King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

DECEMBER 2022 • VOLUME 16, NUMBER 12 • $6.50

# Operation Airdrop

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King Air
December 2022 Volume 16 / Number 12
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King Air is distributed at no charge to all registered owners of King Air aircraft. The mailing list is updated bi-monthly. All others may subscribe by writing to: King Air, P.O. Box 1810, Traverse City, MI 49685, or by calling 1-800-447-7367. Rates for one year, 12 issues: United States $15.00, Canada $24.00 (U.S. funds), all other foreign $52.00 (U.S. funds). Single copies: United States $6.50, Canada/Foreign $9.00.

**COVER PHOTO**

Courtesy of Robert Johnson




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

ADVERTISING: Advertising in *King Air* does not necessarily imply endorsement. Queries, questions, and requests for media kits should be directed to the Advertising Director, King Air, P.O. Box 1810, Traverse City, Michigan 49685. Telephone 1-800-773-7798.

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# BOOTS IN TH


Operation Airdrop board members Robert Johnson (left) and Larry Robicheaux on location during Hurricane Ida in September 2021. Johnson's King Air E90 is loaded with food and supplies being delivered to southern Louisiana. Each of the black coolers has 250 servings of food prepared by Operation BBQ Relief.

# Operation Airdrop activates GA community to respond to natural disasters

by MeLinda Schnyder

Robert Johnson saw a Facebook post in August 2017 from friend Doug Jackson asking fellow general aviation pilots in the Dallas area to help in an effort he was leading to fly critically-needed relief supplies to small airports in coastal Texas. While ground transportation was unsafe due to catastrophic flooding, aircraft could land with basic necessities to be dispersed to people displaced from their homes by Hurricane Harvey, a devastating Category 4 hurricane that ravaged the Texas coast from Corpus Christi to Beaumont, including the greater Houston area.


"Every time we deploy the needs are different, but the ability to carry a large amount of cargo is always needed and this is an area where all King Airs shine," said Robert Johnson, who loads his 1980 King Air E90 with food and supplies for Operation Airdrop missions.

Above, Johnson flying a World Hope International team to Fort Myers, Florida, in October 2022 aboard his King Air E90. They operated desalination plants to provide clean drinking water in the aftermath of 2022's devastating Hurricane Ian.

"I responded immediately, and I ended up flying the very first mission for what became Operation Airdrop," Johnson said. "At the time I owned a Cessna 421C, and I spent the better part of a week carrying both supplies and people all over South Texas. As best as we can figure, general aviation was responsible for delivering around 250,000 pounds of relief supplies in the days following Harvey. We believe it was the largest use of general aviation airplanes ever for disaster relief and being part of it was simply the most impactful flying I've ever done."

Johnson, who traded his Cessna for a 1980 Beechcraft King Air E90 in early 2019, is now a board member for Operation Airdrop (OAD), the 501(c)(3) nonprofit organization that formed from Jackson's effort during one of the worst natural disasters in U.S. history. He has flown with OAD in support of four hurricanes, including Hurricane Ian in September 2022, the deadliest hurricane to strike Florida since 1935.

OAD remains an all-volunteer organization that specializes in deploying GA assets for disaster relief. Through fall 2022, OAD has flown well over 1,000 missions to deliver an estimated 650,000 pounds of cargo – from hot meals to cleaning supplies to diapers.

Johnson says there are more than 2,000 volunteers in the OAD database and more are needed. A wide range of aircraft have flown missions, from an Aeronca Champion single-engine light aircraft to a Bombardier CRJ-700 regional jet.

"We always need more planes, pilots and volunteers," he said. "Every time we deploy the needs are different, but the ability to carry a large amount of cargo is always needed and this is an area where all King Airs shine! There are no specific pilot requirements, but airplanes with cargo capacity – both in pounds and cubic space – are highly desired. The best place to get information on donating and volunteering is through links found at *operation-airdrop.com*."

## How Operation Airdrop Works

Operation Airdrop is a grassroots, scalable, airborne disaster relief that mobilizes quickly in order to solve "week one" problems after a major disaster. Critical supplies need to arrive in hours, not days, and OAD coordinates the flights from a team of volunteers either working virtually or deployed into the affected region.

