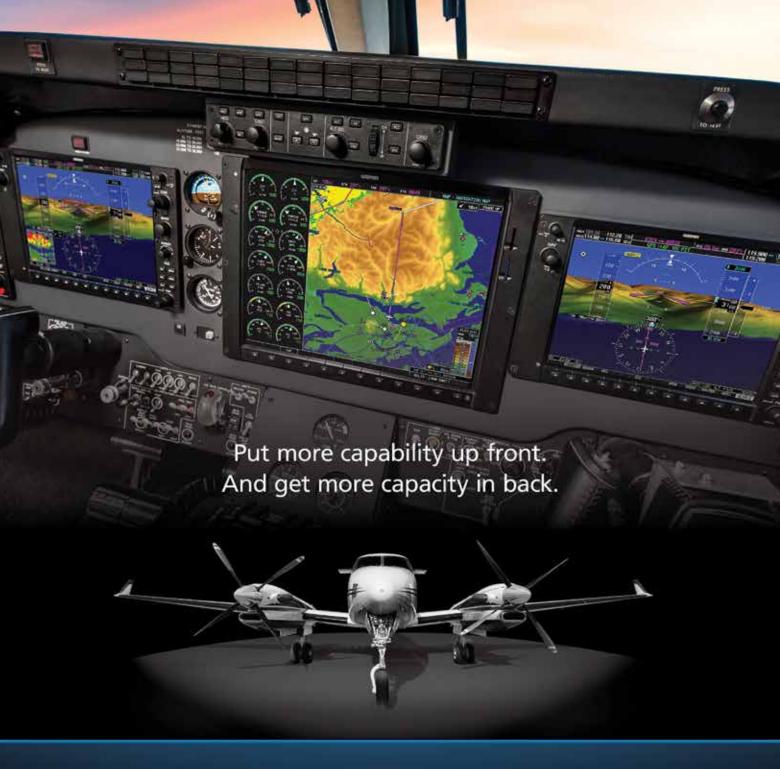




King Air Report
Product updates from NBAA 2015



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G1000/G950 Upgrade

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT





EDITOR

Kim Blonigen

EDITORIAL OFFICE

2779 Aero Park Dr., Traverse City MI 49686 Phone: (316) 652-9495 E-mail: kblonigen@cox.net

PUBLISHERS

J. Scott Lizenby Dave Moore Village Publications

GRAPHIC DESIGN

Luana Dueweke

PRODUCTION MANAGER

Mike Revard

PUBLICATIONS DIRECTOR

Jason Smith

ADVERTISING DIRECTOR

John Shoemaker King Air Magazine 2779 Aero Park Drive Traverse City, MI 49686 Phone: 1-800-773-7798 Fax: (231) 946-9588

E-mail: johns@villagepress.com

ADVERTISING EXECUTIVE ASSISTANT

Betsy Beaudoin Phone: 1-800-773-7798 E-mail: betsybeaudoin@villagepress.com

SUBSCRIBER SERVICES

Rhonda Kelly, Mgr. Molly Costilow Jamie Wilson P.O. Box 1810 Traverse City, MI 49685 1-800-447-7367

ONLINE ADDRESS

www.kingairmagazine.com

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Photo courtesy of Textron Aviation

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A Recap of King Ai

by MeLinda Schnyder

he debut and announcement of new airplane models often dominate the headlines at the annual National Business Aviation Association (NBAA) Convention & Exhibition, but this year there was also plenty of news regarding Beechcraft King Airs at the Nov. 17-19 event in Las Vegas. Among the estimated 26,000 attendees, 1,100 exhibits and 100 aircraft on static display at NBAA 2015 were companies announcing updates on products and modifications to improve in-service models of the King Air.



Beechcraft Corporation provided an update on its progress toward making Rockwell Collins' Pro Line Fusion suite the standard avionics package for its entire line of new production King Air models, a move it announced earlier this year.

The company has received type certification from the Federal Aviation Administration (FAA) for the new Pro Line Fusion-equipped King Air 350i/ER and said deliveries for those models, as well as the King Air 250, will begin before the end of the year. In addition to the avionics change, factory King Air 350i/ER and King Air 250 aircraft now come standard with Wi-Fi and electronically dimmable window shades. Certification for the Pro Line Fusion-equipped King Air C90GTx is expected in the first half of 2016.

"Our product roadmap is focused on satisfying our operators' requirements, and making Pro Line Fusion standard on our production King Airs is in direct response to customer feedback," said Christi Tannahill, Textron Aviation's senior vice president, Turboprop Aircraft and Interior Design. "Offering the latest technology in the cockpit and cabin has resulted in great market reaction; our owners and operators clearly appreciate that these new features improve the overall flight experience and value of the King Air."

According to Rockwell Collins, Pro Line Fusion features the industry's only certified touch screen primary flight displays and is also available as an upgrade for Pro Line II or Pro Line 21 avionics-equipped King Airs.



The panel of the new Pro Line Fusion-equipped King Air 350i, which recently received FAA certification; deliveries should begin before the end of the year.

The following is a roundup of other King Air news from NBAA 2015:

Sandel Avilon avionics

Vista, California-based Sandel Avionics, Inc. introduced Avilon, a retrofit flight deck for the King Air 200 with a guaranteed price of \$175,000 fully-installed. The company said it will begin shipping the King Air 200 systems in June 2016 and eventually will offer Avilon for all King Air models.

Designed to enhance safety, affordability, and installation efficiency, Avilon arrives assembled from the factory as an integrated panel replacement. Sandel said this eliminates the complex and time consuming task of building custom wire harnesses, racks and assemblies. Nearly all legacy avionics and associated wiring are completely removed from the aircraft, allowing installation centers a clean replacement of the old panel with a weight savings between 100-150 pounds.

The system includes all the components of a NextGen flight deck, including radios, Flight Management Computer (FMC), sophisticated audio control, ADS-B capable Mode S transponder and high performance flight director/autopilot. Information is displayed to the pilot in an easy-to-consume format, and highlights the data that is most relevant to the current phase of

flight. The patent-pending Avilon Path Guidance Panel, which integrates tactical aircraft control with the FMC, provides a continuous displayed path, making single-pilot operations, in particular, safer and less stressful, the company said.

Certified dealers for selling and installing Avilon are Cutter Aviation, Landmark Aviation and Stevens Aviation in the United States and Rocky Mountain Aircraft in Canada. "We have handpicked dealers who understand King Air owners and operators, and also have an appreciation of the enormous change Avilon brings to the retrofit avionics industry," said Gerry Block, president and CEO of Sandel. "Our dealers have all committed to a fixed fly-away price which guarantees our customers a predictable upgrade experience." sandelavilon.com

Commuter Air Technology 350ME

Commuter Air Technology, headquartered in Oklahoma City, introduced its CAT 350ME (maximum endurance), which brings carrying capacity and endurance upgrades to the King Air B300 through two supplemental type certificates. The company secured the CAT 350 operational gross weight increase STC in July and expects final approval of the CAT 350ME fuel tank STC in the first quarter of 2016.





Commuter Air Technology's 350ME gives carrying capacity and endurance upgrades to the King Air B300 through two supplemental type certificates—one that increases operational gross weight and the other provides a fuel tank with the largest capacity of fuel in the market, adding a total of 280 gallons.

"CAT's 350 gross weight increase and 350ME fuel tanks enable our customers to fly their King Air from coast to coast: Los Angeles to Miami, or internationally across the Atlantic, without the need to refuel. This has been unprecedented – until now," said Darryl Wilkerson, Commuter Air Technology's president.

CAT 350ME fuel tanks have the largest capacity in the market, adding a total of 280 gallons of fuel and achieving flight time of 12-plus hours with a range of 2,760 nautical miles. This accounts for a 15-plus percent improvement over industry leading solutions currently in the market, the company said.

The operational gross weight increase provides an overall increase in operating weights for the B300 aircraft with increased ramp weight to 16,600 pounds, take-off weight of 16,500 pounds and landing weight of 15,675 pounds. The upgrade also supports the additional weight of the CAT 350ME fuel tanks and minimizes the impact to the carrying capacity for full fuel load operations. commuterair.com

BLR Aerospace Whisper Prop

BLR Aerospace announced that 10 Whisper Prop systems have been sold for King Air 90, 200 and 350



According to flight test data, BLR's certified five-blade, carbon fiber Whisper Prop provides between a 30 and 50 percent reduction in noise measured in dba, as well as some performance gains.

aircraft, and that operators are verifying the effectiveness of the ultra-quiet, low-vibration propeller system.

"The jury is in," said Dave Marone, BLR's vice president of Sales and Marketing. "Whisper Prop is incredibly smooth and quiet providing a step change in cabin comfort."

BLR introduced the fully certified five-blade, carbon fiber propeller in May. The system has a natural composite core and is manufactured by MT-Propeller of Germany. It is available for installation on King Airs individually or as a package with BLR Winglet Systems, which increases wing aspect ratio to reduce induced drag to provide improved speed, climb, fuel efficiency and handling qualities.

The company said its King Air C90GTi flight test data shows that Whisper Prop provides between 30 and 50 percent reduction in noise measured in dba, depending on audible frequency, when compared to the standard King Air C90GTi propeller. The data shows performance gains too, with BLR reporting that King Air 350 operators who install Whisper Prop can expect a six percent reduction in takeoff time from brake release to VR speed. blraerospace.com

Raisbeck/Hartzell swept-blade props

Two of Raisbeck Engineering's newly designed King Air 350 swept-blade propellers manufactured by Hartzell Propeller Inc, in Piqua, Ohio, have reached the order-taking stage, the companies announced at NBAA, where both propellers were on display. The four-blade aluminum propellers will begin delivering in January 2016 and the five-blade structural composite propellers in April 2016. Both have completed FAA certification flight tests and documentation, with STCs expected soon.

The new King Air 350 propellers are an extension of the Hartzell/Raisbeck swept-blade technology already developed for the King Air C90 and King Air B200 series. The companies said the upgrades offer increased across-the-board performance, lower cockpit and cabin sound levels and a striking ramp presence.

