

King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

MARCH 2019 • VOLUME 13, NUMBER 3 • \$6.50



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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

Photo Credit: Textron Aviation

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King Air is wholly owned by Village Press, Inc. and is in no way associated with or a product of Textron Aviation.

King Air (ISSN 1938-9361), USPS 16694 is published monthly by Village Press, Inc., 2779 Aero Park Drive, Traverse City, Michigan 49686. Periodicals Postage Paid at Traverse City, MI. POSTMASTER: Send address changes to King Air, Village Press Inc., P.O. Box 1810, Traverse City, MI 49685. Telephone (231) 946-3712. Printed in the United States of America. All rights reserved. Copyright 2019, Village Publications.

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King Air Market

A high-angle, aerial photograph of a King Air twin-engine turboprop aircraft in flight. The aircraft is dark blue with white and red stripes on the tail. It is flying over a green grassy field with a runway visible in the background. The propellers are blurred, indicating motion. The title "King Air Market" is overlaid in large, bold, yellow letters at the top.

The King Air market overall is very strong; we are seeing very low inventory levels and a brisk sales volume that has been consistent for the last two years. Looking at Q4 2018, we saw 186 King Air transactions compared to 181 during Q4 of 2017.

Market Still Solid

Year-End Numbers Stay Consistent

by Chip McClure



The 350/350i market has been very tight as there aren't many available on the resale market.

Model 90

When it comes to the King Air 90, it is fairly segmented with older aircraft languishing on the market and newer or well-equipped aircraft selling very quickly. The sweet spot is currently the C90B with Blackhawk engines and an upgraded panel. If priced right, those aircraft sell as soon as they hit the market and, in many cases, before they hit the market.

Model 200

The King Air 200 market has a widening gap between straight 200s and B200s as the '70s vintage aircraft continue to be perceived by most buyers as old. Well-equipped 200s and those that are priced below market are selling, but anything that has known negatives tends to sit longer. The B200 market is strong and can be viewed through definite levels: The early B200s that are nice and priced in the very low \$1Ms sell very quickly. The post 1985 (hydraulic gear) airplanes are selling well. The late '90s airplanes, which is typically 1997-1999, are in high demand and tend to fall in the price point with the most active buyers at around \$1.5M, again assuming they are nice and priced correctly. The market for post-2000 B200s is very active as well, with pristine aircraft selling very quickly. The post-2004 B200 (Pro Line 21) and the B200GT markets are very tight and sales/demand seem somewhat volatile. The realities of upgrading the Collins avionics seem to put downward pressure on this market. The cost of the Collins Modernization Package averages around \$200,000 and that is enough to give any King Air buyer pause.

The King Air 200 / B200 / B200GT / 250 market is clearly defined between appealing aircraft with engine time remaining and airplanes that need engines, avionics or cosmetics. The nice airplanes sell very quickly and

the weaker ones hang around on the market, litter up the advertising sites and create the impression that aircraft aren't selling. I tell all of our clients to ignore most of what is on *Controller* because those airplanes are either already sold or not likely to sell. Many of these aircraft have been advertised for more than a year! An interesting footnote specific to the King Air B200 market is that we continue to see a wide variance in actual sales prices, with some aircraft selling above market and some selling well below. I believe this is attributed to the sheer number of aircraft and confusion about values.

Model 300 and 350

The King Air 300 market has changed drastically in the last 18 months; in 2017 there were many great King Air 300s to choose from, today there are very few available.

The King Air 350 / 350i market has changed as well. In 2017, two entities – the Turkish Government and U.S. Government Contractor Leidos – each purchased seven aircraft in a short period of time, most of them 2003 and newer. The reality of 14 airplanes being pulled out of the market combined with an increase in demand for run-out airplanes to be converted with Blackhawk -67A engines, caused the King Air 350 market in 2018 to get tighter than I have ever seen it! It's a little better now, but a nice low time, post serial number 500 (Keith Freon) King Air 350 is very hard to come by. At the time of this writing, there were only six U.S.-based King Air 350i models for sale. That market remains very tight with the oldest listing being just 120 days.

In Summary

The most interesting component of the King Air market may be the sales prices. While some markets have firmed up, we simply have not seen a huge increase in actual sales prices. One can argue that maintaining the same value is actually a price increase because

The C90B with upgraded panel and engines sell very quickly, sometimes not even making it to the market.





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"the King Air B200 market ... we continue to see a wide variance in actual sales prices, with some aircraft selling above market and some selling well below."

each year the aircraft gets older and should be worth less because of its age.

This is subject to deeper research; the reality is that the King Air market is wildly complex. The variables affecting value and resale desirability are incredible. The King Air line has more available modifications and options than any other business class aircraft (see sidebar story for more information on modifications and their values). Each option and modification affects the value and desirability of that individual aircraft. Add to that over 50 years of continuous production and the challenge of understanding the King Air market as a whole becomes a daunting one!

If you are in the market to buy a King Air and are concerned about values, I would say you have a green light. I don't see anything changing dramatically anytime soon. My second bit of advice is to hire an acquisition professional to find an airplane for you; as I mentioned, many of the aircraft that are sold are never advertised.

One thing is for certain, aircraft markets and values rise and fall, but no other aircraft weathers the storm of a world economy better than the King Air! **KA**

Chip McClure is the founder and CEO of Jet Acquisitions, a Georgetown, Texas, based firm that exclusively handles turbine aircraft acquisitions. Chip has over 15 years of experience in the King Air market, including purchasing and refurbishment.

The Most Modified Business Aircraft in History

We routinely ask King Air operators what options they would add to their aircraft and why, and the following is what we've learned.

When buying your King Air, you probably figured out pretty quickly that it is one of the most modified and optioned airplanes in history. No other business type aircraft has more available options. From engines to avionics to airframe, the list seems endless. Add to that the fact that each of these options increases the value, or even worse in some cases *decreases* the value and confusion reigns.

My goal in this article isn't to explain what the different options and modifications do for your airplane, but instead what they do for YOU and for your aircraft's VALUE. I find that when you buy a King Air with or add the modifications to your aircraft, and those options both have a functional aspect to your mission AND increase the value of the aircraft, you have achieved a win-win.

RAISBECK Engineering

I sometimes wonder how different the vulnerable King Air would be without the efforts of men like James Raisbeck, the founder of Raisbeck Engineering. The fact that most of his modifications have been incorporated into the current production aircraft are a testimony to just how important they are.

In the King Air world Raisbeck options are highly desirable and always increase the aircraft's value. Here's a brief overview of their most popular King Air modifications. **◆**



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Raisbeck's Aft Body Strakes reduce drag and increase climb and cruise performance among other things. They also provide a high percentage of your cost back to the resale value of your King Air.

Aft Body Strakes

Aft Body Strakes are designed to improve flight characteristics and they do, but they also look really cool! They are worth the investment, and a must-have on any King Air.

Market Value Add: \$20k - \$25k

Installation New – Less than \$30k; call Raisbeck Dealer for a quote (requires paint).

Tip – Don't get new exterior paint without adding Strakes.

Wing Lockers

Raisbeck Wing Lockers aren't cheap and are on the lower end of value retention for Raisbeck's products, but they score on the charts of functionality. On the King Air 90 they are critical because you need the storage; in the King Air 300 / 350 they are great because you typically have plenty of useful load.

Market Value Add: \$40k - \$60k

Installation New – Less than \$90k; call a Raisbeck Dealer for a quote (requires paint).

Tip – If you are shopping for a King Air and know you want lockers, try to find one with them already installed.

Ram Air Recovery / Leading Edge

These are two options that make the list because they are very important when combined with other mods, but don't stand alone as well. Both increase the performance of the aircraft but add little in the way of functionality regarding daily use.