"Whenever we think there is a potential for deployment – usually a hurricane brewing in the Gulf or Atlantic – we start tracking it and looking at potential affected locations," Johnson explained. "As the storm tracks and predictions get narrowed down, we alert our volunteer pilots and then will make the call to deploy once we get initial assessments from the ground and from our partner organizations."

OAD has strategic relationships with several groups including The Salvation Army, one of the largest disaster-relief organizations in the world; Operation BBQ Relief, a caravan of cooks, mobile pits, kitchens and volunteers feeding first responders and communities affected by natural disasters; and the Cajun Navy, volunteers using their own personal equipment to provide immediate rescue and relief during natural disasters.

"In many ways we operate as the logistics arm for these organizations and can provide rapid transportation when the road infrastructure is compromised," Johnson said. "We can also do spot missions where the speed and range of general aviation airplanes can be utilized to provide help."

Once the call to deploy is made, OAD sends a mass email to its database of pilots and starts coordinating airplanes/pilots, ground staff and supply donations. Volunteers at the OAD operations center are continuously assessing needs, scheduling freight, updating FAA for clearance codes, managing aircraft weight loading specs and fuel burn, identifying fuel replenishment

Robert Johnson's King Air E90 during a 2021 Operation Airdrop mission to support those affected by Hurricane Ida. Johnson wanted the E90 for its extended fuel capacity and upgraded -135 engines.

**"Through fall 2022, OAD has flown well over 1,000 missions to deliver an estimated 650,000 pounds of cargo – from hot meals to cleaning supplies to diapers."**

locations and providing OAD's air force of volunteer pilots with weather updates.

Among OAD's missions since Hurricane Harvey:

Hurricane Irma, 2017: One week after Hurricane Harvey airborne relief efforts had ended, OAD was called to fly supplies to damaged areas throughout Florida, basing aircraft from Tallahassee and Lakeland.

Hurricane Maria, 2017: OAD joined forces with the Major League Baseball Players Association and former players Jose Cruz Jr., Luis Alicea, Nandy Serrano and Ivan "Pudge" Rodriguez to charter cargo flights of emergency supplies to Puerto Rico.

Hurricane Florence, 2018: OAD coordinated hundreds of GA compassion flights from Raleigh/Durham, North Carolina; more than 280,000 pounds of supplies were flown over 520 flights in six days.

Hurricane Michael, 2018: In collaboration with World Hope International, LabCorp and Cobra Energy, OAD flew supplies from Gainesville, Florida, into affected areas in Florida and Georgia.

Big One Exercise, 2019: OAD consulted with Washington state's Kenmore Air and the Washington Seaplane Pilots Association for a statewide exercise to simulate aviation response to a large magnitude earthquake on the West Coast.

Hurricane Ida, 2021: Over three days, OAD transported 21,500 hot meals to residents, first responders and military personnel in southern Louisiana.

Tornado outbreak, 2021: OAD activated in December to deliver supplies to Kentucky, one of the states hit hardest by the deadly tornado outbreak that hit the middle of the country.

Hurricane Ian, 2022: OAD deployed more than 200 pilots and 75 ground volunteers to provide 10,000 hot meals, $15,000 in supplies through donations, 25,000 pounds in flight supply donations and a significant number of Amazon orders in three days.

## A King Air Pilot's Perspective

Johnson is a 4,500-hour pilot and owned a Cessna T210, then a Cessna 421C before moving up to the King Air E90 in early 2019.

"I logged over 1,200 hours flying the 421 and loved the airplane, but I also craved the reliability of a turbine," he said. "The looks of the King Air line always appealed to me, and after a several month search that had me come close to purchasing three other airframes, I ended up owning one of the final E90s made. The extended fuel capacity of the E90 and the upgraded -135 engines make it a great fit for our long-range missions."

Johnson has been flying since college, when a friend's father who was a Marine aviator became his aviation mentor, taking him for a flight in a Piper Archer and encouraging him to learn to fly. He's been using airplanes as business tools since running his first company, and the serial entrepreneur credits being able to reach clients in communities of all sizes quickly via business aircraft for the growth and eventual sale of the three businesses he's started – two in technology and one in oil and gas. He said it also helped him achieve a positive work/life balance.

