

King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

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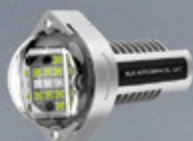
Rave Review

Garmin's Autoland and Autothrottle Systems
Impress King Air Expert Tom Clements



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FIRST IMP

“My hat is off to the Garmin engineers and test pilots: They seem to have hit a homerun in the design and functionality of this never-before-seen option.”

PRESSION: WOW!

Flying with Garmin's Autothrottle and Autoland Systems

by Tom Clements

Surprised, pleased and honored were the feelings I had when I received a phone call from Garmin's Senior Business and Commercial Aviation Sales Manager Scott Frye, inviting me to come to their headquarters in Olathe, Kansas. I'd meet with and get briefed about their new Autothrottle and Autoland systems by some of their flight test engineers and a flight test pilot, as well as fly their B200 demonstrator/test King Air. Oh yeah! Sign me up!

EAA's AirVenture at Oshkosh was where the newest additions to the G1000 NXi were first shown to the public. But since I did not attend the Oshkosh fly-in this year, I went to Olathe instead and spent most of the day there on Friday, Aug. 25. That morning I was at their flight facility at New Century AirCenter (KIXD) where we had the preflight briefing and from which the flight demonstration took place. After lunch, I was treated to a tour of their office building and production/distribution center before catching an evening flight back to Phoenix.

As you may recall, I flew a demonstration flight a couple of years ago experiencing the operation of the IS&S ThrustSense autothrottle system that Textron has made standard

equipment on the King Air models currently being produced: the 260 and 360. That system worked very well and was my first ever exposure to power levers that moved themselves! Although I had a slight concern about my right arm and hand atrophying from lack of use, I was impressed with the features it provided and came to understand what a pilot workload reduction it provided.

With FAA approval of the Garmin system, now there are two choices when it comes to autothrottles.

There is one big caveat concerning the Garmin system: The airplane must be fitted with the latest version of the G1000 NXi avionics package, since the autothrottle (AT) and Autoland (AL) features are optional add-ons to that fantastic system.

As of now, the Supplemental Type Certificate (STC) applies only to King Air aircraft of the 200-series that already have or will purchase the G1000 NXi system, have -42, -52 or -61 PT6 engines, 4-blade propellers, and have the electro-hydraulic landing gear system. Eventually, the system will also be approved for the model 300-series (including the B300, better known as the 350), as well as other 200s with 3- and 5-blade propellers and electro-mechanical landing gear.

Since a lot of King Airs are flown with only one pilot, incapacitation of that person can have deadly consequences. Autoland totally changes that! It is absolutely mind-blowing to read or hear about how the system works and all the actions it takes, but even more amazing to watch it happen! My hat is off to the Garmin engineers and test pilots: They seem to have hit a homerun in the design and functionality of this never-before-seen option. Of course, the *need* to use this system should be and will be almost nonexistent. But when the pilot becomes too disabled to function, Autoland can turn a deadly tragedy into a non-event.

AUTOLAND ACTIVATION SEQUENCE

- Anti-ice vanes deploy within a few seconds of Autoland activation
- De-ice boots run repeatedly on a 3-minute timer if OAT is $> -40^{\circ}$
- Approach flaps: airspeed < 190 KIAS and within 10 miles of airport and less than 3,000 feet AGL
- Landing gear: < 160 KIAS and sequenced inside FAF; landing and taxi lights turned on
- Landing flaps: < 140 KIAS and sequenced inside FAF
- Automatic moderate braking applied after aircraft touchdown (no anti-skid or reverse)
- Uses nosewheel steering and differential braking to track center line
- Engine automatically shuts down when aircraft slows to less than 5 knots

Note: Autoland does not activate prop heat or auto ignition

A Closer Look

The very first Garmin Autoland systems were installed in some SETPs (Single-Engine Turboprops) starting near 2020. In fact, Garmin was awarded the 2020 Collier Trophy for this new marvel. I wonder if there have yet been any actual cases in which Autoland saved the day for some SETP passengers. Anyone know of such incidents?

It is easy to tell if the Autoland option is installed in the King Air by noticing a red, push-button “Autoland” switch on the pedestal that is covered by a hinged clear guard to prevent accidental activation. But what if the switch is not pushed? Perhaps the pilot fades out without the passengers knowing. Maybe the cockpit door is closed and the autopilot is tracking the route perfectly toward the destination. Now what?

A couple of other things will cause the Autoland sequence to begin even though the button has not been pushed. If no Garmin button has been moved within the last 20 minutes, an advisory message appears on the MFD. If that is ignored for another minute, the message changes to an amber color accompanied by an aural chime. If 30 more seconds elapse with no action, the message becomes red, another chime is triggered and the Autoland sequence begins.

The autopilot has an Emergency Descent Mode (EDM). When flying above 20,000 feet and a pressurization loss occurs and triggers the ALT WARN annunciator (cabin above 12,500 feet), the autopilot will turn 90 degrees to the left, reduce power and descend to 15,000 feet. Upon leveling at 15,000 – above all the continental U.S. mountains – if no action is taken by the crew within one minute, then the Autoland sequence begins.

So what exactly is the Autoland sequence? Lots of things, but here are some highlights. The MFD clearly displays comments and videos for the passengers to see, telling them



A red, push-button “Autoland” switch is located on the pedestal and covered by a hinged clear guard to prevent accidental activation. There are a few items that will instigate the system to start its sequence even though the button hasn’t been pushed, which pertain to non-action by the pilot for a specific amount of time.