Market Value Add: depends.

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— John Smith, Vice President Waffle House, Inc.



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Market Value Add: depends on time remaining, but a very high percentage of installation cost.

Installation New – Depends on prop and model of aircraft; call a Raisbeck Dealer for a quote.



Raisbeck and Hartzell worked together to develop the first Swept-Wing Turbine Propeller for business aviation. The swept-wing technology increases thrust while reducing noise and vibration, as well as inherently improving all phases of flight.

Tip – Don't overhaul your props, replace them with new props and then sell the old props to offset some of the cost.

CenTex Aerospace

CenTex is making big changes to King Airs! If you find that the King Air you have or are considering can't do the mission required, CenTex Aerospace can fix that.

The CenTex mods add critical usability to the King Air line and while the value retention depends of who is buying the aircraft, if you NEED the CenTex mods they are priceless.



The CenTex King Air 200 HST Package combines the Halo 275 and ST120 Saddle Tank conversions at a package price, but both items can be purchased separately in the size/capability to meet your needs.

Saddle Tanks

If range is what you are looking for, the saddle tanks are what you need. The ST72 / ST120 option will give you 72/120 gallons of extra fuel respectively – that's an hour of additional flight time! Plus, you still have plenty of storage in the wing locker behind the tank.



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HALO mods

If useful load is what you need, the HALO mods are a great choice.

The HALO 250 mod raises the MTOW of the King Air 200 / 250 to 13,420 pounds, while landing weight remains 12,500 pounds.

The HALO 275 increases the MTOW to 14,000 pounds (High Flotation Gear required).

The HALO 350 mod brings the MTOW of the King Air 350 to 15,950 pounds.

Tip – Some HALO mods require a special type rating.

Garmin

When it comes to upgraded avionics in King Airs, the gold standard is the Garmin **G1000** panel that increases useful load, modernizes the avionics and autopilot, increases weather capabilities, lowers operating cost and flight discrepancies and increases the value of the aircraft far beyond the 50 percent normally seen with avionics installations.

The resale value depends on the model, but with a King Air 300 / 350 that has the **G100NXi** installed, we are seeing an increase in resale values that is north of 80 percent of the cost of doing the install! This is primarily because there are very few glass upgrades available for the 300 / 350, so most aircraft are either stock or have been upgraded to the G1000.

The **G600** and **G600TXi** certainly deserve mention here, but remember they are only options in the 90 and 200 series King Airs. The resale value of the G600 / G600TXi as well as the G1000 in 90s and 200s are more difficult to determine, mainly because there are so many options and configurations.

Tip – Consider downtime as well as total cost – the premier G1000NXi installers like Elliott and Stevens can install a G1000 in less than four weeks. A G600 / 750 panel can easily take two to three times as long and retains the original autopilot.

The Garmin **GTN 750 / 650** is standard equipment in every King Air. If you haven't been told that yet, wait until you sell your airplane and you will. We spoke with the top King Air resellers and they all said the same thing, for a King Air to sell, it has to have at least a 750 / 650 in it and needs to be ADS-B Out compliant.



A King Air 300/350 with a G1000NXi installed has an added resale value over 80 percent of the cost of doing the install.



The King Air 350 with Blackhawk -67A engines makes it the fastest King Air in the world. When the STC for placing the -67s on a King Air 300 is approved, it will take the reign of being the fastest.

(Photo credit: Matthew McDaniel)

Blackhawk Modifications

Jim Allmon is another guy who has made a dramatic impact on the Beechcraft King Air and like James Raisbeck's modifications, Jim's engine upgrades have been incorporated into current production aircraft.

The investment for Blackhawk engines is significant, but when considered in lieu of engine overhauls that routinely exceed \$1 million, the sticker shock fades pretty quickly. Plus, the new five blade props are included as well.

Tip – Aircraft with Pro Line 21 avionics require the Collins Modernization upgrade.

-135A Conversion

The vulnerable King Air C90 is a great airplane, but it is slow. In today's world 220-230 knots just doesn't get you much respect in the turbine world. However, that same airplane with -135A engines is a screamer! We're no longer talking about value retention, we are talking about a whole different airplane with a different price point completely.

-52 / -61 Conversion

The King Air 200 / B200 is the most prevalent turboprop ever built! The 200 was designed in the

early '70s and BB-2 rolled off the line as a 1974 model. Since then, Beechcraft has built over 2,800 King Air 200 series aircraft. That doesn't include the 300 and 350 that grew out of the 200 series.

In 1981 Beechcraft replaced the -41 engines with -42 engines, a noticeable but not exactly a game-changing improvement. When Blackhawk was granted its STC to install -52 engines on the 200 series airframes it was a game changer! The 300-knot King Air was born.

-67A Conversion

The King Air 300 with Blackhawk -67A engines is the fastest King Air ever built; in fact it is one of the fastest non-military turboprops available! As of this writing, the -67 powered King Air 300 is still in flight test but it looks like normal cruise speeds will be around 345 knots.

The -67 powered King Air 350 is without a doubt **the ultimate King Air 350!** I had the opportunity to take a ride in one we modified for a client and I can tell you that I could fill this page with words and you still wouldn't understand. You simply have to fly/ride in it.

BLR Winglets

The cool factor with BLR Winglets is off the charts. Sure, they help with climb and increase flight heights

with higher altitudes that are very important, especially for operations at RVSM altitudes, but who cares?

Winglets are the single biggest cosmetic improvement you can make to a King Air. I'd rather have a King Air with BLR Winglets and old paint, than one with new paint and no winglets.



Besides looking cool – they are the single biggest cosmetic improvement you can make to a King Air – the BLR winglets aid in climb and increase flight height capabilities.

It's hard to say what the value retention is, but one thing is for sure is that they absolutely modernize the aircraft and will help it sell before a similar aircraft without them. If I were to guess, I'd say that you'll get at least 50 percent of your money back; add that to the resale and cool factor and winglets are a hot item to have.

Summary

King Airs have been built for over 50 years and during that time, over 8,000 have been sold. Most of those aircraft had numerous options available from the factory and add the hundreds of aftermarket options and upgrades available, some mentioned here, but there are also many other upgrades out there, as well as other modifications offered over the years.

I didn't even mention AvFab and their fabulous interior upgrades. There are also window shades and tinted windows. Do you have any idea how many different autopilots have been installed in King Airs over the years?

Why are King Airs so darn complicated? Because, my friend, they are the most viable and prevalent turboprop aircraft ever built and have changed business aviation. Heck, it may have even created it! **KA**

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King Air Insurance Discounts

by Kyle P. White



King Air owners frequently ask me about available discounts for their insurance program. This has become more prevalent as the insurance market continues to show signs of hardening – coverages are becoming less negotiable, rates are slightly increasing and underwriters are becoming more critical of an operator's risk profile.

In the May 2018 issue of *King Air* magazine, I wrote the article, "King Air Insurance Market Update." The article profiled the insurance environment for King Air owners and operators over the last 15 years. In the post 9-11 market, the typical premium for King Airs has ranged from approximately \$35,000 to \$65,000, depending on hull value, limits of liability and owner-flown versus professional-flown. Recently the prices bottomed out from several thousand dollars for a low limit and low hull value King Air 90 to \$20,000 for a high hull value King Air 350 with high liability limits flown single pilot by the owner.

