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Correspondence



Another Point Regarding King Air Phase Inspections

I read Dean Benedict's excellent article regarding King Air inspections featured in the August 2016 issue of *King Air* magazine. I wanted to add to his information, something I have experienced with some King Air operators that have limited knowledge of our inspection program.



One of the stipulations, as Dean correctly indicated, is that the King Air must have at least one Phase inspection completed at the 12-month timeframe. What some owners do not realize is that there is *no tolerance on the calendar time and if they go over that 12-month period, the aircraft must have a complete Phase 1 through 4 inspection completed* – an unexpected expense for a low use aircraft.

Many thanks.

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Better Late



Marc Schupan, CEO of Kalamazoo, Michigan-based Schupan & Sons, stands in one of the manufacturing facilities of Schupan Aluminum & Plastic Sales. His company started using the King Air four or five years ago, and discovered what a great tool it could be.

(COURTESY OF LUCKYDOG AND SCHUPAN & SONS, INC.)



(COURTESY OF SCHUPAN & SONS, INC.)

Marc Schupan discovers the benefits of bizav

by MeLinda Schnyder

The only regret Marc Schupan has about owning a 1985 Beechcraft King Air C90A is that he didn't discover the value of business aviation earlier and begin reaping the rewards the King Air has brought to his business and life.

"We started using the King Air four or five years ago, and I wish I would've started sooner," he said. "It's been a great tool."

Schupan has done quite well despite being a late-comer to business aviation. He took over his father's small metals recycling company in 1974 and during the past five decades has grown the business from six employees to more than 500 by diversifying and enlarging its operational footprint. In addition to scrap metal recycling,

the Kalamazoo-headquartered Schupan & Sons does business on a national and international level in beverage container recycling and aluminum and plastic sales. The multi-divisional company has 13 locations throughout Michigan, Ohio, Indiana and Illinois and more than 12,000 customers across the United States.

Schupan & Sons estimates it ships and recycles about 1 million pounds of metals and plastics a day between all of the operations.

Not the career he intended

While Schupan was studying political science at Michigan State University, his father bought a small nonferrous recycling operation in 1968. "I give him a lot of credit," Schupan said of his father, Nelson.



Schupan & Sons has 13 locations in four Midwestern states. The Schupan Aluminum & Plastic Sales division specializes in a full line of aluminum and plastic mill products and large-scale production runs of technical components or low volume repeating products. (COURTESY OF LUCKYDOG AND SCHUPAN & SONS, INC.)

“He was 48 at the time, had four children, two in college, not a lot of money to invest, but he had ambition and wanted to be his own boss.”

Although Schupan worked there during the summer, he did not plan a career in the industry. Instead, he

graduated and began teaching high school history, government and economics while coaching football, basketball and baseball. In July 1974, he decided to take a break from teaching before either going to law school or pursuing a college basketball coaching career. “I agreed to help my father for a year. Three weeks after I started, he died of a stroke at age 53,” he said.

He immediately stepped into the role as CEO and renamed the business Schupan & Sons, Inc. in honor of his father.

Diversification = Growth

“As time went on, we continued to grow and diversify,” Schupan said. “We went from being in the industrial recycling business to the distribution of aluminum, and we also bought a few companies here and there and got involved on the manufacturing side.”

Today the company comprises of three divisions. Schupan Industrial Recycling provides scrap management strategies, collection, processing and sales of ferrous and non-ferrous metals for industry, manufacturing and small businesses. In 2012, the company added

Schupan Recycling, the largest independent processor of used beverage containers in the nation, in partnership with UBCR, converted its entire fleet of trucks used for pickup service to compressed natural gas.

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another arm to its industrial recycling division that solely collects and processes useable and scrap electronics from customers nationwide. Schupan Aluminum & Plastics Sales distributes new metal and plastic mill component for automotive, medical and office furniture products. In the early 1990s, Schupan Recycling formed when the company got involved with recycling used beverage containers.

“Michigan has a 10-cent deposit on containers and because of that we have well over 90 percent recovery coming back,” Schupan said. “We have a joint venture with a Norwegian company that has the barcode technology, and we put their equipment in over 600 stores in Michigan. We run 16 semis around the clock for pickup service, and they run on natural gas. We operate two processing facilities for plastic, glass and aluminum containers.”

Schupan Recycling is the largest volume independent processor and broker of used beverage containers in the U.S. According to their website, the company has recycled more than 50 billion containers. That includes about 4 million plastic water bottles used by Flint, Michigan, residents amid the recent lead water crisis.

Schupan Recycling is among several companies to donate to the cause of recovering empty bottles in Flint, which does not have curbside collection of recyclables. “We got involved real early to put equipment in and coordinate with other recyclers to make sure that the water bottles, which are non-deposit, didn’t end up in the landfill,” Schupan said.

Giving back to the community has always been a part of Schupan’s personal life and his business model. His company and employees support local United Way organizations through payroll contributions and he encourages employees to get involved by giving them time off to volunteer in their communities. Earlier this year, Schupan received a lifetime achievement award from Big Brothers Big Sisters in Kalamazoo for years of mentoring, serving on the board and making financial contributions. The organization also named its Seth Nelson Schupan Mentoring Center in honor of Schupan’s 23-year-old son who died in an auto accident.

Schupan and his wife of 40 years, Jeanne, have four children ranging in age from 38 to 29, including a daughter and a son who work in the family business.

The 1985 King Air C90A owned by Marc Schupan’s Green & White LLC is flown about 100 hours a year for Schupan & Sons of Kalamazoo, Michigan, and dry leased to several of Schupan’s friends and business associates. In addition to the Part 91 operation, Green & White LLC makes the airplane available to a charter company based in Michigan.

(COURTESY OF SCHUPAN & SONS, INC.)



Finding business aviation

Schupan & Sons is headquartered in Kalamazoo, a city in southwest Michigan with limited commercial airline service. The company has several facilities right in Kalamazoo, but also operates 13 locations across four states including major sites in cities like Elkhart, Indiana; Dayton, Ohio; and Toledo, Ohio. That means site visits often required driving around the Great Lakes or flying commercially with multiple stops or both, more often than not.

"The company is located in a market that doesn't have a lot of airline options. Driving 45 minutes or an hour to Grand Rapids presents a few more options, but it still doesn't open up the world to you like the King Air does," pilot Lance Kelsey said.

Visiting a customer in Madison, Wisconsin, from Kalamazoo, for example, would be a six-hour drive around the lake instead of a 35-minute flight in the King Air.

"Even if we were to outgrow this airplane, I don't see us leaving the King Air family because of the overall useful load and usefulness of the airplane."

— Pilot Lance Kelsey

In 2012, a friend and business associate based in Kalamazoo asked Schupan to partner with him on ownership of a 1985 King Air C90A. They formed TCB (Taking Care of Business) Air LLC to jointly own the aircraft that would be operated independently by both companies. In 2014, the other owner sold his business and no longer needed the King Air, so Schupan bought full ownership of the aircraft.

"I really like this airplane, it's become a great tool," Schupan said. "The first time we took it to see employees at my Dayton plant, my Toledo plant and then came home the same day with time to still get some work done, I thought, 'Wow, this is pretty amazing. I should've done this a long time ago.'"

Employees at all levels of the company have access to the King Air, and it's most often used to visit company facilities, meet with customers or to bring customers to Schupan's facilities.

"It's allowed us to give more service to our customers," Schupan said. "It's impacted our employees, helping



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"We had a question on some material the other day so we had our customer fly down with us to the mill that was manufacturing the material for us," Schupan continued. "The King Air has been terrific for building relationships and solving issues in a timely manner."

The aircraft is based at Kalamazoo/Battle Creek International Airport (AZO) with maintenance provided by Kalamazoo Aircraft. It is owned by Schupan through Green & White LLC (Michigan State school colors) and he contracts with Kelsey of Everley Air Management, LLC to manage and crew the aircraft. Schupan & Sons flies about 100 hours a year and Schupan also uses the King Air for family vacations, to central Florida or fishing trips in northern Ontario, for example.

Green & White LLC dry leases to two other companies that Schupan has a personal or business relationship with, bringing the annual total for the King Air to about 200 hours. They are making the aircraft available to a charter company based in Kalamazoo for additional hours.

The 1985 King Air has 8,600 hours on the airframe and the engines are at 2,200 hours since new.



Pilot Lance Kelsey, owner of Everley Air Management, LLC, manages and crews the 1985 King Air C90A owned by Marc Schupan's Green & White LLC. (COURTESY OF SCHUPAN & SONS, INC.)

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"When we got the aircraft, it already had the Blackhawk conversion and the Raisbeck performance packages, so it was as performance capable as it's ever going to be minus getting the new five-blade whisper props," Kelsey said. "From an avionics standpoint, it has a Garmin GMX200 and two Garmin GNS530 WAAS units. Marc asked if we needed to make any upgrades and my response was that there's no reason to go to a full glass cockpit because it just looks nicer. We can get into any airport as well as the more modern King Airs and we're perfectly equipped the way we are."

Short of winglets, Kelsey said, Schupan's 1985 model looks the same externally as the models coming off the production line today in Wichita. And, soon, the interior will look factory-fresh as well. Kelsey was scheduled to deliver the airplane to Unique One in Pontiac in August for a full interior refurbishment in the same color scheme offered by Beechcraft.

"Back in the TCB days, the other owner used the airplane for some in-house cargo operations that did

put some wear marks in spots," Kelsey said. "I notice it because I know every nook and cranny of this airplane but most passengers don't see it. Still, the last time the interior was done was in 1999 and it just looks a little dated. In the charter industry, right or wrong, passengers will associate the maintenance reliability of the airplane with the aesthetic look of the airplane."

