King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

APRIL 2023 • VOLUME 17, NUMBER 4 • $6.50

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A Pilot Shares his Passion

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April 2023 Volume 17 / Number 4
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Flying over the eastern coast of Greenland.

You Should Fly a King Air Across the North Atlantic

10 Reasons Why

Story and Photos by Joe Casey

There was a seminal moment in my life about 10 years ago when I was in the throes of changing jobs; that moment changed my life.

I was in the Army for about nine years in the 1990s and enjoyed it, but I knew I didn't want to extend my service. I decided to join the Army Reserves and become an airline pilot. I flew for American Eagle Airlines as a first officer flying the Saab 340. Back then, regional airline pilots made very little, and it was certainly not enough to feed my growing family. I then worked for a paint company as a "flying salesman"; the owner of the company was a brilliant businessman, and I learned so much from him in the eight years I worked there.

I finally got the courage and decided I needed to do something entrepreneurially crazy – actually do what I wanted to do, which was to fly airplanes all over the world … but I didn't know how. Back then I did what information-seeking people did … I searched the internet to locate someone who flew ferry flights and found Margrit Waltz.

Margrit has been called the "Queen of the Atlantic." That is an understatement, as she has over 924 North Atlantic crossings in her logbook as of this writing. That is a record that no one will likely ever eclipse. I worked up the courage to call her. She answered and gave me about 10 minutes of her precious time. That seminal moment I referred to before was when I asked Margrit if I could go with her on a ferry flight.

I did not hear from her again for nearly five months, but unexpectedly she called and asked if I knew anything about Pro Line 21 avionics. I answered, "Of course!"

The long sunrise of the northern latitude highlighting the King Air.

“ ... I flew five international ferry flights in King Airs, and my love affair for the aircraft ... began.”

She graciously asked if I could be in Illinois the following morning for a trip to France in a Pro Line 21-equipped King Air 200. I immediately and eagerly affirmed that I'd be there and canceled everything else I was doing for the next five days. Little did she know how little I knew about Pro Line 21! That night, I studied as much as possible and did my best to "wing it" on my way to France. By the time I got to Bangor, Maine, I was a "Pro Line pro." The trip to France with Margrit went well and I was hooked. And so it started … my next trip was a solo flight from Mali, Africa, back to the U.S. and I soon had another King Air flight to Germany. The following year I flew five international ferry flights in King Airs, and my love affair for the aircraft and its ability to travel anywhere in the world began. In the piloting world, we call flying across the North Atlantic a "NAT crossing." I just finished my 75th trip and 90% of them have been in a King Air.

Why do I love it so much? Here are my top 10 reasons why every adventurous pilot should fly a King Air across the North Atlantic at some point in their life!

Ten: It's a Piloting Challenge

The North Atlantic is undoubtedly one of the most extreme climates to fly. A summer crossing is usually more benign than during the winter, but even the summer months can have huge challenges. I vividly remember three times I was thrown weather curveballs that I didn't expect, including severe turbulence, icing,

> **“If you want to challenge the extremes of the world, you can’t do better than to be in a King Air!”**

and winds that curtailed my range. A winter crossing will almost assuredly have curve balls.

Don’t even think of completing a crossing by yourself the first time; the NAT must be respected. Although the mighty King Air is easily my favorite steed to handle the extremes of the NAT. I’ve been at FL350 over the NAT with OATs nearing -60C°, and the King Air 350 kept me toasty warm. I’ve flown into non-forecasted severe turbulence coming into Narsarsuaq, Greenland (BGBW), and I was glad to be in an overbuilt King Air. If you want to challenge the extremes of the world, you can’t do better than to be in a King Air!