Historically, the 30-plus ancillary coverages were easy to add or increase. Last May, we specifically discussed "Garagekeepers" coverage which provides coverage if your guest's car is damaged while in your hangar or by one of your employees. For example, one of your employees details the car as a kind gesture and damages it in some manner. To save money on your insurance renewal, we recommended adding Profit Commission On Renewal (PCOR) – an endorsement that can be added to your insurance policy. The PCOR endorsement is designed to do two things. First, it shares in the profit of your policy with the insured, assuming there

are no losses. Second, it creates loyalty between the insurance company and the insured. In order to share in the profits from the expiring policy, you must renew it with the same carrier. For example, assume you pay \$20,000 for your insurance policy and during the policy period there are no losses. The endorsement can read a couple of different ways, one of which is "10 percent of 70 percent of the earned premium." This means upon renewal of your policy with the current carrier, you will receive \$1,400 back.

Into 2019, it is obvious the insurance market bottomed out in 2018 and pricing is not only on the rise, but the ancillary coverages we've written about over the years are starting to tighten too.

The new market conditions are foreign to most in our industry. We have become accustomed to getting what we want for less than what we paid for it the previous year. Driven by competition amongst the vast number of insurance carriers, there seemed to be a significant amount of flexibility and desire by each of the carriers to write your business. This started to change when last summer Berkley Aviation announced that they were leaving the aviation insurance market.

The other insurance carriers absorbed the Berkley Aviation clients and their needs, but in many situations, at a price increase. Through conversations with underwriting aviation managers at other companies, there is significant chatter that their aviation underwriting portfolio is struggling to meet their company's targets. In order to achieve an underwriting profit, they need an obvious combination – more premium and less losses.

Understandably, you don't want to pay more premium. So, the focus shifts to how you, the operator, can convince the underwriters you are a good risk and won't cost them any money during your policy period. How can you get your "discount"? The answer is *risk management*.

Sophisticated and intelligent insurance buyers in your supply chain have been taking advantage of you. To keep your rates in check, put everything on the table and objectively assess how you can manage risk and push back on those in your circle who try and push or limit their liability on to you and your insurance company. Look at your operation from the underwriter's perspective to effectively evaluate your risk profile:

The following bullet points are in no particular order, but are all among the most important items to manage your risk from an underwriter's perspective:

- Limit pilots to operating only two different types of aircraft in the flight department.
- Simulator-based training every six months. If you are operating two different types of aircraft, alternate the aircraft trainings every six months. If you only operate the King Air, then at a minimum go to simulator-based training every 12 months in make and model.

- Annual "Upset Recovery training" or "All Attitude training."
- Implement NBAA (National Business Aviation Association) resources, such as International Standards for Business Aircraft Operations. NBAA has a plethora of material to help you professionalize your operating environment. Does someone in your flight department leadership team hold a CAM (Certified Aviation Manager) designation?
- Create or overhaul and update the Flight Operations Manual to include minimums for new-hire pilots, operating minimums with regard to runway environment, duty day limits and other manageable criteria.
- Review all of your contracts with suppliers, such as hangar lease agreements and third-party maintenance contracts. Include your list of contract pilots and the contracts you have in place with them.
- Are you dry leasing your aircraft to third parties? You have now opened yourself, and your insurance carrier, to potential payouts in the event of a claim.



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Underwriters are being more particular about who and what they are insuring. Position your risk profile in the most favorable light and have a knowledgeable “brand ambassador” as your broker. One of the most highly glossed over risks aircraft owners have is the hangar lease agreement. One large FBO chain wants you to sign an agreement stating they are not responsible for damage incurred to your aircraft while they service it. They are engaged in commerce but have essentially eliminated their potential liability by pushing it back on to you. This is how they have kept their insurance rates artificially low and been able to retain a high deductible with reasonable comfort. They are forcing your insurance company to pay for their negligence.

Push back on these contracts. If you don’t, this is more risk you are expecting your insurance company to absorb. When the FBO damages your King Air and your insurance company has to pay to repair it, per the contract you signed, they can’t subrogate against the FBO. In the end, you lose. You now have record of a claim, while not your fault that monetary gesture will follow you for at least five years.

Third party leases are also starting to attract the attention of underwriters. At one time insurance companies charged a higher rate for a chartered King Air versus one operating strictly as “Industrial Aid,” which refers to a corporate flight department flown

by professional pilots for strictly business/personal transportation needs.

During the Great Recession many King Air owners saw their utilization go down. As an attempt to dilute their fixed costs, they entered into third party dry lease agreements. In dry leases you typically extend your liability coverage to the lessee, waive the carrier’s rights to subrogate, and have increased utilization (more takeoffs and landings equals more opportunities to fly through a flock of birds). Underwriters are going to start wanting additional premium dollars for this increased risk.

Utilizing contract pilots also opens you, and your insurance company, to a higher risk of claims. Employees are covered by workers’ compensation, but a contracted pilot is most likely not. Your policy may have “Guest Voluntary Settlements,” or GVS – the first line of defense the insurance carrier offers on your behalf. By going through a company in the business of outsourcing pilots or requiring your contract pilots to carry workers’ compensation and enter into a legitimate contract, you are a better risk in the eyes of an underwriter.

The hardening market will also likely bring additional charges from underwriters for items such as unfavorable signed contracts you may have in place. Keep that in mind before signing anything that may impact your insurance policy and coverage. Be

sure to send any signed contract to your insurance broker too; it is a condition in your policy.

Strategies and professionalism are going to be what sets you apart from the pack. Having a high-level risk management program in place, while being proactive to managing the perils you are asking the insurance company to take in return for premium dollars, is going to be the best discounts you can provide your operation. Additionally, if you can attend aviation industry events throughout the year, ask your broker if he/she will be there, and if so, if there are any underwriters you can meet with face to face. Relationships will become more important and beneficial as the market continues to harden. **KA**

Kyle P. White, an aviation insurance specialist for a global insurance brokerage company. He has professionally flown King Air 90s and B200s and holds an ATP and multi-engine instrument instructor license. You can reach Kyle at kpwhite816@gmail.com.

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Registration Now Open for King Air Gathering IV

Sept. 26-29, 2019

Hangar Hotel – Fredericksburg, Texas (T82)

by Kim Blonigen



Registration is now open for King Air Gathering IV held Sept. 26-29, 2019. The King Air Academy had a vision for the gathering as a way to bring King Air owners and pilots together with experts in the industry and leading King Air vendors to offer a personal experience with the King Air community. Being an attendee of the first three Gatherings, I must say that the knowledge gained and experience in meeting a variety of King Air owners, pilots and experts just keeps getting better!

Due to popular demand and the uniqueness of being able to be up close to all the King Airs parked on the ramp at the last King Air Gathering (KAG), the next event will again be held at the Hangar Hotel Conference Center located right on Gillespie County Airport (T82) at Fredericksburg, Texas.

If you choose to do so, hotel rooms will be available at the Hangar Hotel, which is uniquely designed as a World War II hangar and a 1940's theme of that time. The Hotel features airplane memorabilia, model airplanes and USO history, and is located adjacent to the airport. **New this year, KAG attendees flying in to T82 have first rights on rooms at the Hangar Hotel.** Other hotel options are also available and provided on the KAG website at kingairgathering.com.

Aerial view of the T82 ramp at King Air Gathering III.

A change in the agenda will feature the cocktail reception Thursday night, Sept. 26, for all in the King Air community attending can get to know each other before the seminars start Friday morning, Sept. 27. King Air experts will present on hot topics all day Friday and Saturday morning. Saturday afternoon will highlight one of the most requested



King Air experts discuss a variety of topics during the seminar portion of the Gathering, from pre-buy inspections and aircraft operations to maintenance and technical issues.



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King Air products and service providers showcase their offerings on actual King Air aircraft flown in for up-close viewing on the ramp (left), as well as inside the conference area with exhibits (right).

presenters at each Gathering, Dr. David Strahle, who will be offering an in-depth weather course.

At press time, a detailed agenda and keynote speakers had not been released.

Once again attendance numbers are limited to allow a more personal connection to the presenters and King Air vendors who will be highlighting their King Air products and services.

