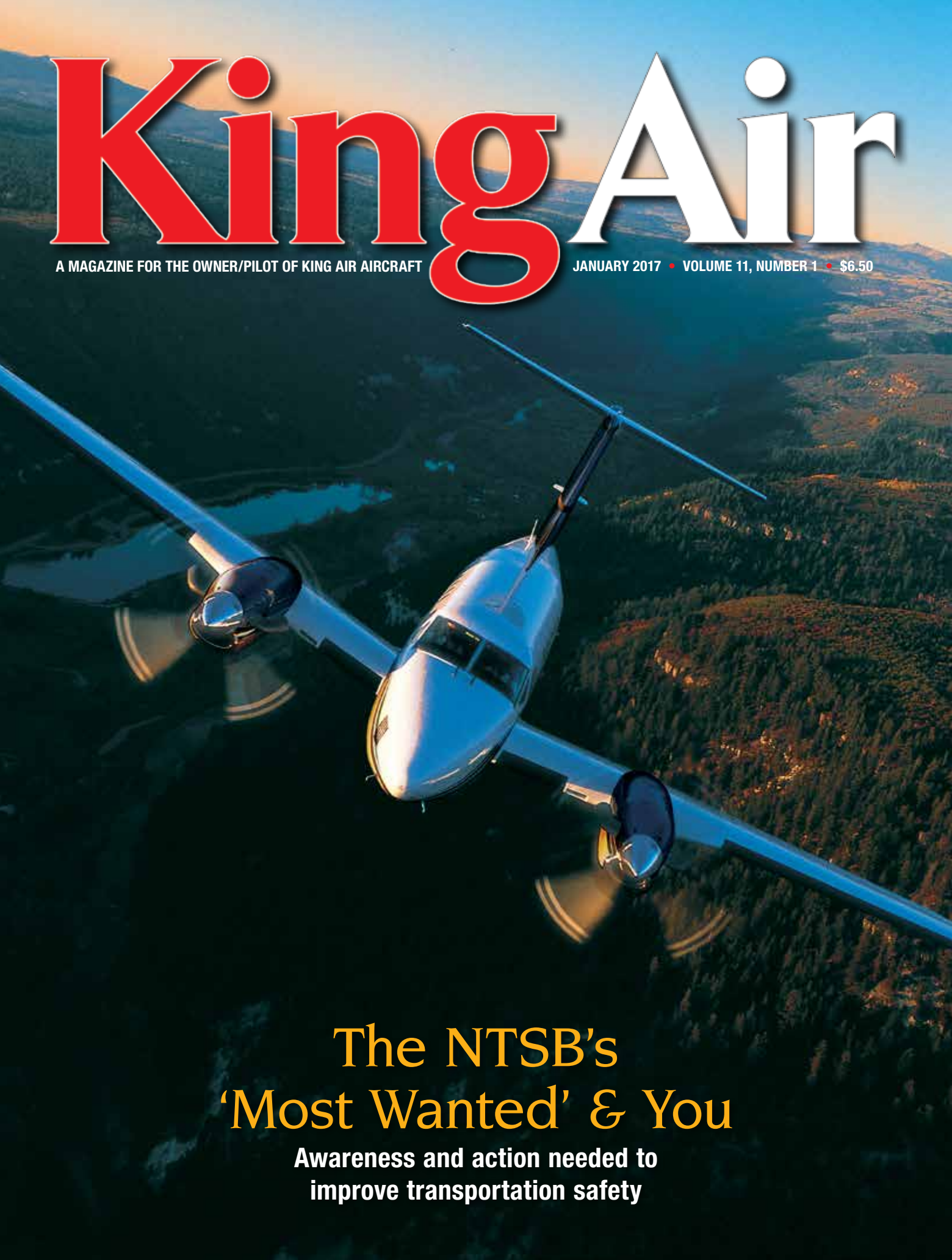

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JANUARY 2017 Volume 11 / Number 1

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

COVER PHOTO
Photo courtesy of
Paul Bowen Photography

Contents

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.

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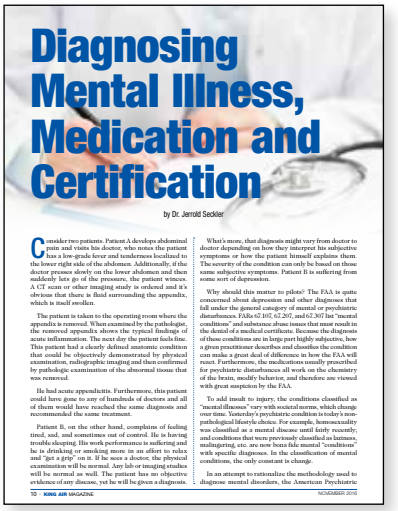
Correspondence

Comments on Mental Illness Article

Dear Editor,


Diagnosing Mental Illness, Medication and Certification

by Dr. Jerrold Seckler

Consider two patients. Patient A develops abdominal pain and visits his doctor, who notes the patient has a low-grade fever and tenderness localized to the lower right side of the abdomen. Additionally, if the doctor presses slowly on the lower abdomen and then suddenly lets go of the pressure, the patient winces. A CT scan or other imaging study is ordered and it's obvious that there is fluid surrounding the appendix, which is itself swollen.

The patient is taken to the operating room where the appendix is removed. When examined by the pathologist, the removed appendix shows the typical findings of acute inflammation. The next day the patient feels fine. This patient had a clearly defined anatomic condition that could be objectively demonstrated by physical examination, radiographic imaging and then confirmed by pathologic examination of the abnormal tissue that was removed.

He had acute appendicitis. Furthermore, this patient could have gone to any of hundreds of doctors and all of them would have reached the same diagnosis and recommended the same treatment.

Patient B, on the other hand, complains of feeling tired, sad, and sometimes out of control. He is having trouble sleeping. His work performance is suffering and he is drinking or smoking more in an effort to relax and "get a grip" on it. If he sees a doctor, the physical examination will be normal. Any lab or imaging studies will be normal as well. The patient has no objective evidence of any disease, yet he will be given a diagnosis.

What's more, that diagnosis might vary from doctor to doctor depending on how they interpret his subjective symptoms or how the patient himself explains them. The severity of the condition can only be based on those same subjective symptoms. Patient B is suffering from some sort of depression.

Why should this matter to pilots? The FAA is quite concerned about depression and other diagnoses that fall under the general category of mental or psychiatric disturbances. FARs 67.107, 67.207, and 67.307 list "mental conditions" and substance abuse issues that must result in the denial of a medical certificate. Because the diagnosis of these conditions are in large part highly subjective, how a given practitioner describes and classifies the condition can make a great deal of difference in how the FAA will react. Furthermore, the medications usually prescribed for psychiatric disturbances all work on the chemistry of the brain, modify behavior, and therefore are viewed with great suspicion by the FAA.

To add insult to injury, the conditions classified as "mental illnesses" vary with societal norms, which change over time. Yesterday's psychiatric condition is today's non-pathological lifestyle choice. For example, homosexuality was classified as a mental disease until fairly recently; and conditions that were previously classified as laziness, malingering, etc. are now bona fide mental "conditions" with specific diagnoses. In the classification of mental conditions, the only constant is change.

In an attempt to rationalize the methodology used to diagnose mental disorders, the American Psychiatric

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Thank you for publishing Dr. Seckler's article "Diagnosing Mental Illness, Medication and Certification" in the November 2016 *King Air* magazine. As someone who suffers from social anxiety, deciding to take an SSRI at the risk of losing my privilege to fly was the best decision I ever made, for the sake of my overall health and my relationship with my family. There is more to life than flying.

Airmen considering taking an SSRI though should consider the following: (1) Airmen should be prepared to be without a medical certificate for anywhere between a couple of days and several months. This year has been especially slow: I took my exam four months ago, and am still waiting for a decision (despite my condition being stable for years). (2) If an airman does receive a medical certificate, the date on the certificate will be the exam date, not the date [the] FAA makes the decision … so for me this year, I will have lost more than four months (and counting) of useful life on my second class medical certificate.

Name Withheld

Editor's Note: Dr. Seckler responded to the above correspondence with the following:

The writer is to be commended for getting treatment and then disclosing it to the FAA, even at the cost of having to go through the special issuance process.

In my opinion, the FAA's position on non-psychotic psychiatric illness is truly counterproductive and not in the best interest of either pilots or the general public. By making it so difficult for pilots like the writer to achieve and maintain medical certification, the FAA creates a situation where pilots are incentivized to either not get relatively simple and appropriate treatment for their condition or not disclose such conditions and treatment to the FAA.

There is no doubt in my mind that pilots with depression and a variety of personality disorders are far safer pilots when they are properly treated. The FAA should encourage such treatment rather than discourage it by making it absurdly difficult for treated pilots to obtain or maintain medical certification.