"We have greatly advanced the technology of propellers by taking advantage of the aerodynamic effect of blade

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Raisbeck Engineering is now taking orders on its newly designed King Air 350 swept-blade propellers manufactured by Hartzell Propeller. The four-blade aluminum propellers and five-blade structural composite propellers have completed FAA certification flight tests and documentation, with STCs expected soon. According to the companies, the propellers offer increased across-the-board performance, lower cockpit and cabin sound levels and a striking ramp presence.

sweep, the strength of lightweight structural composites and robotic manufacturing technologies for both composite and aluminum blades," said Joe Brown, Hartzell's president. "As a result we can offer across-the-board performance improvements in all phases of flight." hartzellprop.com, raisbeck.com

CenTex saddle tanks

Waco, Texas-based CenTex Aerospace, Inc. exhibited its newest saddle tank for King Air 90, 200 and 300 series aircraft. The ST72 provides 72 gallons of additional fuel capacity plus a 55-inch long by 28-inch wide cargo compartment. CenTex's saddle tank line already includes the ST190 and ST120.

The company also highlighted its HALO 250 conversion for King Air 200 series aircraft that increases payload capability by moving the airplane into commuter category and approving a MTOW of 13,420 pounds. The conversion also adds safety features found only on commuter and transport category airplanes. Textron Aviation is offering the Halo 250 conversion as the enhanced payload option on new King Air 250s, and according to CenTex, one-third of new owners selected the enhanced payload option during the past year. Aircraft with HALO 250 are operating in North America, Central America, Europe, Australia and the Middle East. centex.aero

Nextant Aerospace's G90XT

Nextant Aerospace announced it has received FAA certification for the Nextant G90XT, a remanufactured Beecheraft King Air C90.

Assembled at the Nextant facility in Cleveland, Ohio, the G90XT features General Electric H75-100 engines that Nextant said improve high-altitude performance along with an approximate 10 percent improvement in specific fuel consumption. The airplane's fully-integrated Regent flight deck is based on the Garmin G1000 and also incorporates a series of safety features designed to significantly enhance single-pilot operations, including what the company said is the first of its kind, digitally controlled, single-lever power control technology. There's also a new interior and a new environmental cooling system that Nextant said moves 300 percent more air in the cabin.

"Our goal was to deliver an entry-level, twinengine turboprop that offered the best combination of overall value, performance and cabin comfort in the category. We specifically focused on creating the safest single-pilot operating platform in the industry, and the G90XT has exceeded our expectations," said Jay Heublein, Nextant's executive vice president. nextantaerospace.com



Nextant Aerospace announced it has received FAA certification for the Nextant G90XT, a remanufactured Beechcraft King Air C90. The company said the airplane has exceeded its expectations of being an entry-level, twin-engine turboprop that offered the best combination of overall value, performance and cabin comfort, as well as being the safest single-pilot operating platform in the industry.

Trying to decide between a Jet and a King Air? Contact us today to find out about the finer points and benefits of each model!



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CENTEX AEROSPACE GWI STC SERIE INCREASES MTOW TO 13,420 LBS



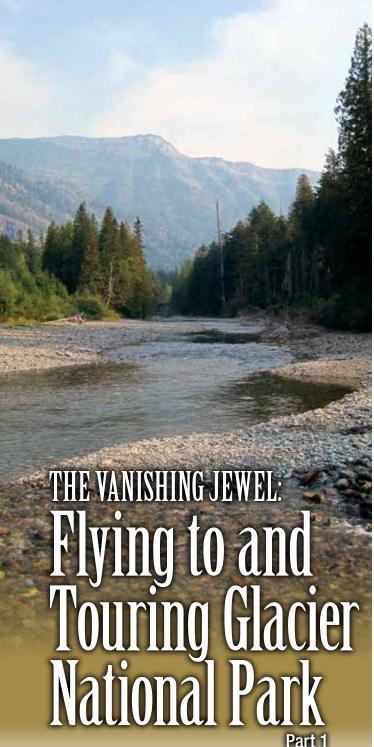
Fly Farther, Faster and Safer

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FASTER — INCREASES M_{MO} FROM .52 TO .58 MACH

SAFER — INSTALLS FIVE NEW SAFETY SYSTEMS





Just upstream from the impressive McDonald Falls, McDonald Creek is a shallow, winding stream of ice-cold glacier watch. The rocky shores and many trails and paths to them give ample opportunity to explore off the beaten path without wandering too far from it.

seasons ever. I'd been watching the Park Alerts, NOTAMs, and fire-related TFRs for a couple weeks, hoping the fires threatening Glacier National Park (GNP) would soon be contained. After all, this might be my one and only opportunity to visit Glacier as a tourist, and the kids were at great ages to do so. Most importantly, the old axiom that you can always go next year because the mountains aren't going anywhere, does not apply to GNP. The park is best known as one of the few places to see true glaciers in the continental United States, yet those glaciers are disappearing at an alarming rate.

You Can't Get There from Here

It would be an understatement to say that GNP is remote. Nestled on the Canadian border, in northwestern Montana, Glaeier adjoins Canada's Waterton Lakes National Park. Waterton is in the extreme southwestern corner of Canada's Alberta Providence, bordering British Columbia. Both parks are quite distant from any significant population. The closest sizable city to GNP is Kalispell, Montana (population: 21,000), about an hour's drive from the west park entrance. Those entering the park at the east gate most often come through Great Falls, Montana (population: 60,000), nearly a four-hour drive away. My family and I had been trying to get to Glacier for years.

I'd gotten a taste of the area a few times when piloting charter flights into Kalispell and Great Falls. While both airports have airline service, neither are served by anything larger than regional jets. That translates directly into high airfares for the minimal number of airline seats to choose from. Driving from our Wisconsin home would take roughly 24-hours non-stop. Taking a train would be wonderfully scenic (both the east and west park areas are served by train), but the distances were still too vast for us to cover in the allotted time. Airlining into Great Falls would cost us almost an entire day in the park, due to the long roundtrip drive. Paying the expensive airfare into Kalispell, also required us to fly from the Midwest to the West Coast, then back east to Montana (not exactly the most time-efficient routing). For those reasons, combined with its short tourist season and our personal time commitments, we'd missed the annual window for visiting GNP year after year. That frustration was only exasperated by our knowledge that the glaciers were melting away faster with each passing year. There was only one reasonable solution for a pilot and his family: General aviation to the rescue!

Gateway to Glacier

We decided that flying ourselves into Kalispell's Glacier Park International Airport (KGPI) would be the time-saving solution we required. Our route inbound would take us just south of the park across the Lewis

By Matthew McDaniel

n cruise flight, we had reached the halfway point across the expansive width of Montana. The smoke that had been looming ahead, obscuring the western horizon in a thick and dingy haze, was now upon us and reduced forward visibility to almost nil. Peering out the side window and downward, the terrain features were visible as though looking through yellow stained-glass in need of a good washing. Extreme drought had parched most of the western United States throughout 2015, contributing to a deadly wildfire season. The Pacific Northwest was particularly hard hit, with Washington and Oregon experiencing their most destructive wildfire



& Clark and Flathead National Forests, and Flathead Lake. Prior to reaching the mountain crossing, we'd broken out of the dense smoke and were now cruising well above broken clouds. This made the location of the ongoing forest fires obvious, as their smoke plumes rose well above our altitude. I asked to make deviations around the plumes (all of which had TFRs associated with them, mostly from 12,000 feet to the surface to clear the airspace for aerial firefighting aircraft). Initially, we were assigned the RNAV (GPS) Z Runway 2 approach into GPI, because the ILS was out of service. This required us to navigate well west of the airport to the Initial Approach Fix (IAF), as there was no eastern transition into that approach. Thankfully, ATC soon reported the ILS was again operational and offered us vectors to the ILS 2. We readily accepted this time-saving clearance and began step-descending as the mountains fell into the valley. Upon landing, we exited the runway adjacent to our chosen FBO.

Glacier Jet Center proved to be very helpful both before and during our visit, arranging a rental car for us and pulling it planeside upon our arrival on their apron. Fuel was reasonably priced and the facilities were first class, yet loaded with rustic charm. The receptionist provided a local map to help us navigate to our hotel in West Glacier and was even kind enough to mark a couple of known speed-traps along the route! She also had current information on road closures and travel restrictions associated with the fires. After the long flight in, we were ready for lunch and the Jet Center recommended Montana Coffee Traders, in the little town of Columbia Falls. Far more than a coffee shop, it was a perfect introduction to the locals and their casual cuisine. The place was packed (always a good sign), the staff was friendly, and the food was excellent.

One of the dozens of 1930's White Motor Coaches operated as tour shuttles within Glacier National Park, makes a photo-op stop along the Going-to-the-Sun Road. Since the early 2000s, they've been riding on modern Ford chassis, with clean-burning propane engines and other safety improvements.

Crown of the Continent

The vast ecosystem of Glacier and Waterton Lakes is one of the most pristine remaining in North America, with its thousands of native plant and animal species and hundreds of glacier-fed lakes, rivers, and streams. In 1932, the combined U.S. and Canadian parks were designated Waterton-Glacier International Peace Park (the world's first international peace park). Both parks are also designated World Heritage Sites (sites of cultural and natural importance to all humanity). While GNP itself covers over one million acres (1,500-plus square miles), all associated protected lands on both sides of the border encompass 16,000-plus square miles (over 10.2 million acres).

The wild solitude of Glacier beckons hikers, photographers and naturalists with its 700-plus miles of marked trails. Yet, the park is teeming with sites and structures on the National Register of Historic Places. Those interested in geology will find some of the best preserved and most accessible examples of ancient rock in the world, due in large part to the Lewis Overthrust. As the Rockies formed millions of years ago, this area of rock (hundreds of miles long and several miles thick) was forced upward, displacing newer rock. The end result was upper rock one-and-a-half billion years older than the lower rock it now rests upon, leaving fossilized records of some of the earliest life anywhere on the planet. These fossils were once part of an ancient seafloor that now lies among mountain summits. Scientific significance aside, even the casual tourist is enthralled by the easily spotted

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wildlife, the 200-plus waterfalls, and the sweeping vistas of Glacier that seem to refuse to relinquish your gaze.