The aircraft is always flown with two pilots: Kelsey, who has 1,050 hours in King Air series aircraft, and often a higher time multi-engine instructor from Kelsey's alma mater, Western Michigan University College of Aviation.

Typical missions for Schupan & Sons include day trips with two to four passengers traveling 200-300 nautical miles from Kalamazoo, although they also regularly travel as far as Atlanta to meet with Coca-Cola.

"With all of the different modifications that we have, it's also

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Schupan & Sons CEO Marc Schupan (right) stands with John Barry, President of Schupan Aluminum and Plastic Sales, in front of a truck that delivers on the "Call today, get it tomorrow" promise.

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given us a max gross takeoff weight increase to 10,500 and that allows us six people with day bags and we can still get in and out of essentially any strip in the U.S.," Kelsey said. "We haven't found an airport that is too small for the 90. I think that's part of the allure of this airplane. Anything that's within a 1,000 nautical mile range circle, throw a dart and if it's got a runway, we can get there.



"Today we are in a satellite airport of Toledo that I can't imagine anything bigger than a King Air getting into," he continued. "It's put us within five

As a board member of the Kalamazoo Air Zoo, Michigan's premier aviation and science center and museum, Marc Schupan was instrumental in acquiring the multimedia presentation about the history and significance of the Tuskegee Airmen during Black History Month. (COURTESY OF LUCKYDOG AND SCHUPAN & SONS, INC.)

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Balancing Your Backups

PART 2

by Matthew McDaniel

In Part 1, the article left off with GPS failures that would affect both primary and secondary GPS units (such as failures related to shared antennas, identical software bugs, satellite outages, or the loss of shared power sources or cooling equipment). In such cases, being able to revert to “old school” forms of navigation can sometimes be the only options left. We pick up the discussion there...

Very High Frequency Omnidirectional Range (VOR)

VOR's stations are cumbersome and expensive to maintain. Many have been shut down in recent years and an accelerated decommissioning schedule looms in the near future. However, while the number of VOR facilities may be on the decline, VOR navigation is a long way from disappearing, as Victor Airways (below FL180 in the United States) and Jet Airways (FL180 and above in the United States) are still in common use. Yet, the explosion of advanced avionics over the past decade-plus, has made it far more common to track such routes via GPS or FMS overlays of the actual airway. Regardless, pilots should still practice their airway and VOR radial intercepting and tracking skills, should the need arise to do so using an actual VOR signal as the sole source of navigation. Sadly, it has become all too common during training events to see pilots fumbling with their avionics to complete the simple (but unpracticed) tasks of tuning and identifying a VOR and selecting an assigned radial or airway. What was once IFR-101 has become an “advanced skill” in the age of glass panels and GPS. When was the last time you practiced these tasks?

It seems the procedures for intercepting and tracking radials should be the same, regardless of whether that radial is created by a VOR signal or is being mimicked by a GPS signal. At the most basic level, that is essentially

true. However, it is more complicated than that. Because VOR radials emit in all directions from a VOR station, the width of a given radial is never constant. Instead it is ever-widening, from zero at the station to eight miles wide (or more) at triple digit distances from the station (taking into account, of course, the service volume of the VOR station in question [Figure 1]). Thus, VOR radials become less precise with increased distance from the station. This is not the case with GPS courses programmed to overlay VOR radials. Such GPS courses are constant in width and that width is subject to the Course Deviation Indicator (CDI) scale the GPS unit is set to (a setting that can be changed automatically as a function of software and aircraft position, or manually by the pilot). Additionally, VOR

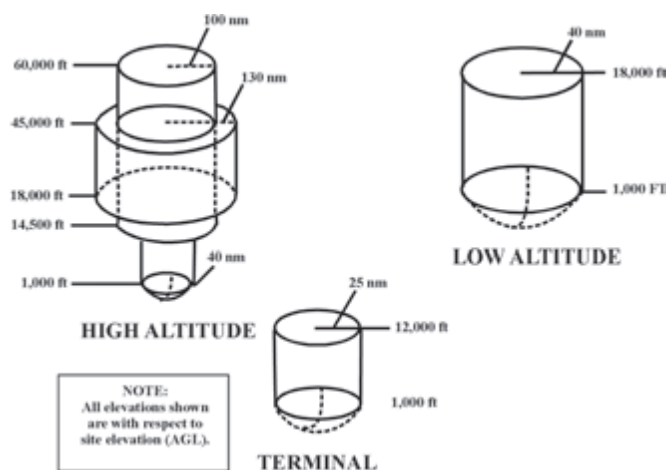


Figure 1: Aeronautical Information Manual (AIM), Figure 6-3-20, Frequency Protected Service Volume for VOR. This diagram details the service volumes (effective ranges) of the various VOR types in Above Ground Level (AGL) altitudes and straight-line distances. These numbers should be considered maximum numbers, as signals received beyond these parameters should be considered unusable. Other factors can further reduce the effective range of VOR signals, including (but not limited to) line of sight limitations, antenna capabilities and receiver condition.

radials reflect magnetic courses to/from the station and, thus, are always straight lines. In contrast, GPS routes that are not pre-programmed to follow true or magnetic courses are, by default, great-circle courses between fixes (curved lines that are actually shorter than a straight line between the same points because they follow the curvature of the earth). The point being – GPS courses are generally far more stable and easier to intercept and track because they are not subject to constantly changing signal sensitivity. Most of us already know that, intellectually. But, recalling the nuances of intercepting and tracking VOR radials at various distances from the station, when GPS has unexpectedly failed you, is a skill that can only be retained through routine training and practice.

During your next training event in a simulator or the actual airplane, ask the instructor to create a scenario requiring you to tune and identify a VOR. Then choose a specific radial to intercept and track. Do this for courses both TO and FROM the station. Overfly the station to refresh your memory and skills related to the ever-increasing signal sensitivity leading to the “cone of silence” (the area overhead the station where VOR signal reception is briefly lost). Then leave an assigned radial to intercept and track a different radial and, again, practice this for both TO and FROM courses. You might be surprised how much you fumble with these very basic IFR skills which, if you are like most pilots, you’ve allowed to atrophy through disuse.

Distance Measuring Equipment (DME)

In U.S. airspace, an IFR enroute certified GPS unit can be used in lieu of enroute DME. Similarly, an IFR approach certified GPS may be used in lieu of DME required for terminal procedures. Thus, the use of true DME has fallen dramatically with the widespread usage of GPS. Yet, most turbine aircraft still have DME unit(s) installed or incorporated into integrated avionics packages.

When enroute or terminal VOR navigation becomes necessary, one must still be able to track position along the route as well. This requires the ability to utilize DME and/or triangulation via crossing radials/bearings from other navigation aids. Traditional airway intersections and fixes are all still identified and charted via one or both of those methods. Yet, pilots struggle mightily to read IFR enroute charts to determine alternate means of identifying fixes when GPS/Moving Maps fail. Such struggles often increase sharply while attempting to setup and interpret the backup avionics appropriately.

DME and GPS distances do differ slightly in that GPS is, again, the great-circle distance to the active waypoint. DME, on the other hand, is straight-line, magnetic-course, slant-range distance to the station. While DME slant-range error is greatest near and/or at high altitudes above the station, great-circle versus magnetic course error is greatest at the midpoint between given GPS

waypoints. When using GPS in lieu of DME, we’ve become accustomed to measuring our distance TO the active waypoint. DME might identify the same fix via a specific distance TO or FROM the DME station. Arrival at a GPS waypoint will always happen at an indicated 0.0 distance, while arrival at a fix using DME measurements will almost never occur at 0.0 (unless that fix is the VOR which is co-located with the DME station, while at altitudes below 600 feet AGL [0.1NM]).

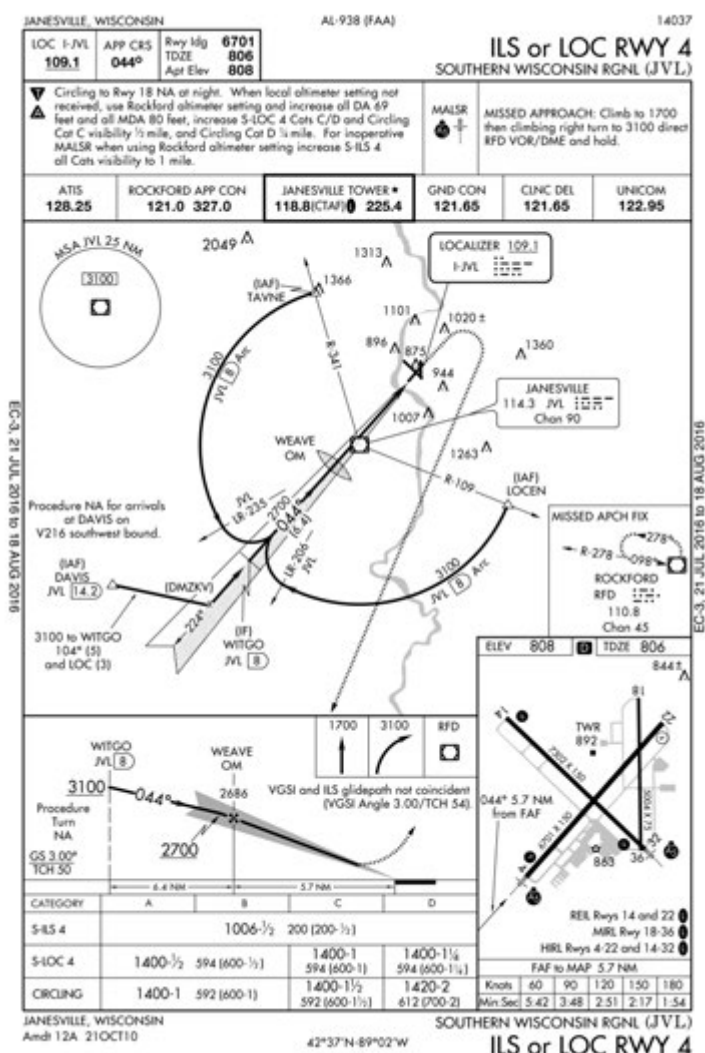
During the same practice suggested in the VOR section, incorporate DME usage into the training exercises. Observe the slant-range error by flying directly over the VOR/DME station. Track radials to specific DME distances, while flying towards and away from the station. Choose radial intercept angles that will allow interception to occur at specified DME distances.