Flight Path to Safe

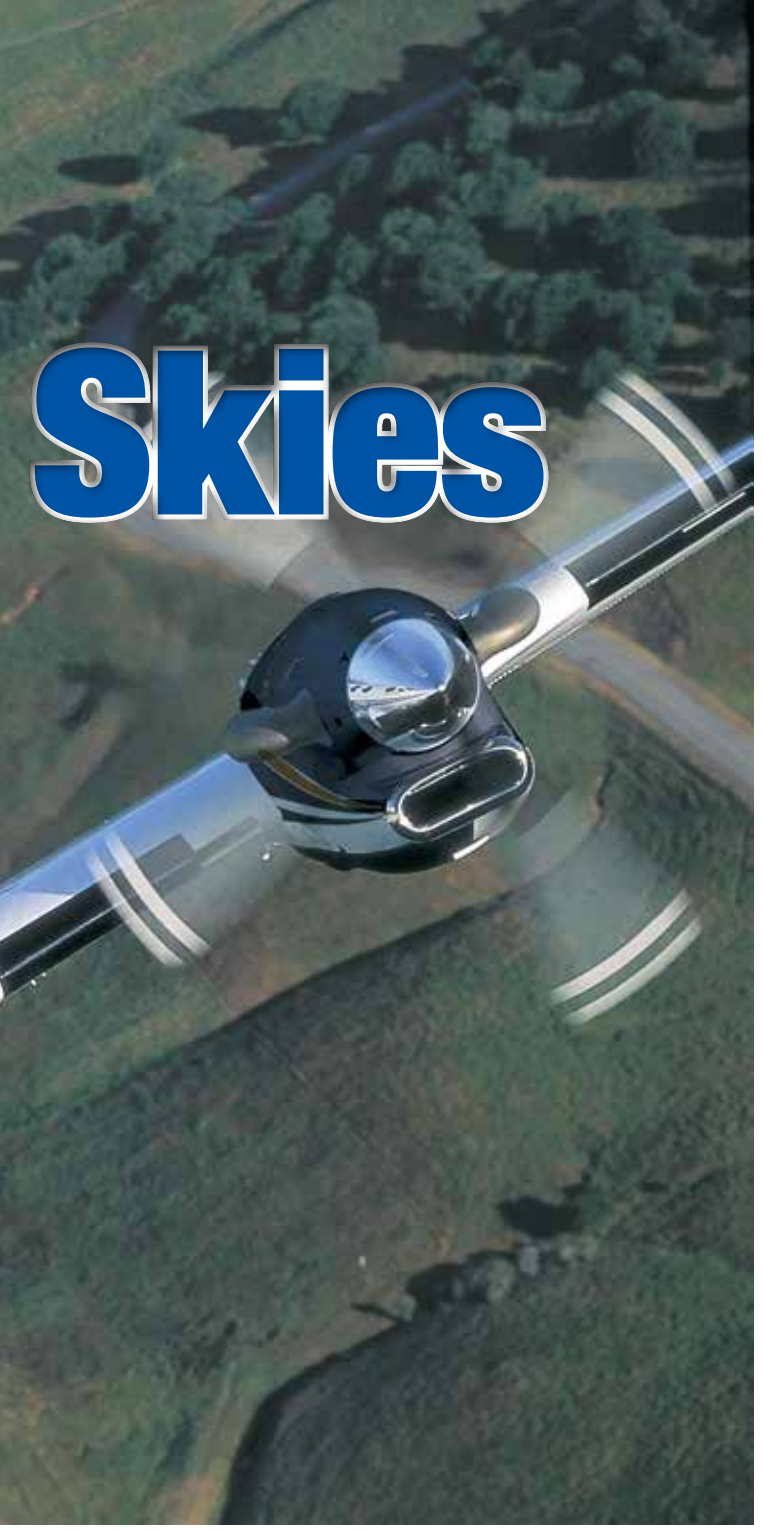
Aviation prominent in transportation safety wish list

by Kim Blonigen

Established in 1967, the National Transportation Safety Board (NTSB) is an independent federal agency that investigates accidents in aviation, as well as significant catastrophes in other modes of transportation including highway, marine, pipeline and hazardous materials, and rail. A probable cause of the accident is determined by the agency, in addition to recommendations on how to prevent them from happening again.

Every year since 1990, the NTSB has released a "Most Wanted List," which serves as its premier advocacy tool and addresses all modes of transportation. The list identifies what is considered the top safety improvements that can be made to prevent accidents and save lives, and is created by lessons learned from previous investigations.

Recently, when announcing the list for next year, Chairman of the



National Transportation Safety Board Christopher Hart stated that they have decided to move to a new two-year cycle that will "help to focus our advocacy efforts (and your coverage) on sustained progress." At the one-year mark, progress that has been made on the items of the list will be reviewed and additional improvements added, if needed.

The following is the 2017-2018 Most Wanted List that pertains to the aviation industry. Most significant is the return of in-flight loss of control in general aviation, on the list for the third year, as well as repeating items related to fatigue, distractions, medical fitness and substance impairments.

Prevent Loss of Control in Flight in General Aviation

Although in-flight loss of control (LOC) accidents in general aviation in the United States are decreasing, the NTSB notes that they still occur at an unacceptable rate. Between 2008 to 2014, nearly 48 percent of fatal fixed-wing GA accidents resulted from pilots losing control of their aircraft in flight. During this time, LOC in flight accounted for 1,194 fatalities. According to the National Business Aviation Association (NBAA), business aviation LOC accidents are a subset of the broader GA spectrum, and the alarming consistency of catastrophic outcomes in this type of accident compels an effort to better understand and control LOC risks. The NBAA's Safety Committee has created a resource regarding this issue for business aviation, "Loss of Control In-Flight" which can be found under the Safety section of its website (*www.nbaa.org*).

Per the NTSB's information, the most common type of LOC is a stall, including a post-stall spin, which can occur when the pilot allows the aircraft to enter a flight regime outside its normal flight envelope. Stalls may happen because a pilot lacks understanding about how a stall actually relates to exceeding a wing's critical angle of attack (AOA), as opposed to the more common idea that it's just related to airspeed. When airplanes are close to the ground, such as in a landing pattern, there is limited time and altitude available to recover from a stall or spin, making these stalls particularly deadly. Although LOC happens in all phases of flight, approach to landing, maneuvering and initial climb are, statistically, the deadliest phases of flight for LOC accidents.

The NTSB recommends the following for pilots to prevent LOC accidents:

- Understand stall characteristics and warning signs, and be able to apply appropriate recovery techniques before stall onset.
- Realize that stall characteristics can vary with aircraft loading and are usually worse at aft CG positions.
- Be aware that stall can occur at a lower AOA in icing conditions.
- Use effective aeronautical decision-making techniques and flight risk assessment tools during both preflight planning and in-flight operations.
- Manage distractions so that they do not interfere with situational awareness.
- Obtain training in emergency response skills so it is more natural to apply those skills in an emergency situation.
- Understand and maintain currency in the equipment and airplanes being operated.
- Take advantage of available commercial trainer, type club and transition training opportunities.

- Consider installing new technology, such as an AOA indicator, which, when coupled with pilot understanding and training on how best to use it, can assist pilots during critical or high-workload phases of flight.

The NTSB believes that "pilots play the most critical role in preventing LOC accidents through ongoing education, flight currency, self-assessment, use of available technologies and vigilant situational awareness in the cockpit."

If there is something on the list above or the NBAA's information of LOC in business aviation that you could improve upon, it would be worth investing in, as it might lead to a situation of life or death.

Reduce Fatigue-Related Accidents

For a corporate pilot or crew member of a flight department, it is up to the company you work for to ensure you have enough off-duty time to get high-quality sleep. However, it is up to the pilot, whether they are a corporate or an owner/pilot, to use the off-duty time to get sufficient and quality rest.

According to the NTSB, human fatigue can be acute or chronic; both often arise from poor sleep and inadequate health management. The consequences of fatigue on human performance can be subtle. Operators may not recognize loss of attention, slowed reaction times and poor judgment until it is too late.

As a pilot, it is your individual responsibility to manage your own personal fatigue, and be aware that some medical conditions may affect sleep quality – obstructive sleep apnea (OSA), insomnia and restless legs syndrome, for example. Also, be informed of impairing drugs that can impact the quality and duration of sleep, as well as some over-the-counter (OTC) medicines that have sleep-inducing effects. If you are unsure about the medication, check out the Federal Aviation Administration's (FAA) website for a list.

The NTSB believes that "ultimately, fatigue-related accidents can be avoided with a combination of science-based regulations, comprehensive fatigue risk management programs, and individual responsibility."

Eliminate Distractions

The increasing popularity and availability of portable electronic devices (PED) in recent years has led to increased potential for pilots to get distracted in the cockpit. Non-essential conversation was an early form of disruption in the cockpit, and the increase of PEDs has only accentuated the risk. The NTSB explains that "focusing attention on a PED or non-essential distraction can erode the margins of safety the aviation industry has built up over years with procedures, equipment and training." Distraction in the cockpit can interfere with the pilot's ability to complete tasks and maintain situational awareness, which could lead to catastrophic consequences.

Compared to other modes of transportation, the NTSB states that the aviation industry has long recognized the need for "sterile cockpit" procedures that restrict activities and conversations to the task at hand. In 1981, the FAA introduced the "sterile cockpit rule" (Title 14 Code of Federal Regulations Part 121.542), which prohibits distracting personal activities during critical phases of flight, including all ground operations involving taxi, takeoff and landing and flight operations below 10,000 feet (except cruise). This rule strictly prohibits the flight crew from engaging in specific distracting activities.

The NTSB has also asked for a ban on PED use on the flight deck, and in 2014 the FAA issued its final rule on

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the *Prohibition on Personal Use of Electronic Devices on the Flight Deck*, publishing guidance encouraging the aviation industry to expand procedure manuals and training programs to include other personnel in the prohibition of PEDs in the operational environment.

Require Medical Fitness

The NTSB professes that the aviation medical certification process is the most comprehensive fitness evaluation system, in comparing the other modes of transportation, but states that a certificate does not give a pilot a free pass for the duration of the document. It is the pilot's responsibility to recognize when they are not fit to fly and remove themselves from the task until they are healthy. It also points out that pilots are increasingly testing positive for over-the-counter sedating medications. It is essential that pilots understand the effects of OTC medications and, for those medications with sedating or impairing side effects, follow FAA guidance or talk with their medical professionals to determine when they are medically fit to return to flying.

Operating aircraft requires full cognitive and physical capabilities, and pertains not only to pilots, but also maintenance personnel and other aviation safety-critical functions.

End Alcohol and Other Drug Impairment

As mentioned earlier, many drugs (including OTC drugs) have impairing side effects, and the NTSB notes that determining the relationship between a drug's presence in the body and an individual's ability to operate an airplane is very complex.

A 2014 NTSB report, "Drug Use Trends in Aviation: Assessing the Risk of Pilot Impairment," showed increasing trends in pilots' use of all drugs – potentially impairing drugs, drugs used to treat potentially impairing

IMSAFE Checklist

Illness – Am I sick? Illness is an obvious pilot risk.

Medication – Am I taking any medicines that might affect my judgment or make me drowsy?

Stress – Am I under psychological pressure from the job? Do I have money, health, or family problems? Stress causes concentration and performance problems. While the regulations list medical conditions that require grounding, stress is not among them. The pilot should consider the effects of stress on performance.

Alcohol – Have I been drinking within eight hours? Within 24 hours? As little as one ounce of liquor, one bottle of beer, or four ounces of wine can impair flying skills. Alcohol also renders a pilot more susceptible to disorientation and hypoxia.

Fatigue – Am I tired and not adequately rested? Fatigue continues to be one of the most insidious hazards to flight safety, as it may not be apparent to a pilot until serious errors are made.