West Glacier

Reaching West Glacier, we checked into a motel of the same name. While small and basic, it was clean and served its purpose for us. Best of all, a few steps outside our door was a beautiful, wildflower-filled gorge of the Flathead River (Middle Fork). Trails down to and along its banks were accessible on either side of the bridge straddling the river between West Glacier Village and the park entrance. We ventured into the park to get the lay of the land and updates on the fires and smoke. My biggest concern was whether the famous Going-to-the-Sun Road, which traverses the park, would be open, as the Reynolds Creek fire threatened parts of its eastern half, both north and south of the road. We were relieved to learn the whole road was open and that stopping was restricted only on the eastern third. The fire had been contained and only hot-spots remained.



The author's son had a brief staring contest with a juvenile deer near Fish Creek, on Lake McDonald's west shore.

A deer doe and her two fawns graze and drink peacefully along a rocky shore of Lake McDonald, near Fish Creek. Observing quietly from a safe distance, we were able to watch them for about 10 minutes before they moved back into the forest.

A Canadian Visitor's Center in West Glacier was filled with information and exhibits about our northern neighbor's connected park and the many other National Parks and protected areas deeper into Alberta and British Columbia. Leaving there, we spent the remainder of the afternoon exploring Apgar Village and trolling about on Lake McDonald (Glacier's largest lake at 9.4 miles long, over 460 feet deep, and covering nearly 7,000 acres). Smoke limited our views, but not our enthusiasm, and we stayed into the evening. We wandered up Lake McDonald's west shore to Fish Creek for a solitary picnic dinner on a rocky beach and some casual hiking. We watched a deer doe and her two fawns grazing peacefully along the shoreline and drinking from the lake.

Going to the Sun and Beyond

We rose early for a hearty breakfast at the cafe adjacent to our motel. We were discovering that the combination of late season (end of August) and the smoke had made even the villages feel desolate. We were told many folks had checked out early due to the smoke. Their loss was our gain as the night had carried a front through and shifted the winds and smoke back west, creating much improved visibilities over the previous day. We were anxious to drive the marvel of 1920's engineering; a 53-mile road that's impassable for eight months a year due to massive snow accumulations. Taking 11 years to complete (1921-32), it is both a National Historic and a National Civil Engineering Landmark. While we chose to drive the Going-to-the-Sun Road ourselves, I watched the public transportation navigating the switchbacks and steep grades with fascination. The National Park Service operates a fleet of around 70 1930's-era White Motor Coaches. Restored in 2001 by Ford, they now ride on modern Ford chassis, powered by efficient propaneburning engines. Their driver/tour guide, known as "Jammers," stop at the most popular scenic overlooks and visitor centers, as well as the major lodging areas on both sides of the park.

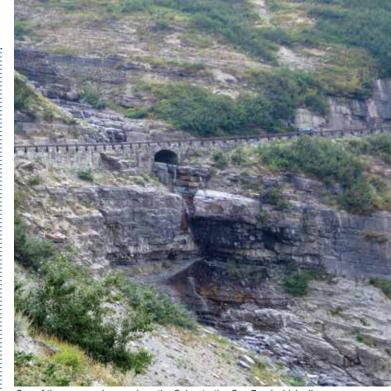
The road is narrow and lacks guardrails in the areas where the tons of snow and resulting avalanches have

destroyed every attempt to build them. However, it's smooth and relatively easy to drive in a typical rental car (vehicles over 22-feet long are prohibited). We stopped at several scenic spots along the way and viewed magnificent peaks, valleys, and various wildlife. We spotted mountain goats perched precariously on steep cliff faces, hundreds of feet above us, and bighorn sheep grazing on rock-strewn meadows. At the apex of the road, several trailheads emit from Logan's Pass Visitor's Center. Hiking with kids, we skipped the famous Highline Trail (which winds along cliff edges and mountain ridges). Instead, we chose the three-mile Hidden Lake Overlook trail. While mildly challenging in places, its scenery, wildlife, lakes, and glacier views did not disappoint. During our time there, I was trying to picture the whole of Logan's Pass (including the buildings) as they are in winter (literally buried under a mountain of snow). Just a little further east are Big Drift, Garden Wall and the Continental Divide areas, which often see snow depths of 80 feet! While it usually takes about 10 weeks for snow plow crews to reopen the Going-to-the-Sun Road each year, it can take a full month to clear just this one-mile stretch, using equipment that can move 4,000 tons of snow per hour!

Fire damage was obvious on both sides of the eastern portion of the Going-to-the-Sun Road, with vast swaths of trees standing naked and charred. Scenic overlooks were closed to prevent people from wandering into still-volatile areas, yet the scenery was still majestic, when viewed with the knowledge that before modern firefighting, forests burned and rejuvenated and that such fires were, in fact, necessary to sustain a balanced ecosystem. The final 10 miles of the Going-to-the-Sun Road follows the north shore of St. Mary Lake (Glacier's second largest lake), ending at the community of St. Mary (year-round population: less than 50). There, we checked into our cabin at the St. Mary Lodge and Resort and picnicked on our porch, a few yards from Divide Creek, enjoying views of Otokomi and East Flattop Mountains. The St. Mary Visitor's Center provided tips for seeing the eastern park and we ventured out again for a quick hike to a historic ranger station.

Afterward, we decided there was enough day left for more exploring and proceeded north to the Many Glacier Hotel and the area known as the American Alps.

In the next issue, we'll continue our tour of Glacier National Park and proceed north to the adjoining Waterton Lakes National Park in Canada. Part 2 will hopefully provide you more reasons to put a visit to Glacier on your short-list of "must go" destinations. Finally, we'll discuss departing the area via general aviation.



One of the many archways along the Going-to-the-Sun Road which allow the glacier-fed waterfalls to flow, uninterrupted, under the roadway and into the valley rivers below.

About the Author: Matthew McDaniel is a Master and Gold Seal CFII, ATP, MEI, AGI and IGI. In 25 years of flying, he has logged over 15,000 hours total, over 5,500 hours of instruction-given, and over 2,500 hours in the King Air and BE-1900. As owner of Progressive Aviation Services, LLC (www.progaviation.com), he has specialized in Technically Advanced Aircraft and Glass Cockpit instruction since 2001. Currently, he also flies the Airbus A-320 series for an international airline and holds six turbine aircraft type-ratings. Matt is one of less than 25 instructors in the world to have earned the "Master Certified Flight Instructor" designation for seven consecutive two-year terms. Mr. McDaniel can be contacted at (414) 339-4990 or matt@progaviation.com.

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Ask the **Expert**

Answers to a Variety of Good Questions from Readers

by Tom Clements

always appreciate when readers of our magazine take the time to contact Kim Blonigen, our editor, with operational questions they would like me to address. I try to reply as rapidly as possible to the person who is posing the question. Sometimes, ideas for an entire article or two are prompted by the question(s), whereas at other times a brief personal response is all that is necessary.

This month I will present the questions and my answers to a variety of topics that have been received in 2015. To all who wrote to us, thank you for your input!

The first question comes from Ray Orr, Chief Pilot for Air Charter Coordinators of Brisbane, Australia. Ray wrote, "In the *King Air* magazine, the photo in a Raisbeck advertisement of the belly of a King Air 200 while in flight shows that a wing strap has been fitted. Could Tom explain the strap history? We don't see many straps here in Australia and the industry experts are mostly too young to know the real history."

Oh boy! Now here's a meaty topic upon which I could spend a lot of ink! I will give a rather abbreviated version of the story here and suggest a Google® search for those who want to read even more about wing spar straps.

David Saunders of Camarillo, California, president and owner of Aviadesign, came out with a Spar Strap for the Twin Beech 18 after there had been seven wing separations and the FAA mandated a strap modification, yet Beech offered no strap kit. A few years later, in 1974 and 1975, two relatively low-time model 99s (19-passenger, unpressurized, PT6-powered, commuter planes) showed up with lower main spar problems and Allegheny Airlines commissioned Saunders to develop a failsafe strap for the 99 that would extend the wing spar life past the low 10,000-hour life that Beech had mandated in response to the problems' appearance. Beech's fix was to come up with the "Super Spar" in which the bolt's bathtub fittings were integral with the lower spar cap. (This design was also used on the first 1,000-plus 200s, as well as on F90s.) To change from the old to the new spar was a huge job that only a few Beecheraft facilities could accomplish, and it was very expensive with a lot of downtime. But Mr. Saunders' strap provided a "secondary load path" by connecting the left and right outboard wing sections to each other



via a strap that ran through the wheel wells and under the fuselage. The outboard wings were modified with two doublers – one running almost to the tip, and a second one terminating near the tie-down ring. The strap was bolted to the doubler just outboard of the wheel well. Before the holes were drilled and the strap bolted on, 1,000 pounds of sand bags were placed on each wing tip to flex the wings down so that the strap would always be carrying some of the lifting loads.

There was concern about "galvanic corrosion" between the steel strap and the aluminum wing and spar structure, and the spar cap was insulated from the strap in the wheel well.

Beech, of course, thought that Mr. Saunders was Satan himself, succumbing to the NIH (Not Invented Here) syndrome and cutting a great deal into their sales of super spars. The strap did not eliminate the requirement for bolt and bathtub fitting inspections and one drawback was that the strap needed to be removed for that inspection. Later, Saunders made a revised strap that was widened around the bolt location and had a hole in the center that allowed inspection while still installed.

Some of those 99s that should have been parted out when they hit 10,000 hours are still going strong with the strap with over 50,000 hours. Saunders went on to develop and sell straps for almost all King Air models. In the late 1970s, two King Airs – one was an E90 and the other a 200 – had the lower forward wing bolt break in flight. The 200 (after the crew heard a "snap" and observed the outboard wing making small movements

on its own!) landed successfully, while the E90 had the wing come off, crashed and killed the one occupant. In both cases, tests showed that the bolt had been weakened by "stress corrosion." It was a real fiasco of a time as all bolts had to be pulled and inspected, and more problems were being caused when this was done incorrectly, especially when a washer was installed backwards, gouging the fitting. The outcome was (1) putting the bolts in a lubricated environment instead of "dry," (2) instituting an inspection and replacement requirement for the bolts, and (3) offering a nickel-alloy "Inconel" bolt that was much more corrosion resistant and allowed longer inspection/replacement intervals. (I doubt that any steel bolts remain in King Airs.)

