcraft maintenance boutique" with a strong following of King Airs, for 15 years. Currently, with BeechMedic LLC, Dean and his wife, Lisa, consult with owners, pilots and mechanics on King Air maintenance issues, troubleshooting and pre-buys. Dean also provides expert witness work on request. He can be reached at 702-524-4378 or via email at *dr.dean@beechmedic. com.* 



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#### **AVIATION ISSUES**

## **FAA Reauthorization Act Signed into Law**



resident Biden signed the bipartisan Federal Aviation Administration (FAA) Reauthorization Act of 2024, May 16, which renews authority for the agency for the next five years and invests in air travel infrastructure nationwide. Regarding the passage of the bill, NBAA President and CEO Ed Bolen said, "Both sides of the aisle, on both sides of the Capitol, have come together and passed a bill that reflects the business aviation community's priorities, provides a long-term roadmap for the agency and ensures that America will continue to lead the world in aviation safety, security, sustainability, innovation, workforce development and investment in airports and other critical infrastructure."

The bill included the first-ever title dedicated to general aviation (GA). Bolen noted a key section of the legislation focused on enhancing safety, streamlining regulations and improving certification processes for general aviation aircraft, supporting certification for advanced air mobility (AAM) powered-lift aircraft and other technologies and protecting flight privacy.

Specific to GA, the bill increased funding for the FAA's airport improvement program and aid in funding GA airports, including construction of itinerant and transient parking areas. It also protects the permanent closure of any grant-obligated airport unless it will not affect its aeronautical purpose. The Government Accountability Office was directed to conduct a study on the efforts of FBOs to meet their commitments to improve the online transparency of prices and fees for all aircraft. In addition, the bill expanded BasicMed to cover aircraft maximum takeoff weight up to 12,500 pounds, as well as an increase of passengers and seats; established a working group to ensure efficient certification of pilots; developed an "Airman's Medical Bill of Rights;" took steps to eliminate aircraft registration backlog; and secured the future of GA through improving FAA Workforce Development programs, national oversight of Designated Pilot Examiners and more.

The bill authorizes more than \$105 billion in funding for the FAA and \$738 million for the National Transportation Safety Board for fiscal years 2024 through 2028.

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#### **ASK THE EXPERT**

# "Help! I can't get my King Air's autopilot to fly wings level."

by Tom Clements

his article's title pertains to a somewhat common request that I have received over the years of my King Air training career: Help me find a fix for the autopilot. Even when no question has been asked, I find that quite often when I ride as an instructor or passenger in a King Air, I find that the wings are not level when the autopilot is handling routine "straight and level" flight.

I am happy whenever I get this question because the answer is so simple. In fact, a lot of my readers – the ones who already know what the answer is – may as well go ahead to the magazine's next article, because you'll find nothing new here. But stick around if you're waiting to learn the magical fix.

Ready? Want to know where the problem lies and what is the magical fix? Here it is: Turn the rudder trim wheel toward the lower wing. OK, I'll see you next month.

What?! You're still here? Well OK, I'll spend a little more time explaining what this is all about.

Only one autopilot (AP) that has been certified in King Airs has rudder trim capability ... the rare King KFC-400 system. If you are flying a King Air with that system, the autopilot will position the rudder trim as it sees fit. Yes, you can manually turn the rudder trim wheel to a new position, but when you take your hand away the wheel will move back to where the AP wants it. If you find your KFC-400 flying with one wing low, an avionics technician with experience in that system will be required. (This does not apply to the much-morecommon KFC-300 system.)

All other autopilot systems available in King Airs have four, not five, autopilot servomotors, more commonly called servos. One servo controls roll by moving the ailerons, one controls pitch by moving the elevators, one controls yaw by moving the rudder, and one adjusts the elevator trim to lighten the load on the elevator servo. Only the KFC-400 has the fifth one that adjusts the rudder trim.

A single-axis autopilot controls only roll. A two-axis autopilot controls both roll and pitch. A three-axis autopilot (yes, you guessed it!) controls all three: roll, pitch and yaw. To the best of my knowledge all King Air autopilots are and always have been the three-axis type.

As you know, the only trim control that routinely gets much use is pitch trim. Change airspeed? Trim. Change configuration? Trim. Aileron trim hardly ever gets touched unless a large fuel imbalance exists. Rudder trim? Many pilots must believe it is akin to aileron trim ... hardly ever used (except for single-engine work). Yes, a normal flight can be successfully completed without a tweak of the rudder trim wheel. Is that the way to go? No! Did you hear me? NO!