Emotion – Am I emotionally upset?

conditions, drugs designated as controlled substances and illicit drugs. Although evidence of illicit drug use was found only in a small number of cases, the percentage of pilots testing positive for marijuana use increased during the study period, mostly in the last 10 years.

The 2014 study showed that the prevalence of potentially impairing drugs in fatally injured accident pilots increased from an average of 11 percent during the period from 1990 to 1997 to an average of 23 percent during the period from 2008 to 2012. During the same time periods, positive marijuana results increased from 1.6 percent to 3 percent. The most commonly found impairing substance in fatal crashes was diphenhydramine, a sedating antihistamine found in OTC medications.

The NTSB suggests that pilots should be familiar with the Aeronautical Information Manual's "IMSAFE" checklist (shown at left), which helps assess and verify if they are healthy and fit for flight. The checklist includes assessing if various issues, like illness, medication or alcohol, may impair their ability to fly safely. It also asks that pilots taking any medication should talk to their pharmacist, aviation medical examiner or private physician to determine the effects of those medications and whether there are any dangerous interactions that can occur when using multiple medications. Additionally, read the package warnings for all medications, heed

the warnings and don't fly after taking sedating and impairing medications until you are no longer experiencing the detriments of the medication. Finally, to ensure the adverse effects of a medicine have resolved, pilots should follow the FAA recommended minimum wait times between the last dose of the medication and performing pilot duties, which is five times the maximum dosing interval.

Ensure the Safe Shipment of Hazardous Materials

The light weight and high energy density of lithium batteries, including lithium-ion batteries (LIBs), has made it a common power source for PEDs, electronic flight bags (EFBs), as well as some aircraft systems. As the popularity for these batteries has grown, it has been reported that the FAA has seen an increase in related accidents, incidents and service difficulty reports. For this reason, the NTSB recognizes the need to address the safety of lithium batteries on airplanes.

On the 2011 Most Wanted List, the NTSB included the safe transportation of lithium batteries on aircraft. For 2017-2018, they have expanded it to include other hazardous material while recognizing the continuing importance of lithium batteries in aviation. Per the NTSB, lithium batteries installed as part of airplane systems have resulted in the release of smoke, fumes and flammable electrolytes. Testing has revealed that the fumes and electrolytes released in a lithium battery fire are potentially hazardous, and the fires themselves introduce a serious hazard to occupants and the aircraft.

The FAA, in conjunction with the Commercial Aviation Safety Team, has established a joint government-industry working group that is developing ways to make lithium battery fires less likely in aviation and to reduce the consequences in case they do occur.

Strengthen Occupant Protection

The NTSB recommends that "general aviation pilots and passengers should use shoulder restraints whenever possible, and small children should be secured in appropriately sized restraints, just as they are in passenger cars. Holding an infant in a lap during flight is not a sufficient safety measure; rather, car seats approved for use on aircraft ensure maximum safety for children, especially during takeoff and landing."

Also, in all areas of aviation, including general aviation, the NTSB has found that inadequate evacuation procedures have placed crew and passengers at unnecessary risk following an accident. Pilots should consider reviewing with passengers before each flight what to do in case of an emergency or crash.

Expand Recorder Use to Enhance Safety

Per the NTSB, data, audio/voice and video recorders capture and store critical information that can assist investigators in determining the cause of aircraft accidents, which helps companies and operators take proactive steps to prevent them. Recorders can also aid companies and operators to establish effective safety management strategies. Data from recorders can be used to adjust procedures and enhance crew training to prevent accidents from happening in the first place.

Even though recorders are readily available, easily installed and largely affordable, the NTSB says there are still some aircraft that aren't equipped with the recorders. It has stated that the benefits of recorders are many, and both regulators and operators should do more to see that these technologies – in all their forms – are installed and used to improve aviation safety.

Individual and Industry Actions Needed

"General aviation has seen enormous gains in terms of safety in recent years," said George Perry, senior vice president of AOPA's Air Safety Institute. He cited data showing the fatal accident rate has dropped from 1.73 per 100,000 flight hours in 1994 to 0.89 in 2015.

The NBAA states that it views its most important responsibility as advancing business aviation safety and fostering development of industry safety best practices. Its Safety Committee identifies the association's Top Safety Focus Areas every year, which highlight the priorities to support business aviation safety. The safety issues are developed from the committee's data-driven annual risk assessment, with the NTSB's Most Wanted list regarding aviation being some of that data. According to the NBAA Safety Committee, "the focus areas are intended to help promote safety-enhancing discussions and initiatives within flight departments and among owner-flown operations."

AOPA's Perry says it will continue to advocate on behalf of aircraft owners and pilots, including pushing for friendlier policies and regulations that make it easier to install safety equipment on the existing GA fleet.

The various aviation groups are doing what they can to assist aircraft owners and operators in terms of safety. Are you taking advantage of what they are offering and doing all that you can? KA

Simulator-Based Training and Insurance Coverage

by Kyle White

As aviators operating high performance turbine aircraft, we are accustomed to mandatory and elective training. From our first experience of pursuing the private pilot license, we learn that the FAA has rules and regulations pilots must comply with. For the recreational, single-engine piston operator, the minimum training is a flight review every 24 months, while professional pilots could find formal training must be completed as often as every six months. As we gain experience and acquire additional ratings and licenses to operate turbine aircraft, we find ourselves evaluating the best way to operate at the highest level of competency. When this occurs, we also realize that the FAA's rules for us to remain current and proficient is now combined with what our insurance underwriter and policy requires – most of the time, it requires training above and beyond the FAA mandates.

The aviation insurance marketplace has changed dramatically in the last 15 years. After 9-11, insurance rates spiked, policy terms and conditions tightened, and many of my colleagues, and myself, were furloughed as corporate flight departments closed. Fast forward 15 years and times have changed once again. Aircraft insurance rates are at historic lows, ancillary coverages are becoming increasingly more inclusive at each renewal, and jobs are plentiful. We are also seeing many more turbine aircraft, such as King Airs, becoming part of the owner-operator segment of general aviation. Whether you fly your King Air yourself or you hire a pilot to do so, King Airs are highly capable aircraft and are designed to be very versatile. Pilots operating the King Air should make sure they are as capable and versatile as the aircraft and conduct themselves as professional pilots.

We have more choices than ever before when it comes to training. To get the most out of your "risk placement program" (aka insurance policy), you and your flight department, if you have one, must be positively portrayed with a well communicated training plan to your broker and underwriter. There has been much debate in some flight departments on the best way to train – in the aircraft or simulator. Personally, as a professional King Air pilot, I experienced both. In the last 24 months, I have attended two separate training programs in full-motion based simulators from well-known and respected training venues. Most recently, I attended CAE, formerly known as SimuFlite, which is where I routinely trained starting with my King Air 200 initial over 15 years ago. Additionally, I've trained in the actual aircraft for the King Air B100. There is great argument that supplemental training should be part of any professional pilot training curriculum too. We should not discount the importance that supplemental training provides the pilot in "rounding out" his or her airman skills and aeronautical decision making. However, I will be focusing on the benefits of full-motion, simulator-based training as the foundation of the training regimen and why insurance companies place value on this method.

Coverage Differences

As training relates to aviation insurance, underwriters are particularly interested in full-motion, simulator-based training programs for the make and model of aircraft being insured. As I stated earlier, the industry has changed significantly over the last 15 years. If you want the best (top-rated carriers with the most liberal claims adjusters) insurance companies to insure you with the broadest coverages at the highest limits, your policy will require you to have a full-motion, simulator-based training program in place. Even if the pilot warranty in your policy states, "Anybody approved by the chief pilot or his/her designee," the insurance company still expects acceptable training is taking place. If you desire low limits of liability with very basic and limiting ancillary coverages, depending on the pilots' qualifications, you can probably get approval for in-aircraft training.

As a former professional pilot turned aviation insurance expert, I had the privilege to fly for a corporate flight department until they dissolved the company assets, starting with the company aircraft. I then flew for two different charter companies. The corporate flight department had

Full motion simulators don't look like much on the outside, but these are multi-million dollar machines on massive hydraulic actuators that make the experience unbelievably realistic. The moment you enter the simulator, you feel like you've stepped into the real aircraft.

us train at CAE and one of the charter companies had us train at FlightSafety International (FSI). The other charter company had us train in the aircraft. I can attest that the corporate flight department and charter company that trained in the simulator had lower insurance rates from one of the best insurance companies. Additionally, the charter company with the simulator training was able to secure $100,000,000 of liability coverage and the corporate flight department maintained $300,000,000. The charter company that performed in-aircraft training was only able to secure $10,000,000 of liability coverage. In addition to not being able to get higher liability limits, their policy did not contain the broad ancillary coverages.

Why do insurance companies prefer full-motion, simulator-based training over in-aircraft training? There are a couple of reasons; statistics show that aircraft accidents typically happen during the takeoff, departure, approach to landing, and landing and/or go-around phase of flight. What do these all have in common? They are typically below 3,000 feet AGL and combine with a busy workload for the pilot. The margin for error is limiting. When you want to push and enhance your skills to see what you are capable of, the insurance company doesn't want this exposure to happen in the aircraft on their nickel. Additionally, they feel you can do more, and learn more, in the full motion simulator environment. When I completed in-aircraft training, we did not take the aircraft to the extreme limits that we could safely do in a full-motion simulator.

Abraham Maslow, an American psychologist, created "Maslow's Hierarchy of Needs." He hypothesized that

in order to effectively learn, humans have five needs, the second most important is safety. A person needs to feel safe from danger to effectively learn. When you are barreling down a 4,000-foot runway at gross weight, with low ceilings and visibility in a mountainous area and the left engine quits, doesn't auto feather and you are at 95 knots with the nose wheel just off the ground … would you feel safer in a full-motion simulator or in the actual airplane?

Getting Recurrent

Earlier this year, I decided to go to CAE for a King Air 200 upgrade recurrent course. The experience rekindled some great memories and revealed that my skills were a little rusty. CAE's professional program helped me blow the cobwebs out, re-strengthen my skills and give me the confidence that a professional pilot requires to do the job well when "Murphy's Law" rears its ugly head.

The five-day course started on a Monday morning in a well-appointed classroom of their massive complex with a great view of DFW. I glanced around the room to see eight other pilots in my class from various companies. My instructor, Steven Kopankis, has an extensive background in professional aviation, but I knew immediately I wouldn't be learning just from Steven, but the entire class and their experiences would

The cockpit procedures training room that allows pilots to go through the motions of exercising memory items.

be a plethora of information. Throughout the week, this belief came to fruition as we all shared operating procedures and "things" each student had seen in the King Air 200 throughout our respective careers. This environment was very helpful to the learning process, and Steven was very knowledgeable and genuinely cares that his students are learning.