Johnson, who moved to the Dallas area with his parents when he was 13 and lives there now, stepped away from the day-to-day operations of

Johnson's wife Kelly and two kids enjoying the flight from the cabin of the King Air. He flies the King Air about 175 hours each year, which includes beach and mountain vacations and visits to upstate New York where the kids attend college.

his last company in 2020 and has been spending time since 2021 as a contract pilot, flying various King Airs, Cessna Citations and other aircraft types.

He uses his King Air E90, which is based at Addison Airport (KADS), for beach and mountain vacations, and he flies often to upstate New York, where his kids are attending Colgate University. Johnson and his wife Kelly met while attending Colgate where they were both athletes on the track and field team in the 1990s.

"I'm also on the Board of Trustees at Colgate and use my King Air to travel both to Hamilton, New York, and other locations for board meetings," he said. "Getting to upstate New York from Texas is not the easiest thing in the world, so having our King Air makes those trips much easier and faster. In fact, I hold the FAI world record for the Dallas to Syracuse flight in the King Air's weight class." *(FAI, the World Air Sports Federation, is the world governing body for air sports and for certifying world aviation and space records.)*

He said he flies the King Air about 175 hours a year and adds another 50 hours in the 2006 American Champion Citabria he owns. Additionally, he is a partner and airshow demonstration pilot in the Trojan Phlyers (thetrojanphlyers.com), a Dallas-based group of aviation professionals preserving the history of the North American Aviation Company's T-28 Trojan by performing formation and solo aerobatics with two 1953 T-28B Trojans at air shows and events across the country. The Phlyers were invited to perform at Oshkosh in July 2022 and Johnson calls it "a highlight of my airshow career!"

The most rewarding flying of his career, though, remains the philanthropic flights he makes on behalf of Operation Airdrop and Veterans Airlift Command (VAC).

VAC provides free air transportation to post 9/11 combat wounded

**"The most rewarding flying of his career, though, remains the philanthropic flights he makes on behalf of Operation Airdrop and Veterans Airlift Command (VAC)."**


Left, two 1953 T-28B Trojans during an airshow. Johnson is a partner and airshow demonstration pilot for the Trojan Phlyers. (credit: Gary Daniels)

**"The reliability, ruggedness and capacity of the King Air makes it a great airplane for Operation Air Drop's missions ..."**

and their families for medical and other compassionate purposes through a national network of volunteer aircraft owners and pilots. *King Air* magazine featured the organization and several King Air owners who volunteer in April 2015. Johnson got involved with VAC after getting to know the organization's founder Walt Fricke through the warbird community.

"I feel that I truly make a difference volunteering my airplane and time for OAD and VAC, and they are both exceptionally run organizations," Johnson said.

He hopes King Air owners reading this will consider getting involved with either cause. While financial donations are always welcome, he stresses that there is nothing like the feeling you get when you provide a comfortable mode of transportation for a wounded veteran or deliver water, peanut butter and toilet paper to folks who have just lost their homes.

Johnson said the most memorable Operation Airdrop flight is one that he didn't fly but he helped to coordinate this past September when Hurricane Ian

## TO DONATE OR VOLUNTEER

**OPERATION AIRDROP (OAD) is an all-volunteer organization that goes to the front lines of a disaster zone to provide airborne aid and relief to those in need. Learn how to get involved as a pilot, volunteer or donor at *operation-airdrop.com*.**

**VETERANS AIRLIFT COMMAND (VAC) provides air transportation for medical and other compassionate purposes to wounded warriors, veterans and their families through a national network of volunteer aircraft owners and pilots. Visit *veteransairlift.org* to find out how to be a volunteer pilot, to donate money or to request transportation for a wounded warrior.**


Volunteers loading up Johnson's 1980 King Air E90 with supplies and hot food to deliver to residents and first responders during Hurricane Ida in September 2021.


David (right) and another Pine Island resident, unloading an OAD airplane. Johnson had read an article about the island being cut off from help when the barrier island's bridge was destroyed by Hurricane Ian and set up an OAD mission to bring them much-needed supplies.

hit southwestern Florida. Early on a Monday morning, after a long day of flying his King Air to get from Texas to Florida and then flying an OAD mission, Johnson was reading a *Wall Street Journal* article about the 9,000 residents of Pine Island being cut off from help when the barrier island's bridge was destroyed by the hurricane. He emailed the journalist who wrote the article to get a contact name and number on Pine Island.