Nine: Bayou Self

The Army has the High Altitude Training School (HATS) at Eagle, Colorado. Many years ago I attended that school in a Blackhawk helicopter and we went to the top of many peaks in Colorado, learning to maximize the performance of the helicopter. One of those peaks is a high flat top of a spire barely big enough to land a Blackhawk. That peak, soaring hundreds of feet above the surrounding terrain, was named “Bayou Self” because you felt “all by yourself” if you landed there. It is a cool feeling. The NAT is the same way. There are parts of the flight where you simply cannot talk to anyone, where you are Bayou Self. That creates both a sinking feeling and an opportunity for those that like to “get away.” I’m one of the latter. Flying in a remote area is one thing, but there are places where the word “remote” doesn’t suffice. If you fly the NAT, assuredly there will be times when you are Bayou Self.

Eight: The Beauty of Greenland

I’ve been fortunate to see many parts of the world and the beauty of Greenland stands out amongst them all. Whether clothed in the white of winter or the icebergs of summer, Greenland is stunning and the immensity of the Greenland Icepack cannot be overstated. I’m awestruck every time it comes into view.

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A beautiful site of the northern lights dancing off the King Air 350 engine nacelle with its exhaust glowing at FL300 between Greenland and Iceland.

Seven: The Strength of the King Air Airframe

I've alluded to it, but this fact needs a point of its own considering the NAT. I've flown the crossing in Piper singles, a Cessna Caravan and about six different variants of King Airs. By far – there's not even a close comparison – the King Air is the airplane I feel the most comfortable flying for that mission. Multi-engine, super-strong and tested over the decades, there is no comparison to the King Air when you need an airplane that can haul around seven to 10 people comfortably and safely in the harshest environments. I'm writing this on the leg that takes me from Nuuk, Greenland (BGGH) to Quebec City, Canada (CYQB), and when I landed in Nuuk, I parked next to a King Air 200 airplane operated by Air Greenland for medevac flights. The fact that they picked the King Air 200 for this challenging mission is no secret. They know the King Air to be the safest mission-accomplishing airplane.

Six: The Northern Lights

I must include this one because the northern lights (or aurora borealis) are mesmerizing. I've seen them on three separate trips, and I've been blown away each time. My favorite sighting was in January 2022 while flying a King Air 350 to India. The lights showed up in

"By far – there's not even a close comparison – the King Air is the airplane I feel the most comfortable flying for that mission."

Getting fueled up at the Narsarsuaq Airport in Greenland (photo taken from the control tower).

Fjords are very common in the Iceland and Greenland regions and the view from above show their vastness and beauty.

> **"Sometimes you've just got to dig deep and find a way out."**

full force between Greenland and Iceland at FL300 at 10 p.m. and put on a show that seemed to be just for me. It was the most incredible show that anyone would have appreciated.

Five: You Meet the Most Interesting People

People that fly the NAT are unusual, and that's the way I like it. Pilots that fly the NAT want to see all this world has to offer in three dimensions. If you are reading this, you already appreciate the third dimension because you are one of the small minority of people who own an airplane or are a pilot. Interesting people are found all over the NAT.

Four: Experience "No Turning Back" Scenarios

I've had a windshield completely crack over the NAT. I've flown into Narsarsuaq when I experienced unexpected severe turbulence. I've been over the Greenland Icecap when Nuuk went 200 OVC due to a cloud layer coming in from the Davis Strait. I've diverted to an alternate where I had no choice but to land because there simply was not enough fuel to go anywhere else. In the lower 48, if you are at FL200 or above, you are usually in gliding distance to a runway somewhere. Over the NAT, you are rarely within gliding distance of anything resembling a flat, dirt surface.

The NAT will definitely make you think. I recently read the book "Failure is not an Option" by Gene Kranz from the U.S.'s early days in space. It articulated situations within our space program when there seemed to be no "out" of a bad situation. But with Gene's leadership and many brilliant minds in Mission Control partnering with astronauts in the spacecraft, they came up with the idea that got them out of a jam. Such is the mentality of a ferry pilot over the NAT. Sometimes you've just got to dig deep and find a way out. Options are few and many times there's no turning back.

High noon in southern Iceland.