DME Arc Procedures

DME Arcs are still an aircraft separation tool used by Air Traffic Control (ATC) in both published and non-published versions. Published DME Arcs are generally limited to the initial legs of Instrument Approach Procedures (IAPs), where they are used in lieu of traditional procedure turns. Modern IFR approach certified GPSs have such arcs built into their databases as curved flightpaths between GPS waypoints. As such, they are flown simply by keeping the CDI centered while tracking around the arc and distance is measured TO the active waypoint (usually the arc’s exit point or a step-down fix along the arc where an altitude change may be initiated). Yet, such published arcs are usually associated with VOR/LOC/ILS type approaches and, thus, can be flown without the aid of GPS, if necessary. Without GPS, traditional navigation of the arc would be required via your backup navigation equipment (VOR and DME) [Figure 2].

Non-published DME Arcs are assigned randomly by ATC, usually for the purpose of aircraft separation in times of heavy traffic load, radar outages (or non-radar environments), and/or when airspace or terrain require it. Non-published arc courses cannot be overlaid with GPS courses and must be flown using VOR crossing-radial navigation methods to determine position along the arc’s course. Those savvy in the art of modern GPS navigation might say they can fly a non-published DME Arc using GPS information alone ... and they would be correct. However, the process for properly programming and setting up such a procedure is both beyond the scope of this article and is, in fact, every bit (if not more) complicated than that required to set up and fly the arc using more traditional methods.

Flying a DME Arc requires good situational awareness and the ability to visualize your position, even with a functional GPS, and certainly so without one. These are skills that are becoming more and more scarce as the population of IFR pilots shifts from those that learned on conventional gauges to those that learned on (and have



pointer for tracking DME arcs, as they always point to the station, or 90 degrees from the aircraft's heading, +/- wind correction. This not only makes position along the arc simple to monitor via the tail of the bearing pointer, it makes wind correction visualization simpler, as well. In short, bearing pointers are simple and versatile devices for navigation that are no less relevant today than they were in the pre-GPS era. Yet, I rarely see IFR pilots commonly utilizing or maintaining proficiency in bearing pointer usage. Those pilots that do, however, generally display some of the best situational awareness skills within the ranks of IFR pilots, professional or otherwise.

Conclusion

I don't believe for a minute that we should return to pre-GPS navigation. IFR pilots should absolutely embrace and take advantage of the latest and greatest advances in both navigation and flight control. Returning to old-school methods as a matter of routine holds no appeal to myself, nor makes practical sense. However, as technologies advance, it becomes ever more critical that we stay both abreast of them and of the longer established technologies that back them up. It is easy to become complacent when the wonders of GPS make advanced navigation chores seem so simple and routine.

The use of back-up navigation systems becomes nearly forgotten, rarely practiced, and almost never studied. Of course, the problem with this reality is that when the primary navigation tools are compromised, the use of the secondary tools becomes a near emergency in and of itself, rather than the simple inconvenience that it should be. **KA**

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Is My Gear Down?

by Tom Clements

Well of course it is! “Three Green, No Red,” I’m good to land.

And so you are. You have verified that the individual green gear down lights are illuminated and the two lights in the landing gear handle with the red lenses are both extinguished. You have proper confirmation that your gear is safe for landing. Go for it!

But what about when the system throws us a curve ball and the normal “Three Green; No Red” is *not* what we see? Now what? The intent of this article is to review the operation of the landing gear indication lights and the landing gear warning horn to remind us there are at least one or two additional ways to decide if the gear is safely extended or not.

With the exception of the original King Air 65-90 model of 1964 and 1965, the landing gear indication and warning horn system is basically the same for all King Air models. Yes, there are minor changes between the various models and years, but overall the system is nearly identical. Each of the three gear legs has both a “downlock” and “uplock” switch installed. The name for these switches sometimes leads to a bit of confusion because the switches themselves have nothing whatsoever to do with actually locking the leg safely in the down or up position. But the switches should be installed and adjusted in such a way that they do not activate – the plunger on the switch is not depressed – until the gear leg has indeed reached its fully extended or fully retracted, locked position.

The downlock switch, when activated, turns on its respective green light – very simple. The uplock switch, on the other hand, does not turn on a light. Instead, when all three uplock switches are properly activated, the red lights in the gear handle are extinguished. The red handle lights serve two purposes: (1) To advise us that the landing gear is “in transit,” not locked up or down, and (2) To advise us that the gear is “unsafe.” Let’s discuss each of these functions in a bit more detail.

The “in transit” nature of the red lights is telling us that at least one downlock or uplock switch is not being activated. I am sure some of my readers can relate to what I am about to write. You are in flight and encounter some moderate or severe turbulence. As the airplane gets bounced around you observe that the red handle lights blink on and off. As you watch more intently, it even becomes apparent that the lights glow when a positive



G force is experienced and go out when a neutral or negative G force exists.

What’s happening here is that the positive G force is causing at least one gear leg to sag down enough to deactivate its uplock switch. Is one leg sagging, or two, or all three? There is no way to know. The activation of the red lights requires only one leg to move off of its switch, so there will be no change in indication if another one or two are also moving. There is, however, a way to know if the right main gear is sagging in those models that have the Type I, older prop sync system and hence also have a yellow “Prop Sync On” annunciator. That light is triggered, with the sync switch on, when the *right* main gear’s uplock switch is not activated. So if you observe that the annunciator blinks in tune with the red lights, you can tell your mechanic that at least the *right* side needs adjustment, needs improved rigging. As for the left and the nose? No way to know if they, too, are involved or not.

By the way, this sagging gear phenomenon is highly unlikely to happen on the later models with the electro-hydraulic landing gear system. It is almost exclusively applicable to the older electro-mechanical operating systems. Why? In the mechanical system, only the friction of the jackscrew is providing the force that holds the gear up. In the hydraulic system, positive pressure on the retraction side of the hydraulic actuator piston is the holding force and it is mighty potent!

It is understandable why so many King Air pilots incorrectly believe that the red handle lights are “disagreement” lights, telling them that the gear handle position and the actual gear position do not agree. Of course, every time we move the landing gear handle from one position to the other, we expect to see the red lights illuminate until all gear legs have properly reached their new positions, and then the lights extinguish. So when disagreement exists, we have the lights. True, but that is not what is triggering them. You see, what if the gear never moved at all? What if we have a tripped CB or a bad motor so that when we move the handle nothing happens? We certainly have disagreement now, right? But we won’t have red lights. At least one of the gear legs has to move enough to deactivate its uplock or downlock switch before the red lights will appear. That is why, technically, they are not disagreement lights, but truly are *in transit* lights.

In addition to the *in transit* trigger mechanism of the red handle lights, we have said that the other trigger is “unsafe.” What exactly does that mean?

Unsafe, in this context, means that we may be getting ready to land and yet all three gear legs are not fully in the down and locked position. Unless you are willing to touch down extremely fast, it is rather difficult to land an airplane while a lot of power is still being applied. So the King Air series – just like almost every other retractable gear airplane – has a landing gear warning horn system that is triggered by the combination of low throttle (power lever) position and “not down” gear position. Inside the power quadrant in the cockpit, both the left and the right power levers activate switches when those levers are *not* well forward. Depending upon your exact model and serial number, these may be set for an N1 of about 79 percent to as high as 86 percent. (TPE331 powered B100s? Oh, about half-way from Flight Idle to Full Forward.) Keep in mind this is power lever *position* only, not actual engine power output.

In the King Air, the designers decided to include the red handle lights into this warning horn system. When the horn sounds, the lights illuminate ... a double indication that landing is not advised yet! As you know, the obnoxious horn may be silenced with a button – since it is not at all uncommon in the turbine-powered airplanes to intentionally pull power back so far as to trigger the warning during some descents – but the red lights remain lit until either the power levers are moved forward past the switches or all three gear legs activate their downlock switches.

In the mid-1970s, the FAA changed the rules and required that another mechanism be added to trigger the “gear unsafe” warning. Apparently there had been a few close calls or actual gear-up landings that followed a too low, too slow, airplane fully dirty, “drag it in” type of landing approach. Overcoming so much drag, the power being applied was above that which triggered the warning.



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The change, therefore, was to add a flap position trigger into the unsafe warning circuit. In the King Air series, Beech added a switch beside the flap limit switches attached near the inboard track of the right inboard flap. This switch was adjusted to be activated whenever the flaps exceeded the approach position. So most King Airs, now, will have the horn blow and red lights illuminate whenever the flaps exceed approach if the gear is not correctly down, regardless of power lever position. There was no requirement to retrofit this flap trigger to earlier airplanes so many vintage King Airs still will not have it.