For more updated information and to register, go to kingairgathering.com. 



The KAG cocktail party allows King Air owners/pilots to get to know each other, as well as the King Air experts and vendors who are attending.



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Full Funding Request for CTP, Runway Incursions Investigation at CYYZ and New Customs Entry in Florida

by Kim Blonigen

Aviation Groups Ask for Full Funding for Contract Tower Program

In a recent letter to Rep. Nita Lowey (D-17-NY), chairwoman of the House Appropriations Committee, a number of aviation groups asked that the Committee fully fund the Contract Tower Program in the FY 2020 appropriations bill. The \$170 million requested will fund the 256 contract towers currently in the program (smaller airports in 46 states) and provide full-year funding for several new airports expected to be added to the program in FY 2020.

The group pointed out that the “FAA Contract Tower Program has provided cost-effective and essential air traffic safety services for over three decades,” and together the “256 towers handle approximately 28 percent of all air traffic control tower aircraft operations in the U.S. but only account for about 14 percent of the FAA’s overall budget allotted to the air traffic control tower operations,” saving the FAA and taxpayers “approximately \$200 million per year.” The letter further stated that “the safety and efficiency record of the FAA Contract Tower Program has been validated numerous times by the DOT Inspector General, as well as by FAA safety audits.”

The letter also stated, “The FAA controls and oversees the Contract Tower Program including operating procedures, staffing plans, certification and medical tests of controllers, security and facility evaluations. The contract towers operate together with the FAA-staffed

facilities throughout the country as part of the unified national air traffic control system.”

The letter was signed by U.S. Contract Tower Association Executive Director J. Spencer Dickerson, Aircraft Owners and Pilots Association President and CEO Mark Baker, National Air Transportation Association President Gary Dempsey, National Association of State Aviation Officials President and CEO Shelly Simi, Cargo Airline Association President Stephen Alterman, Regional Airline Association President Faye Malarkey Black, National Business Aviation Association President and CEO Ed Bolen, Airports Council International – NA President and CEO Kevin Burke and Air Traffic Control Association President and CEO Peter Dumont.

Also receiving a letter were Reps. David Price (D-4-NC), Mario Diaz-Balart (R-25-FL), Kay Granger (R-12-TX), and Sens. Richard Shelby (R-AL), chairman of the Senate Appropriations Committee, Patrick Leahy (D-VT), Susan Collins (R-ME) and Jack Reed (D-RI).

TSB Canada Investigates Runway Incursions at CYYZ

The Transportation Safety Board (TSB) of Canada submitted Investigation Report A17O0038 regarding runway incursions that occurred on the inner runway (06L/24R) at the Toronto/Lester B. Pearson International Airport (CYYZ). The investigation was conducted for the purpose of advancing transportation safety. There were 27 incursions that occurred between June 2012

and November 2017 and although they weren't the only ones that took place during that period, the high number raised concern. The study focused on determining the underlying causes and contributing factors of the incidents and to assess the degree of ongoing risk.

All of the incursions studied occurred on the inner runway after the flight crews involved had landed on the outer runway (06R/24L), had been instructed by air traffic control (ATC) to hold short of Runway 06L/24R and despite intending to stop, had missed the visual cues depicting the runway holding positions.

The report stated that "the taxiway layout between the runways has several characteristics that are uncommon compared to those at other airports, both within North America and internationally. The runways are spaced a relatively short distance apart, and the rapid exit taxiways (RETs) provide direct access to the adjacent runway without first progressing to another transitional surface."

Recommendations from the investigation are as follows: The airport make physical changes to the taxiway layout to address the risk of incursions and; until these changes can be made, make improvements to increase the conspicuity of the runway holding positions; the FAA and the Canadian DOT work with operators to amend

procedures so that post-landing checks are sequenced only after landing aircraft are clear of "both parallel runways"; and that Nav Canada amend its phraseology so that safety-critical transmissions "are sufficiently compelling to attract the flight crew's attention."

Customs Now Available at Witham Field in Florida

Arriving international flights to Florida's east coast now has another option for customs processing – Witham Field (SUA) at Stuart now has a new, stand-alone U.S. Customs facility, which is the first intermodal clearance facility of its kind in the state that will allow pilots, boaters and visitors to be processed.

Witham Field has become more popular for aviation recently due to presidential TFRs and is also the closest airport to Jupiter Island. Hours for the new customs facility at SUA will be 11 a.m. to 7 p.m. Thursday through Monday. Service fees will range from \$30 for single-engine piston aircraft to \$500 for heavy jets. After-hours services and international garbage disposal are available for additional fees. [KA](#)

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“Help! I can’t get my King Air’s autopilot to fly wings level.”

by Tom Clements

This 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

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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-more-common 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 with never 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.

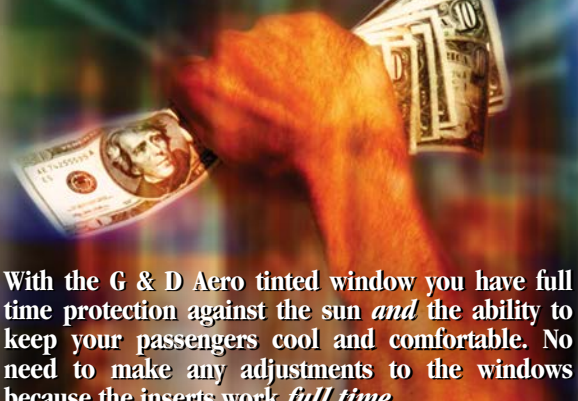
Imagine this scenario, which is a very good one for instructors to teach/demonstrate to their flying students. In level flight, tell the student to keep both feet on the floor, away from the rudder pedals. Now assign a heading – let's use an example of 270 degrees – and observe the student doing the 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 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.

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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 low-wing side.

Back to our training scenario: If we are now banking two degrees left-wing-down 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 right-rudder 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 you’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 wing-tip-to-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 Damp engaged – and, 90 percent 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! **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.” 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 book, contact Tom direct at twcaz@msn.com. Tom is actively mentoring the instructors at King Air Academy in Phoenix.

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

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Stearman — The Early Days

Part Two

In 1927, Stearman Aircraft, Inc. struggled to meet demand for its Sport Commercial Model C2 biplane, but operators carrying the mail by air were soon clamoring for the Model C2M.

by Edward H. Phillips



According to records held by the Federal Aviation Administration (FAA), Stearman Aircraft, Inc., designated the airplanes built in California using constructor (serial) numbers 101-104. These ships were not registered or certified during Lloyd's brief time in California, chiefly because no federal regulations had been developed to govern the design, construction and manufacture of commercial airplanes.

In addition, as part of the postwar Treaty of Versailles in 1919, nations were assigned a letter to designate civil aircraft registered and operating in that country. Although the letter "N" had been assigned to the United States, Congress did not ratify the treaty and America was not bound to comply with its applicable provisions. In 1927 when the United States Department of Commerce began regulating and registering commercial aircraft, the letter was adopted and remains in use.

In the wake of the Model C1's first flight, the C2 was under construction, followed by a second C2 and the new Model C2M. The C2M, however, was a landmark airplane because it heralded Lloyd Stearman's entry into the new and potentially lucrative airmail business that would help fuel his company's success into the early 1930s.