Three: Experience Extreme Cold

I'm not a fan of the extreme cold, but you will get extremes flying the NAT, especially during the winter. The brutal cold punishes the pilot, sometimes with his life. You will be far better off if you are prepared. I've been guilty of being unprepared for the cold along the NAT, and I'm fortunate to have survived. The extreme temperature will impact every decision you make. That experience will make you a better pilot flying in the lower 48.

Two: The Airline Pilots Wish They Were You

Sitting at FL380 in the cockpit of a wide body jet with additional crew and flight attendants handing you first-class dinners is one thing. It is another to be making stops, enduring the extremes and challenges of the NAT. And, when they look north while flying the North Atlantic Tracks (NAT-OTS), they wish they could be doing what you are. They don't want to do it every day; I get it. It's not for everyone. But, deep down, they wish they were you, even if just for a little while.

And … the Number 1 reason every pilot should fly the North Atlantic …


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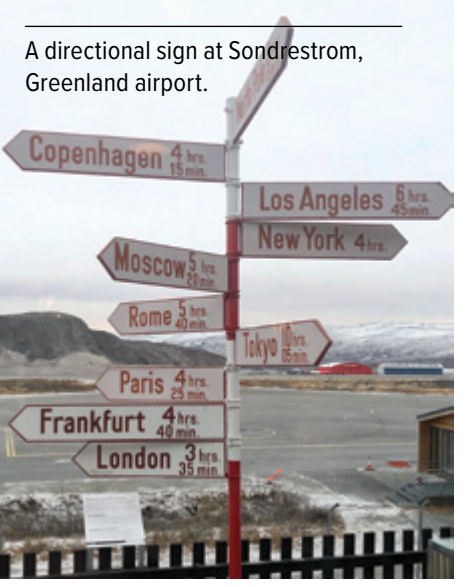
The author during a stop at Nuuk, the capital of Greenland.



A directional sign at Sondrestrom, Greenland airport.

One: The History of the Route

If you take a King Air from North America to Europe, you'll either go the "north route" or the "south route." Either way, you are stopping at airports hewn out of the rough and icy ground to create a way for our war machine to get to Europe to stop Hitler and his plans to rule the world during World War II. We bought those airports with the lives of many early aviation pioneers who figured out how to make it happen. We sent over 10,000 airplanes to Europe over the North Atlantic, many of which did not make it. If you want to learn some great history, look up "Bluie West One," "Black Watch Regiment" and "Battle of the Atlantic." When you fly the NAT, you can feel the history come alive.

I just finished flying a King Air 300 from Germany to Missouri and had all sorts of trouble while flying that route. There were fuel indication issues, airline flight cancellations, ground transportation challenges, swiftly changing weather, long hours at the flight levels, and body changes to the circadian rhythms. I actually called one of my trusted friends and asked if I should stop flying the long-distance ferry flights. They are so hard in so many respects, and I could fly domestically and have a wonderful career.

None of them are easy. The NAT throws something different at you every time. Now that I've slept since that conversation, I can't believe what I was thinking. The phone rang, and the request was to go to Sweden and pick up another King Air destined for the U.S. Do you think I took the flight? Of course! The NAT is in my blood, and I can't fathom a time when I'd seriously give up the chance to take the trip.

Will you see me in a King Air flying from Iceland to Greenland again? You bet! The North Atlantic is the epitome of living for a pilot, especially a King Air pilot. When are you going to take your King Air on a NAT trip? It could be a trip of a lifetime. KA

Joe Casey is the owner of Casey Aviation, Inc. based at KJSO in eastern Texas, which manages four King Air aircraft and provides flight training in many models of airplanes. He has 16,800 hours of total flight time, over 4,000 of which are in King Air airframes. He is a certified ATP-ME Commercial Pilot with ASEL/ASES, Rotorcraft-Helicopter/Instrument and Glider ratings. Casey is also a Designated Pilot Examiner (DPE) with BE-300 type rating issuing authority up to the ATP level, and also holds CFI, CFII, MEI, CFI-H, CFI-IH, CFI-G certificates. He has flown over 75 North Atlantic crossings in King Air aircraft.