Saunders jumped into the fray with a very extensive advertising campaign that implied the King Air wing was unsafe without that secondary load path his strap provided. Many, King Airs had the strap added. A Canadian Government flight inspection King Air lost a wing, too. (The strap is very popular in Canada!) Personally, I think it is unnecessary – with proper bolts and inspections – but I have nothing against an airplane with a strap. In fact, unless someone points it out, most pilots wouldn't even notice it.

I was actually in attendance at a King Air Maintenance and Operation Symposium held at an NBAA convention in the early 1980s. Linden Blue was then the relatively

new president of Beech Aircraft. He was sitting in the back of the crowded room and observing a rather contentious exchange between the Beech customer support people and the somewhat angry operators who were needing assurance that the wing was safe. Mr. Blue stood up, was recognized from the podium, and asked for a show of hands of all of those who would feel more comfortable if there was a secondary load path. Well over half of the hands went up. Then Mr. Blue said something to the effect of, "Well, if so many of you want it, then we'll provide it for you, using Beechcraft quality design and manufacturing." You should have seen the look of surprise and horror on the faces of the Beech customer support and engineering people there! After telling people why the strap wasn't necessary and what a waste it was, their boss had just "endorsed" it and put them on the hook to make one!

So off to the drafting boards they went and came out with the "Beechcraft Center Section Bridge"... they couldn't call it an evil "strap," after all. Because of the argument they'd made about the dissimilar metal corrosion concerns, their strap was made of aluminum. Hence, it is about three times as thick as the Aviadesign strap, has a huge fairing that sticks down quite far below the fuselage, and is ugly as sin. To "hurt" Saunders, they charged the same price as his – about \$50K, I think – and lost at least that much on every kit.



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US STC SA02963CH and SA03114CH EASA STC 10049107 Visit us at our web site: aerospace-resources.com In a few years, the furor had died down, Beech had come out with the totally new lower forward wing attach fitting for King Airs, in which the bolt goes through "knuckles" and is now under shear, not tension, load, and the "need" for any type of strap faded away.

The second question comes from pilot Chris Donnelly. He writes, "When parking the airplane after a flight, I always move the prop levers back into the full forward position after shutdown has been fully completed, before I put the control locks into place.

I have been doing this for about 20 years now and have never found a reason not to. It's just my personal way of leaving the aircraft until I return for the next flight. Most guys are taught to leave the prop levers in feather until the next flight, but my reasoning was that you have to push them forward before you initiate the start anyway, so why not return them to that position once you have completed a normal engine shut down? I have never noticed any difference in the start in any way, whether they were moved forward just before start, or whether they were left that way overnight.

This is something I have wondered about, but no one has ever been able to explain exactly why the POH recommends leaving the levers in feather after shutdown is complete."

There is absolutely no reason that your habit is bad in any way, Chris. It is my guess that the checklist is written as it is so that a pilot in a rush to exit the cockpit and get to the cabin door to aid the passengers' egress does not place the prop levers back forward too soon, before the props have stopped, which could lead them to start partially unfeathering again. But so long as they have truly stopped – or darn close to it – then there is no downside. I, too, often do it your way, just getting one step ahead of the game for the next start. (Although there are times I start in feather, to reduce noise and prop wash.)

In fact, I see one tiny advantage of your procedure: As you may recall, the prop governor has a spring that is always trying to push the speed select lever to maximum RPM, so if the cable connection ever comes loose, the governor will go to and maintain maximum speed. So you are placing that spring in its natural, relaxed state, rather than leaving it stretched to its limit. Take that, naysayers!

Matthew Robinson wrote, "I have a question for Tom regarding the electric landing gear systems in King Airs versus the hydraulic systems that replaced them around 1984 and after. Are the electric systems more failure prone, or at least more maintenance sensitive with frequent replacement of motors, switches, wires, and retraction chain for the front gear?"

No, I don't think there is a significant reliability difference between the electromechanical and

electrohydraulic landing gear systems. The hydraulics are a bit easier to rig without limit switches to adjust, yet shops are very familiar with the old system since it has been around for so long (beginning with the Twin Bonanza). There is a very slight advantage in the newer system since it has a totally separate emergency extension line going to each actuator yet failures of the normal or the emergency system in the older as well as the newer styles are very rare.

I think other considerations – engine times, avionics, modifications and appearance – would play a larger role in my decision making when buying a used King Air than the type of gear it has.

Lew Marden had this query: "I am currently flying a B200, BB-1896. Is it acceptable to have fuel transfer from the main tanks into the aux tank? We are experiencing a transfer rate of between six and 12 gallons per 24-hour period while the plane sits on a level floor inside a hangar. Also, is it common for King Airs to have inaccurate fuel gauges?"

Hello Lew,

Where are you located? The biggest enemy of accurate fuel quantity gauges is moisture. Here in the American Southwest where I live, the gauges usually remain quite trouble-free, once the access panels to the quantity probes and the wiring coming out of the probes have

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both been carefully sealed to prevent the ingress of new water. However, it is not uncommon for the gauges to be inaccurate for a while after a wash job, until things dry out. Those operators who are based in moist, humid climates fight a lot more problems in this area and it is sad, but true, that the gauge accuracy is not generally a King Air strong point. I surely wish the 200s, like the 300s, had an independent low-fuel-warning system – an optical sensor in the nacelle tank – but they do not, not even as an option.

As for the fuel migrating from the mains back into the aux – no, that should not happen. There are three vent connections at the top of the nacelle tank - under that oval plate - and if one or more of them leaks, it allows the backwards flow to take place. (There is also a return path back through the jet pump, but seepage here is not as common as from the nacelle top.) This is most likely to happen when the plane lands while still transferring aux fuel, before the auxes are empty, if one follows the Beech procedure precisely. I recently wrote an article for this magazine about the problems associated with "over-stuffing" the mains with aux fuel, and this takes place all the time unless you use our "trick." The trick is to keep the left and right Aux Transfer circuit breakers pulled as standard practice, only pushing them in at Top-of-Climb, when you have aux fuel, then pulling them again when the auxes go empty. This eliminates the pressurizing of the mains and



goes a long way towards alleviating the type of situation you are observing.

The final question comes from Aircraft Maintenance Manager Fixed Wing Fleet, Carolinas HealthCare System /MedCenter Air, Ken Blevins, who writes, "The first question is: In the King Air B200, if the brake de-ice is left on, the landing gear is retracted after the 10-minute time delay that turns off the brake de-ice system, does the "Brake De-ice" annunciator remain illuminated or does that annunciator turn off? We have looked at the wiring diagrams for this system and we do not see a clear cut circuit that would turn the "Brake De-ice" annunciator off if the system is turned off by the time delay printed circuit card.

The second question: In the King Air B200, what prevents the propellers from going into the Beta range or even into Reverse if the power levers are selected to the Ground Fine or Reverse positions in flight?

Apparently our pilots are being told by CAE/SimuFlite that it is 'not possible' for the propellers to enter Beta range or Reverse in flight even if someone was brave enough (stupid enough?) to try it.

I have been working on all series of King Air aircraft for over 20 years now, and I do not believe that there is anything installed on the King Air airframe or on the PT6 engines that would actually prevent or make it impossible for the propellers to enter Beta or Reverse in flight."

Hi Ken,

First, yes, the Brake Deice annunciator should extinguish if the timer times out. Go ahead and try it on a flight or two; it won't hurt anything, especially if you turn it on at altitude where it's cold. Did you read my recent article on this system? A couple of comments from there: First, even if the gear is up for only a few minutes – say, three – and then the switch is turned off, the timer keeps running, so after the total 10 minutes elapse, it won't be able to be activated for the "rest" of the time. Second, it can be reactivated by, of course, extending the gear, but also by cycling the circuit breaker.

As for the second question, it looks like CAE/SimuFlite is putting out some bad information. We can only enter Beta and Reverse when the propellers are in an underspeed condition, turning at less than the selected propeller governing speed. Depending on the exact model of propeller installed, even with the propeller governor set at its maximum speed (2,000 RPM) and with the power levers at Idle, the indicated airspeed must still get below 110 knots or so before the propellers will finally encounter their Low Pitch Stop and hence start to slow down, or underspeed. So in *most* flight conditions, it is true that selecting Beta or Reverse will merely tend to stretch the Reverse cable and not achieve anything except mis-rigging; the same as trying to Reverse in the

hangar. But during stall practice in flight with idle power or deep into a landing flare – oh yeah! They'll flatten right on out! Any lifting of the power levers in flight is expressly forbidden by the POH, and if they are not lifted they cannot be pulled back.

Again, my thanks to readers who have provided these good questions. Keep 'em coming!

About the Author: King Air expert Tom Clements has been flying and instructing in King Airs for over 43 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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KınaAır

King Air 350

One for the Books

by Dean Benedict

long-time, out-of-state customer called to say his R/H generator went offline mid-flight. He's got an F90, but this could happen to any King Air. For troubleshooting purposes, I suggested he swap the GCUs (Generator Control Unit) to see if the problem went to the other side, and it did. I had an exchange GCU drop-shipped to him and it was installed on the right side, putting the GCU that came off the left side back in its original position. Everything worked fine on the ground.

On the next flight, going through 12,000 feet, the right generator dropped offline again, so he brought the aircraft to my shop. We performed standard troubleshooting, such as ringing out all the wiring between the GCU and the generator to confirm continuity. We found no obvious "smoking gun," but tweaked a few things, changed the GCU and it ran great again ... on the ground.

Frustration

On the next flight, going through 12,000 feet, the right generator dropped offline yet again (by then I was getting frustrated!). I will spare you the excruciating details and the expletives uttered during this protracted fix, which came to be known as "The Great GCU Saga."

John, one of my avionics guys, and I go way back; he's a fantastic "sparky" – my term for avionics technicians. I swear those guys are wired differently from the rest of us (pun intended). His approach to troubleshooting meshes with mine, and between the two of us, we have unraveled quite a few mysteries; but this one had us stumped.