If you have operated a King Air for very many hours, I am sure you have experienced at least one case of “Two Green; No Red.” Huh? That ain’t right! By far, the most likely reason for this is a burnt out green light, right? Merely test the bulb by pressing it (or the module), verify it is bad, replace it with a spare bulb, and now we are relieved to see the “Three Green” that we were expecting. (If you are not 100 percent sure how to test and change the bulb, ask your mechanic or another pilot to show you the procedure!)

Unfortunately, there will come a time when the “Two Green; No Red” situation reveals that the bulb is good; it tests just fine! Now wait. How can that be?! If all three downlock switches must be activated to turn out the *in transit* red lights, how come that downlock switch is not also activating its greenie?

The answer comes from the fact that even though there is only one downlock switch per gear leg, that switch contains more than one set of contacts and has a lot more than just two wires attached to it. History has shown that it is not uncommon for the portion that deactivates the red lights to still function properly after the portion that activates the green light has failed.

In this situation, I like to say that we have a tie vote: One Aye and one Nay. The Aye vote – that the gear is safely down – comes from the absence of the *in transit* red lights. The Nay vote – that all three gear legs are *not* safely down – comes from the lack of that one Green. How do we break the tie?

Yes, you are correct: Use the gear warning horn. Pull one or both power levers back to idle, or go ahead and select full flaps. No horn? Whew, we are safe to land. We have two safe votes now and only one unsafe vote. I am not saying that the old tower fly-by is *incorrect* now, and feel free to do so if you prefer. But the situation I am describing is common enough in the King Air fleet that most experienced King Air pilots think the visual check is unnecessary.

Two more comments concerning this “Two Green, No Red” scenario: First, it is also quite common that sometime prior to touchdown the @%&! last green light will finally appear! The downlock switch contact had not totally failed but was just “sticky.” Second, for the older electro-mechanical systems, realize that all three gear jackscrews are driven from a common source, a common transmission that has torque tubes attached to the main jackscrews and a chain drive attached to the nose jackscrew. Unless there was a rather catastrophic failure of that transmission assembly, if one jackscrew has been driven properly to “full” extension then the chances are good that the other two are also fully extended. You didn’t hear a big, loud, “Sprong, Clackity-clack!” did you? If not, all three legs are likely operating together just fine.

Before I end this article, allow me also to review landing gear limit switches. It is surprising for a lot of King Air pilots and mechanics to find that the uplock and downlock switches play absolutely no role in telling the motor when to stop running! (With one exception that I will cover.) No, for the electro-mechanical system, the switches that tell the motor it’s time to quit are associated with that transmission/gearbox in the belly. If they activate too soon, the gear remains *in transit* without good contact on the uplock or downlock switches. Activate too late, and we put undesirable and possibly damaging stress on the jackscrews, torque tubes, and chain drive when they are asked to travel further than they should.

Lastly, what shuts off the motor that drives the fluid pump in the electro-hydraulic systems? Where is its “Limit Switch?” On the retraction side, the shutoff is triggered by a pressure-activated switch. As all three

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gear legs hit the stops on the upside and stop moving, the pressure from the pump – that was causing the three actuators' pistons to retract and expel fluid back to the reservoir via the normal extension lines – rapidly builds up as the piston motion ceases. In the C90A (and after) system, the shutoff pressure value is near 1,800 psi. In the B200 (and after) and 300-series, the shutoff pressure is just slightly under 3,000 psi. It is this pressure that holds the gear up and leads to the conclusion that a sagging leg is highly unlikely so long as the pump can still develop pressure and the motor that operates the pump has not died.

It's a different story entirely on the extension side. Now what tells the pump motor to stop running are our "old friends" the downlock switches. For the left and right mains, the same switch that triggers the respective green light – and eliminates the red *in transit* and unsafe lights in conjunction with the other downlock switches – does double-duty in telling the motor to stop. For the nose? That is slightly different. Now the designers added a new switch that looks at the position of the actual ball-in-groove mechanical downlock in the nose gear's hydraulic actuator. When that switch senses the "all safe" condition, it feeds that information also to the motor's shutoff circuitry.

In addition to what has already been covered – namely, using the gear horn to cast the deciding vote whenever

a green/red disagreement occurs – there is one last way to feel sure that your gear is down when in a King Air with the electro-hydraulic system. In the C90A (and after) series: Is the pump motor still running? If it is not – and you can usually tell whether it is running or not by its noise – then that is another vote that all three gears legs are safely extended. The 200- and 300-series models have one last thing I have not yet mentioned: A 14-second time delay relay that shuts off the pump motor if it operates too long, before it burns itself out. This circuit, when it activates, also provides a ground to the Landing Gear Relay Circuit Breaker – the CB right next to the gear handle – causing it to trip or pop. So if that CB has not tripped, then you have a vote that all three gear legs are safely extended.

Is my gear down? Now you have a few more ways to feel certain that indeed it is. **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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They Wanted Wings

When two teenage boys and a college girl yearned to fly, Walter H. Beech gave them the opportunity to “learn the business” and make their dream come true

by Edward H. Phillips

Walter H. Beech is remembered world-wide for the airplanes that bear his name. In addition, his skills as a pilot made him a household name during the late 1920s, and few if anyone would question his prowess as a salesman, entrepreneur and staunch champion of aviation. There is, however, another side to Mr. Beech that is often been overlooked: befriending those who truly wanted to fly.

Although Walter had earned a reputation as a hard-nosed, tough and demanding individual when it came to building high quality airplanes and leading one of America's foremost airframe manufacturers, he had a deep and generous desire to help young people enter aviation. Among those fortunate enough to receive his assistance were identical twin brothers from Wichita named Newman and Truman Wadlow, and a young lady from Arkansas named Iris Louise McPhetdridge.

By 1926, the Travel Air Manufacturing Company, Inc. (TAMC), originally co-founded by Walter Beech, Clyde Cessna and Lloyd Stearman along with a few visionary Wichita businessmen, was struggling to fill orders for its three-place, open-cockpit biplanes that included the *Model A* and *Model BW*. The tiny “factory” on West Douglas Avenue was bursting at the seams when Beech reached out to help the Wadlow boys realize their dream of learning to fly. Walter knew Truman and Newman, then only 17 years of age and still in high school, were working part-time for “Jake” Moellendick's company on North Hillside Avenue in Wichita, building the *New Swallow* biplane.

In 1925, Walter had invited the twins to leave Jake's company and work at Travel Air, at that time one of the fastest-growing airframe manufacturers in the United States. Newman declined the offer, but Truman jumped at the opportunity. Beech promised the teen that if he worked hard selling tickets for “joy rides” on weekends at the East Central flying field, coupled with laboring after school at the factory doing odd jobs, he would be taught to fly for free! As the months passed that hot summer of 1925, Truman traded hard work for flying time under the tutelage of Travel Air's chief pilot, Clarence E. Clark.

Wadlow earned his wings in a *Model A* powered by the ubiquitous Curtiss OX-5 engine, and after only a few hours of dual instruction, managed to solo without incident. True to his word, Walter Beech continued to

support Truman's flying, and had enough confidence in the young man that during the work week he allowed him to take paying passengers on sightseeing rides over the Wichita area. Wadlow had accumulated less than 10 hours in the air when, on a very hot afternoon in August, he carefully secured a paying passenger in the front cockpit and nursed the aging *Model A* into the air for an aerial tour of Wichita.

Everything was well as the ship climbed slowly to the north, the OX-5 chugging along at 1,400 RPM. At an altitude of about 1,500 feet, the Curtiss powerplant suddenly fell silent. Stunned and unsure of what to do, the teen aviator believed he could make a 180-degree turn, glide back to the flying field and make a “dead-stick” landing. Unfortunately, as Truman banked the ship around he hauled back on the stick in an effort to conserve precious altitude. Instead, the Travel Air abruptly stalled. Truman panicked. The passenger panicked. The airplane pitched and rolled sluggishly. Desperate to regain control, Wadlow shoved the left rudder pedal to the floorboards and pulled the stick full aft.

The *Model A* responded eagerly and appropriately by entering a fully-developed spin to the left. Its intrepid pilot could do nothing to halt its swirling descent toward terra firma. Seconds later there was a thundering “whump” as the biplane smashed nose first into a thick hedgerow, accompanied by the sorrowful cries of cracking wood and ripping fabric. Then, all seemed quiet except for the hissing of steam escaping from the engine's crumpled water radiator. Truman quickly regained his senses, unbuckled his seat harness, jumped out of the aft cockpit and extracted his unconscious passenger from the front seat.

Wadlow dragged the man a safe distance from the wreck and fled on foot to his home in Wichita. He was terrified of what Walter Beech would do once he found out about the accident (Beech and Clyde Cessna were notified within minutes and rushed to the crash site). Truman hid away for days. He went nowhere near the factory on West Douglas Avenue, and briefly managed to avoid facing the certain ire of Mr. Beech, not to mention possible criminal charges of negligence.

Finally, he came out of hiding and “faced the music” regarding the accident. Mr. Beech scolded the teen, not



A young Truman Wadlow poses with the Travel Air Type A-4000 biplane he ferried in the summer of 1928 from the factory in Wichita to the company dealer in Los Angeles. The aerial trek took nearly a week, but was uneventful. The airplane was powered by an Axelson radial engine rated at 150 horsepower.