Troubleshooting Autofeather

by Dean Benedict

In recent months I've fielded quite a few calls on the autofeather system in King Airs. In one case I was engaged to assist a shop with unraveling an autofeather mystery. The system was inoperative on one side and they had taken every conceivable step to fix it, with no luck.

As the tech outlined the actions they had taken, it sounded much like what I would have done. They swapped things from side to side. They replaced pressure switches and relays. Maybe they went a little overboard in changing every switch and relay in the system, but nothing fixed it and they were desperate to solve the problem.

It happens. When the source of the problem proves elusive, the tendency is to change everything and hope for a fix. As the story unfolded, there was one thing I kept wondering about – engine torque – is it really getting down to 200 foot-pounds?

Remember: Prop blades are kept in flat pitch by oil pressure. Engine torque drives oil pressure to a pressure

switch in the autofeather system. When the oil pressure drops, the prop feathers. But that's not happening here, even with a new pressure switch. My thoughts were: Either the engine is way out of rig, the torque meter is off … or both.

Sure enough, the torque meter was out of calibration. This prevented the 200 lb-ft switch from activating, so the prop would not feather. This was a brain teaser, I admit. The autofeather system in King Airs is fairly simple and it works great; but to troubleshoot it (or to help your shop troubleshoot it), you really need to know how it works. Accordingly, I'm repeating part of my article, "Autofeather Review" from 2018.

> **"The autofeather system in King Airs is fairly simple and it works great; but to troubleshoot it … you really need to know how it works."**

Autofeather Test

On takeoff, the autofeather system arms when the power level reaches 92% N1 or higher. But to test this on the ground in your preflight run up, you'd have to stand on your brakes and hope your fillings don't pop out while pulling each power lever back one at a time. Fortunately, the "Test" position of your autofeather switch eliminates this problem. In Autofeather Test, the power lever switches in the pedestal (the ones set at approximately 92% N1) are bypassed, which enables you to test autofeather function at a much lower power value. Note: The Test position of the autofeather switch is spring-loaded so that you can't mistakenly leave it in that mode.

The torque meter in question still reads 200 lb-ft after being removed from the King Air and was clearly out of calibration. This prevented the switch from activating so the prop would not feather.

Auto-ignition and Autofeather

Each engine has a high pressure switch on the torque manifold that actuates at approximately 400 to 500 foot-pounds of torque. These pressure switches have a dual function: they turn auto-ignition off and they arm the autofeather system (they don't *activate* it, they just *arm* it). It is common practice to test auto-ignition and autofeather in the same power run-up. At this point in your ground run-up, you would have the auto-ignition switch in the "On" position and you're holding the autofeather switch down in the "Test" position.

Both the autofeather and the auto-ignition annunciator lights are green. Below 400 lb-ft your auto-ignition annunciators will be on. As the power levers are advanced toward 500 lb-ft, the auto-ignition greens go out and the autofeather greens light up. Most King Air training programs use the phrase "two greens off and two greens on" as a memory technique to teach this relationship. Just don't expect the autofeather greens to come on simultaneously. The pressure switches on the torque manifold can trigger anywhere between 400 and 500 lb-ft, and engine N1 acceleration is another variable. You want two greens off and two greens on … eventually.

The main thing to remember about autofeather arming is that *each engine arms the opposite side*. This is where new King Air pilots can get easily confused. The left engine arms the right side autofeather and vice versa. Imagine advancing your power levers and the left autofeather light comes on but the right light does not. You have to fight the instinct to continue advancing your right engine power lever, because at this point, *the right engine just armed the left-side autofeather and gave you a green light.* In this scenario, the right-side autofeather is not yet armed and the left power lever must be moved further forward. So, if your left light comes on first, continue advancing your left lever until you get the right-side autofeather light. Conversely, if you get the right light first, keep advancing the right lever until the left-side autofeather light comes on. It's counterintuitive in the beginning, but you'll get the hang of it.

Autofeather Test Continued

Now you have two greens on, so autofeather is armed on both sides, and it's time to test the system. Starting with the left side, pull the left power lever back while holding the autofeather switch in the Test position. As you pull back through 400 lb-ft with your *left* power lever, the *right light* should extinguish (the right side is now unarmed and cannot go into feather).