In our fight to resolve this conundrum, we went through four or five GCUs – though I think one was an out-of-box failure. We sent the starter generator out for repair and found the field was out of spees; we were hoping that would do the trick. But in the subsequent flight, after about 20-25 minutes while going through 12,000 feet, the same problem reared its ugly head.

Exasperation

We megger tested all the wires going in and out of the GCU. A megger tester will tell you if there is a short, then it's up to you to find it. Everything checked out okay, indicating there were no shorts in the wiring. All systems ran great on the ground and the R/H generator was fine on the flight home. Hooray! On the next flight ... you guessed it, the R/H generator went offline.

The exasperation multiplied exponentially; the expletives proliferated. Meanwhile, I was getting teardown

reports (and the inevitable core charge bill backs) on exchange GCU cores from earlier in the process. Two different shops squawked blown transistors at Q6 and Q7. This was like crack to John because the King Air maintenance manual includes a breakdown of the GCU. We saw that Q6 and Q7 run the line contactor, so we used a power supply on the line contactor to see if it was drawing the correct amperage – it was. We even left it going for four hours to see if it would break down from the buildup of heat – it did not.

Despair

At this stage, I think we had even exchanged the generator. I was totally beside myself and beyond frantic about the costs mounting up for my customer. I wasn't even thinking about the labor cost. I was in agony over the GCUs, the core bill backs, the generator repair and replacement, etc. My wife's attempts to placate me with logical discussions such as: "Troubleshooting is like peeling an onion, you can only go layer by layer, you can't always get to the crux of the matter on the first try..." wasn't helping at all.

I rented a GCU breakout box and teed it into the system. We flew the aircraft and confirmed that the GCU was operating normally. Then we were thinking we had a chafed wire problem that was triggered by pressurization; going through 12,000 feet measured around 3.0 psi in the cabin.



A close-up look at the cause of the perpetual problem – a small black mark on part of a wire bundle.

We borescoped the wire bundles, starting at the GCU and worked our way out. We were looking for something inside the pressure vessel, but found nothing. Totally deflated, we labored on and removed the leading edge yet again. We examined every inch of the wire bundle with magnifying glasses. There was no evidence of arcing on any portion of the airframe. Parts of the wire bundle were encased in spiral wrap which also showed no traces of arcing, but we removed it anyway. At long last we found a sign – a small black smudge on

four little wires, and one of them went from the line contactor to the GCU. Eureka!

Success at Last

We repaired that wire, as well as the Q6 and Q7 transistors in the GCU again, and put everything back together – the R/H generator has stayed faithfully online ever since. Hot diggity dog! It's a great feeling when everything finally works. My only lingering problem is understanding how the replacement of Q6 and Q7 translated into \$1,000 core bill backs each time I returned a GCU. When John did the job, it was \$50 in parts and an hour of labor – clearly I'm in the wrong business!

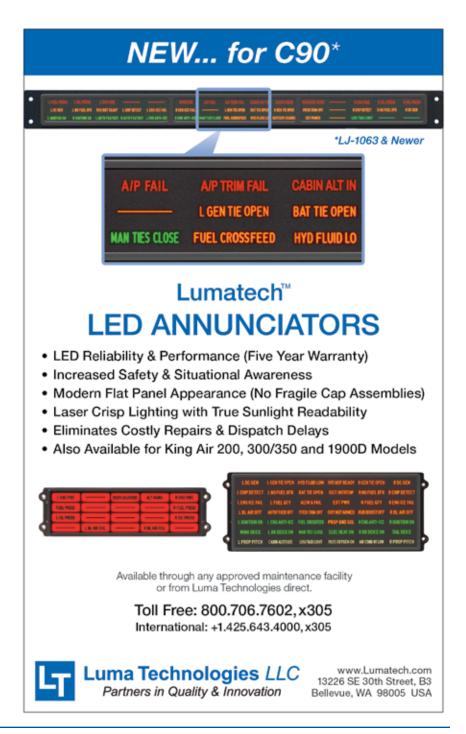
This GCU saga was one for the books for a number of reasons. The location in the leading edge isn't subject to much expansion/ contraction, so why did it short out consistently when going through 12,000 feet? And why didn't the megger testing indicate a short in the leading edge wire bundle? The wire bundle was properly tied up and even had spiral wrap added in places. Everything appeared totally normal each time the leading edge was removed.

This was quite the wild goose chase and completely unexpected in a King Air. At one point in my career, I maintained a couple of Citations for about 10 years. Chafed wires were an everyday problem. Those Citations became the bane of my existence.

Keeping the Craft in Beechcraft

King Airs do not typically get chafed wires. What happened with this F90 is rare for any King Air. In production, when the wire bundles go in, care is taken to allow for the expansion and contraction brought on by fluctuations of altitude, temperature and pressure. At least that's how it used to be.

It's been awhile since I've visited the factory, and now the Beechcraft



line is under the same umbrella as Cessna. I do not wish to cast aspersions; I just hope that the standards of excellence achieved under the watchful eye of Olive Ann Beech will be continually upheld and implemented.

I wish everyone a fabulous holiday season, a productive and prosperous New Year, and a King Air free of chafed wires.

About the Author: Dean Benedict is a certified A&P, AI, and has 40 years of experience in King Air maintenance. He is president of Honest Air, Inc., which specializes in Beecheraft King Air maintenance and repair.

If there is a particular maintenance issue you would like Dean to address in a future issue, please email Editor Kim Blonigen at kblonigen@cox.net.

Ted's Twin (Part Two)

During more than 30 years of production, the Beechcraft Model 18 series distinguished itself in peacetime and in war, emerging as one of the most successful small, twin-engine transports in aviation history.

by Edward H. Phillips

Beech Aircraft Corporation test pilot H.C. "Ding" Rankin eased both throttles forward as the latest version of Ted Wells' Model 18 accelerated down the runway. Sitting in the right seat, and acting as Rankin's co-pilot, was none other than Walter H. Beech himself. Beech scanned the engine gauges for any signs of trouble as the sleek Model 18S gained airspeed. Rankin eased the control column forward as the tail came up to takeoff attitude and the ship continued to accelerate. Moments later the Beechcraft's wings were full of lift, leaving terra firma behind for the blue skies above. "Gear up!" hollered the pilot, and Beech complied, but kept a close watch on the engine gauges to make sure all was well with the two Pratt & Whitney radial engines.

January 6, 1940, was a cold, snowy day. Beech and Rankin had just departed Lambert Field in St. Louis, enroute to Miami, Florida, where they hoped to capture the Macfadden Trophy. The race presented Walter Beech with a splendid opportunity to demonstrate the latest Beechcraft's capabilities to the aviation world and the public. Although he spent a majority of his time flying a desk as president of the company, Walter had racing in his blood and his thirst for speed was insatiable.

The Model 18S was the first "Twin Beech" to feature the R-985 static, air-cooled radial engine that was rated at 450 hp. Previous versions, including the Model 18A, 18B and 18D built in 1938-1939, were powered by Wright

Aeronautical R-760, Jacobs L-5 or L-6 radial powerplants. Initially developed in 1929, the R-985, also known as the "Wasp Junior," was designed by Connecticut-based Pratt & Whitney as a direct competitor to the R-975 built by Wright Aeronautical Corporation located in Paterson, N.J. Both engines featured nine cylinders and similar displacement. The R-985 produced 450 hp at 2,300 RPM, with a cylinder bore and stroke of 5.2 inches and a dry weight (no oil or fuel) of 653 pounds. Thousands of R-985s were built during the war, many of which would find their way onto the wings of military Model 18 Beechcrafts.¹

As for Beech and Rankin, they flew the Model 18S to victory by covering the 1,084 nautical miles between St. Louis and Miami in four hours, 37 minutes, at an average speed of more than 234 mph. Up to that time, it was the fastest speed recorded by a licensed commercial airplane during an event sanctioned by the National Aeronautical Association. As Beechcraft Model 18 historian Robert K. Parmerter recalls, "the R-985 engines were operated at 52 percent of their rated 450 hp for the duration of the race, and although 330 hours had been logged on each engine up to that time with only routine servicing, total oil consumption was a mere 1.5 quarts," whereas the engines gulped 208 gallons of aviation fuel.

The first major technical upgrade to the legendary "Twin Beech" was the Model 18S introduced in 1939. In January 1940, Walter H. Beech and co-pilot H.C. "Ding" Rankin won the Macfadden Trophy race in the prototype Model 18S. It was the first Model 18 to feature Pratt & Whitney R-985 static, air-cooled radial engines. (WICHITA STATE UNIVERSITY LIBRARIES, SPECIAL COLLECTIONS AND UNIVERSITY ARCHIVES)



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Second-place pilot Russell Holderman was flying a twin-engine Lockheed Model 12-A. The "Beech Boys" collected the tidy sum of \$3,000 for their efforts, and a few days later the Model 18S won the Congress Cup Race flown between Miami and Havana, Cuba, covering the distance in only 59 minutes and setting a speed record for that route.

The Model 18S possessed a number of key changes not found in the current production airplane, the Model 18D. Ted Wells and his engineering staff began work on the upgrades in 1938. As mentioned, chief among these was adoption of the Pratt & Whitney R-985. In addition, new, more streamlined cowlings were designed that included cowl flaps fitted to the lower half of each cowl. Another salient change centered on the two vertical stabilizers that were enlarged compared to the original configuration.

Wells and his team also improved operation of airframe systems and subsystems such as flight controls, heating

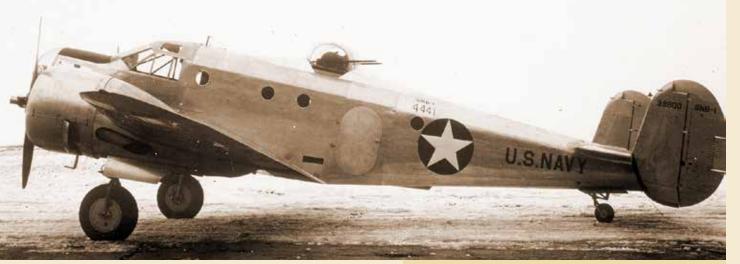
The AT-11 and AT-11A were assigned to train bombardiers who would serve in medium and heavy bombers, such as the North American B-25 and the Boeing B-17, respectively. "Top Secret" Norden bombsight was housed in the nose section. A majority of these Beechcrafts were based in the Southwest United States where good flying weather prevailed. Ten, 100-pound practice bombs were carried internally using vertical racks. More than 1,500 airplanes were delivered during the war.