HALO 350

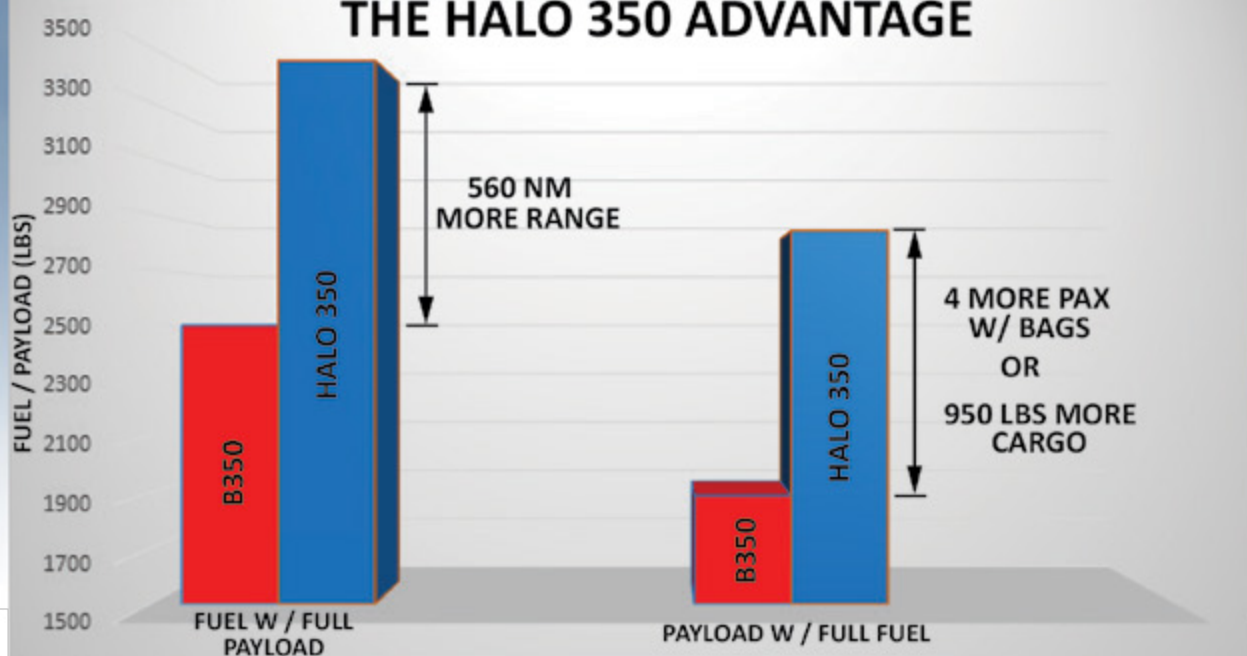
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HALO 350 Information Chart

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

Weight and payload shown in pounds.

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



In order to install the autothrottle and/or Autoland features, the aircraft must have the latest version of the G1000 NXi avionics package.

“I sat in amazement as the right wing dropped and the left rudder moved forward to give us a very nice touchdown.”

what is happening and what they should do ... if anything; 7700 is squawked by the transponder and automatic messages are transmitted to ATC advising what is occurring. The system checks for suitable airports with longer runways, checks fuel remaining and terrain, plans a flight to the airport's final approach fix, reduces power appropriately and makes a safe descent, activates Engine Anti-Ice, lowers approach flaps, landing gear and full flaps when appropriate, turns on landing and taxi lights, follows basically an LPV approach to the runway, flares and pulls power to idle at 45 feet above the runway, uses rudder and ailerons to compensate for any crosswind, steers on the centerline

and applies brakes until stopped (no use of Beta or Reverse). Finally, it shuts off fuel to both engines after coming to a stop.

Did you notice one thing the AL system does *not* do? It does not adjust the cabin altitude setting on the pressurization controller. If the pilot has used my suggested technique of setting the controller for landing when still in cruise, this will be insignificant if the emergency airport is close to the elevation of the destination airport. On the other hand, if the controller is set for sea level yet AL selects an airport high in the mountains, then expect a sudden cabin climb when the strut compresses on touchdown. Vice versa, if the controller had not been



“On takeoff, the power levers are operated by the autothrottle servos after torque has reached 1,000 ft-lbs ... I like this a lot.”



Notice the added “AT” button that comes with the Autothrottle installation.

set for landing, then the airplane will be unpressurized if/when the airplane descends below the selected cabin altitude. Dangerous? Not at all. But not as comfortable as if the pilot were still functioning.

The demonstrator/test B200 (N288KM, BB-1508) had a modified version of the Autoland system that did not squawk 7700 and did not talk to ATC. Aaron Newman, Garmin’s fine test pilot who was keeping me safe and legal from his right seat location, communicated with his home-base tower operator to coordinate our activities. At this time there was about a 12-knot direct crosswind from the right. I sat in amazement as the right wing dropped and the left rudder moved forward to

give us a very nice touchdown. Then the brakes slowed us smoothly to a complete stop. (The shutdown of the engines had also been disabled for the demonstrator airplane.) I will gladly admit that I could not resist moving one control myself: I had to put the landing gear handle in the down position to agree with the three green lights I saw!

The Autothrottle

Although the Autoland system impressed me the most, there is so much else in this complete system that works so impressively well. The autothrottle is very easy to use. A button on the control panel in the center of the instrument panel below the glareshield, labeled “AT,” turns

the system on or off with successive hits. It may also be disconnected by depressing either button that sits on the forward bottom portion of the slightly longer and pointed power lever knobs.

On takeoff, the power levers are operated by the autothrottle servos after torque has reached 1,000 ft-lbs ... about 50% power. I like this a lot. Why? Because two PT6s very rarely accelerate from Low Idle speed at identical rates. If the power levers are kept side-by-side initially as they are advanced for takeoff, almost always some noticeable differential thrust will be experienced. Thus, my attention is on the propeller speed gauges when I first start advancing the levers for takeoff. If one prop shows

I like this particular autothrottle feature very much: The ability for conservative pilots to set lower climb and cruise ITT limits ...”

1,300 RPM, say, while the other is at 1,150, then I will slow down or stop moving the faster side's lever and keep advancing the slow side until they match. By the time 1,500 RPM is reached, the engines now tend to accelerate much faster and stay more synchronized. My attention stays on the prop tachometers to verify that both stop their increasing at 2,000 RPM, the takeoff setting for the 200-series. Only now does my attention shift to the Torque and

ITT gauges. And guess what? It's right about now that AT takes over the power levers. Perfect!

What about the chance of Power Lever Migration (PLM)? As most readers know, power levers are spring-loaded toward idle, and the proper setting of the friction knobs are critical to prevent that from happening when the pilot's hand leaves the levers to reach for the landing gear handle. The servos that move the power levers are mounted

within the cockpit pedestal. Setting friction too tight can prevent smooth AT operation and too loose can lead to PLM. As part of a cockpit preflight, it's good to shove the power levers forward and make certain they don't creep back. If they do, tighten the friction just enough so they don't.

The autothrottle system abides by the AFM (Aircraft Flight Manual) limits – 2,230 ft-lbs or the ITT limit that varies depending on the dash number PT6 engine you have – until 400 feet AGL. Then it abides by climb limits: maximum torque until the climb ITT limit is reached. In cruise, the system knows both the maximum and normal cruise setting per the AFM and sets that torque. The props must still be controlled manually by the pilot. Golly, maybe that right arm won't shrivel up from lack of use after all!

I like this particular autothrottle feature very much: The ability for conservative pilots to set lower climb



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Advisory messages show up on the MFD instructing the passengers of what's going on and what to do.



and cruise ITT limits if desired by easily entering them on the proper MFD display screen.