At approximately 200 lb-ft of torque, the *left prop should feather.* A different pressure switch on the torque manifold triggers the feathering. It activates a solenoid

on the overspeed governor when the torque drops to 200 lb-ft. It's oil pressure from engine torque that keeps prop blades in flat pitch. When the oil pressure dumps, the prop feathers. Autofeather function is wired on the same side … in other words, the left engine controls the feathering of the left prop and vice versa. *Only the arming of each autofeather system is wired to the opposite side.* There's a good reason for this and I'll explain that shortly.

Flickering Lights and Oscillating Blades

I am often asked about autofeather lights blinking during test. When a prop goes into feather, particularly while on the ground, it increases the engine torque. In the example above where you just feathered the left prop, if the torque pushes far enough above 200 lb-ft, the left autofeather light will come back on and the left prop will flatten out. Flat pitch reduces torque. If it falls back down to 200 lb-ft, the left annunciator light will go out again and the left prop will feather again.

This flicker of the annunciator lights and oscillating of the prop blade is not unusual during autofeather testing on the ground. But it's equally normal for that annunciator light to go out and stay out. There are lots of variables (engine rigging, N1 settings, pressure switch adjustments) that influence whether or not you'll have a blinking annunciator during autofeather test. Either way you are good to go. Now let's bring the left engine back to speed and do the same with the right engine.

Autofeather Test – Last Step

Once you have brought each engine, one at a time, down to 200 lb-ft and feathered each prop, there's one more check to do. Assuming that you feathered the left prop first and now you have your right prop in feather, pull back the left power lever and make sure the left prop *does not go into feather.* Also make sure that the righthand prop comes out of feather. This is a crucial test. It ensures all switches and wiring are operating properly. If, in this last test step, the left prop feathered along with the right, you have a problem. Or, if the right prop doesn't come out of feather you have another problem. Either way, your autofeather system needs attention.

Test Versus Arm

You are now ready for takeoff, put the autofeather switch in the "Arm" position and take the runway. You go through 500, 600, 700 lb-ft of torque but the autofeather lights don't come on. Why? Because you have not yet gone through 92% N1. When you pass that N1 threshold, your autofeather annunciators should come on. Both sides are armed and ready to go.

The Test position of the autofeather switch is spring-loaded for a good reason. It makes it impossible to accidentally leave the system in Test mode and risk unintentional arming of the autofeather system at an insufficient power level.

The King Air automatic feathering system allows only one prop to feather at a time; they will never go together. You will recall the left engine arms the right side auto feather (between 400-500 lb-ft in Test and above 92% N1 in Arm) and vice versa. Imagine this: Your left engine fails on takeoff and the left prop goes into feather; it is now physically impossible for your right prop to feather, because the left engine, being well below 400 lb-ft, has *unarmed the right side autofeather.*

Leaving the Switch in Arm

In my opinion, autofeather is most crucial during takeoff. Some leave the switch armed in cruise, but at FL 250, if you had an engine failure and the switch was off, you'd still have plenty of time to cage the problem engine. On approach, even if the switch is in the Arm position, the system is unarmed as long as you are below the 92% N1. However, if you need to make a go-around and your switch is in Arm, the system will arm as soon as you push the power up high enough.

Maintenance

Where's the maintenance tip in all of this? How you squawk an autofeather problem can make your mechanic's job simple or complex. Many a pilot has dropped the aircraft off for maintenance on a Sunday night and realized they forgot to write up their squawks, so they leave a hastily scribbled list in the cockpit that includes "Autofeather inop." Of course I can troubleshoot from square one and work my way to the root of the problem. But if I get more precise information from the start, the job goes faster and that saves you money.