"Not realizing it was 6:30 in the morning, I called the number and David groggily answered. He quickly woke up when I said I had a fleet of airplanes with supplies to deliver to Pine Island," Johnson said. "A couple of hours later we landed three planes on a 2,600-foot grass strip, and David and a couple of his friends met us with pickup trucks. When David said 'You gave us hope' it brought tears to my eyes."

**"When David said 'You gave us hope' it brought tears to my eyes."**

"Over the next few days we delivered approximately 15,000 pounds of supplies directly to people in need on Pine Island with general aviation aircraft all piloted by volunteers." KA

The melted heat ducting (and a close-up of the damage, right) that was under the floorboards of an F90.

# F90 Heat Ducts:

## A Curious Coincidence?

by Dean Benedict

Last summer I supervised a gear overhaul (inspection) on a King Air F90 belonging to a client. We were coming down the home stretch. The motor, gear box and torque tubes were ready for reinstallation. The cabin had been gutted for ease of access and we were about to reinstall all the floorboards that had been removed for the inspection. On a whim, we decided to look around before closing up.

To my dismay, we found a mess of melted ducting. The under-floor heat duct going to the aft cabin and baggage compartment was totally melted and deformed (photos above). Worse yet, the tail deice supply line, which runs right on top of the heat ducting, was melted flat which would point to no air getting to the boots on the tail. That's a problem.

### Seen It Before

Believe it or not, 10 years ago I saw this exact scenario on another F90. It flew to my shop for same-day service on a couple squawks. I'd never seen this King Air before. For one of the squawks, I needed access under the floorboards

and there they were – melted heat ducts. The deice line was also melted flat. I checked the duct temperature sensor and it ohm'd out correctly. I needed to troubleshoot this further, but this guy was in a huge hurry. He was hell bent on leaving that same day until I told him that a collapsed deice line was a no-go item. It had to be replaced. I got it ordered for the next day and he left the F90 in my shop overnight. The next morning, I received and installed the new deice line, put the ducts back in and off he went.

That wasn't how I liked to do things, but he had Phase Inspections coming due very soon, and he scheduled to bring the F90 back to me in a couple of weeks. I knew I could replace the ducts at that time and become more familiar with this King Air. I looked forward to unraveling the mystery of those melted ducts. Unfortunately, I never got the chance. A week later the pilot called to tell me the gear collapsed on landing.

*Allow me to digress briefly, because this is a perfect example of what happens when you skimp on a pre-buy inspection. That F90 was recently purchased. The pilot and owner had worked together for a while, both of them new to King Airs. The owner deferred to the pilot in all things aviation-related, and the pilot was*

**(continued on page 18)**

***" ... the tail deice supply line ... was melted flat which would point to no air getting to the boots on the tail. That's a problem."***


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# RANGE

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TPA

Flight image courtesy of
FlightAware (flightaware.com)


The AB and CD circuit pins of the duct sensor thermostat. The CD circuit wasn't providing a proper reading.

*extremely confident in his ability to assess and fly any aircraft. The pilot seemed eager to please the owner by saving him money wherever possible. From what I could see, the gear was due for a six-year inspection at the time of purchase. The shop doing the work did not work on King Airs regularly. After the gear collapse, I was engaged to investigate the cause and I found clear evidence the gear was not rigged properly. This would have been found during a proper pre-buy inspection. Enough said?*

Fast forward to the F90 with the gear collapsing – here was my opportunity to solve the mystery of the melted heat ducts. We ohm'd out the duct temp sensor and it checked out good. We went a step further and applied heat to it, as called out in the maintenance manual. There are two circuits in this thermostat. The AB circuit gave a proper reading, but the CD circuit wasn't reading what it should have been.

My client happened to have an E90 in the hangar, so we decided to test

that temp sensor. We ohm'd it out and it checked perfectly, but when we applied heat, the CD circuit was out of whack. What were the chances of two bad temp sensors? That wasn't what we hoped for.