After spending a full day in the classroom on Monday, Tuesday yielded another wealth of information and systems review. Although class ran until 6:00 p.m., no one minded because of the great interaction amongst the students with the class syllabus and objectives. It was time well spent. In addition to spending time in the simulator, CAE has a CPT (cockpit procedures training) room. This was an extremely beneficial venue to visit and go through the motions of exercising your memory items. The redundancy reinforced the muscle memory that is required to respond correctly, and effectively, in the simulator during emergencies.

CAE's full motion King Air 200 simulator is unbelievably realistic; these are multi-million dollar machines on massive hydraulic actuators. The moment you cross the catwalk and enter the simulator, you feel like you've stepped into the real thing. As I sat down in the left seat, I immediately felt like I was sitting in the cockpit again. Once I got through my expanded checklist and the aircraft (simulator) was started, I conducted the run-up, got my departure and taxi clearance, and was ready to have some fun and learn (remember Maslow's theory? I felt safe.). In addition to being a safe learning environment, the simulator

has some other benefits. One, it doesn't burn any Jet A, so you're saving about 800 lbs/hour! Secondly, you can do what the instructor refers to as "batting practice." Remember earlier, I gave the scenario of a departure that went awry at 95 knots? You can practice this same scenario multiple times in a fraction of the time required to do it in the actual aircraft. Once you takeoff, go through the process of flying the aircraft and running your checklist, they can freeze the simulator and reposition you back at the beginning of the runway for you to do it again. Also, for debriefing purposes only, they can track you on the airport diagram/departure plate. This allows you to see how well you tracked the centerline and course profile along with other parameters such as airspeed, vertical speed and altitude creating a very objective experience.

Full motion simulators simply allow you to practice scenarios and emergencies you can't safely perform in the actual aircraft. The engineering behind these state-of-the-art machines also creates the environment of "the real thing," along with the pressures and control inputs required to manipulate the controls. I still vividly remember my initial course 15 years ago. With only 450 hours total time, I went through the initial class at CAE. Once I returned from training, our chief pilot put me in the right seat of the aircraft and assigned another pilot to the left seat. We went out and performed three takeoff and landings – me being the sole manipulator of the controls. The aircraft flew just like the simulator, only the airplane was easier to land. I left CAE with the confidence to fly the aircraft in the deepest of emergencies while in the most inclement weather conditions. The airshow industry offers great advice to the performers, the gist of it is, never try a new maneuver for the first time during an airshow. This same advice applies to us as King Air pilots, let's not try the most complex of emergencies in the worst of IMC conditions without rehearsing first in the simulator.

The FAA believes in full-motion based simulators, that's why you can get an ATP license and type ratings in them. Insurance companies believe in them too; many times, pilots can get out of the simulator and jump right into the cockpit and have insurance approval with no IOE requirements unless imposed by the FAA. So, as far as the best insurance carriers are concerned, if you do the best training, they'll give you the "Cadillac" plan for the Chevy Cruze price! In the words of CAE, "Elevate Your Training." Your insurance carrier will reward you and you will be at the top of your game. KA

Kyle P. White is the CEO of Aviation Solutions, a Marsh & McLennan Agency company, an insurance brokerage and risk management company, and a former professional King Air pilot holding an ATP and MEII license. He can be reached by e-mail at *Kyle.white@marshmma.com*.

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KAG and KAS – Two New Acronyms You'll Like

by Tom Clements

This month you're getting a break from my normal efforts at imparting some King Air systems or operational knowledge to you. Instead, I am going to introduce you to two different, yet related, endeavors which I believe you will find of great interest. I want you to participate in these ventures and benefit from them.

It has surprised and somewhat depressed me to realize that there has never been a successful King Air owner-pilot association. I have enjoyed being a Duke Flyers Association (DFA) member for eons and when I was actively instructing in those airplanes, I found their annual gatherings to be both highly informative as well as lots of fun. The members saved a *lot* of maintenance and parts dollars due to the information that was exchanged. I was an American Bonanza Society (ABS) member when I owned my three Bonanzas – A35, V35B, and A36 – and gladly paid the annual dues to the Cessna Pilots Association (CPA) in the years I was a 180K owner.

Mitsubishi MU-2s, Turbo Commanders, PC-12s, TBMs, Cheyennes … they and others all have varying degrees of action in their owners' groups. But King Airs, the most popular and prolific executive airplane of all time? Pffft, almost nothing!

I have a theory as to why this is the case. When the King Air first appeared back in 1964, it was one of the very first turbine-powered twins and almost all were flown by a professional crew of two. Yes, there were many exceptions, but that was the norm. The professional pilots were in no position to ask their bosses to allow them to take the plane to some annual fly-in and the desire to save maintenance and parts dollars was not very important to the crew. After all, it wasn't *their* money!

But times have changed and now there are a lot of King Airs, from model 90s to 350s, that are owner-flown. And you know what? I think that is a very good thing! Cowl flaps, mixtures, ROP, LOP, CHTs, EGTs, shock cooling, engine monitors … golly, those piston twins are so much harder to operate! I think the lower-time, owner-pilot is safer in the King Air, due to the lower workload required. I recall the old line uttered by a high-time pilot as he first transitioned into the King Air: "I felt fine flying it in an hour, but it took me ten hours to learn how to start the SOB!" Sure, there are some new things to learn – starting, reversing props, pressurization, for example – but once they are in the memory bank, isn't the King Air a relative piece of cake to operate?

Another factor that makes the King Air safer than, say, a 421 or a Navajo, is the improvement in single-engine performance when faced with an engine failure. Sure, an old standard A90 does not have knock-your-socks-off performance, but I will still take it against most of the piston competition. And the later King Air 90 models? Much better. 200-series? Outstanding! 300-series? Amazing!

The three King Air models currently in production celebrating the 50th Anniversary of the King Air in 2014. More than 7,300 Beechcraft King Air turboprops have been delivered to customers around the world since 1964, making it the best-selling business turboprop family in the world. The worldwide fleet has surpassed 60 million flight hours in its first 52 years, serving roles in all branches of the U.S. military and flying both commercial and special mission roles around the world.

So as the mystique of turbine flying has rightly been relegated to its low-priority status, more and more King Airs are now being flown by their owners. Well, guys and gals, let's take advantage of this new demographic and make an association that will be truly beneficial (and fun!) for all of us who share this common bond. Let me introduce KAS, the **King Air Society.**

How many of you have been to the Beechcraft Heritage Museum (BHM) in Tullahoma, Tennessee? Isn't that an awesome Beechcraft collection? It began in the 1970s as a place to collect and honor the Beech Model 17, better known as the Staggerwing. Under the careful and dedicated guidance of John Parrish, Sr., aided by his hard-working staff of volunteers, the Staggerwing Club grew and grew. What it has evolved into is mind-boggling. Beechcraft factory memorabilia, instead of sitting forgotten in some musty Wichita warehouse corner, is now assembled here in this lovely setting of metal hangars and log cabins. Want to see the very first Beechcraft Staggerwing, serial number 1? It's there, as is one of virtually every standard model Staggerwing. How about the very first Baron, serial number TC-1, and the very first Army U-21 Ute, serial number LM-1? Yes, they're present, too, as well as the Starship, and Bonanzas from serial number D-9 to one of the last V-tails built, as well as 33 and 36 models. If you are a history buff, you'll especially enjoy seeing the first Travel Air from the 1920s. (Travel Air was the Wichita company Walter Beech headed before founding his own business in 1932.) Also, Beech's "Mystery Ship," the Model R racer, is there. If your interest is in the famous Twin Beech Model 18, you'll find both early and later examples. Dukes? The P-596 is there; the last one built, a 1982 model in which I have spent many delightful hours conducting recurrent training for its only owners, Jim and Marge Gorman of Mansfield, Ohio. There is also a Model 50 Twin Bonanza.

Get the idea? What started as a Staggerwing club has evolved into an organization that honors the entire Beechcraft heritage. I put it this way: "The factory of Beechcraft is in Wichita, but the heart of Beechcraft is in Tullahoma."

In 2013, The Beechcraft Heritage Museum decided to add one more branch: The **King Air Society,** or KAS. In 2014, '15, and '16, the BHM Board of Directors asked me to present a brief seminar aimed at KAS members (although all interested folks were welcome to attend) during the annual October "Beech Party," a four-day fly-in aimed at Beechcraft enthusiasts of all types. I was happy to do so, even though the attendance at my presentation was limited, since few people had yet learned of KAS. I want that to change and this is an attempt to get that ball rolling.

I realize that some King Air owner-pilots couldn't care less about seeing the museum, talking airplanes day and night, attending seminars, eating good food, enjoying an adult beverage while watching endless single and formation fly-bys of various Beechcrafts as daytime turns to dusk. Wait! What?! Are there really pilots who won't have a blast doing these things?! Well, probably a few.

That is why I have concluded that gathering a large group of King Airs with their owner-pilots, once a year at the Beech Party in Tennessee, is not enough to develop an active, worthwhile, and successful owners' group. If the owner is going to fly his King Air, perhaps quite a distance, pay for lodging and meals, be away from home and business for at least a couple of days, then the attraction of the Beech Party won't be enough. That's why we need the **King Air Gathering** (KAG).

As many readers know, I have been actively mentoring the instructors and helping the King Air Academy get started to becoming *the best* source of practical, accurate and enjoyable King Air initial and recurrent training. The facility is just west of Runway 25R at Deer Valley Airport (KDVT) in Phoenix, Arizona. Although still the new kid on the block, our client list continues to grow as people discover the value that we offer. In addition to having two Advanced Flight Training Devices, simulators, we also have an actual B90 for those who have never stepped foot into a real King Air before. Our founder, B200 owner Ron McAlister who was profiled in this magazine

last year, wants this endeavor to always stay with one airplane model only, the King Air. We will never dilute our knowledge or threaten our accuracy by trying to be a jack of all trades.