Keep in mind that none of this is possible without the G1000 NXi system. Similar to ESP – Electronic Stability and Protection – that is an extra-cost option for the G1000 NXi installation, both Autothrottle and Autoland are optional, extra-cost additions. My gut feeling is that very few if any future King Air G1000 NXi installations will not include these options.

ESP is very worthwhile and cool in and of itself. If a pilot exceeds 45-degrees of bank angle while hand-flying, the aileron servo will automatically start nudging the control wheel in the proper direction to reduce the bank angle. In a short time, if the pilot has not gotten the hint and leveled the wings some, then the autopilot will be automatically engage in Level mode. That should get his/her attention! In a one-engine-inoperative (OEI) situation, a bank of more than 10 degrees into the “dead” engine will also eventually trigger Level mode.

ESP also allows for coupled go-arounds. When the GA button on the left power lever is hit, the autopilot remains engaged and follows the flight director as the power levers automatically advance to takeoff power limits. Prop levers, flap handle and gear handle are still manually operated by the pilot as desired. Hitting the NAV button will cause the missed approach track to be followed.

Overspeed and underspeed protection exists. With the ability to control both pitch and power you'd have to really work hard to go faster than V_{ne} or slower than V_s . It can be disabled for stall training sessions. There's V_{mca} protection also.

Want to guess how many pages are in the Aircraft Flight Manual Supplement (AFMS) that covers the G1000 NXi installation and all of its great options? A mere 210 pages! Pilots, it's time to budget the necessary time to study and know what you are now operating. It's not your grandpa's King Air anymore.

Pricing? In addition to the installation of the G1000NXi system, the additional cost for autothrottles is about \$45,000 and for Autoland is \$33,000. This does not include the avionics shop labor. Very ballpark estimates of shop hours are 80 for AT and 200 for AL.

As an old-timer raised on round-dial “steam gauges,” I am not an expert in operating and fully understanding the “glass panels” that are now so commonplace. I can fumble through, but it ain't pretty. Considering that young, new pilots very likely received a lot of their training in a Garmin G1000-equipped 172, their step up to a King Air with a Garmin panel will be easy!

If it's not obvious by now, I like what Garmin is bringing to the King Air table ... I like it a lot! I wonder how long it will be before a human pilot will become an extra-cost option? **KA**

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 twc@msn.com. Tom is actively mentoring the instructors at King Air Academy in Phoenix.

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Aircraft Purchase Agreements: Devils Lurk in the Details

by Scott Williams, Esq.

In a perfect world, the seller or buyer of a used aircraft would hire an experienced aviation attorney to draft a purchase agreement. The other side then negotiates modest revisions and everyone signs. That perfect world rarely exists. I'm frequently asked by fellow owners to review purchase or sales contracts drafted by others, and I'm still amazed by some of the dangerous language I find. Equally important is what is often missing in a purchase agreement to protect the parties from a financially painful experience.

Sellers: Limit Your Liability

Sellers have two simple objectives when selling an airplane: 1) Get the money, and 2) Never hear from the buyer again. Or dare I include subsequent buyer(s)? To help avoid any lingering liability, every seller should have this essential (or very similar) language in every sales contract:

"Except as provided otherwise in this agreement, this Aircraft is sold 'as is.' There are no warranties, either express or implied, with respect to merchantability or fitness for a particular purpose applicable to the Aircraft or any installed equipment."

Further, to ensure there are no inferences that the seller was supposed to explain any part of the aircraft or its systems to the buyer, also add:

Buyer (or its designated professional pilot) has the skills, training and experience necessary to safely operate the Aircraft. Seller is not providing any transitional training for the Aircraft of any kind."

Even though the basic rule of caveat emptor (let the buyer beware) usually prevails, it's better to be safe than sorry. As a seller's attorney, I still recommend disclosing any known defects and answering truthfully any questions about the aircraft's known damage history. Having said that, there is one buyer's question that no seller should ever attempt to answer: "Is this aircraft airworthy?" The answer to this question is for the seller to tell the buyer: "Ask your mechanic when he does the pre-buy exam." The last thing any seller should represent (either orally or in writing) is that their aircraft is "airworthy," as this has a distinct legal meaning that could create a legal representation that will come back to haunt a seller. Millions of dollars in litigation have been spent on buy-sells gone wrong over what the term "airworthy" means.

With regard to a pre-buy inspection, a seller's biggest fear is: What might the buyer's mechanic find? More

importantly, if the buyer doesn't like the results and walks from the sale, what happens next? When a mechanic starts tearing apart an airplane for the pre-buy, it legally grounds the airplane until it is returned to service by a mechanic's signature. What if the mechanic discovers an airworthiness issue and won't sign it off for a return flight home? For the seller's protection, there should be a restoration clause, something to the effect of:

"If buyer elects not to proceed with the sale for any reason, buyer is responsible for restoring the aircraft to its pre-inspection condition at the KXXX (Seller's) airport" within XX days of the commencement of the examination."

Without this clause, the seller may have to hire his own mechanic at some unknown airport just to get the bird home.

Other critical language that every seller needs is an integration clause, something to the effect of:

"This Agreement constitutes the entire understanding among the parties hereto with respect to the subject

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matter hereof and supersedes any prior agreements or understandings, written or oral, with respect thereto. No statements, promises, or inducements made by any party (or their agents) to this Agreement, which are not contained in this written contract shall be valid or binding."

Granted, this clause won't completely protect a seller from a claim of fraudulent concealment, but at the very least, it gives cover to a buyer's claim that: "But the seller promised me the plane was ..."

Buyers: Keep the Seller Honest

When purchasing a used aircraft, buyers should seek certain reasonable representations from the seller to ensure some semblance of transparency in the transaction. For this reason, I prefer a couple of key clauses when representing buyers:

"Seller represents that all airframe, engine, and propeller logbooks are true and correct to the best of Seller's knowledge"; and "No material maintenance or repairs have been performed on the aircraft during Seller's ownership which have not been entered into the aircraft logbooks."

As for the pre-buy inspection, a buyer should never be required to use the seller's mechanic and should not use any mechanic who has worked on the aircraft before. Such a mechanic would have an inherent conflict of interest to inspect his own prior work and, not surprisingly, will be reluctant to report his own mistakes. Buyers should be free to use any mechanic of their choice for the pre-buy, including one a reasonable distance from the aircraft's home base.

Deposits and Liquidated Damages

Every purchase agreement should contain a provision for the buyer to place a good faith deposit (usually 5%) as security before moving the aircraft for a pre-buy inspection. The deposit starts out as fully refundable and then becomes non-refundable after the buyer accepts the aircraft following the pre-buy. For reasons I cannot comprehend, I still see some buyers paying a deposit directly to a seller or broker. Never! All aircraft transactions should use a reputable aviation escrow company to handle all funds, including FAA sale documents and a thorough title and records search.