The Model 18 served with distinction during World War II flying with Allied air forces around the world, chiefly in a training, transport and logistics role. A wide variety of military derivatives of the commercial Model C18S comprised the majority of airplanes built by the Beech Aircraft Corporation during the war. The photograph is of a factory-fresh UC-45B assigned to the United States Army Air Forces. The C/UC-45 also served with the Great Britain's Royal Air Force and Royal Navy, designated "Expeditor I and Expeditor II." (WICHITA STATE UNIVERSITY LIBRARIES, SPECIAL COLLECTIONS AND UNIVERSITY ARCHIVES)

and the main landing gear. Lastly, thickness of the wing skin was increased. The higher horsepower of the engines coupled with technical improvements allowed a maximum gross weight increase to 6,700 pounds from 6,500 pounds. These airframe changes applied to all Model 18S built regardless of what type of engines were installed.³

Back in 1937, production of the Model 18A had been slow to start, with only six airplanes built that year. It is important to note, however, that the factory delivered only one airplane that year – the Model 18 prototype, constructor number 62 registered NC15810. Feedback from initial operators of the new Beechcraft led to development of the improved Model 18B and 18D. The former were powered by the Jacobs L-5 radial engine rated at 285 hp, whereas the latter featured Jacobs L-6 engines rated at 330 hp. The L-6 was a new engine and helped to boost sales of the Model 18D, particularly to





customers who preferred the more powerful engine. The first of that version was built in May 1938. The interior appointments, in terms of fabric material, color and texture, were often selected or suggested by Olive Ann Beech.

Despite the improving economic conditions in the United States by 1938, selling the Model 18 proved difficult. Operators were hard pressed to come up with as much as \$37,000 for the new Beechcraft, and many business executives remained unconvinced that airplanes could be an effective tool for increasing their business. During the years 1937-1940, only 28 twinengine Beechcrafts were delivered. The winds of war, however, were beginning to blow with more intensity across Western Europe as Germany's Fuhrer, Adolph Hitler, increasing his saber-rattling rhetoric while building up the Third Reich's powerful army, navy and air forces. In addition, diplomatic relations between Washington, D.C., and the Japanese capital of Tokyo were becoming increasingly strained as the Nipponese military flexed its aggressive muscle in Manchuria and China while casting a lustful eye on the rich oil fields of Indonesia.

The Nazi invasion of Poland in September 1939 led to Great Britain and France honoring their obligation to defend Poland by declaring war on Germany. In the wake of that declaration, American opinion was steadfastly against involvement in that conflict, but as time wore on, it was becoming obvious that the United States would be drawn into the war. Any doubts about that probability were brutally dashed on December 7, 1941, when the Imperial Japanese Navy crippled the American Pacific Fleet at Pearl Harbor.

By 1940, with the war going badly for Great Britain and France, both of which entered the fray woefully unprepared to confront Hitler's modern and well-equipped war machine, the United States slowly began to rearm its own military forces. President Roosevelt was committed to helping the British by declaring America the "arsenal of democracy." Beech Aircraft Corporation (BAC) and other small aircraft manufacturers played a vital role in the United States' rearmament initiatives.

The U.S. Navy's SNB-1 was almost identical to the Army's AT-11. The electrically-operated, revolving gun turret atop the fuselage housed twin 0.30-caliber machine guns and was designed and built by Crocker-Wheeler. During the war, Beechcraft workers manufactured more than 325 of these training airplanes for the Navy. (EDWARD H. PHILLIPS COLLECTION)

Walter and Olive Ann Beech knew that if the nation went to war, their company would be called upon to produce aircraft for the cause of freedom.

When Roosevelt signed the National Defense Act of 1940, \$300 million was made available for the specific purpose of buying 6,000 aircraft for the Army Air Corps and to increase personnel to more than 3,000 officers



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and 45,000 enlisted men and women. In the wake of that law, Wichita-based BAC, the Stearman Division of Boeing and Cessna Aircraft Company began receiving contracts for large numbers of airplanes. Roosevelt's appropriation, however, was only the beginning of a massive procurement initiative aimed at preparing America for the war that would soon strike its shores.

In anticipation of a surge in demand for training airplanes, Beech Aircraft executives stretched the company's financial power to the limit, securing loans from the Federal Government's Reconstruction Finance Company to expedite construction of production facilities. Ted Wells and his engineering department soon turned their attention to design versions of the Model C18S suitable for training thousands of fledgling pilots, navigators and bombardiers.

In 1939, nearly two years before America's entry into the war, BAC delivered a military Model 18D to the Philippine Army Air Corps, and the Swedish Royal Air Force took delivery of a Model 18R modified into an aerial ambulance. One year later, the Republic of China bought six Model AT18R featuring internal bomb racks, provisions for fixed and flexible machine guns as well as a bombardier station in the nose section.

In what must have seemed like a prophetic fulfillment to Walter and Olive Ann, late in 1939 and continuing into 1940, BAC received orders from the U.S. Army Air Corps and the U.S. Navy for special versions of the Model 18S. Among these were 14 ships designated by the Air Corps as F-2 and F-2B. Designed specifically for high altitude aerial reconnaissance training, the cabin was configured to accept a variety of camera installations including equipment for night photography. The F-2 series were powered by Pratt & Whitney R-985-14 radial engines

After the war, a large number of military versions of the Model C18S series were remanufactured to D18S configuration, such as the Navy SNB-5 shown here. Both the Navy and the newly-created United States Air Force flew the airplanes on a wide variety of missions including VIP transport, delivery of spare parts, and pilot training/proficiency.

each rated at 450 hp, and regularly flew at altitudes up to 25,000 feet. The Air Corps eventually took delivery of 56 F-2 aircraft.

The Navy ordered five Model 18S converted to accept a special cupola built above the cockpit that housed an observer/operator to control aerial target drones. Designated JRB-1, all five of the monoplanes were delivered in 1940 and were equipped with R-985-AN-4 of -50 radial engines. Another order from the Army Air Corps that year called for 11 Model 18S configured as light duty transports and designated C/UC-45. The Wichita factory built more than 1,400 UC-45 airplanes during the war, with many sent to serve with the Royal Air Force in Great Britain, designated "Expeditor I" and "Expeditor II."

Other important derivatives based on the wartime Model C18S included:

- C/UC-45F: Built later in the war, the C-45F was intended as a VIP and general transport that could carry up to five passengers and 80 pounds of baggage.
- SNB-1: The Navy needed a small transport capable of training bombardiers and operators of machine gun turrets, which were standard fitment on medium and heavy bombers in naval service. These airplanes were almost identical to the Army Air Corps' AT-11 with a maximum gross weight of 9,300 pounds. In 1942 only 14 airplanes were built, but by war's end the Navy had 320 SNB-1s in inventory.
- SNB-2: Production of the SNB-2 for the U.S. Navy began in July 1942. It was designed as a navigation trainer but could serve as a general purpose transport. Powered by R-985-25 radial engines, the SNB-2 had a maximum speed of 225 mph and a maximum gross weight of 8,700 pounds. The Navy took delivery of 606 SNB-2 during the war.
- AT-7: As with the Navy and its SNB-2, the U.S. Army Air Forces (AAF) needed a small, twin-engine





In 1945, Beech Aircraft Corporation introduced the Model D18S to the commercial market. Starved for new aircraft following four years of global conflict, the postwar business aviation industry welcomed the D18S. More than 1,000 were manufactured from 1945-1955 before production transitioned to the upgraded Model Super E18S.

(WICHITA STATE UNIVERSITY LIBRARIES, SPECIAL COLLECTIONS AND UNIVERSITY ARCHIVES)

transport equipped to teach navigation by the sun and stars. The cabin was equipped with drift meters, work tables and various compasses. In addition, an auxiliary instrument panel displaying essential flight information such as airspeed and altitude was installed in the front of the cabin for student reference in solving navigation problems. Celestial sightings at night were made through a small, clear Plexiglas dome in the upper fuselage. The AT-7 trained thousands of navigators who later guided hordes of American bombers to their targets over Germany and Japan. The Army took delivery of 884 AT-7 during the war.⁴

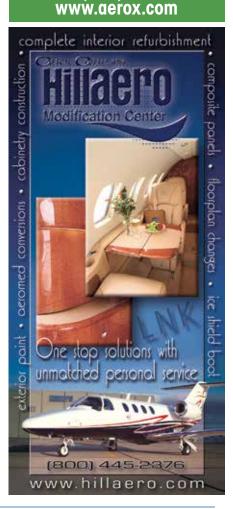
- AT-11: The AT-7 trained navigators, but the Army's AT-11 trained men to drop bombs on the enemy. The airplane was equipped with a large Plexiglas nose section for the student bombardier and housed the top-secret Norden bombsight that made accurate bombing possible. Based primarily in the Southwestern United States because of the region's favorable flying weather year round, the AT-11 normally flew with two pilots and three students. The fuselage featured internal bomb racks that held 10, 100-pound practice bombs. As with navigators, bombardiers were desperately needed for the massive bombing campaigns over occupied Europe, the Pacific and Japan. As a result, more than 1,500 AT-11s were built.
- Other minor variations of the C18S produced only in small numbers were the AT-7A, equipped with floats and skis; AT-7B, specially equipped for service in cold weather climates in sub-zero temperatures; and the AT-7C was equipped with more sophisticated avionics and autopilot than the standard airplanes. The AT-11A was an AT-11 configured for aerial photography as well as bombardier training. The type was also designated T-11-BH.