(EDWARD H. PHILLIPS COLLECTION)

so much for seriously damaging an expensive airplane, but for exhibiting gross irresponsibility by leaving the crash scene. Truman was relieved to learn that his passenger would recover from minor injuries, but was disappointed to learn that he was banned from further flying until he received remedial training in avoiding stalls and recovering from spins. As for the *Model A*, it was quickly hauled back to the factory, repaired and was soon flying again at the airfield.

In addition, Walter pointed out that Wadlow's accident not only damaged an airplane and made the fledgling company a target for a lawsuit it could ill afford, but the repairs to the *Model A* put a big dent in Travel Air's bank account. Fortunately, no charges were filed, but Truman was "grounded" until further notice and was made to pay for his error by assisting workers in the final assembly, rigging and testing of production airplanes. Eventually, Mr. Beech assured Wadlow that all was forgiven and allowed him to resume flying with Clark. Truman never "spun in" again. During an interview in 1982, Truman told the author that he never forgot Beech's unexpected benevolence toward him. Perhaps Walter remembered that in 1921 he had destroyed a *Swallow* soon after joining E.M. Laird's airplane company. As Laird recalled during an interview with the author in 1982, Beech was "a pilot of limited experience" and the crash nearly bankrupted the business, but he forgave Walter and helped him grow into a competent aviator whose flying and sales skills eventually proved invaluable to the success of the firm.

During the next three years, as Truman gained both sales and flying experience, Beech gradually gave him increasing responsibility as an assistant test pilot to Clarence Clark as well as assigning him to ferry new airplanes to Travel Air dealers and distributors from coast-to-coast. In a further demonstration of his faith in Truman's abilities, in 1927 Walter placed him in charge

of a company dealership located at the airport near St. Joseph, Missouri. During his time there, Truman learned valuable lessons in demonstrating and selling airplanes. In addition, he performed routine service and maintenance work on various types of airplanes



By 1930, Truman had gained valuable flying experience and was deemed sufficiently competent by Mr. Beech to act as a secondary test pilot at the factory, assisting chief pilot Clarence Clark. Truman also ferried Travel Air ships to dealers and distributors from coast-to-coast from 1928-1930. (EDWARD H. PHILLIPS COLLECTION)

located at the field. Truman also played an important role in helping to keep the Travel Air Type 5000 airline transports, operated by National Air Transport, flying on schedule.

Soon after Louise Thaden's victory in the 1929 Women's Air Derby held in August, the Travel Air Type D4000 biplane she flew was sold to a buyer on the East Coast. Mr. Beech ordered Truman to ferry the ship, but engine problems forced him to make a forced landing that resulted in the ship flipping onto its back. Damage was minimal, but repairs made what should have been a three-day flight into one that required 14 days to complete. Although Truman remembered that trip with regret, he had no regrets about the next major assignment he received from Mr. Beech.

In 1930, Walter tapped Truman to fly a factory-fresh Curtiss-Wright/Travel Air 6B *Sedan* in the sixth annual "National Air Tours for the Edsel B. Ford Reliability Trophy" (commonly called "the Ford Tour"). Walter Beech was counting on Truman to make Travel Air proud by scoring as many points as possible during the cross-country journey. Beech himself would be flying a Curtiss D-2 *Kingbird* twin-engine transport accompanied for part of the Tour by none other than his wife, Olive Ann Beech, and Curtiss-Wright salesman Owen G. Harned.

The route chosen for the 1930 event began at Dearborn, Michigan, and wound its way across much of vast western United States and north into Canada before returning to Dearborn – a total of more than 4,800 statute miles. At the end of the grueling 17-day aerial trek, Walter Beech placed sixth while Truman managed a respectable ninth-place finish. The two Curtiss-Wright pilots collected \$1,000 and \$400, respectfully, for their efforts.



Truman (left) and Newman Wadlow operated the Central Flying Service during 1930 before the deepening economic depression clipped its wings in 1931. The airplane behind them is a Curtiss "Robin" monoplane powered by a Curtiss OX-5 engine. (EDWARD H. PHILLIPS COLLECTION)

By 1931, the deepening economic depression that gripped America had devastated the aviation industry, and the factories of Travel Air, Cessna Aircraft Company and the Stearman Aircraft Company were operating at a snail's pace compared with the halcyon days of 1929. Despite the dark financial outlook, Walter Beech was an investor in Central Air College located at the East Central Flying Field. In 1929 the company built a massive, modern hangar across the field from the Travel Air factory complex, but by 1931 the business faced bankruptcy.

Eager to make their mark in Wichita aviation circles, Truman and Newman Wadlow approached Walter Beech about taking over the former school's aircraft and facilities. They would call their new venture the "Wadlow Brother's Flying Service," but they needed a healthy infusion of cash to make their dream come true.



Truman Wadlow (far left) stands beside famed aviator and "speed demon" Frank M. Hawks and his wife during the grand opening of the Wadlow Brother's Central Flying Service located on the east side of Travel Air Field. Walter and Olive Ann Beech (far right) not only encouraged the brothers to open their own flying operation, but helped them finance the venture. (EDWARD H. PHILLIPS COLLECTION)

Beech had sufficient confidence in the two brothers to co-sign a note for \$25,000, and within a few weeks they were in business. The Wadlows offered flight instruction as well as air taxi and charter flights, and their "air fleet" of six ships included Travel Airs, a Ryan *Brougham*, Curtiss-Wright *Robin* and other aircraft. One of the Travel Air cabin monoplanes had a history worth mentioning: Charles A. Lindbergh asked Walter Beech if he could use the airplane to fly to Mexico City, where he was courting Ann Morrow, daughter of United States Ambassador to Mexico, Dwight Morrow.

When Lindbergh returned the ship, the Wadlows found a way to capitalize on its brief association with Lindbergh and Ann Morrow. They named the monoplane "The Romancer" and emblazoned the tantalizing title on both sides of the fuselage. They advertised the

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In less than two years, Louise Thaden went from selling coal in Wichita, Kansas, to setting flying records in California. Walter Beech was chiefly responsible for giving the young woman from Arkansas her start in aeronautics. She made him proud in 1929 by winning her division of the Women's Air Derby, and in 1936, with Blanche Noyes as co-pilot, she was the first woman to win the Bendix cross-country race, flying a nearly stock Beechcraft C17R.

(EDWARD H. PHILLIPS COLLECTION)

airplane as a unique venue for courting couples as well as performing aerial nuptials, and a number of weddings were performed while airborne above Wichita (both brothers also "romanced" their future wives in the ship). The *Wadlow Brother's Flying Service* managed to survive until 1933 when the Great Depression forced the twins to close the doors and seek other aviation endeavors. Both brothers eventually went to work once again for Walter Beech, who had returned to Wichita in 1932 and established the *Beech Aircraft Company*.¹

Not long after Mr. Beech had helped Truman and Newman Wadlow take their first steps toward a career in aviation, a pretty college graduate named Iris Louise McPhetridge came to Wichita and took employment with Jack Turner's company selling coal, fuel oil and construction materials. Although she proved to be a loyal and hard-working employee, she gradually developed a habit of stopping at the Travel Air factory. As her visits increased in frequency, Louise was branded a nuisance by the men working on the production line and in back shops. Undaunted, Ms. McPhetridge kept up her visits.

Hailing from Bentonville, Arkansas, Louise was fascinated by flying machines, how they were built and the daring aviators who flew them. As her curiosity increased, so did her unauthorized stops at the Travel Air facilities. Late in 1926 she realized her true dream was not medicine, which she had studied in college, but the desire to fly. One cold day in December she was caught by her boss at the flying field, watching with great interest as Clarence Clark flew the latest Travel Air, the Type 5000 cabin monoplane, on its maiden flight. Fearing that she would lose her job, or at the least be scolded severely for dereliction of duty, Louise was surprised when Jack Turner laughed and told her to stay and witness the flight.

The next day she was called into Turner's office. Certain that a reprimand would be followed by unemployment, Ms. McPhetridge was told to sit down and answer a few questions regarding her interest in aviation. Turner concluded their conversation by saying that he would talk with his friend Walter Beech to determine if Beech could help Louise win her wings. A few days went by before Walter called her on the telephone and arranged a meeting between himself, Louise and D.C. Warren, a new Travel Air distributor based in Oakland, California. Beech explained that her serious interest in flying had impressed him, and after much consideration, he had an offer he hoped she would not refuse.

Warren agreed to take Louise out west with him and teach her the aviation business. It would mean long hours and hard work, but she would receive flying lessons at no expense to her. Louise could hardly believe what she was hearing! Saying farewell to her family in Arkansas and her job in Kansas, on April 2, 1927, McPhetridge climbed into the front cockpit of a new *Model B* biplane and accompanied Warren on the long flight westward. In her autobiography, *"High, Wide and Frightened,"* published in 1938, Louise vividly describes how she learned to fly and eventually became manager of Warren's satellite facility in Oakland, California. Along the way she met and married Herbert von Thaden, a talented aircraft designer and pilot who shared her love of flying.

A year after leaving Wichita, Louise had gained sufficient experience in the air to attempt an assault on the women's altitude record. Her airplane of choice, of course, would be her favorite mount – a Travel Air

Type 3000 powered by a Wright-Hispano Suiza V-8 engine rated at 180 horsepower. Louise and the company's mechanics, whom she worked with almost every day and shared their dirty hands working on airplanes, had rigged the airframe, tuned the engine and equipped the open cockpit with a very crude supplemental oxygen system based largely on hospital equipment.