Here's the idea: We are planning the first of many King Air Gatherings around the country with the following goals in mind. First, get a group of like-minded, owner-pilots together to share information and to see what the "other guy" is doing with his King Air. Second, have an outstanding group of experts who can put on brief, hard-hitting, presentations. Dean Benedict and yours truly – two *King Air* magazine authors who contribute regularly – will be on the agenda. Paul Jones of Specialty Turbine Service, "Mr. PT6," will present. Paul Sneden, maintenance instructor and BeechTalk forum responder par excellence will be presenting. An avionics whiz who can discuss the ADS-B mandate will be there. Jack Braly, King Air F90 owner-pilot, ex-Beechcraft president, and story-teller extraordinaire will provide a welcome break from the technical as he regales the gathering with Beechcraft tales.

This will be a two-day program, beginning at midmorning of Day One – to allow for those who arrive that morning – and finishing by 5:00 p.m. of Day Two. Lunches on both days will be catered at the airport meeting facility. A highlight will come after Day Two's lunch, when Dean Benedict and Paul Sneden will perform a complete walk-around inspection/demonstration on a King Air that will be jacked up to allow landing gear operation.

In addition to the individual presenters, various King Air aftermarket vendors have indicated a strong willingness to attend: Blackhawk Modifications, Raisbeck Engineering, Sandel (with their Avilon BE-200 demonstrator), and others. They will be available during breaks from the presentations as well as before and after the official gathering. A happy hour will wrap up the end of Day 1.

The very first King Air Gathering will be held at the Apex Aviation facility in Henderson, Nevada, on Friday and Saturday, April 21 and 22. Henderson is next door to Las Vegas, so there will be plenty of other attractions when you are not involved with the KAG. Discount rates at a nearby hotel are being arranged. Although an official spouse program has not yet been planned, significant others and guests are welcome, especially for the meals, cocktail hour and casually walking the flight line to see the various attendee airplanes. Golly, this is going to be fantastic!

So, what's the snag, the hidden problem, the unknown negative? Yes, there is one: All attendees will be charged $250 to cover the expenses involved. Of that fee, $50 will be applied to your 2017 membership in the Beechcraft Heritage Museum as a King Air Society member, and you will be encouraged to attend some or all of the October Beech Party. Additionally, the full $250 will be deducted from the cost of your next training session at the King Air Academy. What a win-win deal!

For more information, the schedule of events, and to register, please go to the web site: *www.kingairsociety.com* or call (602) 456-2417. Alternately, you may also send an email to *kingairsociety@gmail.com*. Call or write now so you won't forget.

Can you tell that I am enthused about both endeavors? You bet I am! Owner-pilot groups like these are certainly not everyone's cup of tea, but at last those King Air owners and operators who wish to share their joy and experience with like-minded individuals will finally have the opportunity to do so. I hope to see you in Henderson! KA

King Air expert Tom Clements has been flying and instructing in King Airs for over 44 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, go to *www.flightreview.net*. 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 kblonigen@cox.net.

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Game Changer — Pratt & Whitney Canada's PT6A

Part One

The company's small gas turbine proved to be the right engine at the right time for Beech Aircraft Corporation's next generation of business aircraft

by Edward H. Phillips

By the late 1950s, the military forces of the United States, Great Britain, Russia and other nations had been developing and flying jet-powered fighters and bombers for nearly 10 years. Lessons learned from the German Luftwaffe in World War II made it clear to the allies that the day of the piston-powered airplane was drawing to a close. The superior performance of the twin-engine Messerschmitt Me-262, in particular, caught the U.S. Army Air Forces by surprise with its 100-mph speed advantage over America's premier fighter, the North American P-51 *Mustang*.

After the war, the commercial airlines were not only cautious about adopting jet engine technology, but deeply concerned about the costs associated with buying and operating such sophisticated powerplants. Instead, airlines clung to the proven, reliable, static, air-cooled radial engine that had reigned supreme since the 1920s. The advent of early jet-powered transports such as the revolutionary de Havilland *Comet*, the Avro Canada C102 (the first jet airline transport built by a company in North America) and later the benchmark Boeing 707 transformed airline flying and sealed the fate of the radial engine as a prime mover for long-distance airline service.

During the 1950s, Beech Aircraft Corporation had prospered under the able leadership of Olive Ann Beech, who assumed the reigns of power following Walter Beech's death in 1950. Its chief products – the Model 35 *Bonanza* and the cabin-class Model 65 *Queen Air* – were selling well and framed an ever-expanding lineup of Beechcrafts to serve every mission. Always conservative but never afraid to look to the future, in 1955 Olive Ann Beech gave the green light for Beech Aircraft to act as the sole distributor in North America for the Morane-Saulnier MS 760 *Paris Jet* – a four-place, 410-mph, twin-engine, low-wing monoplane that seated four in pressurized comfort. The company's brief foray into the "Jet Age" lasted less than one year, but gained the company a degree of prestige among business aircraft operators that would prove useful 10 years later.

Sales of the Beechcraft Model 65 Queen Air remained strong well into the mid-1960s. The airplane was built from 1958-1977, with the final version being the Model 65-B80. The airframe had reached its limit of development with piston engines, but the Queen Air served operators who preferred reciprocating engines to the new, more sophisticated gas turbine PT6A of the Model 90 King Air.
(EDWARD H. PHILLIPS COLLECTION)

In the mid-1950s, Beech Aircraft Corporation was already looking toward turbine engines when it briefly marketed the French Morane-Saulnier MS760 jet that carried four people in a pressurized cabin.
(EDWARD H. PHILLIPS COLLECTION)

Meanwhile, up north in Montreal, the Pratt & Whitney Canada division (PWC) of New England-based Pratt & Whitney Aircraft (PWA) was about to make a technical transition that would have a massive impact on its future business. In 1951 the Canadian company's primary product remained the air-cooled radial engine, specifically the R-1340 *Wasp.* By 1954, however, when the long-running R-1340 program was nearing its end, the company began building Wright R-1820 radial engines under license to Wright Aeronautical. These powerplants were installed on the Royal Canadian Navy's Grumman *Tracker*, an anti-submarine warfare aircraft.

By 1954, PWA officials had decided that the company's future lie with turbines, not reciprocating engines, and announced that a new facility would be built in Longeuil, Montreal. Plans called for transferring to PWC all tooling for production of the R-985, R-1340, R-1830 and R-2000 radials, as well as spare parts, making the Canadian division the sole source for those components.

In 1956, however, the Canadian division was revamped under the direction of CEO Ron Riley. The reorganization included a plan to create a new group responsible for conducting design and development of gas turbine engines, and Riley was quick to authorize a search to find men who were well acquainted with design and development of such powerplants.

Although no one at the time could have known about the ramifications of Riley's decision, it marked a critical first step toward uniting PWC and the Beech Aircraft Corporation. The chief question that emerged from a series of discussions centered on what type of engine would help make PWC one of Canada's major engine manufacturers. The primary builders of gas turbine engines in the country at that time were Orenda and Rolls-Royce. Riley wanted to transition PWC from its long-standing function as a service and support provider for PWA, to designing and building engines of its own design.

"We were determined to reverse the picture as it existed in Canada with Orenda and Rolls-Royce as the big names. Riley and I looked at a variety of areas that could launch PWC into new product development. In the end, we decided to focus on a small gas turbine engine," said engineer R.H "Dick" Guthrie.[1] Riley's initiative was a bold one, but as Hugh Langshur, PWC's chief engineer remembered, he was "surprised that we were allowed to enter the gas turbine business without being led by a 'big name.'" He recalled that there were only two potential sources that employed men with the necessary experience – Canada's National Research Council (NRC) and Orenda.[2]

By June, six engineers had been hired: Doug Millar and Elvie Smith were wooed away from the NRC, followed by another NRC engineer, John Vrana. The other three – Pete Petersen, Allan Newland and J.P. Beauregard – bade farewell to good jobs at Orenda for an uncertain future with PWC. "We were all excited about working at PWC, but aware that it was a gamble," Peterson recalled. The last few engineers, Ken Elsworth, Gordon Hardy, Fred Glasspoole, Fernand Desrochers, Arthur Goss and Jim Rankin, joined the team in the summer of 1957.[3]

Part of the team were transferred to PWA's headquarters in Hartford, Connecticut, to begin design studies on a small, lightweight engine. That same year the RCAF released specifications for a new jet trainer, and Canadair offered the CL-41 *Tutor* – a single-engine design featuring side-by-side seating for student pilot and instructor. Officials at PWC immediately recognized the opportunity to supply an engine. The team worked feverishly on a configuration that featured an axial compressor section and would produce 3,000 pounds static thrust. Initially designated the DS-3J, the engine was redesignated as the FDS-4J and eventually the JT-12. It is important to note that in addition to military applications, the DS-4J also showed promise as an engine for business aircraft.[4]

Throughout the second half of 1957, the Canadian engineering team in Hartford continued to work on the jet until early in 1958 when PWA assumed responsibility for the project. The primary reason for the shift was simple: PWC lacked the money, manpower and facilities to complete the job. That decision, however, would prove to be providential for Canada and Beech Aircraft Corporation.

Free to begin work on another small gas turbine, the team reassembled in Longueuil began a number of preliminary design studies, but further progress was slowed until PWC conducted a survey to determine if a market existed for such an engine, and if so, what power range was required. Finally, in July of 1958 the decision was made to focus on a series of turboprop powerplants in the 200-2,200 shp class, including an emphasis on engines rated at 250-500 shp.