Sometimes, even after an aircraft is "accepted," the buyer fails to proceed with closing. This is no time for a Seller to start calculating what their actual damages might be. Instead, the buyer's deposit should constitute liquidated damages:

"Once Buyer has accepted the Aircraft following the Examination, and if for any reason other than a material breach by Seller, the Buyer fails to purchase the Aircraft as specified in this Agreement, Seller shall retain Buyer's Deposit as liquidated damages, and not as a penalty."

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What happens if there is a dispute?

Unlike used vehicle transactions in which the buyer and seller are usually close to each other, many aircraft buy-sells are hundreds (or thousands) of miles apart. If one party has a dispute, where shall it be heard? The general rule is that a lawsuit must be filed in the defendant's home court, which might be cost-prohibitive for the other party. To streamline things and provide a level playing field, an arbitration clause with this basic language is helpful:

"All disputes concerning this Agreement and the sale of the aircraft shall be decided by arbitration, in accordance with the commercial arbitration rules of any alternative dispute resolution service agreed upon by the parties. All parties shall initially advance an equal share of the costs of arbitration (excluding each party's own attorneys' fees), with the arbitrator awarding all costs (including attorney fees) to the prevailing party. The decision of the arbitrator shall be rendered within thirty (30) days after the submission of all evidence from all parties to the arbitrator for decision and shall be binding upon the parties. If necessary, a judgment upon the decision rendered by the arbitrator may be entered in any court chosen by the prevailing party."

All mediations or arbitrations shall take place via videoconference without any physical appearance by the parties. Nothing in this section shall prohibit any party from seeking injunctive relief from any court to preserve the status quo pending arbitration."

While arbitrations are not free, the ability to appear via video or telephonically takes away the distance barrier if the initiating party is far away. Also, without an express provision for attorney fees to the prevailing party, each side must pay their own legal fees win or lose. This causes many legitimate claims to become worthless when the cost of bringing an action exceeds the potential recovery.

Brokers: No two are the same

There are a handful of reputable brokers who specialize in King Air aircraft and using them provides a higher level of professionalism to the entire transaction. However, there are still many lesser-known brokers who insist that everyone uses that broker's own forms, which often contain very dangerous language:

"In the event of any dispute, both the buyer and seller shall indemnify the broker from any claims made by any other party."

The advertisement features a large, high-quality image of a King Air aircraft in flight, viewed from a low angle, against a backdrop of a sunset or sunrise over a mountainous landscape. The aircraft's wings are the primary focus, with circular motion lines around the de-ice boots. In the top left corner, the 'ice shield' logo is displayed in a stylized blue and black font. The main headline, 'Break through with Ice Shield® Wing De-Ice Boots', is written in a large, bold, white sans-serif font with a slight drop shadow. Below this, a call to action in a smaller white font reads: 'High Quality, Reliable Wing De-Ice Boot. Contact an authorized Distributor today for purchase!'. At the bottom, the contact information 'IceShield.com • 800-767-6899 • info@iceshield.com' is presented in a white sans-serif font.

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“There are a handful of reputable brokers who specialize in King Air aircraft and using them provides a higher level of professionalism to the entire transaction.”

Seriously? What if the broker was the one who caused the problem? While I respect any business that seeks to limit its exposure to liability, these clauses should never be agreed to. If the broker won't take it out, find another one.

LLCs and the Disappearing Act

It is common for aircraft owners to hold title in a Limited Liability Company, especially for liability protection, when someone else is operating the aircraft.

However, when the aircraft is sold, most single-purpose LLCs are dissolved as they no longer hold any assets. Likewise, many Buyer LLCs are newly formed with no assets of any kind. So, a purchase agreement between these entities could very well leave one side with no real remedy in the event of a dispute. For this reason, it is strongly recommended that all purchase agreements be personally guaranteed by the entities' principals with language such as:

“Notwithstanding the status of any Buyer or Seller as a legal entity or trust, the signatures below are binding on the named parties as well as in the signatories in their individual capacities. These guarantees are limited to the parties to this Agreement; nothing herein shall be construed as an expansion of liabilities to any third parties.”

Buying and selling a used aircraft is never simple, and buyers and sellers alike should watch for certain legal landmines in their contracts. **KA**

Scott Williams, Esq. is the principal attorney of The General Aviation Law Firm, P.C. His firm represents buyers and sellers in aircraft transactions, aircraft owners in disputes with their insurance carriers and pilots in FAA enforcement matters.



Pilots N Paws®
is an online meeting place for pilots and other volunteers who help to transport rescue animals by air. The mission of the site is to provide a user-friendly communication venue between those that rescue, shelter, and foster animals; and pilots and plane owners willing to assist with the transportation of these animals.

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-Henry Maier, President and CEO, FedEx Ground

Maintenance Records and Logbook Research

by Dean Benedict



I spend a lot of time researching logbooks on behalf of buyers considering King Airs for purchase. They need to know where the aircraft is maintenance-wise. Some of these King Airs are “younger” but many have 10,000 hours or more. The longevity of the Beechcraft King Air makes me proud, but 10,000 hours makes for a lot of maintenance records and researching them can be challenging at times.

Recently I’ve encountered some really frustrating situations that could have been avoided if the log entries were clear, concise and complete. All log entries are not created equal as you will soon see.

Over the course of my career I’ve slogged through a lot of logbooks. Early on I formed some strong opinions on what

makes a good log entry. Is this a topic of interest to the average King Air owner? Maybe not, but bear with me.

Critical to Aircraft Value

Accurate logbooks are crucial to the value of any aircraft. When an aircraft changes hands, the logbooks come under intense scrutiny. If maintenance records are in disarray, maintenance items that have been complied with may not be found. These items will have to be re-done at the seller's expense.

Missing logbooks are a serious problem. They wreak havoc on the value of an aircraft because damage history in the time span covered by the missing book(s) cannot be ruled out. If a missing logbook doesn't kill the sale, it will certainly reduce the price.

If you haven't done so already, have your logbooks scanned to a computer file. It's good (and cheap) insurance. These days, digitized logbooks are practically a requirement for sellers.

What about your log books? When it's your time to sell, how will they hold up?

Too Vague

Here's a real example from a very poor log entry:


"Complied with all lube items currently due."

This blew my mind! King Airs have lube item requirements due every 12 months plus a host of others due at 200-, 400-, 600-, 800- and 1200-hour intervals. Each is a special inspection unto itself. Some contain service items (replace a gasket, service a filter) in addition to specific lubrication tasks. There is no overlap or duplication. They're all different and must be listed independently in the log entry.