This little sensor lists around $6,100 (that's correct – six-thousand, one hundred dollars for a thermostat). He ordered it and got it the next day. We put the thermostat through its paces and it passed all tests with flying colors. Even when heat was applied, it met all the prescribed parameters. We installed it along with new heat ducts and a new tail deice line. To date, the new ducts and deice line appear to be holding up. He uses his borescope to check periodically. The jury is still out, though. He needs to fly more and keep monitoring it.

The big question is: What happens when the CD circuit goes high on resistance after 300°F is applied? The Maintenance Manual does not elaborate.

## Tail Deice

My overriding concern is the deice line going to the tail. The only way to verify if the tail boots are working is to test them during a ground run and have someone stand outside to watch them inflate. If air is not getting to the tail boots, the gauge for deice boot pressure will still be reading the proper pressure. The pressure gauge cannot differentiate if the line going to the tail boots is blocked.

As we go forward, my client is monitoring his situation and if he finds anything I will let everyone know. Further, I would love to hear if anyone out there has seen melted heat ducts below the floorboards on any model of King Air. Please forward any and all details to me by phone or email. I'm very keen to know if this "mystery melt" is something we all should be digging into or if it's an oddball occurrence. KA

After the repair was completed: The ducting (right) is wrapped with insulation and the new deice line (left) is a different color but has the same "deice" tags – one above the rib and one below it.

Dean Benedict is a certified A&P, AI with over 45 years of maintaining King Airs. He's the founder and former owner of Honest Air Inc., a maintenance shop that specialized in Beech aircraft with an emphasis on King Airs. Currently, with BeechMedic LLC, Dean consults with King Air owners, operators and maintenance shops on all things pertaining to King Air maintenance. This includes troubleshooting, pre-buys and maintenance management. He can be reached at ***dr.dean@beechmedic.com*** or **(702) 524-4378.**

# Aircraft Registration Extension, Aviation Associations Concerned with Ligado Canada Proposal and Restoration of NEXUS and FAST Requested

## FAA to Extend Aircraft Registration Duration

In mid-November, the Federal Aviation Administration (FAA) posted a draft of a direct final rule to extend the duration of aircraft registration certificates from three to seven years. Per the draft, "Initial Certificates of Aircraft Registration will expire seven years from the month issued. In addition, the FAA is applying this amendment to all aircraft currently registered under existing FAA regulations governing aircraft registration, which will extend valid Certificates of Aircraft Registration to a seven-year duration. This rulemaking also makes other minor revisions to rules related to internal FAA registration processes."

The National Business Aviation Association (NBAA) "welcomed" the FAA ruling with its Director of Flight Operations and Regulations Brian Koester stating, "The new rule comes with tangible benefits that will help drive convenience and efficiency for business aircraft owners."

According to the NBAA, the policy change, which was required by the 2018 FAA Reauthorization Act, provides two types of relief for aircraft owners. First, the change to a seven-year registration period will greatly reduce the number of applications for ownership renewals awaiting FAA approval at any given time, thereby drawing down the agency's administrative burden, and expediting the approval of renewals. Second, the rule expands authority for aircraft owners to operate beyond the registration renewal date from 90 days following expiration to 12 months – a timeframe that should cover any renewal delays stemming from agency backlogs.

The FAA will accept comments on the ruling 30 days from when it's published in the *Federal Register* and it will become effective 60 days from publication.

## CBAA, NBAA Express Concerns with Ligado Canada Implementation Proposal

The Canadian Business Aviation Association (CBAA) and the NBAA partnered recently to express concerns with a Ligado Canada application to operate an Ancillary Terrestrial Component (ATC) in a band that could negatively impact aviation safety.

Ligado Canada submitted its application to operate the ATC in the L-band – essentially the band adjacent to bands used by the aviation sector. The company has conducted similar operations in the U.S., though at much lower power levels.

In a letter to Innovation, Science and Economic Development (ISED) Canada, the associations explained, "Ligado Canada proposes to operate an ATC in a manner similarly to how they have been authorized by the U.S. Federal Communications Commission (FCC) to operate in the U.S., however, Ligado Canada's application is for significantly higher power levels (~82 times greater) and relaxed Out-Of-Band-Emissions limits."