Front view of the Model C2 reveals the generous wing area of the upper span compared to the lower wing panels that feature minimum dihedral. The engine water heat exchanger was relocated below the fuselage. The wide track of the landing gear facilitated maneuvering on the ground despite the rigid tailskid. (Wichita State University Libraries and Archives, Department of Special Collections)

The following information provides the basic specifications for the Stearman Commercial Sport Model C2 and the C2M:

C2:

Wingspan: 35 feet (upper panels); 28 feet (lower panels)

Wing chord: 66 inches (upper panels); 54 inches (lower panels)

Wing area: 297 square feet

Airfoil: Stearman design

Height: 9 feet 2.5 inches

Length: 23 feet 2 inches

Weight: 2,450 pounds

Engine: Curtiss OX-5, 90 horsepower

Maximum speed: 90 mph

Price (approximate, standard aircraft): \$3,500

Fuel capacity (standard): 38 gallons

C2M:

Same as Model C2 except for:

Engine: Wright Aeronautical Corporation J4, nine-cylinder static, air-cooled radial, 200 horsepower.

Payload: 500 pounds

Fuel capacity: 68 gallons

Oil capacity: 8 gallons

Maximum ceiling: 18,000 feet

Maximum speed: 130 mph

Of the four airplanes built by Stearman Aircraft, Inc., during its brief operation in California, the third (constructor/serial number 103) was designated Model C2M. In February 1925, Representative Clyde Kelly from Pennsylvania was serving as the chairman of the House Post Office Committee. He introduced H.R. 7064 that became known as the Contract Airmail Act. The bill authorized the postmaster general to contract carriage of the

mail by commercial air operators, set rates and the amount of cash subsidies that would be paid to the carriers. In addition, H.R. 7064 would expand airmail service without placing more burden on the taxpayer. Its passage into law would have an enormous impact on development of the commercial aviation industry in America. One of the beneficiaries of that development would be Stearman Aircraft, Inc.

Harry S. New was the postmaster general in the administration of President Calvin Coolidge. New was enthusiastic about the prospects of airmail service and urged carriers to buy larger, faster airplanes that could haul more mail across longer distances. Initially, about 80 percent of the money derived from the sale of postage was paid to operators of C.A.M. routes. The amount of postage required to mail a letter or parcel varied by the weight and volume of mail and how many "air zones" it would cross before reaching its destination. Contract airmail operators, however, quickly realized that they would make more money if they carried small but heavy bulk mail and over a shorter distance. The postmaster soon saw what was happening, and in June 1926 the Kelly Act was amended to

Rear view of the Model C2 reveals the single fuel tank in the center section that held 38 gallons. Note long span of the ailerons and single-bay design – a feature that was standard on many light aircraft of the day. (Wichita State University Libraries and Archives, Department of Special Collections)



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It should be noted that the Kelly Act was not the first attempt to provide airmail service to the public. The United States Post Office had begun flying the mail in the mid-1920s, using obsolete aircraft left over from World War I. The brave pilots who flew Curtiss JN-4 and deHavilland DH-4 biplanes lacked any benefits to help them achieve their mission. Despite the total lack of navigational aids, dangers of weather, night flying, mechanical failures and fatigue, these pilots flew routes stretching from coast-to-coast with surprising success.

Lloyd Stearman and Mac Short anticipated that there would be demand for airplanes designed specifically for that mission, and the basic Model C2 airframe was used to develop the C2M. The C2 airframe was designed from the beginning to accept more powerful engines than the ubiquitous and aging Curtiss OX-5, and with the introduction of Wright Aeronautical Corporation's nine-cylinder, 200-horsepower J4 static, air-cooled radial powerplant in 1926, the C2M would have the horsepower necessary to haul up to 400-500 pounds of mail. Early in 1926, before relocating to California, Lloyd Stearman had gained experience engineering the Wright radial into the airframe of a modified Travel Air Model "A" to create the Model BW – the first Travel Air

to feature that powerplant as an option. By the end of 1928 the majority of Travel Air biplanes rolling off the assembly lines were powered by Wright engines.

The Wright J4 engine originally was developed at the request of the United States Navy. The admirals wanted to find an alternate powerplant to the inline piston engines that were cooled by water. The additional weight of the large coolant heat exchangers coupled with the required plumbing of tubing, hoses and connections, made the engines more expensive to maintain and operate, not to mention being prone to leaks and other malfunctions. The Navy was searching for an air-cooled engine to power its future fleet of fighters, torpedo and dive bombers.

The J4 was among the first modern military and commercial engines and helped transform the aviation in the mid-1920s. In the early 1920s the Wright Aeronautical Corporation hired engineer George Mead to redesign the original Lawrence radial into a lightweight, reliable engine. A minor disadvantage of the J4, however, was the mounting of two magnetos on the front of the crankcase where they were exposed to moisture, dirt and other contaminants on the ground and in flight.

Despite its general reliability and robust design, the J4's potential proved limited, and by 1927 it was



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Front view of the C2M. The rod/torque tube aileron control systems was retained and was later used on production aircraft built in Wichita, Kansas.

(Wichita State University Libraries and Archives, Department of Special Collections)

eclipsed by the advanced Wright J5 that quickly became the engine of choice for a large number of military and commercial airplanes (magnetos were mounted on the radial's accessory section at the rear of the powerplant, shielding both units from potential contamination). The famous Ryan monoplane *Spirit of St. Louis*, flown by Charles A. Lindbergh from New York to Paris in May 1927, was powered by a J5 rated at 220 horsepower. During Lindbergh's 33.5 hours flight over the deadly North Atlantic Ocean, it never missed a beat.

As for the C2M, the only salient changes incorporated into the new biplane's airframe were a metal cover for the front mail pit and reinforcement of the front windshield to withstand random impacts of mail being loaded into the mail pit. On April 6, 1926, Walter T. Varney, owner of Varney Air Lines, began operating Contract airmail (C.A.M.) Route 5 that stretched between Elko, Nevada, and Pasco, Washington, with one stop in Boise, Idaho. The Varney Air Lines fleet, based at Boise, consisted of six *New Swallow*

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biplanes powered by Wright J4 radial or Curtiss K6 inline engines.

The route would prove to be a formidable challenge considering the aircraft and technology of the day. One Post Official described C.A.M. 5 as “starting nowhere and engine ending nowhere, and over impossible country getting there.”

Walter Varney and Lloyd Stearman knew each other well. Varney was the first customer to order a custom-built airmail airplane from Lloyd – the C2M. Built to Varney’s specifications and completed in the summer of

1927, it would prove to be the right airplane at the right time both for Varney and Stearman. The handsome ship was assigned Varney Fleet Number 8 and quickly proved to be a major improvement in performance compared to the aging *New Swallows* that would eventually disappear entirely from the C.A.M. 5 route.

On July 19 Fred Hoyt departed Clover Field in the C2M. He landed at a field near San Francisco where Varney pilots put the biplane through its paces, then took off for Salt Lake City, Utah, where Mr. Varney officially accepted the ship. The C2M was quickly placed into service flying the mail along the treacherous air

trail, a distance of more than 400 statute miles between Elko, Pasco and Salt Lake City. A testimony to Varney’s success as an airmail operator appeared in the August 1927 issue of *Aero Digest* magazine – a popular publication that covered news, technical developments and regulatory issues. The article stated that during the first six months of 1927 Varney Air Lines averaged an efficiency rating of 84 along that route. Of 332 scheduled flights, 278 were completed, 26 were listed as “incomplete” and 28 were grounded by inclement weather both day and night. Reports showed, however, that Varney’s fleet had flown 147,340 statute miles while carrying 22,612 pounds of mail that earned the company \$67,838.

The fourth and final airplane built by the original Stearman Aircraft, Inc., was a Model C2C (constructor number 104). George Lyle, one of the original investors in Lloyd Stearman’s company, bought the fourth airplane and it remained in airworthy condition at least through 1934 when it was operated by the Quick Flying Service based at Chehalis, Washington.