By war's end, more than 14,000 Beechcrafters had manufactured more than 7,000 military aircraft for U.S. and allied fighting forces. The majority were versions of Model C18S, but a few hundred "Staggerwing" cabin biplanes were built as military variants of the commercial Model D17S. Late in 1944 it became obvious that a devastated Germany and a fanatical Japan were facing certain defeat at the hands of the Allied nations. Walter Beech was anxious to return to peacetime production, and he soon had Ted Wells working on a postwar replacement for the trusty Model C18S.

That replacement was the Model D18S that featured a maximum gross weight 20 percent higher than that of its predecessor. Other major upgrades included a redesigned main landing gear, stronger wing center section, lengthened engine nacelles and a new instrument panel. When

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introduced in the summer of 1945, the D18S had the distinction of being the first postwar commercial, nine-place, multi-engine airplane to receive an Approved Type Certificate. The latest Beechcraft sold well. Production quickly reached two per day as pent-up demand for new aircraft made customers quick to plunk down cash to secure a position on the production line.

The factory produced 296 D18S aircraft in 1946 – the highest number for any Model 18 in a single year. When production ended in 1955, more than 1,000 had been delivered to customers. Powered by R-985 radial engines, maximum speed of the D18S was 230 mph at 5,000 feet. The next-generation Beechcraft cost \$61,500 for a standard-equipped airplane.

In 1954, the D18S gave way on the production line to the Model Super E18S that introduced major changes to the airframe. These included cabin height

of the venerable Beechcraft Model 18 had been built since production began in 1937. In 1969, the last Model 18, a Super H18, was delivered to Japan Air Lines where it served as a multi-engine trainer. (WICHITA STATE UNIVERSITY LIBRARIES, SPECIAL COLLECTIONS AND UNIVERSITY ARCHIVES)

that was increased six inches; four cabin windows on each side of the fuselage; a larger, air stair-type entry/exit door and a maximum gross weight of 9,300 pounds. Wingspan was increased 48 inches to 49 feet eight inches, resulting in a total wing area of 361 square feet. The E18S proved to be popular with longtime Model 18 operators, and 451 were built before production ended in 1960.

Demand for an improved Model 18 led to development of the Super G18S introduced for the 1960 model year. The most salient change was installation of a new, larger windshield that improved visibility and the dispersion of rain. In addition, a large center cabin window afforded passengers



a better view of the sky and the earth below. Pratt & Whitney R-985 engines turning three-blade Hartzell constant-speed propellers was a feature of the G18S. A total of 154 airplanes were built from 1959-1963 when the final version of the venerable Model 18 took to the air.

The year 1962 marked the 25th year of consecutive production of the legendary Beechcraft Model 18. In August, Beech Aircraft Corporation unveiled the Super H18 featuring a maximum gross weight of 9,900 pounds, a useful load of more than 4,200 pounds (the highest for any version of the Model 18), and a speed of 236 mph. Other key changes centered on the main landing gear struts that featured a forged, heat treated half-fork assembly instead of the full-fork design, and the adoption of smaller 8.50 x 10 wheels and tires. The H18S also featured electrically-operated cowl flaps and for the first time in any Model 18, air conditioning was available.

In 1963, the H18S was available with a choice of landing gear configurations, either standard, conventional-gear or a tricycle design developed by Volpar. The latter eventually became standard chiefly because a majority of customers preferred a tricycle gear. In November 1969, Japan Air Lines took delivery of the last three production Super H18s that

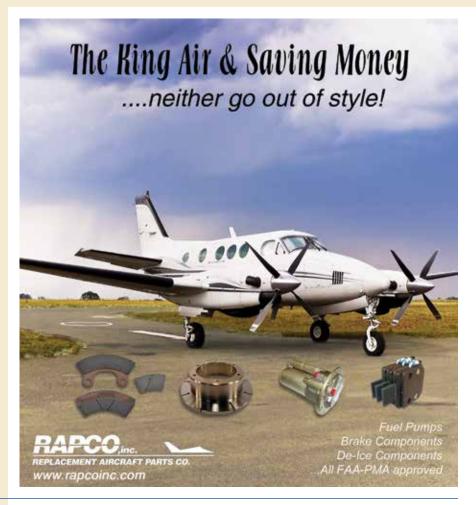
were employed as multi-engine trainers. The limited number of H18s built (149) was a sign of the times. The introduction of lightweight, powerful and reliable turboprop engines such as the revolutionary PT6 series developed by Pratt & Whitney Canada hastened the demise of static, air-cooled radial engines (and to a lesser extent, some opposed piston engines). More importantly, Olive Ann Beech had decreed that two PT6 engines be mated to a Queen Air airframe for flight testing. Her decision ultimately paved the way for introduction of the Model 90 King Air.

Ted Wells' classic Beechcraft Model 18 was more than an iconic executive transport. It served with distinction in World War II and the Korean and Vietnam conflicts, and under the care of private owners and museums, will continue to roar through the skies for years to come.

NOTES:

- 1. As of 2015, the R-985 is still in plentiful supply and powers not only versions of the venerable Beechcraft Model 18, but a variety of other antique and classic aircraft.
- Parmerter, Robert K.: "Beech 18—A Civil and Military History;" The Staggerwing Museum Foundation, Inc., Twin Beech Society, a division of the Staggerwing Museum Foundation, Inc.; 2004.
- 3. Parmerter, Robert K: "Beech 18—A Civil and Military History;" The Staggerwing Museum Foundation, Inc., Twin Beech Society, a division of the Staggerwing Museum Foundation, Inc.; 2004. The Model 18S was available with Jacobs or Wright Aeronautical radial engines, but an only limited number of airframes were built with these powerplants.
- According to "The Official Guide to the Army Air Forces," the Army Air Forces was created on June 20, 1941, to coordinate the activities of the Air Force Combat Command and the Office of the Chief of the Air Corps.

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



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Garmin® and Pratt & Whitney Canada Offer King Air Aircraft Upgrade Incentives

Garmin International Inc. and Pratt & Whitney Canada (P&WC) announced new incentives to provide King Air aircraft owners and operators significant savings on the G1000® Integrated Flight Deck and qualifying P&WC engine upgrades. The upgrade incentives apply to a broad range of King Air aircraft models and is applicable through January 29, 2016.

On the King Air 300/350 aircraft, customers will receive a free G1000 Integrated Flight Deck upgrade with the purchase of a new pair of PT6A-60A engines via P&WC's Fleet Enhancement exchange program. Other eligible engine and avionics upgrades will qualify for savings of up to US\$105,000, providing customers with high performance technologies that expand aircraft utility and greatly improve the capability and reliability.

Customers who have pursued either a G1000 retrofit or select P&WC PT6A engine upgrades within the last calendar year may also be eligible for incentives.

With the G1000 upgrade, aircraft also receive a fully integrated, FAA/EASA rule-compliant Automatic Dependent Surveillance-Broadcast (ADS-B) Out solution,

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so aircraft are positioned to meet NextGen industry requirements. Factory new zero-time avionics contribute to a total weight savings of up to 200 pounds and significantly reduce cost of ownership and operation.

Pratt & Whitney Canada's engine exchange programs covered under this new incentive include the PT6SMARTSM Flat Rate Engine Exchange Program, the Converter Enhancement Program (CEP) and the Fleet Enhancement Program (FEP). Aircraft life is further extended with zero-time factory engine overhauls through the PT6SMARTSM program, which minimizes aircraft downtime and offers a cost effective approach to engine maintenance. Factory-new engines offered through the CEP provide operators with performance improvements including range, speed, fuel efficiency and more, while also offering an associated warranty with the engine upgrade. The FEP maximizes aircraft dispatch reliability and reduces operating and maintenance costs. Customers also receive new lifelimited components, a new factory warranty and realize enhanced aircraft resale value associated with the FEP and CEP upgrade programs.

For more details regarding the incentives offered by Garmin and Pratt & Whitney Canada, contact Scott Frye of Garmin at (913) 440-2412 or Denis Latremouille of P&WC at (450) 647-3976.

For a comprehensive list of King Air aircraft models and qualifying engine types related to the new incentives, visit www.garmin.com/kingair or www.pt6smart.ca.

Garmin Also Announces Comprehensive Obstacle Database Now Includes Canada

Garmin has announced expanded availability of its comprehensive obstacle database to now include Canada for select Garmin portables and certified avionics. Manmade structures such as towers that are greater than 200 feet AGL are included within this database.

Customers can now download and install a U.S./ Canadian combination obstacle database for the following portable and non-certified products: GPSMAP 695/696, aera 500/510/550/560, aera 795/796, G3X and G3X Touch.

An obstacle database that offers coverage tailored specifically to Canada is also available for the following certified avionics: G1000, G2000, G3000 and G5000; GTN 650/750; G500/G600; GNS 430/530 and GNS 430W/530W.

In addition to offering coverage throughout Canada, Garmin obstacle databases also provide coverage within select European countries.

The Canadian obstacle database is available now starting at \$49.95. Customers may download the latest

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obstacle database via the flyGarmin website at www.fly.Garmin.com.

TRU Simulation + Training Opens New Maintenance Training Facility

TRU Simulation + Training, a Textron Inc. company, announced the opening of its new Aviation Maintenance Training Academy located on the Textron Aviation Mid-Continent campus in Wichita, Kansas. Courses currently offered include mechanical and avionics theory and practical for new production Beechcraft King Air 350i, 250, and C90GTx turboprops with the Pro Line Fusion® avionics system.