"Preliminary analysis has demonstrated that the Ligado proposal is likely to have an adverse effect on aviation," said Robert Sincennes, CBAA's vice president of regulatory affairs, which corresponds to U.S. data supported by the FAA that indicates there is a clear adverse effect. "We are asking the ISED to reject the Ligado Canada application at any power level until such a time as aviation safety concerns are resolved."

The power levels presumably must be higher in order to provide adequate coverage to remote areas of the country.

"The U.S. has a long history with Ligado implementation," said Heidi Williams, NBAA's senior director,

> *"In 2019 U.S. tourists visiting Canada reached 25 million and Canadians took 44 million trips to the United States."*

air traffic services and infrastructure. "At lower power levels, as proposed in the U.S., data shows there will be aviation impacts. Now consider the impacts at a much greater scale."

Source: NBAA

## Canadian Business Organizations Request Restoration of NEXUS and FAST

In early November, over 50 Canadian business organizations signed a letter to the Hon. Marco Mendicino, P.C., M.P. Minister of Public Safety of Canada and the Hon. Alejandro Mayorkas, U.S. Secretary of Homeland Security requesting that the two countries "demonstrate the creativity and commitment to urgently resolve the outstanding issues" to reopen NEXUS and the Free and Secure Trade (FAST) programs.

Over two decades ago, the Prime Minister of Canada and the President of the United States announced NEXUS – a safe and secure way for citizens of both countries to cross the border more securely and efficiently by "pre-clearing" them.

The letter states that both "the Canadian and American economies have benefited enormously from the expedited and enhanced security protocols." Trusted Traveler programs like NEXUS and the FAST program have "allowed citizens and goods to pass across our shared border more efficiently at the same time as they enhanced security by allowing government border security resources to be deployed where they are most needed, focusing on unknown people and goods, as opposed to hindering low-risk travelers and carriers at our borders."

In 2019 U.S. tourists visiting Canada reached 25 million and Canadians took 44 million trips to the United States. KA

# Automatic and Manual Prop Heat

by Tom Clements

The King Air model 200 was the first of the King Airs to have both an automatic and manual mode of propeller de-ice. All previous King Air models offered only the automatic system. The purpose of this article is to describe the system differences and to provide some insight into their use.

All King Air models have been approved for icing flight and were standardly equipped with multiple anti-ice and de-ice equipment. This included, for most models, engine auto-ignition, engine anti-ice (inertial separators), windshield heat, pitot heat, fuel vent heat, stall warning heat, engine lip boot heat (for the original cowling design) and propeller heat.

Regarding the propeller heat system, up until about 1981 this system had both an inboard and outboard electric heating element embedded in a rubber boot that extended from the propeller hub out to about one-third of the propeller blade length. Beyond that boot, there is enough centripetal force and blade flex that ice is not an issue. But near the hub, there is less velocity through the relative wind and less flex since the blade has not yet tapered from its "baseball bat" shape into an airfoil.

The heating elements are fed electric power via three brush blocks and associated slip rings (two in the hot prop system which will be explained later) that are mounted on the backside of the propeller spinner's bulkhead. To conserve electric power, the inboard and outboard heating elements work separately, not simultaneously. Each heating element uses about 5 amps of current and they are connected in parallel not in series. That means that about 15 amps total is required to heat either the inboard or outboard elements on a three-blade propeller and 20 amps is required for a four-blade prop.

The system is activated by turning on a single Prop Heat switch located on the pilot's right subpanel. This is a circuit breaker type of switch that will trip itself to the off or down position if excessive current is encountered. On the pilot's left subpanel, originally, and then on


The Prop Heat switches, both automatic and manual, on the King Air 200 pilot's right subpanel.

*"Overall, Prop Heat has proven to be a reliable and trustworthy system."*

the overhead panel in later year models, is an analogue ammeter with a needle that moves on a fixed background. There is a green arc painted on the background that designates the proper current usage. The green runs from 14 to 18 amps for the three-blade propellers and from 19 to 23 amps for the four-blade ones.

Again, to decrease the electric power required by this system, a timer unit cycles the current in the following fashion: Current is supplied to the right prop's outer heating elements for 30 seconds, then for 30 seconds it goes to the right prop's inner elements, then to the left prop's outer elements for 30 seconds, and finally to the left prop's inner elements for the same time. By removing the outboard ice first, it makes it easier for the inboard ice to be slung off by the spinning propeller.