The rudder (yaw) servo is there for only one purpose ... to dampen yaw. It helps in keeping the nose from swinging side-to-side. Cruising in perfectly smooth air with no change in power, the rudder servo would never be needed and would never activate. But since air is rarely that smooth, imagine keeping your feet on the floor while flying manually. What? You say you've ridden with pilots who do that? Yes, I have too ... and it drives me nuts! Now every little bump usually leads to some nose-swinging. Even in perfectly smooth air, lack of rudder awareness and proper usage leads to what this article is all about ... correcting a wing-low situation.

Imagine this scenario, which is a very good one for instructors to teach/demonstrate to their flying students. In level flight, tell the student to keep both feet on the floor, away from the rudder pedals. Now assign a heading – let's use an example of 270 degrees –and observe the student doing the proper job, on the control wheel only, to maintain altitude and heading. Now suppose the instructor slowly put some force on the right rudder pedal. The airplane will respond by swinging the nose slightly to the right, making the heading change to, say, 275 degrees. The student, following the assignment



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www.kaman.com/cleveland www.clevelandwheelsandbrakes.com that was given, will turn the wheel counterclockwise, dropping the left wing and turning back to 270. Now, to keep holding that assigned heading while the instructor is still pressing the right pedal, the wings cannot be brought back to level. Instead, a slight left bank must be retained.

Has the light bulb illuminated? Has your brain grasped why the autopilot is not flying wings level? It is doing so in order to fly the heading it wants while compensating for an incorrectly adjusted rudder. Keep in mind that although the autopilot may be in GPSS, Nav or Approach mode, not Heading mode, it still must find and hold an exact heading to track the course. Sure, that heading may be changing often as conditions especially crosswind components - change, but at any given time the autopilot has a heading target when holding a heading or tracking a course.

It is common to see a pilot attempt to raise the wing that the autopilot is keeping low by turning the aileron trim wheel. If the bank angle changes due to this action, then no longer will the target heading be held, so the AP will not let that wing come up. Oh sure, there is a reaction time so the wing will probably rise before it returns to the position it needs. Eventually, enough aileron trim will likely overpower the strength of the roll servo and the wing will indeed come up ... and keep coming! Thus, it is incorrect and fruitless to adjust aileron trim to correct the wing-low condition. Instead, just adjust rudder trim to add rudder force on the lowwing side.

Back to our training scenario: If we are now banking 2 degrees left-wingdown to compensate for the right rudder force our instructor sneaked in, we could take the rudder trim wheel – assuming our trainer has one – and turn it left, toward the low wing. Eventually, the rudder trim would create just the right amount of left-rudder force to balance the rightrudder force that the instructor was



applying and we would have the wings level again as we held the assigned 270 heading.

"Patience is a virtue." I am sure vou've heard that adage. If we move the rudder trim wheel in our King Air rapidly, the nose will of course momentarily swing in the direction of the rudder force that has now been applied. The Yaw Damper, obediently doing its job, will apply opposite rudder to dampen that yaw. Go slow with the trim and then stop to give the airplane and autopilot time to stabilize. Truly, in a King Air, the initial motion of the rudder trim wheel toward the low wing may be no more than one-fourth of one index division on the trim indicator. Expressed another way, the geared knurled knob that you are moving with your hand probably rotated only 30 degrees or less. Wait 30 seconds or so and inspect the wings. Better, but not level? Turn the trim wheel another small amount and wait again. Eventually you'll have it nailed in level flight. Doing this perfectly throughout an entire flight (without an engine failure!) I will state that the rudder trim index is never more than one unit from center. Be patient; go slow.

Rarely do two different airplanes fly identically and hence what is right for one may not apply to others, even others of the exact same model. But let me tell you, readers, every King Air needs rudder trim adjustment throughout a flight! Why it drives me nuts when I ride with pilots who treat rudder trim and aileron trim the same –rarely if ever touching either one – is because the result is uncoordinated flight. Please work at being more aware of coordination.

"But I am aware! I keep the ball pretty darn well centered!" Yes, I am sure the ball is "pretty darn well centered" most of the time, as it should be. Give yourself a pat on the back; you're doing good thus far. However, the amount the ball is out of the center – or the slip-skid bar is not aligned with the bank index – in level cruise flight is so small as to be almost unnoticeable even though the wings are obviously not level. Holding a constant heading with level wings and equal engine power, by definition, means that the airplane is perfectly coordinated. It is my belief that comparing wingtipto-horizon alignment – in almost all cases – is a more accurate way of gauging the true state of coordination than the ball.

You will come to find that adding some right rudder trim will always be required as you climb after takeoff unless you dialed in a little while setting trim wheel positions before takeoff. A small left rudder trim tweak will invariably be required as you level off and accelerate into cruise. If speed picks up in the descent, you'll need a dab of more left rudder trim. Extension of flaps and gear? Because other things are changing so quickly now – airspeed, power, probably altitude – there usually won't be enough time to make the wing-low evaluation of trim. But be alert to the ball. Trim as needed.