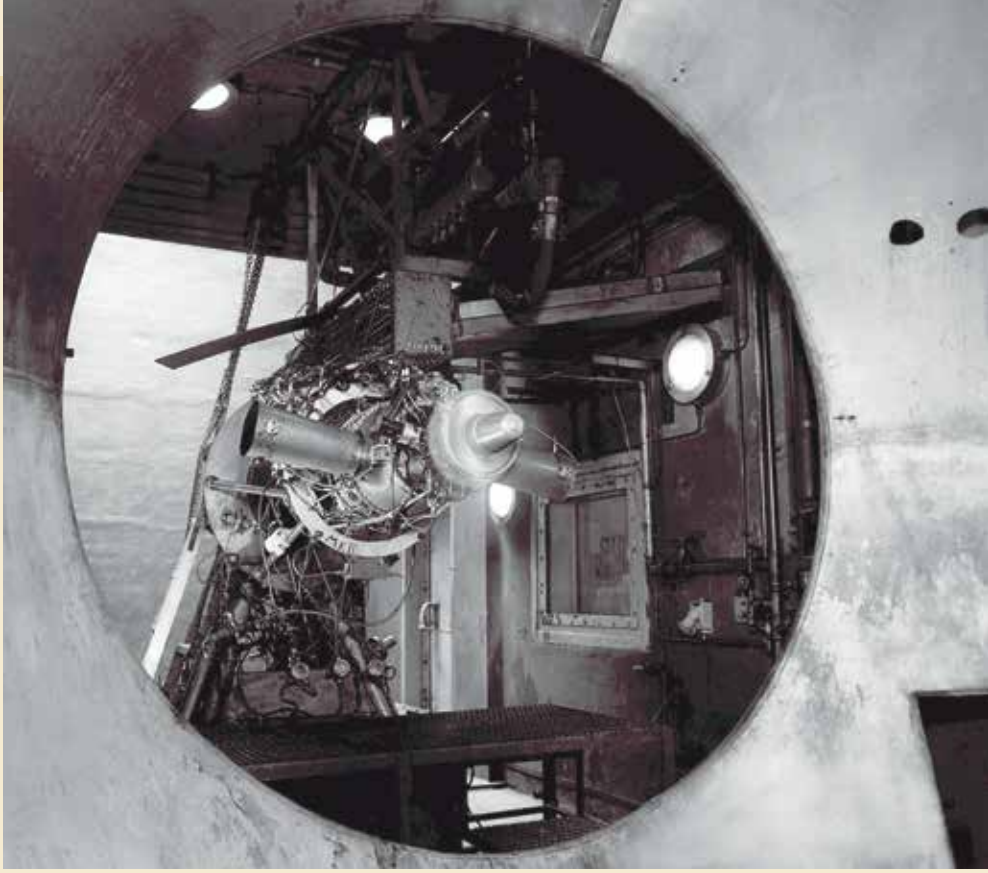
These engines seemed best suited to small, single- and twin-engine private and business aircraft built by airframe manufacturers Piper Aircraft Corporation, Cessna Aircraft Company and the Beech Aircraft Corporation. A series of meetings were held between PWC and all three companies. Cessna, of course, already had extensive experience with gas turbines in the T-37 jet trainer, of which hundreds had been delivered to the U.S. Air Force since 1955. Piper officials were not keen on turbine engines, but Beech Aircraft management was interested in "turning to turbines with all possible speed," according to a PWC official. Both engineering and marketing at Walter H. Beech's company were certain that the "future of the light aircraft lay with turbines, especially turboprops, and was ready to install an engine as soon as it was available."[5]

Although CEO Olive Ann Beech believed in a "go slow" approach to technical innovation and new aircraft designs, she realized that the company could not afford to rest on its past successes and remain on the leading edge of development in business aircraft. Engineering already had made preliminary plans to mate a turboprop in the 450-shp class to a next-generation Beechcraft based largely on the successful Model 50 *Twin Bonanza* (that "next-gen" airframe would become the Model 65 *Queen Air*). In addition, turboprop engines were being tested in France on the venerable Model 18, and those experiments were being closely monitored by the company.

As 1958 came to an end, the chief issue facing Dick Guthrie's design team was choosing a configuration for the new engine. Key factors affecting that choice included reliability, cost, specific fuel consumption, weight and maintainability. Two concepts finally emerged – free turbine and fixed-shaft. Members of the team freely debated the merits of both – a fixed-shaft would cost less to build, but the free turbine had a few distinct advantages every King Air pilot should be thankful for: less power required to start the engine, less complex fuel controls, and in the case of one engine becoming inoperative, only a part of the engine would freewheel with the propeller feathered, creating less drag.

In addition, the engine could use existing propellers, obviating costly development of a propeller designed specifically for a fixed-shaft turbine. One other advantage of the free turbine design is that the engine's gas generator typically operates at about 35,000 rpm and the

The first complete prototype PT6 underwent initial runs in a test cell during February 1960. (PW&C ARCHIVES)

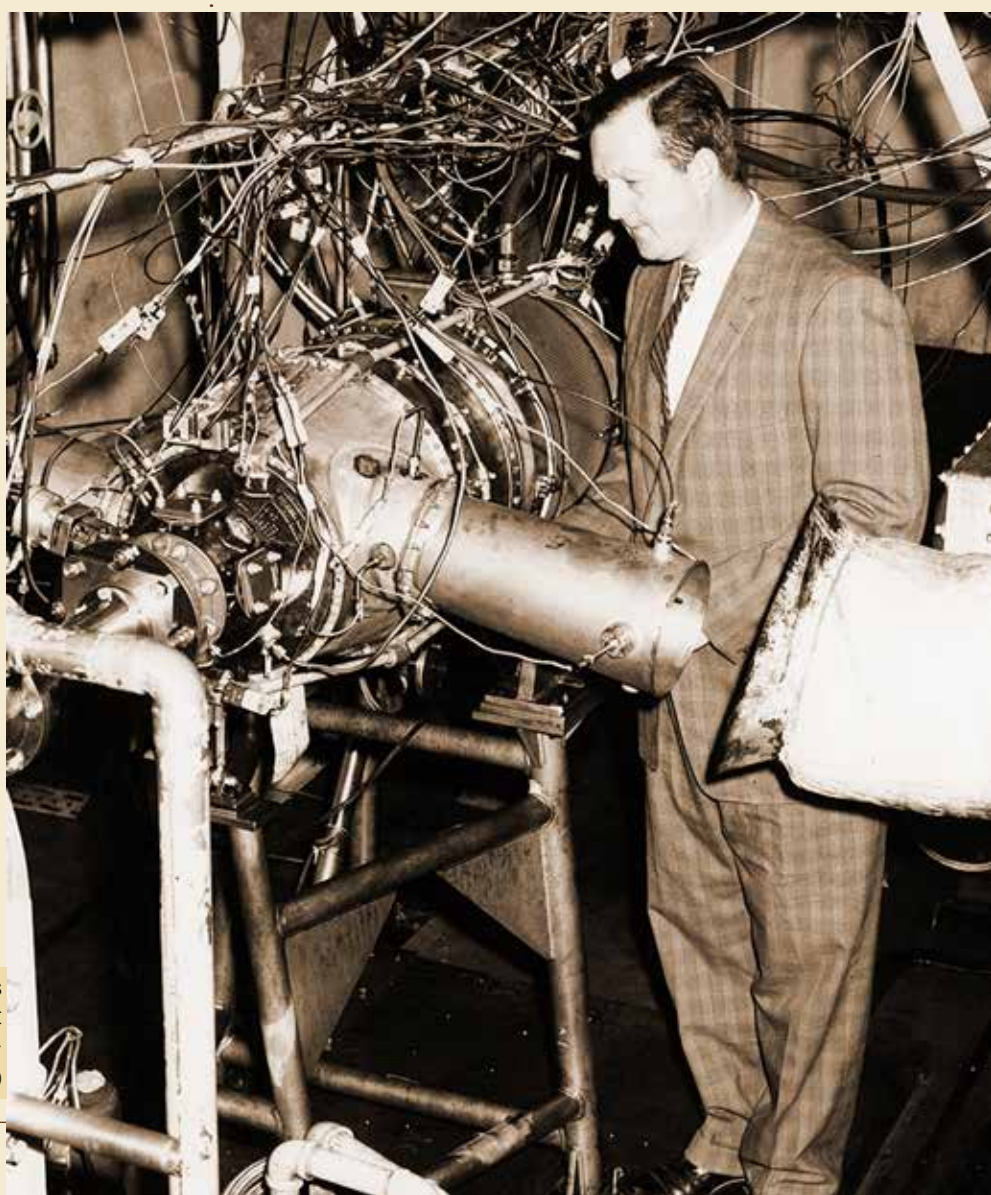


propeller rotates at about 2,000 rpm, resulting in a reduction gearbox ratio of 15:1. The compressor section can be operating at a high rpm with the propeller idling, resulting in much less noise. By contrast, a fixed shaft turbine and its propeller rotate at the same speed and create a much higher noise level (compare a PT6-powered King Air to a Mitsubishi MU-2 powered by the AiResearch TPE331).

The free turbine was selected, but the next question centered on location of the air inlet. Earlier free turbines featured an inlet at the front of the engine with a long, concentric shaft running through the center of the engine to transfer power from the rear section to the front. Because the new design (now designated DS-10) would be small and lightweight, size constraints were an important factor. The team elected to use a reverse-flow configuration whereby air entered at the rear of the engine and passed through the compressor section on its way to the power turbine. By placing the air inlet at the rear, components could be mounted on the reduction gearbox (RGB), which could be removed and replaced without demounting the entire engine from the aircraft.

A basic description of the DS-10 was provided to airframe manufacturers including Beech Aircraft and included a number of key points:

- A 450-shp, free-turbine turboprop and turboshaft engine suitable for fixed-wing, helicopter or VTIOL aircraft.
- Size based on airplane design studies and surveys of light aircraft manufacturers.
- A pressure ratio of 6:1 should be attainable.



Chief engineer on the PT6 project was Allan Newland, shown here with the first PT6 that was heavily connected to instruments for data gathering. (PW&C ARCHIVES)

- Turbine inlet temperature (ITT) set at a level consistent with turbine disks weight, but higher temperatures will be possible if integrally cast turbine wheels prove feasible.

Armed with a design that had been well thought out, the Canadians traveled down to Hartford where their proposal squared off against one from engineers at PWA. After considerable study, PWC's DS-10 was selected for further development. Hartford also set aside $4.4 million to construct four prototypes and proceed with a 50-hour test program. One PWC team member recalled that in the wake of their victory, the engineering challenges that lie ahead would be significant. "Everyone understood that the engine program would evolve in response to the market," and that PWC's marketeers would have to work long and hard to sign customers if the program was to be successful.

In addition to the technical obstacles that would have to be overcome, financing was another concern. The majority of the cost burden in bringing the DS-10 (soon designated the PT6) to market would be borne by PWC. A large chunk of that money would come from the ongoing sale of spare parts for Pratt & Whitney's R-1340 and R-1820 radial engines. In January 1959, the Canadian government agreed to provide $1.2 million to help carry the team through 30 months of tests leading to the 50-hour goal of flight qualification. The agreement called for PWC to provide four PT6A-2 engines for the tests and another four PT6A-2 or PT6A-B2 for further development.