In most of these timers – but not the latest version – when the switch is turned off and then back on, the timer starts on the next stage. For example, if the right prop's inner elements were in use when the system was shutdown, it would restart on the left prop's outer elements. To verify that all heat boots are working properly for the whole system, two minutes must elapse as the prop ammeter is monitored so that all four heating combinations are checked. If your timer is the earlier type, a complete check can also be made by cycling the Prop Heat switch on and off four times. If you're not sure which timer you have, this action may have just checked one section four times!

Usually the ammeter will show a small but noticeable "jump" as the timer switches to a new section. If a very *noticeable* drop on the ammeter is exhibited – perhaps going from 15 amps to about 10 amps – and then the ammeter jumps back up to 15 after 30 seconds, it is telling you that one blade's heating element has come disconnected: Current is only flowing on two, not three, blades. (Of course, for a four-blade propeller the ammeter would have gone from 20 amps down to about 15.)

Overall, Prop Heat has proven to be a reliable and trustworthy system. If there is a weaker link in the system, it is probably the timer unit. With the advent of the model 200 in 1974, Beech addressed the issue of a defective timer. Read on…

In the 200-series and 300-series, a second switch is installed in the pilot's subpanel next to the other Prop Heat switch. The left switch is labeled "Auto" and works exactly as we have been describing. The right switch is labeled "Inner/Outer" or, in later airplanes – 1981 and after, "Manual." Let's talk about that new switch.

This switch – the Inner/Outer earlier one – activates electric relays that send current to both propellers simultaneously. The "Inner" position – the up position on the switch that is spring-loaded into its center position – as you would expect, activates the inner heating elements of both propellers simultaneously. Likewise, the "Outer" position – down – does the same for the outer elements. Remember to use Outer before Inner so that the shedding of the inner ice is not impeded by outer ice.

If ever the automatic system fails – for example, perhaps the circuit breaker switch trips itself off – now the pilot has another option to use. Here's what's important to realize: The manual system switch has its own circuit breaker as well as breakers for both left and right prop heaters. These are totally independent of the circuit breaker switch that is used in Auto mode. These three switches are located on the left cockpit side wall, in the bottom of the two rows beneath the fuel panel.

Furthermore, the ammeter used for measuring the operation of the automatic system is also removed from the manual system. If it were not, it would always be pegged out on the high end of the scale since twice as much current is flowing. However,


The circuit breakers for the manual system, shown above.

since now a normal system will be using 30 or 40 amps – 3-blade or 4-blade – this is readily observed on the generator loadmeters, each of which would increase about 6 or 8%.

The electric wires – typical, round wires – embedded in the inner and outer sections of the earlier boots, as we've stated, pull about 5 amps each. When BF Goodrich developed their "Hot Prop" system – with only a single heating element per blade – it would be logical to think that now 10 amps would be required. But no, it's still 5 amps. This "magic" is accomplished by replacing the wires with metal foil that starts wider near the spinner but narrows as it moves out the blade. This causes more heat to be felt closer to the spinner and less further out. As we've stated, no heat at all is needed beyond the boot due to flexing and centripetal force and it follows that the farther out we go on the blade the less need

for heat there is. The larger props on the 300-series take about 7 amps per blade.

I believe I am correct in stating that all four-blade King Air propellers use the Hot Prop system. With a single heating element per blade, it now sends current to one propeller for 90 seconds, then the other side for 90 seconds before it repeats. A complete heat cycle for the inner/outer style requires two minutes: 30 seconds per section times four sections. The newer Hot Prop style requires three minutes: 90 seconds per side. But here's the rub: Ice was shed from only one-half of the boot originally. Now it's shed from the entire boot. It is my experience and opinion that the nose of the fuselage tends to exhibit more ice "dings" with the more modern system. Oh well, it's simply a fact of life.

With their four-blade propellers, the later 200s (and all members of the 300-series) replace the three-position inner/outer switch with a two-position switch labeled "Manual." It is spring-loaded to remain in the down, off position and is held up by a finger of the pilot's right hand for about a minute and a half when being used. The idea is to then wait until some prop vibration is felt and then hold it up again. Once again, current for the manual system is not displayed on the prop de-ice ammeter but the two loadmeters now show an easily observed 8% increase.