Too Much Information

Here's another real example:

"Pilot reported aircraft's RH engine would not ignite. Troubleshooting carried out, igniter box Unison p/n 10-381550-1 s/n xxx found with very weak spark. New exciter Unison p/n 10-381550-4 s/n xxx (A.P.I. SO-xxx-xxx) installed. Aircraft ground run and operation of ignition system checked OK."




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The discrepancy and its disposition have no place in a logbook; this information belongs on the work order. The vendor's Sales Order number is also unnecessary. If a warranty issue cropped up down the road, the shop would research the work order kept on file and take it from there.

All that's needed is "Installed igniter box in new condition, R/H position, p/n 10-381550-4 s/n xxx; removed p/n 10-381550-1, s/n xxx" and nothing more. Keep clutter out of the logs.

I put detailed squawk and disposition write-ups in my client invoices. I want the customer to see what it took to sort out and resolve their squawk. It's important to the customer but it has no place in the log entry.

Hobbs Is Not Enough

I see way too many airframe log entries with nothing but the Hobbs reading at the top. This doesn't cut it. Hobbs meters fail and when replaced,

they start over at 0.0 hours. The only acceptable proof of compliance with any hour-based requirement is by linking it to Aircraft Total Time (ACTT).

Recently, on another job, I struggled to find compliance for the lube items, the instrument air filter replacement (800-hours) and the power lever pin inspection (1,200 hours). I was faced with a long string of Hobbs-only entries in the airframe records. Was this the original Hobbs meter? I had no way of knowing.

I rummaged through the records, looking for an entry that had Hobbs *and* ACTT. Finally, after going back quite a few years, I found an entry with both numbers. Eureka! I moved forward from there and calculated the ACTT for each entry based on elapsed Hobbs. In the end, I found proof of compliance for all those hour-based items.

That seller lucked out. In a pre-buy situation, if the compliance for those items could not be found, the

items would have to be done and the seller would have to pay for it. (In case you're wondering, it was not the original Hobbs!)

Engine Logs Need Airframe Time

All too often I find engine log entries with engine times and cycles, but no ACTT. This is my biggest complaint in log entries. Even the FARs, which give precious few specifics for log entry content, require that every log entry contains the Aircraft Total Time (Ref. FAR 43.11).

If you've only owned airplanes with original engines – which means the Engine Total Time and ACTT are the same number – consider yourself lucky. Engines come off one airplane and go onto another all the time. I just did a maintenance assessment on a King Air with 17,000 hours. The accumulated logbooks could fill a full-size pickup! I was surprised that it was only on its third set of engines.

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LOG ENTRY—L/H ENGINE—DATE: 0-0-2020

A/C Model: King Air E90	Eng Make: Pratt+Whitney
A/C Reg: N000XX	Eng Model: PT6A-28
A/C S/N: LW-XX	Eng S/N: PCE-00000
ACTT: 11,263.7	Eng TTSN: 6235.8
Hobbs: 1263.4	Eng TSO: 2099.8
A/C Cyc: 11,281	Eng TSHSI: 00.0
	Eng Cyc: 6,450

Eng CSO: 2269

1. C/W Phase Inspections I, II, III and IV per Beechcraft M.M.
2. C/W 1000-hr oil filter replace.
3. Installed new igniters, inbd and outbd positions.
4. C/W Hot Section Inspection; components repaired and reinstalled by Dallas Airmotive (RPR 0X0X0).
5. Installed O/H bus bar p/n 3027628, s/n=HR11xxx.
6. Installed O/H temp harness p/n 3117923-01, s/n=NR18xxx.
7. C/W compressor turbine wash.

I certify this engine has been inspected IAW Phase Inspections I, II, III and IV per Beechcraft M.M. and was found to be in airworthy condition with respect to the work performed.

MR. MECHANIC, A&P/AI 00000000

Figure 1: An Engine Log entry example containing the airframe information that should be included.

Great care and detail is taken with the log entries at installation and removal. All the airframe information (registration, serial number, in addition to ACTT) is found on engine entries at installation.

The problem comes after installation. Somebody completes an engine log entry and only includes Engine TSO (Time Since Overhaul) and then everyone afterward does the same. I've seen this go on for 15 years in the logbooks. Then I come along, trying to calculate the time left on the starter generator, for example, and I'm stymied.

Engine Book or Airframe Book?

Starter generators are considered an airframe item even though they are attached to the engine. Their 1,000-hour overhaul *belongs in the airframe book*, but many mechanics and shops don't understand this. They assume if it's attached to the engine, then it belongs in the engine book. This is an area of great confusion.

In truth, only the items that came with the engine in the crate

are included in engine log entries. All other engine accessories are airframe items. But I don't think this confusion will clear up any time soon, so I've learned to bop back and forth between the engine and airframe books to get the information I need.

In my example of finding the time remaining on a starter generator, there was no trace of it in the airframe book, but I found an entry for the starter generator in the engine book with Engine TSO only. This was no help as the engine wasn't original to the airframe. I had to go back in time to the log entry when that engine was installed on that airframe to calculate the hours on the starter generator. If the engine logs referenced the ACTT, I would have had a much easier time.

I heard a horror story about a Hot Section Inspection performed 800 hours earlier than necessary because of a simple mistake in the logbooks. The engines were mismatched. This was the "younger" of the two, but somewhere along the line a figure got transposed. Again, the engine logs only showed TSO with no reference to Airframe Total

Time – an expensive omission. A cross reference to ACTT could have brought the problem to light before the engine was removed and torn apart for no reason.

The ACTT belongs on every log entry, whether airframe, engine or propeller. That should be your main takeaway from this. Figure 1 (left) is an example of an engine log entry showing the full array of airframe data that should be included.

Format

In addition to keeping my log entries concise, I always composed them in a numbered list format. The most important maintenance items like Airworthiness Directives (AD)s, major inspections and required items come first; bulbs, O-rings and less consequential issues come last. It makes it so much easier to find what you're looking for when verifying compliance.

Paragraph-style entries drive me nuts and I'm clearly not alone. I see paragraph entries where someone before me used a highlighter to pick out the salient points, separating the wheat from the chaff.

Unfortunately, the FARs don't dictate format, but I've had many conversations with FAA and NTSB personnel and they all prefer concise log entries formatted as a numbered list.

Bring Logbooks to Maintenance

When your King Air goes in for maintenance, bring the logbooks. Some of those Hobbs-only airframe entries are because the shop never sees the books and can't compute the ACTT.