Although almost identical to the C2, it featured a Hispano-Suiza upright V-type, eight-cylinder engine rated at 180 horsepower. The engine was well-built and reliable, having evolved from the same powerplant that powered the famous British S.E.-5 and French SPAD S.VII and XIII-series fighters during the Great War. The engine was built in the United States by the Wright-Martin company under



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license from Hispano-Suiza – a famous company long renowned for building exquisite automobiles both before and after the war. As with the Wright J4 radial engine, Stearman also had experience with the Hispano-Suiza during his years with the Travel Air Manufacturing Company. The engine was installed in a small number of biplanes designated Type 3000, but the company did not keep those engines in stock because of their high cost – it was the responsibility of the customer to provide the engine.

After only a year in California, Lloyd Stearman was doing well and as of August 1927, he had a three-month backlog of orders but was struggling to complete and deliver the ships to impatient customers. What Stearman needed was more capital to fuel his business. He required the money to expand the enterprise and sought local funding, including a group of businessmen in Venice, California, to help meet demand for his airplanes. Fortunately for Lloyd, his friends back in Wichita, Kansas, were well aware of his situation and made him an offer he could not refuse – they raised about \$60,000 and proposed that Stearman relocate to Wichita.

Lloyd had to make a decision: stay in California and hope that new investors would be found, or relocate men, equipment and materials 1,500 miles eastward and start from scratch all over again. He chose Kansas. Lloyd ceased operations and sent his “factory” and workforce to Wichita by rail. As for his customers, he offered them a choice: return money deposited for aircraft on order or wait until production resumed in Kansas. The majority of customers chose to wait but others reclaimed their deposits.



In the summer of 1927 Mac Short relocated to California and joined his longtime friend Lloyd Stearman in the design and manufacture of rugged biplanes. Short was a native Kansan and became a highly respected aeronautical engineer during his 10-year association with the Stearman Aircraft Company.

(Wichita State University Libraries and Archives, Department of Special Collections)

Lloyd had always liked the West Coast, and California in particular. After arriving in Wichita with his family on September 30, he told reporters, “I have always been impressed with Wichita, but I cannot say that I don’t like California, for I do and I have lots of friends out there.



Stearman and Mac Short designed the C2M to be a workhorse airplane for pioneer airmail operators such as Walter Varney and his Varney Air Lines. To increase fuel capacity, the wing center section was enlarged to accommodate four tanks. Note “Stearman Aircraft, Inc.” on the rudder and “Venice, California.”

(Wichita State University Libraries and Archives, Department of Special Collections)



Profile view of the C2M before delivery to Varney Air Lines in July 1927. Assigned Fleet Number 8, the Stearman biplane was quickly placed in service on the tortuous C.A.M. 5 route between Elko, Nevada, and Pasco, Washington. One drawback of early production Wright J4 radial was mounting of the two magnetos on the front of the engine, subjecting the units to moisture and contaminants. Control rods for the aileron system are visible forward of the windshield.

(Wichita State University Libraries and Archives, Department of Special Collections)

But I can say that Wichita is an almost ideal location and has better flying weather than California. There are no fogs or mountains here. I've always liked the town and the people in it, and it seems a great deal like coming back home to be here."

By the end of 1927, the old Stearman Aircraft, Inc., of California had been renamed the new Stearman Aircraft Company of Kansas, and at last, the future looked bright. The national economy was booming, flying fever was sweeping the country, and people had money to spend. It looked as though the excesses that defined the "Roarin' Twenties" would never end. **KA**

Ed Phillips, now retired and living in the South, has researched and written eight books on the unique and rich aviation history that belongs to Wichita, Kan. His writings have focused on the evolution of the airplanes, companies and people that have made Wichita the "Air Capital of the World" for more than 80 years.

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King Air Academy Adds Full-Motion G1000NXi Simulator

The King Air Academy (KAA) based at Phoenix, Arizona, (KDVT) recently added a full-motion Garmin G1000NXi simulator to their group of training tools. Focused exclusively on the King Air model of aircraft, KAA provides personalized training based on the pilot's experience and centered around today's flying environment including WAAS approaches through static and motion simulators and the aircraft.



For more information, email info@kingairacademy.com or call (602) 551-8100.

Apex Aviation Receives Certification from Mexican Government

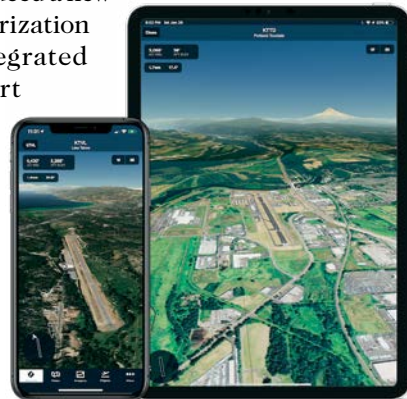
Apex Aviation of Henderson, Nevada, is now authorized to conduct repair and maintenance activities on aircraft registered in Mexico. The Mexican Direccion General de Aeronautica Civil (DGAC) issued Approved Maintenance Organization Validation Certificate Number CO-192/18 to the service center. This is the equivalent of a United States FAA Part 145 Repair Station certification, which the company also holds.

The company serves corporate aviation from King Airs through Gulfstreams, as well as the general aviation industry by providing aircraft maintenance, repair, modifications, ADS-B upgrades and avionics installations, repairs, and overhauls for turbine, piston, turboprop and rotor aircraft. They also provide professional interior and exterior detailing.

Apex Aviation has two locations in the Las Vegas area – a 40,000-plus square foot state-of-the-art facility at the Henderson Executive Airport (KHND), which also houses its corporate offices, and a North Las Vegas (KVG) location.

ForeFlight Introduces 3D View

ForeFlight recently introduced a new interactive airport familiarization tool for its Mobile Integrated Flight app. Called "Airport 3D View" the company says it simulates airport environments around the world by using the company's mapping and synthetic vision platform to combine high-resolution terrain with aerial imagery. 3D View lets users pan and zoom 360 degrees around the 3D airport model, along with providing a camera view that tilts from a three-degree approach path to a top-down view.



Airport 3D View also provides data on the camera's current position including altitude, distance from the camera pivot point at a runway end or airport center, and camera inclination in degrees. Runway buttons allow the camera to be repositioned to one nautical mile from the end of the runway along the published glideslope. 3D views for an airport can be downloaded for use in the air via ForeFlight's Pack feature.

Garmin Adds More Functionality to FtlLogic Service

Garmin recently added an FBO fuel price comparison feature and filters for developing flight department reports to subscribers of its FtlLogic scheduling program. The new features are available immediately on FtlLogic, which integrates with the free FtlPlan electronic flight planning and filing website.

According to the company, the new contract fuel pricing feature will help operators who are subscribed to FuelerLinx find the cheapest fuel by comparing FBO prices at their departure and destination airports.

The company also has increased the functionality of FtlLogic's reporting by adding filters that allow flight departments to pull together different reports on their pilots, aircraft and expenses.

Garmin acquired FtlPlan in August 2018.

KingAir Technically...

From Multi-Engine Turboprop Communiqué # ME-TP-0011:

Dated: February 2019

ATA 00 – Model 90, 200 and 300 Instructions for Continued Airworthiness

Textron Aviation has recently made a number of Instructions for Continued Airworthiness (ICA) documents available on the txtavsupport.com website. These ICAs are for factory installed supplemental type certificates (STCs) installed in recent production aircraft as well as several common kit installations which could have been installed after aircraft delivery.

Links to vendor sites have been provided for STC ICAs not owned by Textron Aviation. To access these ICAs, log in to txtavsupport.com, select the aircraft model on the left, then in the “Aircraft Publications” block, select “Instructions for Continued Airworthiness.”