Donning her heavy, fur-lined flying suit, leather helmet, goggles and gloves, Mrs. Thaden clambered into the aft cockpit. Mechanics swung the prop and the Wright-Hispano came to life, belching puffs of smoke before settling into a steady, staccato idle. Minutes later Louise and the Type 3000 were airborne, climbing steadily over the Oakland airport. For more than an hour she nursed the biplane upward, eventually reaching an indicated altitude of 27,000 feet according to one altimeter, but another altimeter indicated 29,000 feet.

The engine was gasping for breath and the wings had given up their last shred of lift. As she tried in vain to nurse the ship just a little higher, she slowly succumbed to hypoxia because of the frozen oxygen equipment, and lost consciousness. Fortunately, she regained consciousness at 16,500 feet as the Travel Air roared toward the earth in wide spirals at the rate of 1,500 feet per minute. Taking control, Thaden began a long descent back to the flying field.

When the barograph was removed from its perch in the fuselage, officials of the National Aeronautic Association, which had sanctioned the attempt, confirmed that Louise had attained an altitude of 20,200 feet. She now held the altitude record for women, and later followed up that feat by capturing the women's records for speed (156 mph) and endurance (22 hours 33 minutes). Thaden was the only female aviator to simultaneously hold all three records, albeit only briefly.

Two of Louise Thaden's most significant accomplishments, however, were her victory in the 1929 Women's Air Derby, and along with co-pilot Blanche Noyes, took first place in 1936 Bendix cross-country from New York City to Los Angeles, California. The Derby was held in August 1929. The 20 women pilots took off from Santa Monica, California, and flew a circuitous route to Cleveland, Ohio, site of that year's annual National Air Races. Thaden flew a specially-prepared Travel Air Type D4000 biplane fitted with "speed wings," an NACA cowl around the 300-horsepower Wright J6-9 static, air-cooled radial engine, and carried race number "04" for the event. Thanks largely to careful dead-reckoning navigation and a reliable airplane, Louise placed first in the heavyweight airplane class after flying 2,500 miles during a period of 10 days. Her friend and well-known aviatrix, Phoebe Omlie, won the lightweight class in her Velie-powered Monocoupe.

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An exhausted but thrilled Louise Thaden posed for the cameras after flying her Travel Air Type D4000 from Santa Monica, California, to Cleveland, Ohio, in August 1929. Thanks to careful navigation, she beat more famous fliers such as Amelia Earhart and Ruth Elder. The D4000 was later sold and ferried by Truman Wadlow to its new owner.

(EDWARD H. PHILLIPS COLLECTION)

By 1936, Louise was working for the Bureau of Air Commerce when she received a telephone call from an old friend, Olive Ann Beech. She wanted Louise to enter the Bendix Trophy race, which was allowing women to compete directly with men for the first time in the event's history. Walter Beech agreed to the proposal, and aviatrix and close friend Blanche Noyes was tapped as Thaden's co-pilot and navigator.

Walter provided the duo an essentially stock Beechcraft Model C17R *Staggerwing* as their mount. Departing Floyd Bennett airport near New York City in the early hours of September 4, Louise and Blanche cruised across the nation, stopping only for fuel at preplanned points, including one at Wichita. After a relatively uneventful journey of 14 hours 55 minutes, the two women were stunned to learn that the C17R was the first to land at Mines Field near Los Angeles, beating a field of highly

respected men and women pilots. In addition, they had established a transcontinental record (east-west) for women.

In the years ahead, Louise never forgot that Walter Beech was chiefly responsible for not only helping her enter aviation, but also for his guidance and friendship until his death in 1950. **KA**

NOTES:

1. In the mid-1930s, Walter Beech sent Truman Wadlow to California, where he became a Beechcraft distributor. During World War II he flew military transport missions with the United States Army Air Forces in the United States and Europe. After the war he flew as a corporate pilot for Phillips Petroleum, flying alongside his former instructor, Clarence Clark. Truman died in 1993. Newman Wadlow flew in the 1929 Ford Tour in a Travel Air Type 6000B, accompanied by Ralph Nordberg, director of public relations for the company. As with his twin brother, Newman had a distinguished career in corporate and private aviation, flying and selling airplanes until his retirement in the mid-1980s. He died in 1989. Both brothers were inducted into the Oklahoma Aviation Hall of Fame in 1983.
2. In 1929, Louise became the fourth woman in the United States to earn a Transport License, and later that year, together with Amelia Earhart and other female pilots, established the Ninety-Nines – a unique organization aimed at inspiring women to fly. During the early 1930s Thaden worked for Walter Beech, demonstrating the Model 17 biplane to potential customers. In 1934, Louise was hired by the Bureau of Air Commerce to promote the marking of airports in the western United States to help pilots determine their location. During World War II, she was active in the Civil Air Patrol. Louise Thaden died in 1979.

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.

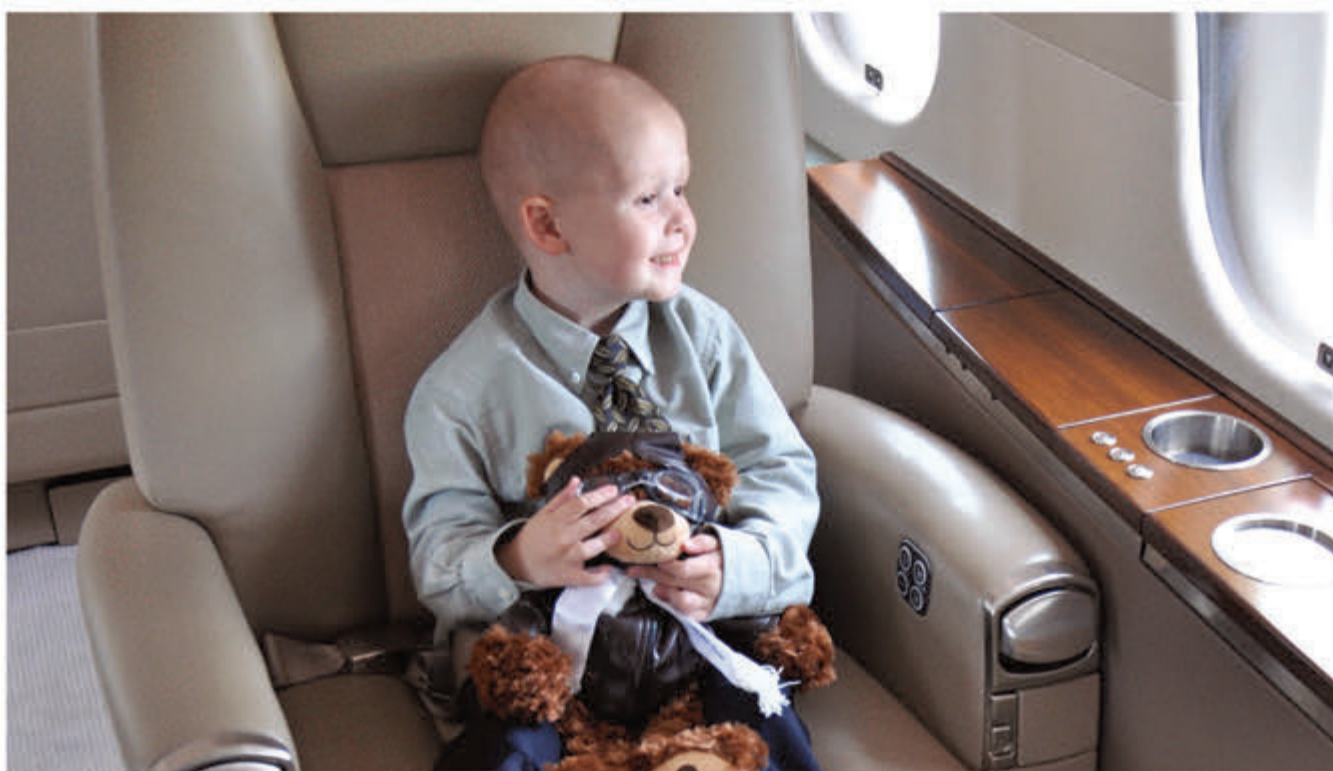
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Raisbeck's EPIC Platinum Performance and Swept Blade Propellers now available for King Air 250

Raisbeck Engineering has announced that King Air 250 operators can now enjoy the increased takeoff, climb, cruise and landing performance available only

through its EPIC Platinum Performance Package. The FAA-certified short field performance allows safe access to thousands more airports around the world, all while retaining the increased MMO. An additional capability with the EPIC Package includes increased cruise speeds of up to 10 knots, with associated quicker time-to-climb. Raisbeck's Swept Blade Turbofan Propellers are also available as a stand-alone installation.

The EPIC Platinum Performance Package and Swept Blade Propellers for the 200, C90 and 350 series are certified with the European Aviation Safety Agency (EASA), Brazil's Agência Nacional de Aviação Civil (ANAC) and many other aviation authorities around the world.

These improvements are available through the company's worldwide network of Authorized Raisbeck Dealers, including all Textron Aviation Service Centers.

For more information, visit www.raisbeck.com.

Innova Aerospace Introduces Enhancement Options for King Air 90 Series

Innova Aerospace has announced the availability of two new aircraft modernization and performance enhancement programs for the King Air 90 series aircraft. The first program is an engine modification utilizing the advanced power of GE's H80 engine. The second program

complete interior refurbishment • composite panels • cabinetry construction • exterior paint • aeromed conversions • cabinetry conversions • floorplan changes • ice shield boot

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Jason Wondra Michael Williams

is a full avionics retrofit with the AeroVue integrated flight deck by BendixKing.