Each time a new shop sees your King Air they need to research what's been done and what needs done. If you've been going to the same shop for a decade, you should still bring your books (unless the shop keeps a maintenance summary for each customer – many shops do this).

Maintenance Tracking Service Reports

I have mixed emotions on this topic. These reports come in handy for sellers to pass on to prospective buyers and maintenance consultants like me. But these reports are no substitution for actual logbooks. I've never reviewed a maintenance tracking report without errors.

Just a few months ago I evaluated a King Air 200 built in 1981. The seller, an air ambulance company, had computerized maintenance tracking for their whole fleet. The report for this 200 was used in the marketing materials. The engines were billed as a few hundred hours since overhaul, but the logbooks told a different story: The engines were *over 400 hours past overhaul*.

Additionally, the report described it as a B200 when it was not. There are many differences between a straight 200 and a B200 besides

the -41 and -42 engines. Although this 200 had -42 engines installed in 2011, it didn't make it a B200. It still lacked the other features incorporated into the B200.

I've learned I cannot rely solely on these reports. I use them to get the ball rolling when I'm assessing the maintenance status of an aircraft, but *I cross-check everything against the actual logbooks as soon as I get my hands on them*. There's no substitute for the logbooks.

I think maintenance tracking services are fine where multiple aircraft are involved. Owner-operators may find they are overkill and pricy. There are other options for maintenance management should you require it.

Parting Shots

When picking up your King Air after maintenance, check all log entries for Aircraft Total Time. If

it's missing, make the shop put it in. It's an FAR requirement so stand firm. It's not negotiable.

If a shop hands you a log entry in paragraph form, printed in a microscopic 8-point font, can you get them to re-organize it as a numbered list? Probably not, but I'd give it a try.

Get a debrief after maintenance. Each time I returned a King Air to service after a Phase or major maintenance, I did a thorough debrief with the pilot or owner/operator. I went through the entire work order, squawk by squawk, discussing every item. I kept the log entries on the table for reference. A lot of effort went into creating their log entries. I made sure my customers reviewed them before they went into the book and out of sight.

When it finally comes time to sell your King Air, brokers and prospective buyers will be crawling all over your logbooks. Hopefully they will stand up to the scrutiny. In the meantime, however, enjoy the heck out of your King Air! **KA**

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Dean Benedict is a certified A&P, AI with nearly 50 years of maintaining King Airs. He owned and ran Honest Air Inc., a maintenance shop that specialized in Beechcrafts with an emphasis on King Airs. Currently, with BeechMedic LLC, Dean consults with King Air owners, operators and maintenance shops on all things pertaining to King Air maintenance. This includes troubleshooting, pre-buys and maintenance management. He can be reached at dr.dean@beechmedic.com or 702-524-4378.

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The Best Bonanza Ever?

Starting with the Model E33A, in 1968 Beech Aircraft engineers dug deep into their airframe “cookbook” to create the company’s most popular and versatile Bonanza – the Model 36 series

by Edward Phillips

Introduced in mid-1968, the utilitarian Model 36 had evolved into the improved A36 for the 1970 model year and featured cabin and interior appointments that were equal in quality and appearance to that of the Bonanza V35B. (Wichita State University Libraries, Special Collections and University Archives)



“The biggest, most versatile Bonanza ever built.” That was how Beech Aircraft Corporation described the new Model 36 Bonanza when it was certified in May 1968. Introduced to company dealers and distributors June 18, by the end of the year, sales of the six-place Beechcraft had soared to more than \$3.5 million. Standard equipped price was \$40,650.¹

During those months, the production line was kept busy as orders for Model 36 poured in from Beechcraft’s global sales organization. When workers went home to celebrate the 1968 Christmas season, they had built 105 airplanes. In addition, increasing demand for the new multi-mission Bonanza would keep Beechcrafters busy throughout 1969.

From the beginning of the Model 36 design and development program, the airplane was aimed directly at three markets: air taxi, light cargo and private aviation, with an emphasis on the first two. Unlike some of its siblings such as the twin-engine Model 55 Baron, the latest Beechcraft was not answering competition from Cessna Aircraft Company or Piper Aircraft Corporation

– neither had a single-engine, retractable-gear airplane that could accommodate six people. The Cessna Model 210 was a four-place design and Piper's twin-engine Aztec was in a different class entirely than the Model 36.

The Beech Aircraft engineering department, led by Vice President James Lew, used the Model E33A Bonanza as a starting point and relocated the rear cabin bulkhead 19 inches farther aft (also similar to that of the Model V35A Bonanza) and stretched the E33A's fuselage 10 inches. As a result, distance from the cabin's forward bulkhead to the aft bulkhead increased by 29 inches. Cabin volume increased by six cubic feet, and the modification only increased empty weight by 31 pounds.

Compared to the Model S35, V35 and the V35A, the Model 36 fuselage being 10 inches farther forward over the wing, resulted in a much more flexible center of gravity (CG) envelope. The new Bonanza could easily accommodate six 170-pound occupants and remain within the specified CG envelope based on a standard-equipped airplane. Another benefit of stretching the fuselage was a 10-inch increase in landing gear wheel

base, making the airplane easier to maneuver on the ground.

Another significant feature centered on making access to the main cabin easy, particularly for air taxi operators who wanted the ability to remove the aft four seats and carry lightweight cargo if required. To provide that access, engineers designed a four-foot wide double door located on the right side of the fuselage. The doors, constructed of bonded honeycomb for strength and light weight, could be removed for flight although airspeed and other restrictions applied. The ability to remove the doors made the Model 36 an attractive platform for aerial photography. Air taxi operators also liked the Bonanza's FAA certification in the Utility Category at the maximum gross weight of 3,600 pounds, as well as its cruise speed of 195 mph that placed it among the fastest six-place, single-engine lightweight transports in that market segment.²

The choice of a powerplant for the Model 36 would be the ubiquitous six-cylinder Continental IO-520-B. Rated at 285 horsepower, the reliable engine also powered the



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Model V35 and V35A Bonanza. Early production versions of the Model 36 featured a utilitarian interior that was not well received by some Beechcraft customers accustomed to the well-appointed cabin of the V35. The company did, however, offer a deluxe interior in addition to the standard and utility versions that were designed for the rugged environment of air taxi operations.

During the 1969 model year, 79 of the versatile Model 36 were built. For the 1970 model year, Beech Aircraft officials paid attention to feedback from salesmen and operators calling for more upgrades to the airplane that would essentially make it a six-seat equivalent of the V35B – the company's single-engine flagship. There was, however, a problem of how the new Bonanza was perceived by operators.