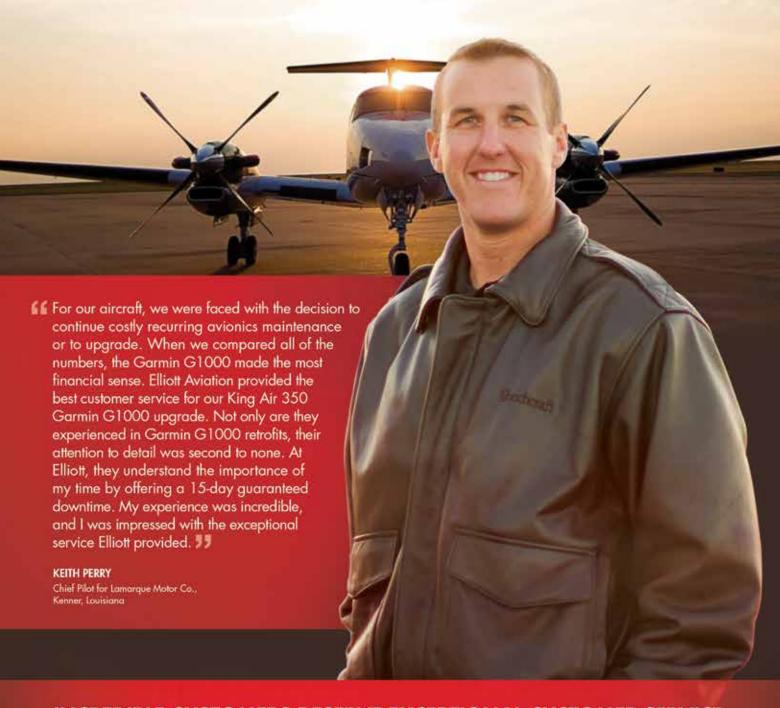
In the new facility, aircraft technicians receive a combination of classroom instruction and training on both maintenance task trainers and actual aircraft housed in the academy's adjacent hangar. Instruction is provided by individuals who not only are experienced in maintaining the type of aircraft they are teaching, but who also have direct interaction with the people who make the aircraft.

Near future plans for the maintenance academy include expanding training to include additional aircraft types and systems, such as engine run and taxi, engine maintenance, avionics differences, and troubleshooting courses. At capacity, the new academy is equipped to handle approximately 7,500 students annually in the Wichita location.

Database Updates Simplified with New flyGarmin App

Garmin has simplified avionics database updates such as navigation, charts and more with the new flyGarmin app for Windows, while also accommodating the distribution of Jeppesen charts. Using the flyGarmin app, pilots will enjoy a streamlined experience that makes database updates easier, requiring less time at their computer.

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Additionally, Jeppesen charts are available for ChartView – enabled devices and subscribers can now download Jeppesen charts alongside other databases purchased from Garmin, offering customers a single location to manage database updates and downloads. Pilots and operators begin at *flyGarmin.com* to register their products and purchase databases a la carte or in convenient PilotPak database bundles.

Prior to initiating a database download for the first time, flyGarmin will prompt customers to download the new flyGarmin app. Once the update process begins, the flyGarmin app will immediately initiate the database download process in the background. When the download is complete, the pilot or operator easily transfers the databases from their PC to the Garmin device.

For added convenience, individual databases are only downloaded once, eliminating the need to download the same database multiple times across several different products. Boasting more reliable performance and, in some cases, faster download speeds than previously available, the flyGarmin app ensures a consistent experience throughout the update process.

Offered for the first time from Garmin, Jeppesen chart subscribers can now download and update Jeppesen charts in addition to Garmin's databases from a single source. When purchased from JeppDirect.com, all charting databases can be conveniently downloaded alongside Garmin databases via the new flyGarmin app. The flyGarmin app is available for Windows, with Mac availability expected in 2016.

To take advantage of this new, streamlined database update method visit www.fly.Garmin.com.

New Mobile Jeppesen EFB Features Introduced

Jeppesen recently introduced new features for Mobile FliteDeck version 2.7 to enhance situational awareness and provide data for both IFR and VFR flying conditions. A new VFR theme provides general and business aviation pilots with the ability to switch between IFR and VFR data on the real time, data-driven enroute map. The ability to import route information and third-party flight planning data is also now available, and the iPad-based electronic flight bag (EFB) solution is also compliant with the iOS 9 operating system.

The ability to switch between IFR and VFR flight data allows pilots to easily transition to the flight information needed while flying under both instrument and visual flight rule conditions. The new route and flight planning data import capabilities provides access to essential information from multiple sources, including third-parties, to establish a single resource for managing the planning and operation of flights. Flight planning data may now be integrated into Mobile FliteDeck from sources including AvPlan, FltPlan.com and RocketRoute apps.

Mobile FliteDeck also now allows pilots to view which origin and destination airport pairs have been cleared by air traffic control in the past 24 hours. Determination of routes based on this knowledge will help pilots plan flights more efficiently, especially in congested airspace. Additionally, new inapp search capabilities now help pilots discover features and user support information. These enhancements create greater pilot control of information display and configuration of Mobile FliteDeck elements based on user preferences, to simplify the flying experience.



The new capabilities introduced with Mobile FliteDeck version 2.7 add to recent enhancements. including the ability for pilots to create, load, view, and save active flight data from either the terminal charts view or the enroute view. Device-to-device sharing of routes, Navaids, waypoints (including userdefined waypoints) and airways also has been recently added.

Use of Jeppesen Mobile FliteDeck eliminates paper-based flight materials to increase fuel efficiency and streamlines the entire flight process, allowing pilots to focus on essential flying tasks instead of managing technology. Mobile FliteDeck also includes enroute weather data display for icing, turbulence, winds aloft, radar and surface observations.

For more information about Jeppesen Mobile FliteDeck and the complete selection of mobile EFB services, please visit www. jeppesen.com/mobile.

Lightspeed Aviation launches Tango™, the world's first premium wireless aviation headset

Lightspeed Aviation announced the launch of a breakthrough in cockpit communications. For the first time in history, pilots and their passengers can enjoy the untethered freedom of a wireless headset along with premium performance and features.

According to the company, Tango uses a patent-pending combination of analog and digital technologies called Lightspeed LinkTM to create a reliable wireless signal that delivers quality audio and clear communications. Neither Bluetooth nor WiFi produced acceptable levels of performance to be selected as the protocol for Tango.

In another aviation headset first, Tango is powered by rechargeable lithium ion batteries in the headset and the panel interface (the communication hub of the Tango wireless system). The batteries, which measure just 1-3/8 inch x 2-1/8 inch and weigh just one ounce, deliver 12 continuous hours of use. Lightspeed refers to them as earth and wallet-friendly because over their lifetime each replaces 300 disposable AA alkaline cells.

The two-port USB charger (included) will fully charge the batteries in just two hours (for those charging during a lunch break, a 75% charge is achieved in 60 minutes). The headset and panel interface can also be charged in use. A separate wall charger and extra batteries can be purchased for those wanting a fully charged backup battery solution.

Because the panel interface includes multiple mounting options and the lower cable it stores is adjustable to 31 inches, it can be placed conveniently in any aircraft. Lightspeed had an eye on redundancy, adding a backup cable that is also stored in the panel interface, ensuring uninterrupted communications in the event of total battery depletion.

Like all Lightspeed headsets, Tango includes Bluetooth for both phone and streaming music and an auxiliary input jack for connecting audio devices via a patch cable, and is compatible with FlightLink, Lightspeed's in-cockpit recording app. Tango retails for \$800 and is available in dual GA, LEMO (panel power), and heli (U-174) configurations. Shipments will begin immediately.

For more information, visit LightspeedAviation.com.



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From King Air Model Communiqué 2015-07:

Issued: November 2015

ATA 12 - Grease Change

All

AeroShell 33MS grease is used as a lubricant in several areas of the King Air airplane. AeroShell has renamed this grease Aeroshell Grease 64. These greases meet the same military standard, MIL-G-21164D. Operator concerns about the close similarity between the product names, AeroShell Grease 33 and AeroShell Grease 33MS, and the possibility of a wrong grease being used in the wrong application, resulted in the name change.

ATA 30 – King Air B200GT/B200CGT (250) Propeller Heat-Blade Damage

BY-122, BY-124 and after; BZ-1 and after

The King Air 250 is equipped with composite propeller blades. The propeller heat system heats the propeller blades anytime the Propeller Heat switch is in either AUTO or MANUAL position, whether in flight or on the ground. If the Propeller Heat system is left ON on the ground for just a few seconds without the engines running, severe damage to the propeller blades and boot will occur (see photo). There are CAUTION statements in the Pilot's Operating Handbook Supplement and the Information for Continued Airworthiness for the propellers.



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It is imperative that anyone turning ON the Battery Master Switch makes sure that the Propeller De-Ice switch is in the OFF position as part of the power on procedures. This practice will prevent inadvertently having the propeller heat ON anytime the engines are not running.

The propeller de-ice system can be tested for maintenance, but it is important that maintenance personnel do not exceed the 10 second limit.

ATA 34 – ACSS TAWS+ System Flap Override Mode Operation

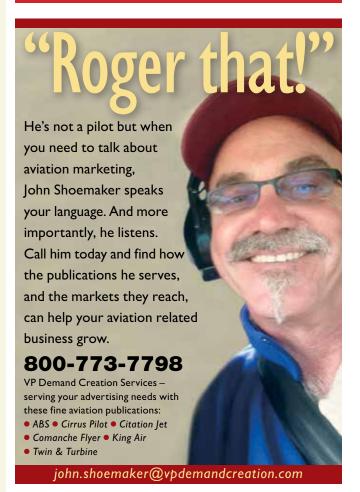
Recently, an issue was reported by a King Air operator whose Aviation Communication and Surveillance Systems (ACSS) Terrain Awareness Warning System (TAWS+) system faulted when the flap override mode was selected in flight. Analysis of the downloaded fault data revealed that the flap override mode was selected on descent while the airplane was traveling at greater than 200 knots. This is per design and normal operation, but is not a published limitation. Pro Line 21 King Airs equipped with the ACSS TAWS+ system are configured through the Aircraft Configuration Data (ACD) and the Aircraft Specific Database (ASDB), which reside in the Aircraft Personality Module (APM). This data configures the TAWS+ computer for operation in a specific airplane model as it initializes. One of the limitations programed into this system for King Airs will fault the TAWS+ computer if flap override is selected when airplane speed is greater than 200 knots. This value coincides with the 200-knot maximum flap extension speed on the airplane. This article is to inform operators of this condition. Depending on the interpretation of the pilot's operating handbook flaps up landing procedure, an operator could select the mode too early and see the reported issue. Deselecting the mode will clear the fault and it can then be reselected after the airplane is below the limiting airspeed. For questions concerning this issue, please contact Beechcraft Corporation customer support at (800) 429-5372, (316) 676-3140 or by email at kingair_support@txtav.com.

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

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