ATA 56 – Electronic Window Shade – Description and Operation

**LJ-2129 and after; BY-207, BY-239, BY-250 and after;
BZ-1 and after; FL-954, FL- 1010, FL-1031 and after**

NOTE: The Electronic Window Shades are covered in the appropriate Maintenance Manuals Chapter 56 for System and Operation; the Wiring Diagram Manuals Chapter 44 and the Illustrated Parts Catalogues Chapter 25.

Introduction

The Fusion King Air Electronics Window Shades are programmed to default to dark on the ground in normal operation, in order to prevent sunlight from overheating the cabin. When powered, each window shade draws less than 50mA to be in a clear state. The purpose of the following paragraphs is to describe the timing, operation, and source of the power used to drive clear window shades.

On each cycle of the cabin door or entry switch, the cabin window shade system draws its power from the main ship battery for 10 minutes to power the windows to a “clear state” to provide light to safely enter or exit the cabin.

Each of these cycles will also cause the Emergency Egress Window Power Supplies (EEWPS) to go through a 45-minute cycle. Multiple instances of this without the whole aircraft being powered up long enough to recharge them could cause them to fail the 45-minute requirement. The EEWPS is a separate battery that only powers the emergency egress window shade.

Pre-Boarding Operation

On C90/B200 Fusion King Air opening the cabin door triggers the Main Switching Unit (MSU) to command all shades to a clear state for approximately 10 minutes.

On B300 [models] this initial Pre-Boarding timer is not activated by opening the door but rather by the Entry Switch Located on the LH side wall of the entry vestibule.

If the door is closed or the entry switch turned off prior to the Furnishings/Interiors Master switch being turned on will result in the MSU immediately switching off. In this instance the windows not on EEWPS would immediately return to a dark state. The windows on EEWPS will begin a 45 +/- two-minute cycle of a clear state before returning to a dark state.

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In-Flight Operation

When the Furnishing/Interiors Master switch has been placed in the on position the MSU will cause all windows to assume whichever state is commanded by the cabin shades master switch located in the cockpit. This will terminate the 10-minute pre-boarding timer if it was still in effect. If the Cabin Shades Master switch is set to "DARK" this will override the individual control panels and cause all cabin shades to assume a dark state.

If the Cabin Shades Master switch is set to "CLEAR" this will override the individual control panels and cause all cabin shades to assume a clear state.

If the Cabin Shades master switch is set to "PAX," then the individual control panels at each window location will become active and will initially default to full clear.

Window shades are designed to cycle from dark to clear or clear to dark in 10 seconds using a continuous press or five momentary presses at typical indoor temperatures. The factory acceptance test is performed in a hangar. It has been noted that at altitude, the extreme cold on the outside of the

window can cause window shades to take much longer to transition.

There is also a lightning bolt switch which will cause the shade to skip to either be clear or opaque at its current level of shade.

Post Flight / De-Boarding Operation

At the end of the flight when the aircraft is shut down and the Furnishing/Interiors Power Switch is turned off, the windows all go to a clear state for approximately five minutes. At the end of this time period if the cabin door hasn't been opened then the windows will return to dark. If the door has been opened, or the B300's entry light switch has been pressed, then the windows will begin a new timer to remain clear for 10 +/- one minute before returning to full dark.

Emergency Egress Window Operation

The windows located just forward of the door on the LH side or in the emergency escape hatch are equipped with independent emergency power supplies. When either the five-minute timer at system shutdown or the 10-minute timer door open/entry switch end or if the main control unit loses power on

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its battery bus connection then the emergency egress windows will switch to their independent power units and operate clear on a 45 +/-two-minute timer.

These independent power supplies are connected such that when the Furnishings/Interiors Master switch is on they charge from the ship power. They have a red charging LED on them to which extinguishes when the unit is at full charge. Brand-new and fully charged they have enough power for two 45-minute cycles.

Switch Locations C90 and B200

The Furnishing Master is located on the Co-Pilot Sub Panel. The Cabin Shades Master is located on the Overhead Lighting Panel.

B300

Both the Interior Master and Cabin Shades Master are located on the Overhead Lighting Panel.

ATA 56 – Electronic Window Shade Power Supply Capacity Test

LJ-2129 and after; BY-207, BY-239, BY-250 and after; BZ-1 and after; FL-954, FL- 1010, FL-1031 and after

The test for power supply capacity is performed after insuring the battery is fully charged. The recharge time for a fully discharged battery is approximately 2.5 hours. To recharge the battery where it can complete a 45-minute cycle would take approximately 45 minutes of charge time. Charging can be achieved by either placing the ship on a ground power source with the Main Ship Power and Furnishings/Interior Master switch on for more than 45 minutes or visually confirming the red charge LED located on the power supply is extinguished before starting. The test then when the aircraft is powered down the 45 +/- two-minute timer does not start until the non-emergency egress windows have gone dark.

If the emergency power supplies do not have enough power to complete the 45-minute timer then the shades may strobe as the timer tries to continue placing them in a clear state.

ATA 56 – Electronic Window Shade Switch Upgrades

C90GT, Serials LJ-2129 thru LJ-2132 which came with 130-384089-33 Switches.

To replace these switches with the new style 130-384089-35 Switches will require Kit 101-3305-



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The following King Air 90 models are now certified under European approval EASA #10039114 and Brazilian approval ANAC #9210-04:

Os seguintes modelos King Air 90 são agora certificados sob aprovação europeia EASA N°10039114 e aprovação brasileira ANAC N°9210-04:

- | | | | | |
|----------|-------|---------|---------|----------|
| • 65-90 | • B90 | • C90-1 | • C90B | • C90GTi |
| • 65-A90 | • C90 | • C90A | • C90GT | • C90GTx |

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0005. This kit includes seven new switches and the procedure and engineering information needed to modify the window shrouds to clear the back guard of the improved switch.

B200GT, Serials BY-207, BY-239, BY-250 thru BY-253 came with 130-384089-23 Switches. Serials BY- 255 thru BY 281 and BZ-1 have 130-387089-33 Switches.

The 130-384089-23 Switches can be replaced directly with 130-384089-33 Switches. Both the 130-384089-23 and 130-384089- 33 switches can be replaced with the new style 130-384089-35 switches using Kit 101-3305- 0003. Like the C90 kit, this B200 kit includes a full set of the new switches and the procedure and engineering information needed to modify the window shrouds.

B300, Serials FL-954, FL-1010, FL-1031 thru FL-1155 currently use the 130-384089-29 switches.

At Serial FL-1156 we began use of the 130-384089-39 switch assemblies. These are also the recommended spares replacements for the previous switches. They will require the use of new spacers and washers. These are in the IPC but the stack up per each stud of the switch will be a NAS1149D0632J Washer, a NAS43DD6-10FC Spacer, a MS15795-847 Washer and a MS21044N08 Nut. Kit 101-3305-0001 is no longer applicable for use on the B300.

ATA 25 – Operations with 9 Passenger Seats or more

B300 Series

The number of passenger seats allowed for a commuter category aircraft operated without a Second in Command pilot under Part 91 is defined by 91.531. Section (a)(3) states that the aircraft can be operated single pilot for aircraft with up to 9 passenger seats. In the Model 350 under Part 91 you cannot operate with one pilot and 10 passengers even though there are 2 crew seats and 9 cabin seats. If you choose to use the co-pilot seat as a passenger seat then you need to install Kit 130-5015-1 which makes one of the cabin seats unusable to a passenger and keeps the total passenger seats to 9 or less.

For operators outside the United States please check your local regulations as this may vary from country to country.

Part 91 91.531 Second in Command Requirements reads as follows as of February 2019.

§91.531 Second in command requirements.