Bonanza historian Larry A. Ball summed up the situation this way: "The original Beech factory approach to marketing the Model 36 was to advertise it as an aerial moving van, an air taxi, a carry-all and an ideal charter airplane for the fixed base operator. Although the Model 36 was all of these, the [company's] marketing approach did not sell many airplanes."³ Although Beechcraft dealers were eager to sell the Model 36, a key disadvantage was that most of air taxi and charter operators were already dealers for Cessna and Piper airplanes, and they were not inclined to buy a Beechcraft.

As a result, it was decided to give the airframe a "make-over," a new look that would bring it up to V-tail Bonanza and Baron standards, both inside and out. Perhaps more importantly, the advertising shifted emphasis to the owner-flown segment of the market – a group that had purchased so many Bonanzas over the years. The changes that occurred demanded a new designation, and the Model A36 was born.

The A36 boasted a litany of improvements from a much more aesthetic, eye-catching exterior paint design, a luxurious interior



Introduced in 1981, the B36TC featured significant upgrades that set it apart from its predecessor, the A36TC. An important improvement was the airplane's fuel capacity that was increased to 108 gallons. Production was terminated in 2002 after 424 airplanes had been built. (Wichita State University Libraries, Special Collections and University Archives)

with a choice of leathers, three green landing gear "DOWN" annunciator lights instead of one used on earlier aircraft; Hartwell quick-release cowl latches, redesigned instrument subpanels, engine and fuel quantity indicators used on the Model 55 Baron, optional internally-lighted flight instrumentation, and electroluminescent components that provided improved lighting for night flying.

These and other changes increased empty weight to 2,023 pounds from 1,980 (including standard avionics), but performance remained the same with a maximum speed of 204 mph, range of 530 statute miles with 50 gallons of useable fuel (980 miles with optional 80-gallon capacity), and service ceiling of 16,000 feet.

As was the usual custom, further improvements were made during 1970-1972 as the A36 established itself as the "Rolls-Royce" of six-seat, high-performance single-engine airplanes in the general aviation industry. A sampling includes:

- Wing tips used on the V35B were adopted to the A36, increasing wingspan to 33 feet 6 inches from 32 feet, 10 inches.
- Thicker Plexiglas on the pilot's side window
- Rotating beacon mounted on top of vertical stabilizer
- Anti-slosh fuel cells that prevented momentary loss of fuel flow during slips, skids

and turning takeoffs with low fuel level in the tanks

- Optional club seating (center two seats facing aft, rear two facing forward) became available beginning with serial number E-221
- From E-226 onward, a relay was added to the landing gear electrical circuit that prevented illumination of the three green landing gear "DOWN" annunciator lights until the gear motor had completed its operating cycle
- Redesigned ventilation system to increase volume of airflow and to reduce noise

Production of the A36 during the 1970-1971 model years began with E-185 and ended at E-282 – 98 units. Base price started at \$42,950, but in August 1970 increased to \$45,550.

As sales of the A36 continued into the late 1970s there was a growing, albeit small, movement toward a turbocharged version of the A36. Beech Aircraft had long been familiar with the advantages of turbocharging, and in the 1966 model year the company offered the Bonanza V35TC. With a base price of \$37,750 and powered by a Continental TSIO-520-D engine rated at 285 horsepower, the artificially-aspirated Bonanza could maintain maximum manifold pressure all the way up to an altitude of 19,000 feet.

As expected, performance increased significantly, with a

maximum speed of 250 mph at 19,000 feet compared with 210 mph for the naturally-aspirated Model V35. Production of the V35TC continued into the 1967 model year, and 79 were built before production changed to the V35A-TC, of which 49 were manufactured during the 1968-1969 model years. The last turbocharged version of the V-tail Bonanza was the 1970 V35B-TC that cost \$45,250. Only seven were built and none were produced during 1971.

After a nine-year absence, turbocharging returned to the Bonanza family of Beechcrafts with introduction of the A36TC in 1979. The company may have been motivated to revisit the concept of a turbocharged A36 thanks to the popularity of Cessna's Turbo Stationair 7, T210N Centurion and Piper's new PA32-301T turbocharged Saratoga that was certified in January 1980.

Built initially for the 1979 model year, the A36TC was powered by Continental's TSIO-520UB engine that developed 300 horsepower. Cowl flaps were eliminated in favor of air cooling louvers that caused cooling problems for certain cylinders during the flight test program, but these were eventually resolved and the airplane received FAA certification December 7, 1978, under (amended) Approved Type Certificate 3A15. An oxygen system was available and the cabin heating system was improved to provide 20% more heat at the turbo Bonanza's maximum certified altitude of 25,000 feet.

The A36TC was well received by pilots, but they had to closely monitor cylinder head temperatures and mixture during climbout to avoid having to "step-climb" the airplane due to high cylinder head temperatures. Beech Aircraft established a special training course to familiarize pilots with the airplane's characteristics, particularly if they were new to turbocharging. If, however, pilots flew the A36TC in accordance with procedures they were taught and specified in the Pilot's Operating Handbook, the airplane was a strong performer and a welcome addition to the Bonanza lineup. During the first year of production, 32 airplanes were built followed in 1980 by 126 and another 113 in 1980 – the last year of manufacture for the A36TC.

During 1980-1981, Beech engineers reworked the A36TC into the improved Bonanza B36TC. It incorporated a series of upgrades to the airframe and engine including:

- Continental TSIO-520-UB engine rated at 300 horsepower
- New instrument panel featuring separate control wheel shafts (the iconic, 1940s-vintage Beechcraft throw-over control column was finally eliminated)
- Throttle, mixture and propeller controls were grouped into a quadrant located in a console between the two front seats



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- Circular engine instruments similar in appearance to those installed in the King Air product line were mounted vertically
- Fuel capacity was increased 108 gallons total (102 useable)
- Wingspan increased to 37 feet, 10 inches from 33 feet 6 inches
- Wedge-like vortex generators were installed in specific locations on the wing leading edge to improve roll control at high angles of attack
- The engine/turbocharger installation was improved
- Air conditioning was available as an option
- Maximum takeoff weight increased to 3,850 pounds

At a power setting of 31 inches Hg manifold pressure at 2,400 RPM (maximum power setting), the B36TC could cruise at 200 knots true airspeed (TAS, ISA conditions) at 25,000 feet. The first and only airplane built in 1981 was serial number EA-242. Another 50 were built in 1982 followed by 65 in 1983. The factory manufactured only 139 airplanes during the 1984 through 1992 model years. According to

Textron Aviation, production of the B36TC ended in 2002 after a total of 424 airplanes had rolled off the assembly line since 1981.⁴

The current production version of the venerable Model 36 series is the Bonanza G36, first introduced for the 2005 model year. The G36 ushered in the era of flat panel, fully-integrated avionics by featuring the Garmin G1000 system. As of 2017, production airplanes have the improved G1000 NXi version. Other features include synthetic vision, XM weather and WAAS precision instrument approach capability.