Innova says that providing a power output of 800 shp and extended TBO of 4,000 hours, the H80 engine is a robust, reliable, cost-effective upgrade for the King Air 90. The GE H80 upgrade is available now for the C90 and E90 with the other models available in Q1 of 2017.

The company says by installing the AeroVue integrated flight deck on the Beechcraft King Air C90 series offers owners a cockpit built with a list of long sought after features. Those who take advantage of the upgrade will experience an increased value on the airframe, as well as improved dispatch reliability, functionality, and maintainability.

To learn more about these programs and other services Innova Aerospace offers for the King Air 90 series, please visit www.MyKA90.com or call (573) 517-6135.

Textron Aviation Announces "Peace of Mind" Program for New King Air Customers

Textron Aviation launched its Peace of Mind program, which is designed to create a simpler transition to a new Beechcraft King Air. Peace of Mind provides up to two years or 400 hours of Textron Aviation's ProParts and ProTech programs, as well as Pratt & Whitney's ESpecially engine maintenance program, all free of

charge for new King Air purchases through September 30, 2016, with delivery by the end of the year.

Textron Aviation's ProParts and ProTech programs are part of the company's ProAdvantage umbrella of programs, which have been designed to provide customers lower, predictable ownership costs, while enhancing aircraft values through comprehensive maintenance. ProParts and ProTech create a powerful support solution for King Air customers, further enhancing their ownership and operating experience. The ESpecially program is Pratt & Whitney's world-class maintenance program and provides engine coverage for up to two years or the first 400 hours free of charge and at a reduced rate until first overhaul.

Garmin® Introduces New Ways to Interact with GTN™ 650/750

Garmin International Inc. announced an expanded feature set, an enhanced user interface and additional wireless connectivity solutions for its popular GTN 650/750 touchscreen navigators. New GTN enhancements include pinch-to-zoom, Telligence Voice Command and more. Additional ConnexT® capabilities include Flight Stream 510 integration, which supports wireless Database Concierge between the GTN and the Garmin Pilot™ app on a mobile device. Flight plan transfer, as



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well as traffic, weather, GPS information and more also display on select mobile devices when paired with Flight Stream 510. Pilots can also utilize the Garmin Pilot app on Apple mobile devices to send text messages and initiate phone calls. These new features bring advanced capabilities and even more functionality to new and existing GTN 650/750 touchscreen avionics.

Control the GTN via spoken commands using Telligence

When installed with a separate push-to-command button, Telligence Voice Command can help reduce pilot workload by using automatic speech recognition technology within the GTN and GMA™ 35/GMA 350 audio panels to perform common tasks. Based on intuitive phraseology, Telligence now accepts hundreds of commands at the push of a button.

Database Concierge wireless database management

The new Flight Stream 510 is a small, patented Wi-Fi® and Bluetooth®-enabled MultiMediaCard (MMC) that enables wireless Database Concierge and communication between the GTN 650/750 series, select avionics and up to two compatible Apple or Android mobile devices operating Garmin Pilot. Wi-Fi connectivity is specifically for wireless database transfer, while Bluetooth enables a wide variety of additional capabilities, including flight plan transfer, the sharing of traffic, weather, GPS and more. Customers can easily incorporate wireless technology into their aircraft with the latest GTN software upgrade and Flight Stream 510 as no wiring changes or complex installation considerations are required. For customers with a G500/G600 glass flight display installed, back-up attitude information also wirelessly displays within a mobile device.

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Chris Crisman/TNC/LightHawk

Database synchronization

Customers with any combination of GTNs or GTNs with G500/G600s receive additional benefits with database synchronization. Once customers complete the wireless database transfer to the GTN, the databases are automatically transferred to the G500/G600 and synced across both systems to ensure database information matches and is up-to-date. Chart streaming also allows pilots to view and utilize departure, approach and arrival charts immediately, even while the charts database is synchronizing between the two systems. Flight Stream improves the experience by adding Database Concierge wireless database transfer, which automates database management between Garmin avionics. Flight Stream 510 wirelessly transfers the following databases to compatible avionics: Jeppesen NavData or the Garmin Navigation Database, Airport Directory, Obstacle, Terrain, SafeTaxi®, FliteCharts® and Basemap.

Connex text and voice control via mobile devices

With Flight Stream 510, customers can pair an Apple mobile device operating Garmin Pilot to the GTN to access text and voice services enabled by a GSR 56 datalink. While in-flight and on the ground, pilots can quickly send and receive messages with a mobile device using a familiar conversation format and conveniently utilize the phone's existing contact database. Similarly, customers

can initiate phone calls on an Apple mobile device using Garmin Pilot, so it's easier to complete phone calls over a headset while in flight. The GSR 56 also supports the display of weather on compatible avionics.

European enhancements

Tailored specifically to European operators, the GTN series now includes the option to display Visual Reporting Points (VRPs) on the moving map. Often used as reporting points in controlled airspace, pilots can easily reference these points relative to their position on the map so it's easy to navigate and help make accurate reports to air traffic control.

Trusted, cost-effective Garmin Navigation Database extended to certified avionics

The new Garmin Navigation Database offers a cost-effective path to incorporate the latest database information within select Garmin avionics throughout a single aircraft for one low price. The Garmin Navigation Database coverage encompasses North America. U.S. coverage of the new Garmin Navigation Database starts at \$129 for a single update and \$299 for an annual subscription for the GTN 650/750. Single navigator bundles for the GTN 650 start at \$499, while a variety of new OnePak annual database subscriptions are available starting at \$649, which can be downloaded across multiple Garmin avionics and one portable in a single



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aircraft at no additional cost. In addition to database information, the purchase of a U.S or North America OnePak subscription also provides customers with an annual subscription to Garmin Pilot IFR Premium on Apple or Android mobile devices. To purchase and download new OnePak database subscriptions and to view additional database pricing or coverage information, visit: www.flyGarmin.com.

Additional features within the latest GTN software upgrade

- Radios available during power-up prior to engine start
- Addition of flight track vector gives pilots more visual cues to help ensure flight plan tracking
- Option to clear-all stored flight plans and user-waypoints
- Pilot selectable SafeTaxi diagram hot spot descriptions

These new features are expected to be available in August from Garmin Authorized Dealers. For additional information, visit www.garmin.com/aviation.

Garmin Also Announced Garmin Pilot™ App Now Displays Jeppesen Terminal Charts

Garmin International Inc. also announced the integration of geo-referenced Jeppesen terminal charts

within the Garmin Pilot app on Apple mobile devices. Jeppesen charts can be viewed within Garmin Pilot from the charts page and in split-screen mode alongside the moving map. The global integration of this new, popular chart option alongside superior flight planning, filing and flight logging capabilities, bring Garmin Pilot customers around the world an all-inclusive, single application solution. Additionally, Garmin FliteCharts® and Jeppesen approach plates can also be overlaid on the moving map for seamless navigation, while Flight Stream 510 integration supports Database Concierge wireless database transfer capabilities. Glide range ring on Apple mobile devices and automated electronic logbook within Android add to the series of Garmin Pilot enhancements.

Jeppesen terminal charts and chart overlay for Apple mobile devices

Within the app, customers with a Jeppesen electronic chart subscription can download and save Jeppesen charts, including approach charts, arrival and departure procedures, as well as Jeppesen airway manuals. Charts can be saved in pilot-selectable binders for convenient access, which can be viewed in full-screen or split-screen mode.

Customers who utilize Jeppesen charts or Garmin FliteCharts can also take advantage of chart overlay, which displays instrument approaches on top of the moving map for optimal situational awareness when transitioning from the enroute to approach phase of flight. Depending on preference, these charts can also be viewed in track-up and north-up on the moving map. Customers with a Garmin Pilot IFR Premium subscription and an available Jeppesen electronic chart license may access Jeppesen charts within the application at no additional charge. To purchase a Jeppesen electronic chart subscription for Garmin Pilot, contact Jeppesen at (800) 621-5377.

Garmin Pilot range ring and flight plan enhancements for Apple mobile devices

Also new as part of the upgrade, Garmin Pilot offers pilots the option to display a glide range ring on the moving map within Apple mobile devices. The glide range ring is depicted as a cyan ring around the estimated area that can be reached by the aircraft in a best glide range configuration. Range is based on Best Glide (VG) speed and the glide ratio entered by the pilot within the aircraft profile, which then utilizes the aircraft's altitude and wind to determine range ring distance. The option to shape the glide range ring for rising terrain that may interfere with the aircraft's glide range is also available.

Additionally, pilots can now more easily modify flight plans within Garmin Pilot on Apple mobile devices by simply selecting the flight plan bar along the top of the display from any page.

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Automated electronic logbook for Android

Pilots can now take advantage of electronic logbook capabilities built-in to the Garmin Pilot application for Android mobile devices, which also offers seamless integration with flyGarmin. While flying with Garmin Pilot, the logbook feature provides automatic record keeping of commonly recorded data pertaining to each flight. Information such as date, total duration of each flight, number of takeoffs and landings, route and more are all conveniently sorted and saved for easy reference across Garmin Pilot devices and within flyGarmin. Built-in redundancy also allows pilots to make manual logbook entries via the flyGarmin website or Garmin Pilot app, where both entries are automatically synced and stored. Additional capabilities include the option to record endorsements, track flight currency, generate historical flight reports and more. All Garmin Pilot customers can also visit the flyGarmin website to import previous flight plans.