As you all know, trim merely lets us reduce control forces. Everything I am saying about rudder trim could be accomplished by pushing the correct rudder pedal. Of course, there are times when forceful and timely rudder pedal input is necessary ... like when an engine experiences a loss of power! When hand-flying without the Yaw Damp engaged, yes indeed, it may be easier to just press a little harder on one pedal than spending time adjusting the trim. However, since we almost always have Yaw Damper engaged – and 90% of the time, the autopilot as well – the rudder pedals resist our attempts to move them due to the Yaw Damper doing its thing. Rather than overpower the rudder servo or get a leg cramp because of the continuous force being applied, I suggest adjustment of rudder trim is much preferred to the application of actual pedal force when correcting the wing-low problem.

If this sounds familiar to you, you are not mistaken. I included a reference to the need for rudder trim adjustment in a previous article discussing Yaw Dampers. However, I believe this is an important topic that deserves another look. I still see a lot of King Air pilots accepting one-wing-low as normal. Folks, we can be better than that!

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*.



#### **VALUE ADDED**

#### D&J Aviation Joins SmartSky<sup>®</sup> Installation Network

#### Installs SmartSky LITE™ on King Air C90

SmartSky, provider of inflight air-to-ground (ATG) connectivity for business aviation, announced D&J Aviation as a new sales and installation partner. D&J recently completed a first-article installation of the award-winning SmartSky LITE<sup>™</sup> on a Beechcraft King Air C90 with a Supplemental Type Certificate (STC) expected in the coming months.

Headquartered in Colorado Springs, Colorado, D&J is a certified Service-Disabled Veteran-**Owned Small Business (SDVOSB)** Maintenance, Repair and Overhaul (MRO) center with over 40 years of aviation integration and installation experience for both commercial and government aviation customers. Their capabilities include a Part 145 Federal Aviation Administration (FAA) certified repair station, engineering and design, mission systems integration, PMA contract manufacturing, as well as expertise in small, unmanned aircraft systems.

"SmartSky is an exciting partner because they give us the ability to offer a complete suite of solutions for our customers, whether special mission or business aviation. Their proven, high-performance inflight connectivity can fit virtually any size aircraft, and rave reviews from customers are driving demand for their systems," said Jim Schawb, CEO of D&J Aviation. "We are beginning our second installation and are actively working on more opportunities to enable continuous streaming connectivity inflight."



D&J is a recent recipient of a military contract to install a communications suite on multiple aircraft, enabling mission operators to reliably deliver mission critical aerial intelligence content efficiently and effectively to network subscribers and mission stakeholders.

"D&J's experienced aircraft maintenance staff combined with their focus on quality customer service ensures they will be a highly effective partner in delivering SmartSky connectivity for a broad range of missions," said Aria Bahawdory, Director of MRO Account Management for SmartSky.

SmartSky holds STCs for more than 6,000 in-service aircraft and has projects in-progress to cover nearly 10,000 more. For more information on the rapid expansion of the availability of SmartSky's award-winning inflight connectivity products, visit www. smartskynetworks.com/stc. DJA performs general and depot level aviation maintenance and overhaul services to all sizes and types of aircraft. Visit www. *djaviation.aero*.

#### ForeFlight's 16.4 Allows Smoother Flying

ForeFlight's latest release – 16.4 – features a Reported Turbulence Map Layer, U.S. Lowest-Tilt Radar and more.

#### Reported Turbulence Map Layer

Utilizing data from Sentry and Sentry Plus devices, this new layer in the ForeFlight Mobile app displays the measured intensity of turbulence at multiple altitudes, making it easy to find the smoothest altitude along your route.

Individual turbulence reports are displayed as colored dots on the



Maps tab in ForeFlight: gray to indicate smooth air, and a progression of yellow, orange and dark orange to indicate light, moderate and severe turbulence, respectively.

Pilots can tap any report to see the reporting flight's altitude, airspeed and aircraft type, as well as the age of the turbulence report, up to about six hours.

Reported Turbulence is available as two add-ons for Pro Plus subscription plans and above: Reported Turbulence (Low) provides access to turbulence reports up to 14,000 feet, while Reported Turbulence (All) grants access to reports at all altitudes.

#### **U.S. Lowest-Tilt Radar**



The Radar (Lowest-Tilt) layer only depicts radar returns obtained at the lowest angle of the radar's sweep, which better correspond to where precipitation is reaching the ground in the form of rain or snow.

The new layer benefits from significantly reduced latency of six minutes or less and also provides enhanced spatial resolution, although the layer doesn't yet support storm track markers. Release 16.4 also provides enhancements to ForeFlight's Runway Analysis product for jets and select turboprops, including an expanded workflow for selecting your flight's Landing Distance Factor and a printer-friendly TOLD card for pilots.



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