- a. Except as provided in paragraph (b) of this section, no person may operate the following

airplanes without a pilot designated as second in command:

1. Any airplane that is type certificated for more than one required pilot.
 2. Any large airplane.
 3. Any commuter category airplane.
- b. A person may operate the following airplanes without a pilot designated as second in command:
1. Any airplane certificated for operation with one pilot.
 2. A large airplane or turbojet-powered multi-engine airplane that holds a special airworthiness certificate, if:
 - i. The airplane was originally designed with only one pilot station; or
 - ii. The airplane was originally designed with more than one pilot station, but single pilot operations were permitted by the airplane flight manual or were otherwise permitted by a branch of the United States Armed Forces or the armed forces of a foreign contracting State to the Convention on International Civil Aviation.
- c. No person may designate a pilot to serve as second in command, nor may any pilot serve as second in command, of an airplane required under this section to have two pilots unless that pilot meets the qualifications for second in command prescribed in §61.55 of this chapter.

[Docket FAA-2016-6142, Amdt. 91-351, 83 FR 30282, June 27, 2018]

ATA 25 - Center Aisle Cabin Floor Board Flexing

Technical Support has received reports that the center aisle cabin floor board at the aft side of the main spar, flexes and sometimes falls through. Investigation revealed that the channel that supports the floor board gives away under heavy weight. Textron Aviation has developed Standard Repair SR-KA-00075 to resolve this condition. The Standard Repair adds a reinforcement angle to add rigidity to the floor board support.

ATA 31 – Fusion Equipped B200GT King Air Phase 3 Production Update

Textron Aviation recently began deliveries of B200GT Pro Line Fusion Phase 3 aircraft. The serial effectively for factory production is BY-324 and after; BZ-3 and after. Phase 3 production aircraft will include the equipment changes and additional options shown [on this referenced Communiqué online].

There are changes to software, databases, electronic activation keys, and manuals with this release that should be noted. With the introduction of Phase 3, the Rockwell Collins Pilot's Operating Guide 523-0824675; Pro Line Fusion Aircraft Maintenance Manual 523-0824677; FMS Quick Ref Guide 523-0823290; Fusion Quick Ref Guide 523-0822518 and Fault Isolation Manual 523-0824683. The list for production phase 3 aircraft software is shown [on this referenced Communiqué online]. The field loadable software files are available on the txtavsupport.com website. The phase 3 AFD software is bundled into a load set as part number 434-310011-0009 file on the website.

An upgrade path for the serials prior to Phase 3 cut-in is in work.

ATA 34 – Universal Avionics Flight Management System Week Number Roll Over

Universal Avionics has issued service bulletin (SB) 34-3719 to address possible loss of approach capability affecting legacy Universal Avionics GPS external sensors, Flight Management Systems (FMS), Navigation Computer Unit (NCU) with internal GPS sensor and the GPS Landing System (GLS-1250) GPS receivers. Some of these systems covered by this SB were installed in production Pro Line 2 King Airs as well as through field installations.

For background, GPS Time as defined in the legacy GPS navigation message, uses 10 bits to count GPS Week Numbers. This representation can only cover a finite period of 1024 weeks (19.7- year epoch). GPS Time is presently in its second Epoch, which will end on April 6, 2019. The degradation of almanac data affecting RAIM predictions will begin at 02:00 UTC on Thursday 4 April 2019. During and after this week rollover event, Universal Avionics GPS product lines will be impacted differently, although GPS satellite tracking and navigation integrity will be unaffected.

To determine if the unit(s) installed in the aircraft are affected, inspect the nameplate on the FMS, NCU or GPS sensor and refer to the table to the right for the effects possible with each system.



Nameplate location for the following units:
UNS-1M, UNS-1C, UNS-1Csp, UNS-1C+,
UNS-1Csp+, UNS-1E and UNS-1Esp



Nameplate location for the following units:
UNS-1D, UNS-1K, UNS-1D+, UNS-1K+, UNS-1F and UNS-1L

If your unit could be affected, please contact a Universal Avionics repair station or their customer support group for possible solutions at repairs@uasc.com or customersupport@uasc.com. A full copy of the SB can be downloaded from <https://secure.uasc.com/uninet/Default.aspx> by registered users.

Model	Part Number	Mod Status	Effect on Approach	Notes
UNS-1M	1013-4X-XXX	All	Loss of Approach Capability	3
UNS-1C	1017-3X-XXX	Without Mod 14	Loss of Approach Capability	3
	1017-4X-XXX			
	1017-6X-XXX	All	No Effect	1, 2, 3
	1017-7X-XXX			
UNS-1C+	10172-3X-XXX	Without Mod 16	Loss of Approach Capability	3
	10172-4X-XXX			
	10172-6X-XXX	All	No Effect	1, 2, 3
	10172-7X-XXX			
UNS-1Csp	1019-3X-XXX	Without Mod 13	Loss of Approach Capability	3
	1019-4X-XXX			
	1019-6X-XXX	All	No Effect	1, 2, 3
	1019-7X-XXX			
UNS-1Csp+	10192-3X-XXX	Without Mod 15	Loss of Approach Capability	3
	10192-4X-XXX			
	10192-6X-XXX	All	No Effect	1, 2, 3
	10192-7X-XXX			

Model	Part Number	Mod Status	Effect on Approach	Notes
GPS-1000	1075-01	All	Loss of Approach Capability	3
GPS-1000A	1078-01	All	No Effect	1, 2, 3
GNSS-2400	1078-02	All	No Effect	1, 2, 3
GLS-1250	1086-01-00	All	No Effect	1, 2, 3
UNS-1K	1116-3X-XXXX	Without Mod 2	Loss of Approach Capability	3
	1116-4X-XXXX			
	1116-6X-XXXX	All	No Effect	1, 2, 3
	1116-7X-XXXX			
UNS-1K+	11162-3X-XXX	Without Mod 4	Loss of Approach Capability	3
	11162-4X-XXX			
	11162-6X-XXX	All	No Effect	1, 2, 3
	11162-7X-XXX			
UNS-1D	1192-00-XXX1XX	Without Mod 5	Loss of Approach Capability	3
	1192-30-XXX1XX			
	1192-00-XXX2XX	All	No Effect	1, 2, 3
	1192-30-XXX2XX			
UNS-1D+	11922-30-XXX1XX	Without Mod 7	Loss of Approach Capability	3
	11922-00-XXX1XX			
	11922-XX-XXX2XX	All	No Effect	1, 2, 3
	11922-30-XXX2XX			
UNS-1E	2017-3X-XXX	All	No Effect	1, 2, 3
	2017-4X-XXX			
UNS-1Esp	2019-3X-XXX	All	No Effect	1, 2, 3
	2019-4X-XXX			
	2019-7X-XXX			
UNS-1F	2192-30-XXX1XX	All	No Effect	1, 2, 3
	2192-00-XXX1XX			
UNS-1L	2116-3X-XXX	All	No Effect	1, 2, 3
	2116-4X-XXX			
	2116-7X-XXX			
	2116-6X-XXX			
UNS-1Ew	3017-XX-XXX	All	No Effect	2, 3
UNS-1Espw	3019-XX-XXX	All	No Effect	2, 3
UNS-1Fw	3192-XX-XXX1XX	All	No Effect	2, 3
UNS-1Lw	3116-XX-XXX	All	No Effect	2, 3
LP/LPV Monitor	3116-52-1110	All	No Effect	2, 3

1. UTC date issue will still exist; Service Letter No. 2889 remains in effect, and will require continued operator vigilance for correct date entry.
2. The GPS week rollover will have no adverse effect.
3. GPS satellite tracking and navigation integrity will be unaffected.

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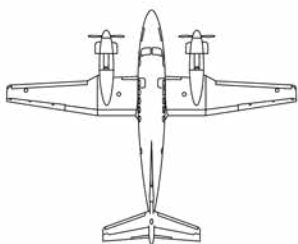
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