Flight Stream 510 for Android and Apple mobile devices

Pilots can more easily manage their database subscriptions with Flight Stream, while also receiving additional benefits such as wireless flight plan transfer, the sharing of traffic, weather, GPS position data and more via the Garmin Pilot app. The newly announced Flight Stream 510 is a small, patented Wi-Fi® and Bluetooth®-enabled MultiMediaCard (MMC) that enables communication between the GTN™ 650/750 series and two compatible Apple or Android mobile devices operating Garmin Pilot. Wi-Fi connectivity is specifically for Database Concierge wireless database transfer and Bluetooth allows for a wide variety of additional capabilities, including flight plan transfer.

With Flight Stream 510 and a GSR 56 datalink, customers can also pair an Apple mobile device

operating Garmin Pilot to the GTN to access text and voice services enabled by a GSR 56 datalink. While in-flight and on the ground, pilots can quickly send and receive text messages and initiate phone calls on an Apple mobile device within the app. Customers can easily incorporate wireless technology into their aircraft with Garmin Pilot, the GTN 650/750 and Flight Stream 510, as no wiring changes or complex installation considerations are required. Flight Stream 510 wirelessly transfers the following databases to the GTN: Jeppesen NavData or the new Garmin Navigation Database, Obstacles, Terrain, SafeTaxi®, FliteCharts and Basemap.

Garmin Pilot 8.4 for Apple mobile devices and 5.4 for Android are both currently available. For new customers, Garmin Pilot is available from the Apple App Store and Google Play 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 starting at \$74.99. A subscription to Garmin Pilot IFR Premium starts at \$149.99. Visit www.garmin.com/aviation for additional information.

Air BP Sterling Card Enters U.S. Market with Signature

Starting in August, Air BP's Sterling Card will be accepted at 62 of Signature Flight Support's 122 U.S. locations for fuel purchases, as well as other ancillary FBO purchases such as ramp fees, lavatory service, lubricants and de-icing.

The agreement brings the card's global acceptance to more than 700 locations, and marks its entry into the U.S. market. According to Signature, after the initial introduction, the company will look to further expand the payment option within its network in the future.

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Service Bulletins

Service Bulletin 21-4165: Air Conditioning – Duct Plug Inspection

Issued: August 2016

Compliance – Recommended: This Service Bulletin should be accomplished at a scheduled maintenance period or inspection.

NOTE: This Service Bulletin may be completed at a time when Left and Right Passenger Compartment Cabin Window Panels are removed to facilitate other maintenance such as at the first Cross Tie Inspection at 2500 cycles.

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 mechanic must complete all of the instructions in the service bulletin, including the intent therein.
- 2) The mechanic must correctly use and install all applicable parts supplied with the service bulletin kit. Only with written authorization from Textron Aviation can substitute parts or rebuilt parts be used to replace new parts.
- 3) The mechanic or airplane owner must use the technical data in the service bulletin only as approved and published.
- 4) The mechanic or airplane owner must apply the information in the service bulletin only to aircraft serial numbers identified in the Effectivity section of the bulletin.
- 5) The mechanic or airplane owner 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.

Effectivity: Beechcraft Super King Air B300/B300C Fusion, Serial Numbers FL-1032 through FL-1041, FL-1043, FL-1049, FL-1053 through FL-1055 and FL-1057.

The equivalent of this Service Bulletin has been incorporated on production airplanes FL-1058 and on.

Reason: This Service Bulletin is being issued to inspect for missing distribution duct plugs to ensure installation meets type design and to ensure adequate air flow distribution.

Description: This Service Bulletin provides parts and instructions to inspect for and if necessary install 300-1184-1 upper duct plugs at FS 156.00.

Warranty: Eligible airplanes may qualify for parts and labor coverage to the extent noted in the Labor Hours and Material Availability sections of this document. (Editor's Note: Full service bulletin can be found on company website).

From King Air Communiqué 2016-08:

Issued: July 2016

ATA 30 – Prop Heat Operational Check Procedure - Engines Not Running

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

King Air Communiqué 2015-07 was issued to remind owner/operators not to operate the propeller heat when the engines are not running. This action helps to prevent damage to the propeller blades and de-ice boot. The propeller manufacturer has also placed a 10-second limitation on operating the propeller heat with the engines not running. This limit creates an issue when performing a propeller heat test because the timer in the propeller de-ice system cycles the power to the left and right propeller every 90 seconds. This condition makes it impossible to assure that the propeller heat system is operating correctly while the airplane is in the hangar. The system can still be tested during ground runs with the engines running. The following paragraph provides a procedure that tests the system without applying power to the boots.

Propeller De-ice Boot Continuity Check: Check the resistance of each de-ice boot by disconnecting the boot and testing it individually. Continuity through the slip rings can be measured with the boots connected by disconnecting the brush block and measuring the resistance between the

rings. Resistance will vary by how many boots are connected. Verify that there is good continuity. Resistance can also be measured between the two terminals on the brush block assembly with the wires disconnected. Remember that the resistance will vary.

Refer to the following chart for the resistance values.

Temperature Range °F	Temperature Range °C	1 Boot	
		Min Ohms	Max Ohms
0 to 5	-17.8 to -15.0	4.51	4.71
5 to 10	-15.0 to -12.2	4.52	4.72
10 to 15	-12.2 to -9.4	4.54	4.74
15 to 20	-9.4 to -6.7	4.55	4.75
20 to 25	-6.7 to -3.9	4.57	4.77
25 to 30	-3.9 to -1.1	4.58	4.78
30 to 35	-1.1 to 1.7	4.60	4.80
35 to 40	1.7 to 4.4	4.61	4.81
40 to 45	4.4 to 7.2	4.63	4.83
45 to 50	7.2 to 10.0	4.64	4.84
50 to 55	10.0 to 12.8	4.66	4.86
55 to 60	12.8 to 15.6	4.67	4.87
60 to 65	15.6 to 18.3	4.69	4.89
65 to 70	18.3 to 21.1	4.70	4.90
70 to 75	21.1 to 23.9	4.72	4.92
75 to 80	23.9 to 26.7	4.73	4.93
80 to 85	26.7 to 29.4	4.75	4.95
85 to 90	29.4 to 32.2	4.76	4.96
90 to 95	32.2 to 35.0	4.78	4.98
95 to 100	35.0 to 37.8	4.79	4.99

Note: Ambient air temperature may not represent the de-ice boot temperature. Solar or infrared heating will affect the temperature of the de-ice boot.

De-ice timer check: Connect a 28 VDC lamp to terminal block E21 on the left and right engine. Turn power ON and place the De-Ice switch to AUTO position. The light should illuminate and alternate between the left and right engine approximately every 90 seconds.

ATA 33 – Emergency Exit Sign Bulb Replacement and Alternate Part Number


B300 Series


The FWD and AFT Emergency Exit signs located in the headliner of the Model B300 Super King Air airplane come from the factory with an incandescent lamp, DS1, which can be prone to loosening in its socket due to vibration or burning out. Textron Aviation has approved an LED replacement for this lamp with Part Number E10-WHP. When the lamp is replaced, either with the incandescent or LED Light, Textron Aviation recommends the use of F900 torque seal on one side of the socket to lamp base. This approved material is listed in Chapter 20 Consumable Materials for King Air Models and may be used to secure the lamp in the socket.

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ATA 46 - XM Weather TAF Data on Pro Line 21 King Airs with XM Receiver Part Number 822-2031-002

Beginning in early 2016, Rockwell Collins began receiving reports of intermittent reception of Terminal Area Forecast (TAF) data through the XM weather receiver installed in Pro Line 21 airplanes. This data includes products such as METARs and AIRMETs. Investigation determined that the National Weather Service had increased the data package size of these messages and the current configuration of the receiver was causing a software time-out and reset before the complete data package was downloaded.

Any owner/operators experiencing this issue may utilize Rockwell Collins Service Information Letter (SIL) 523-0824074 (Editor's Note: See SIL online with this Communiqué) to provide an updated receiver configuration that allows it to handle the new data package size. Airplanes with factory installed Fusion avionics are not affected. Pro Line 21 airplanes that have been upgraded to Fusion avionics through an STC may still have the Part Number 822-2031002 receiver and require the update. Refer to Appendix A.

ATA 54 – Nacelle Splice Plate Inspection

A new inspection requirement has been added to the Model B300 King Air Maintenance Manual. This inspection addresses the nacelle splice plates. Even though this inspection has been in the manual set for many years for other King Air models, it is new on the King Air B300 and it will eventually be added to the King Air 200 and 300 Series Maintenance Manuals as well.

Textron Aviation Technical Support has received inquiries from B300 owner/operators asking for information about the nacelle splice plates since they are not familiar with this new requirement. The purpose of this Model Communiqué is to define the scope of the inspection, provide illustrations of where the nacelle splice plates are located, provide examples of corrosion that have been found in past inspections and explain why these inspections are now required.

The nacelle splice plates are located under the nacelle turtle back. There are two per side and they run longitudinal. (Editor's Note: illustrations provided with Communiqué on website.) For airplanes without wing lockers, the turtle back should be removed. As an alternative, the nacelle splice plate edge may be inspected through the main landing gear wheel well. For airplanes with wing lockers, the splice plates are exposed when the lockers are removed. Model 350ER airplanes will have to deal with external fuel tanks, but the intent of the inspection is met by inspecting the edge of the part as seen through the main landing gear wheel well area. This inspection procedure is included in the SIRM for other King Air models and can be used as a reference until the SIRM is updated to include this procedure in the B300 section.



A severely corroded example.

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

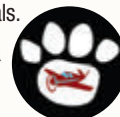
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