Full of enthusiasm that was tempered by the reality of the risks associated with a major engine development program, the Canadian team went to work fabricating and building the first engine. "This was the first time we tried to put a gas turbine together," said team member, Allan Newland. "It is not surprising that we showed a great deal of inexperience in what we did. We had no history, no experience as a team and only brought to the situation what background we had as individuals. This was a far cry from what would happen in a mature organization with a long history of design."[6]

Newland further commented that, "Our inexperience did, however, have a positive aspect – we were uninhibited. We had no past failures, and we had all the expertise in Hartford to draw on and were smart enough to know which questions to ask when consulting with people there. They keenly shared their knowledge and experience. To say that this rubbed off on us would be an understatement."[7] As for PWC's marketing department, they faced an uphill climb to attract customers to the untested, unproven PT6 engine. In 1959 they waged a worldwide campaign and managed to generate great interest, including 70 companies in the United States. Of these, six showed potential, including the Beech Aircraft Corporation.

The future looked bright for the PT6, but it would be another five years and many millions of dollars before the first production engine was shipped to a customer. KA

NOTES:

1. Sullivan, Kenneth H. and Milberry, Larry: "*Power—The Pratt & Whitney Canada Story;*" CANAV Books, 1989. Other companies already had development underway for small turbine engines, including programs in France, Great Britain and the United States.
2. Ibid
3. Ibid
4. The CL-41 was selected by the RCAF over the Cessna T-37, British Jet Provost and the French Fouga Magister, and 212 eventually were built. The JT12 (military J60) lost out to the General Electric J85 that was built under license by Orenda in Toronto. The JT12, however, was installed in the four-engine Lockheed Jetstar and North American Sabreliner business jets, versions of which also operated with the U.S. Air Force and Navy.
5. Sullivan, Kenneth H., and Milberry, Larry: "*Power—The Pratt & Whitney Canada Story;*" CANAV Books, 1989.
6. Ibid
7. Ibid

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.

A part of the team that developed and built the first PT6 posed for the camera at Pratt & Whitney Canada's facility in Longueil near Montreal. (PW&C ARCHIVES)

Beechcraft Introduces Special Mission Enhancements for King Air 350

Beechcraft Corporation announced that the company is now offering Pratt and Whitney Canada PT6A-67A engines for improved performance on its King Air 350HW and King Air 350ER turboprops. In addition, the company is offering an increased gross weight option for these platforms, increasing the maximum takeoff weight to 17,500 pounds. Both enhancements are now FAA and EASA certified and offered as factory options for new aircraft or as aftermarket modifications.

The more powerful Pratt and Whitney Canada PT6A-67A engines provide superior field and climb performance, including hot and high operations. With an outside air temperature of 50 degrees Celsius (122 degrees Fahrenheit), the engine upgrade allows for a maximum takeoff gross weight increase of up to 2,700 pounds at sea level, compared to the standard aircraft. The increased gross weight option provides operators greater flexibility between payload and fuel, representing a potential increase in loiter time of two to three hours.

The King Air 350HW is a Heavy Weight (HW) version of the King Air 350 that provides operators an increased gross weight through larger and stronger main landing gear struts, wheels, tires and brakes. The King Air 350ER is an Extended Range (ER) version that includes the enhanced landing gear and increases the fuel capacity through the addition of low drag metal fuel tanks aft of the powerplants.

Western Aircraft Named Dealer for Advent Aircraft Systems

Western Aircraft, located in Boise, Idaho, announced that it has been named an Advent Aircraft Systems dealer for its Advent eABS™ anti-skid braking system which includes the Beechcraft King Air B300 and B200 aircraft.

The eABS is an affordable, lightweight and easily installed system that requires no change to your existing brake system. It provides improved braking performance in all conditions, reduces the risk of flat-spotted or blown tires, lessens the risk of prop erosion and FOD ingestion and allows for hard braking at touchdown speeds.

Advent states that this is the first eABS for the King Air and the system is proving to be of particular interest to flight departments that transition pilots from ABS equipped aircraft.

The eABS was first certified on the Eclipse EA500/550 in December 2013 with over 110 systems in operation to date. In addition to the certification for the Pilatus PC-12 and Beechcraft King Air B300/B300C/B200, Advent's eABS is currently planned or being developed for other aircraft types, such as the Beechcraft T-6B/C and USAF T-38C, for both retrofit and OEM application.

Rockwell Collins to Provide Sand and Dust Storm forecast for Business Aviation Operators

Rockwell Collins is integrating regional sand and dust storm forecast information into the company's ARINCDirect℠ flight planning tools, enabling business aviation operators in those areas to improve safety and on-time performance.

The data used by ARINCDirect is sourced and exclusively licensed from the Barcelona Supercomputing Center, host of the first World Meteorological Organization's Regional Specialized Meteorological Center with activity specialization on Atmospheric Sand and Dust Forecast, the Barcelona Dust Forecast

Center for the EuMEA region. The data has been used by government authorities for air quality monitoring, as well as industrial and aviation interests.

The integration is currently in beta testing.

Garmin Pilot™ Adds New Tools for Pre-flight Planning and In-flight Ops for Apple Mobile Devices

Garmin announced integrated weight and balance calculations, as well as aircraft performance tables and calculations within the Garmin Pilot app on Apple mobile devices. Also new to Garmin Pilot, Freehand flight planning allows for quick and easy flight plan editing from the moving map page. Pilot-configurable checklists are also integrated within Garmin Pilot, providing pilots the option to create custom checklists that are accessible within the app. These new features and more are available as a free update for existing customers and provide pilots with even more tools to aid in flight planning and in-flight navigation all within a single mobile application.

Integrated weight & balance

Garmin Pilot is the first application that incorporates weight and balance calculations into a flight plan or a saved trip, taking into account fuel burn and more for a comprehensive look at weight and balance characteristics throughout an entire flight. Pilots can take advantage of pre-loaded aircraft types or enter aircraft weight and balance figures manually, noting the arm, moment and station of each point from the Pilot's Operating Handbook (POH). Figures such as center of gravity (CG) are easily referenced in the application relative to an active flight plan. In the event CG limits entered within the app are exceeded, pilots receive a visual alert. Additionally, customized weight and balance profiles can be shared across multiple Garmin Pilot accounts. For example, pilots that operate a single airplane in a club can easily share the same weight and balance profile across different Garmin Pilot accounts.

Enhanced performance calculation

New performance tables conveniently calculate climb, cruise and descent profiles so pilots can easily reference performance characteristics specific to their aircraft within Garmin Pilot. Pilots are provided with an interactive and graphically-rich interface to input figures that calculate aircraft performance, including variables such as power setting, fuel and distance to climb and cruise. All aircraft performance calculations also consider pertinent factors such as outside air temperature (OAT) and altitude. Several of the most popular fixed-wing aircraft models among Garmin Pilot users are pre-populated within the app, however, similar to weight and balance data, aircraft performance tables that are manually created may be shared across multiple Garmin Pilot accounts. Additional aircraft types are expected to be added to the aircraft library in upcoming Garmin Pilot releases.

Additional flyGarmin® integration

Enhanced flyGarmin integration provides customers with more opportunities to easily customize and save data within the Garmin Pilot app. Pilots now have the option to input and save their own aircraft performance characteristics manually within the flyGarmin website, which can be shared across individualized aircraft profiles with other pilots across different accounts. Customized checklists can also be created within flyGarmin and synced to the Garmin Pilot app on a mobile device.

Freehand

With a single tap pilots can utilize new Freehand flight plan editing, which can be quickly accessed via the radial menu within Garmin Pilot. Freehand allows pilots to easily plan or fly around weather, airspace, terrain or other pertinent features without leaving the moving map. Simply access Freehand by long-pressing over an active flight plan route on the map. By selecting the graphically edit icon within the radial menu, pilots can either tap individual waypoints or utilize Freehand mode to dynamically draw a route, which uses a combination of NavAids, intersections and airports to generate a new flight plan with a simple finger swipe across the map.

Customized Checklists

Checklists can now easily be created and displayed within the Garmin Pilot app. Similar to an aircraft POH, these checklists can be categorized by normal, abnormal and emergency and then sorted even further by phase of flight, such as preflight, before take-off and before landing. Customized checklists are also interactive, allowing pilots to select each individual checklist item. When selected, the checklist item turns green and a green checkmark confirms the step has been completed.

Additional features

- Pilots can easily import multiple user-defined waypoints into Garmin Pilot using a CSV file format from a computer.
- Flight plans can now be created online using AOPA's Flight Planner or SkyVector on a computer and sent to Garmin Pilot on a mobile device.

Pilots can configure home screen icons to suit their flight planning preferences. Garmin Pilot 8.5 for Apple

mobile devices is available immediately as a free update, providing existing customers access to these latest features. For new customers, Garmin Pilot is available in the Apple App Store℠ as a free download for the first 30 days. After the 30-day trial period, customers may purchase an annual subscription of Garmin Pilot for the U.S. starting at $74.99.

For additional information, visit: *www.garmin.com/aviation*.

Garmin® introduces VIRB® Ultra 30 Aviation In-cockpit Bundle

Garmin is pleased to announce an aviation-specific addition to the VIRB Ultra 30 action camera family, offering several new accessories tailored to capturing rich, high definition footage in-flight. VIRB Ultra 30 is a waterproof action camera with the power to shoot stunning Ultra HD footage at 4K/30fps. The VIRB Ultra 30 contains a suite of new features, including voice control, an intuitive LCD color touchscreen and one-touch live streaming. Built-in three-axis stabilization and enhanced connectivity with a variety of Garmin products combine to provide pilots with a premier action camera tailored to capturing superior in-flight footage.

The VIRB Ultra 30 aviation in-cockpit bundle includes a stereo headset audio cable, so pilot-to-pilot communications and air traffic control transmissions may be embedded within the video. A prop filter is also provided to eliminate propeller distortion created while filming video in-flight or capturing high quality still photos. The VIRB Ultra 30 aviation in-cockpit bundle also includes a cage mount, which is the smallest and lightest way to mount VIRB Ultra inside the cockpit.

With G-Metrix™, VIRB Ultra utilizes internal sensors such as the high-sensitivity GPS, accelerometer and gyroscope to capture even more performance data. For example, pilots can review in-flight footage to see how many G's were recorded during a flight maneuver and overlay the data overtop the video. In addition to G-Metrix data, VIRB Ultra is Connext-capable so aviation-specific data such as aircraft pitch, roll, lateral acceleration, turn rate and more can also be received from the G3X Touch flight display or Flight Stream 110/210/510 and overlaid within the video.