I'll finish with an idea that is definitely *not* FAA-approved, yet I have it on good authority that it works like a charm. Got a big rubber band? If you use it to hold the Manual switch in the Up position – maybe hook it to a post light on the instrument panel – then the propeller de-ice system truly becomes an anti-ice system. No 90-second accumulation to fling against the nose! Of course, we are using twice the current that the auto system would use but I believe the two generators can handle it quite easily. KA

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King Air expert Tom Clements has been flying and instructing in King Airs for over 50 years and is the author of "The King Air Book" and "The King Air Book II." He is a Gold Seal CFI and has over 23,000 total hours with more than 15,000 in King Airs. For information on ordering his books, contact Tom direct at *twcaz@msn.com*. Tom is actively mentoring the instructors at King Air Academy in Phoenix.

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


## BLR Receives FAA Approval for King Air C90 Winglet Lighting System Upgrade

BLR Aerospace has received Federal Aviation Administration (FAA) certification for its King Air C90 Winglet Series LED lighting system upgrade for winglets and tails. The light package is a turn-key solution that upgrades the forward position, forward anti-collision, forward recognition, rear position and rear anti-collision lights from incandescent to LED.

The LED lighting system improves performance by:

- Directly converting power into light
- Operating 10 times more efficiently than incandescent lights
- Drawing far less current than conventional lighting
- Allowing for lower-voltage power supply

For more information, visit *BLRaerospace.com* or call +1 (425) 353-6591.



## Textron Aviation to Expand Distribution Center

Textron Aviation recently broke ground on its 180,000 square-foot expansion to its parts distribution facility (photo, opposite page). Announced during NBAA-BACE, the project will allow the company to better support customers who own and operate Cessna, Beechcraft and Hawker products.

The company said the additional space and capabilities the expansion provides will enable it to continue to invest in inventory to support not only new models but continue to bolster stock levels for other product lines. The expansion will provide additional space for warehouse storage, customer support analysts and offices. It will also enable Textron Aviation to make it easier for customers to conduct business with the company, including a dedicated lane for customers to drop off or pick up parts in person and opportunities for consolidated shipments. The expanded operations additionally provide expedited support to the company's own Wichita Service Center.

The expansion project is expected to be completed by the end of 2023.

## Starr Aviation Launches Safety Partnership to Help Cut Risks

Starr Aviation, a division of Starr Insurance Companies, recently announced the launch of the Starr Safety Partnership, a network of service providers focused on enhancing safety for Starr-insured pilots and aircraft owners and reducing losses.

The services, offered at a discount for Starr customers, include more than a dozen providers of everything from crisis training to maintenance to risk-reduction technologies. The services apply to each phase of aircraft ownership – from acquisition through safe and cost-efficient operation to the sale of an aircraft – and include aircraft evaluation, engine inspection, safety and egress training and in-flight medical, an advanced bird-avoidance system, and upset prevention and recovery training.[1]

Reducing aircraft downtime is one of the key intangible savings because company aircraft are often critical assets maintained to help facilitate business development and growth.

More information is available at *https://www2.starr.com/aviation-safety-partnership*.

[1] Any services rendered by any network providers will be the responsibility of the individual provider as set forth in any applicable terms, conditions or agreement between customers and the provider, and any payment for such services will be borne solely by the insured.

## Registration Open for NBAA Regional Forum at Miami-Opa locka (OPF)

Register now for the National Business Aviation Association (NBAA) Regional Forum being held Feb. 8, 2023, at the Miami-Opa locka Executive Airport (OPF) in Florida.

The regional forum will bring together current and prospective business aircraft owners, operators, manufacturers, customers and other industry personnel for a one-day event filled with networking, education and aircraft. An anticipated 150+ exhibitors will be showcasing their companies and products, educational sessions featuring topics about the day-to-day operational issues facing the business aviation industry will be offered and a lineup of the world's most cutting edge business aircraft will be featured at an outdoor display.

**Students are invited to come to the NBAA Regional Forum at no cost to them,** which is especially valuable for those interested in working in business aviation.

For more information and to register, go to: *https://nbaa.org/events/2023-nbaa-miami-opa-locka-regional-forum*

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corpangelnetwork.org

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