In 2012, the G36 and its G58 Baron sibling were given a new interior with more comfortable seating, and an improved cabin environmental system was installed that provides air inlets for all occupants, not just in the cockpit as on previous aircraft.

The author was among flight instructors at the Beechcraft Training Center that conducted ground-based courses and familiarization flights aimed at teaching pilots new to the B36TC how to manage the turbocharger system. In my opinion, the B36TC was a major improvement over the A36TC and possessed excellent flight characteristics, but cylinder head temperatures still had to be monitored

closely during extended climbs, particularly on a hot day.

The versatile Model 36 series continues to be one of the most popular Beechcraft airplanes. Despite its extraordinary price tag for a single-engine machine, the G36 offers pilots an attractive combination of speed, value, quality and utility that should keep it in production for years to come. **KA**

Notes:

1. By comparison, in 1977 when the author went to work at the Beech Aircraft factory as a Bonanza marketing representative, base price for a Model A36 had increased to \$105,000. As of early 2017, sticker price for a base Model G36 stood at more than \$ before options.
2. Cruise speed based on a power setting of 75% at an altitude of 6,500 feet and full throttle (2,500 RPM). It is interesting to note that the 2017 G36 offers essentially the same performance as the original Model 36, but features a plethora of upgrades made during nearly 50 years that set it far apart from its 1968 ancestor.
3. Ball, Larry A. "Those Incomparable Bonanzas;" McCormick-Armstrong Company, Inc. Wichita, Kansas, 1971.
4. According to Textron Aviation, as of early 2017 its subsidiary Beech Aircraft Corporation had manufactured more than 4,700 of the Model 36 series, including the A36, G36, A36TC and B36TC.

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, Kansas. 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.



Runway Slot System at CYVR, EU Pushes for Progress on SES 2+ and Support for FAA Admin Nominee

by Kim Blonigen

CYVR Transitions to a Runway Slot System

Starting Oct. 29, 2023, Canada's Vancouver International Airport (CYVR) will permanently transition to a Runway Slot system, which they have already been using as a soft launch into the system with existing users since late August. The reason for the change to runway slots is to manage the flow of air traffic and improve on-time performance.

A letter from the airport states, "ALL users of YVR's runway system will require a pre-approved arrival and departure slot prior to operation." The Airport Reservation Office (ARO) will handle all general and business aviation slot filings.

Those who already fly into the Montreal-Trudeau International Airport (CYUL) that uses a slot program, CYVR will use the same booking system – Online Coordination System (OCS). Contact help@online-coordination.com to add CYVR to your account. New users should go to <https://www.onlinecoordination.com/frontend/#/howToApply> to find out how to get an account. If you do not use CYVR often, it is suggested you ask an FBO on the airport to assist with your booking.

For more information contact ARO at: slot_coordination@yvr.ca

EU Organizations Want Progression of Single European Sky 2+

The European Business Aviation Association (EBAA) recently joined other European aviation organizations in urging the European Union (EU) to advance the Single European Sky 2+ (SES 2+) proposal. According to the EBAA, it has been three years since the European Commission recasting of the SES 2+ proposal and little progress has been made.

EBAA says, "We are calling on EU policymakers and negotiators to refocus on the concept of a unified and harmonized Single and Seamless European Sky as reflected in the Industry Consultation Body's 'ICB Vision for a Single European Sky.' SES2+ must not cement the status quo or stifle innovation. The EU aviation industry needs an updated regulatory framework to increase capacity and improve airspace efficiency. This will ensure maximum connectivity for EU citizens, but most importantly, lead to maximum efficiency and reductions in CO2 emissions."

Overwhelming Support for FAA Administrator Nominee

A diverse group of leaders and aviation organizations are applauding the nomination of Mike Whitaker to be Administrator of the Federal Aviation Administration (FAA). President Biden announced Whitaker as the nominee on Sept. 7 and public statements of support began immediately.

Whitaker's experience in aviation covers a broad area from serving as senior vice president of alliances, international and regulatory affairs for an airline to his most recent as Chief Commercial Officer for a company developing an electric vertical takeoff and landing (eVTOL) vehicle. He also previously served as Deputy Administrator of the FAA where he worked on key issues such as NextGen modernization and emerging aviation technologies. Many also highlighted his understanding of the importance of a collaborative partnership between the aviation industry and the government and felt that Whitaker could immediately step into the position and get things done. **KA**



McCauley's new high-performance propeller for King Air B300 series enters into service

McCauley Propeller Systems announced the delivery and entry into service of its newest C780 propeller for the Beechcraft King Air B300 series. The new propeller, which features four aluminum swept blades and a 105-inch diameter, achieved Federal Aviation Administration (FAA) type certification in July 2023.

With the new C780 propeller, King Air B300 owners and operators will experience:

- Propeller weight savings of more than 50 pounds
- Increased takeoff and climb performance
- Reduced noise in the cabin and cockpit
- Extended Time Between Overhaul (TBO) of 5,000 hours or 72 months
- Textron Aviation's 4,000 hours or 36-month limited propeller warranty

King Air B300 customers can have the propeller installed on their aircraft at a Textron Aviation Service Center or Authorized McCauley Service Facility without any additional modifications required.

For more information, visit <https://mccauley.txtav.com/en/products-overview>.

Garmin Releases Pilot Training Catalog

The Garmin Aviation Training team has announced training opportunities for pilots through June 2024. The training catalog provides information on pilot training offerings, including a description of self-study materials, eLearning courses and instructor-led classes.

The Aviation Training team provides comprehensive instruction for Garmin's most advanced avionics currently being installed in general aviation, business aviation, and helicopter, military and experimental aircraft.

Catalog Highlights:


■ In-Person Courses:

- GTN/TXi, GTN/G3X and G1000/G1000 NXi courses offered every quarter at Garmin's headquarters.
- Regional options include GTN and Flight Display courses offered in Oshkosh, Wisconsin; Salem, Oregon; and Yarmouth, Maine, as well as G1000/G1000 NXi in Chandler, Arizona.

■ Virtual/Remote options include:

- GTN Series one-day virtual instructor-led course in April.
- New two-hour instructor-led classes available for GFC 500/500X Digital Autopilot, GFC 600 Digital Autopilot and GFC 600H Flight Control System.

Additionally, custom training classes are available on request. Those interested should complete a Training Request Form so the team can determine the best options for your needs.

For more details, to view the catalog online or to sign up for a training event, visit fly.garmin.com/training. 



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