The VIRB Ultra 30 also features Sensory Truly-Handsfree™ voice control so customers can speak several straightforward commands to the camera – even when utilizing the headset audio cable in the cockpit. Commands such as "OK Garmin, start recording," or "OK Garmin, remember that," tag specific moments within the video so recordings can be effortlessly reviewed afterwards.

Once video is recorded, customers can take advantage of the free VIRB Mobile app, which can live-stream video footage and allow pilots to view, edit and share videos that automatically highlight the best moments in-flight. When connected, one-touch live streaming allows customers to easily share high-definition videos in real-time by streaming live to YouTube™. VIRB Edit desktop software is an easy-to-use editing program that allows customers to auto-create videos, add music, trim video clips and incorporate transitions to perfect in-flight video.

The VIRB Ultra 30 aviation in-cockpit bundle offers pilots a comprehensive package to takeoff and go flying with the most popular accessories used by pilots. This all-inclusive package is expected to be available in December 2016 for $499.99.

For additional information, visit: *www.garmin.com/aviation*.

Service Bulletins

Service Bulletin 27-3459, Rev. 2: Flight Controls – Flight Control (Gust) Lock Inspection/Replacement

Issued (Original): September 2002
Revision: November 2016

Synopsis of Change: This Service Bulletin has been revised to further define the Compliance period, correct and add flight control (gust) lock part numbers, and reflect the latest change in the publications table. No further action is required for airplane owner/operators who have already complied with previous issues of this Service Bulletin.

Effectivity:

Civil:

Beech Model 90, A90, B90, C90, C90A, C90GT, C90GTi, and C90GTx King Air Series, Serials LJ-1 through LJ-2128; Beech Model E90 King Air, Serials LW-1 through LW-347; Beech Model F90 King Air, Serials LA-2 through LA-236; Beech Model 100 and A100 King Air Series, Serials B-1 through B-94, B-100 through B-204, B206 through B-247; Beech Model B100 King Air, Serials BE-1 through BE-137; Beech Model 200/B200 Super King Air Series, Serials BB-2, BB-6 through BB-185, BB-187 through BB-202, BB-204 through BB-269, BB-271 through BB-407, BB-409 through BB-468, BB470 through BB-488, BB-490 through BB-509, BB-511 through BB-529, BB-531 through BB-550, BB-552 through BB-562, BB-564 through BB-572, BB-574 through BB-590, BB-592 through BB608, BB-610 through BB-626, BB-628 through BB-646, BB-648 through BB-664, BB-666 through BB-694, BB-696 through BB-797, BB-799 through BB-822, BB-824 through BB-870, BB-872 through BB-894, BB-896 through BB-990, BB-992 through BB-1051, BB-1053 through BB-1092, BB-1094, BB-1095, BB-1099 through BB-1104, BB-1106 through BB-1116, BB-1118 through BB-1184, BB-1186 through BB-1263, BB-1265 through BB-1288, BB-1290 through BB-1300, BB-1302 through BB-1313, BB-1315 through BB-1384, BB-1389 through BB-1425, BB-1427 through BB-1447, BB-1449, BB-1450, BB-1452, BB-1453, BB-1455, BB-1456, BB-1458 through BB-1683, BB-1685 through BB-1716, BB-1718 through BB-1720, BB-1722, BB-1723, BB-1725, BB-1726, BB-1728 through BB-2019; Beech Model 200C/B200C Super King Air Series, Serials BL-1 through BL-23, BL-25 through BL-57, BL-61 through BL-72, BL-124 through BL-170; Beech Model 200CT/B200CT Super King Air Series, Serials BN-1 through BN-4; Beech Model 200T/B200T Super King Air Series, Serial BT-1 through BT-38, BB-1314; Beech Model 300 Super King Air Series, Serials FA-1 through FA-230, FF-1 through FF-19; Beech Model B300 Super King Air, Serials FL-1 through FL-953, FL-955 through FL-1009, FL-1011 through FL-1030; Beech Model B300C Super King Air, Serials FM-1 through FM-65, and FN-1.

Military:

Model H90 (T-44A), Serials LL-1 through LL-61; Model A100 (U-21F), Serials B-95 through B-99; Model A100-1 (U-21J), Serials BB-3 through BB-5; Model A200 (C-12A/C-12C), Serials BC-1 through BC-75; BD-1 through BD-30; Model A200C (UC-12B), Serials BJ-1 through BJ-66; Model A200CT (C-12D, FWC-12D, C-12F), Serials BP-1, BP-7 through BP-11, BP-19, BP-22, BP-24 through BP-63; Model A200CT (RC-12D, RC-12H), Serials GR-1 through GR-12, GR-14 through GR-19; Model A200CT (RC-12G), Serials FC-1 through FC-3; Model A200CT (RC-12K, RC-12P, RC-12Q), Serials FE-1 through FE-9, FE-25 through FE-36; Model B200C (C-12F), Serials BP-64 through BP-71; BL-73 through BL-112, BL-118 through BL-123; Model B200C (UC-12F), Serials BU-1 through BU-10; Model B200C (UC-12M), Serials BV-1 through BV-10; Model B200C (C-12R), Serials BW-1 through BW-29.

Non-FAA Approved Airplanes:

Model B200CT (FWC-12D), Serials FG-1 and FG-2; Model B200, Serials BB-1385 through BB-1388; Model B200T, Serials BT-39 through BT-43; Model A200CT (RC-12N), Serials FE-10 through FE-24; Model B200C (RC-12F), Serials BU-11 and BU-12; Model B200C (RC-12M), Serials BV-11 and BV-12.

Compliance – Mandatory: An Airworthiness Directive has been requested on the matter covered by this Service Bulletin.

Civil Airplanes: Textron Aviation considers this to be a mandatory inspection/modification and it should be accomplished no later than the next Annual/Phase 1 Inspection, as applicable, after receipt of this Service Bulletin and annually thereafter.

Military Airplanes: For compliance information on military airplanes affected by this Service Bulletin, contact the appropriate headquarters.

Reason: This Service Bulletin is being issued to provide safety information once more regarding usage of unauthorized or altered flight control (gust) locks on various Beech propeller airplanes. Numerous accidents and casualties over the years have resulted from the failure of a pilot to remove an unauthorized or altered flight control (gust) lock prior to attempted takeoff. A review of the records from these accidents, dating back to 1975, has revealed that many of the accidents involved use of a make-shift control (gust) lock that was not the one provided by Textron Aviation. In some cases, a common bolt or nail had been inserted through the hole provided in the control column for the flight control (gust) lock. Such a device does not meet the requirements for flight control (gust) locks as defined in 14 CFR 23.679, which states in part: "If there is a device to lock the control system on the ground or water, (a) There must be a means to (1) give unmistakable warning to the pilot when the lock is engaged..."

Warranty: None.

Labor: The following information is for planning purposes only:

NOTE: No warranty coverage will be allowed for the inspection portion of this Service Bulletin.

Estimated man-hours: 0.5 hours
Suggested number of technicians: 1

The above is an estimate based on experienced, properly equipped technicians complying with this Service Bulletin. Occasionally, after work has started, conditions may be found that could result in additional man-hours.

Service Bulletin 34-4149: Navigation – Introduction of Automatic Dependent Surveillance-Broadcast Out (ADB-B Out) Installation Kit

Issued: December 2016

Effectivity: King Air C90GTi, Serial Numbers LJ-1847, LJ-1853 thru LJ-2128

NOTE: Textron Aviation-Owned Service Centers are the only facilities that can complete this service bulletin.

Compliance – Optional: This service bulletin can be accomplished at the discretion of the owner.

A service bulletin published by Textron Aviation may be recorded as "completed" in an aircraft log only when the following requirements are satisfied:

1) The installer must complete all of the instructions in the service bulletin, including the intent therein.
2) The installer must correctly use and install all applicable parts supplied with the kit drawings referenced in this service bulletin. Only with written authorization from Textron Aviation can substitute parts or rebuilt parts be used to replace new parts.
3) The installer must use the technical data in the service bulletin only as approved and published.
4) The installer must apply the information in the service bulletin only to aircraft serial numbers identified in the *Effectivity* section of the bulletin.
5) The installer must use maintenance practices that are identified as acceptable standard practices in the aviation industry and governmental regulations.

No individual or corporate organization other than Textron Aviation is authorized to make or apply any changes to a Textron Aviation-issued service bulletin, service letter, or flight manual supplement without prior written consent from Textron Aviation.

Textron Aviation is not responsible for the quality of maintenance performed to comply with this document, unless the maintenance is accomplished at a Textron Aviation-Owned Service Center.

Reason: This service bulletin is being issued to comply with operational requirements for ADS-B Out.

Description: This service bulletin announces FAA-approved Kits 90-3404 and 90-3405 that are available for installing ADS-B Out capable components that meet the operational requirements.

Warranty: No warranty coverage available.

Labor: For planning purposes only:

Work Phase	Labor Hours
Modification	88.0

From King Air Communiqué 2016-11:

Issued: December 2016

ATA 27 – Universal Travel Board Instruction Manual

90 Series (except F-90); 200 Series; 300/B300 Series

Universal Travel Board instructions have been included in the respective Maintenance Manuals for each of the models listed above. If you are in possession of the Universal Travel Board Instructions Manual, Part Number 98-32928E, please disregard and use the appropriate Maintenance Manual instructions for the applicable model. However, this manual may still be used on other airplane models.

ATA 35 – Oxygen System Barometric Pressure Switch Relocation

FL-954, FL-1010, FL-1031 and after

The barometric pressure switch associated with the auto-deployment oxygen system has been relocated from the forward side of the right-hand emergency exit to below the emergency exit and just forward of the right hand forward cabin table.

The barometric pressure switch can be accessed by removing the upholstery panel that covers the right hand forward table. To remove the panel, grasp the panel on the lower portion of the panel and lift up and inboard. The switch is located just forward of the table.

King Air 350i airplanes equipped with the Slick Interior option will have the barometric pressure switch in the new location. However, the lower upholstery panel is one piece from front to back and requires removal of the whole panel. The Model B300C (FM serial numbers) will have the barometric pressure switch in the original location.

Editor's Note: Photos shown with non-abbreviated communiqué online.

The above information is abbreviated for space purposes. For the entire communication, go to www.txtavsupport.com.

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