How about this squawk? "Autofeather tests good on ground but L/H annunciator fails to illuminate on takeoff." Aha! That sends me straight to the righthand power lever switch in the pedestal. Or this: "Autofeather will not test." Great! I can verify that the greens are not coming on at 400-500 lb-ft torque, and then I know to zero in on those torque switches. The more specific the information you give to your mechanic, the faster the problem will be diagnosed and fixed. I hope this helps. KA

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

PHOTO CREDIT: KING AIR ACADEMY

A Suggested Checklist "Cycle"

by Tom Clements

It is my strong belief that few pilots (rightly so!) use the same checklist for all of their flight operations in a particular aircraft. Even if they always open the same manufacturer's current checklist, I believe the way it is used causes it to become a rather different set of procedures. Here are a couple of quick examples: Is the checklist used for the exterior preflight? Is it read thoroughly for the starting engines procedure? I think I will receive almost 100% agreement that scrupulous attention to every checklist challenge and response line is very rarely, if ever, made during these procedures. Is this a bad thing? In my opinion, an emphatic "No!" is the answer.

I hope that you've all heard of the difference between a CHECKlist and a DOlist. When an airplane is brand-new to the pilot, he/she must be directed what to DO and exactly how to DO it. This is, of course, expected since the whole process is totally new. With practice and experience comes the knowledge that allows the instructions governing what to do during a particular checklist step to get relegated to the "back seat" of the braincells and the procedure can be thoroughly and safely accomplished without following the step-by-step

list of DOs. However, we must accept the fact that we as humans can make mistakes and that CHECKing our actions is a very good thing to do to catch these errors before they catch us and cause a problem. At this stage, the checklist truly aligns with its name: A necessary and important aid in CHECKing that nothing of importance has been overlooked.

Imagine that you are Pilot-in-Command (PIC) on the last flight before your King Air undergoes a Phase inspection. For many of you, this will likely be an annual combination of Phase 1 and 2 or a combined Phase 3 and 4, plus attending to calendar items … such as landing gear or propeller overhauls. What an incredibly important flight this is! Now is the time – no matter how familiar you have become with your CHECKlists – to act as if you are totally new to this machine and use the entire POH's Normal Procedures section as a DOlist. Time-consuming? Tedious? You bet! But oh, so important! You want to know the status of every system in your King Air so that you can provide the shop personnel with an accurate list of what needs special attention. "But, Tom, the shop will check things themselves and probably do a better job than I can. Why duplicate their efforts?"

In a few cases, you have stated a correct observation and a lot of efforts will indeed be duplicated. But some won't. How about cabin leak-rate tests? How about the engines meeting cruise power requirements at altitude?

"But wait a minute. Those things aren't on the POH's Normal Procedures lists. I don't know what to do nor how to do it!" I am sure this is a true statement for many of my readers. In some cases, you'll just have to go with the shop's findings even if they are not as complete as we'd like. But move the step up to a higher level as you gain experience in your particular new-to-you flying machine. Get a more-experienced pilot or an experienced King Air mechanic to go with you on some flights to demonstrate how and what to check. Take notes. Video the procedure on your smartphone. Review the King Air Academy's videos on You Tube. Follow some threads on the *Beechtalk* forum. Read *The King Air Book* and *The King Air Book Volume II*. There is a lot of helpful information out there waiting for those who search for it. Before the airplane leaves your hands and enters the shop, you want to ensure that everything within your capability has been examined by you and that a list of discrepancies has been made. Realize that *you* are the PIC, not the shop foreman or owner.

The same procedure is necessary (maybe even more so!) when you pick up the airplane after the maintenance procedure has been completed. Few shops conduct a test flight with their own people after the maintenance is completed. Now is not the time to "Kick the tires, light the fires and go!" Disregard what the humorous T-shirt says: "What could go wrong? It just came out of the shop?" Sadly, but truly, a LOT of things on your squawk-list can still be wrong and some new ones often crop up as well. I will even go so far as to make this suggestion: Give yourself an extra day before returning the airplane to normal service. Give the shop enough time to deal with the problems uncovered after the test flight that **you** conduct before you fly back to your home base.

Similarly, how about when the airplane is in the shop not for scheduled maintenance but for other work? Maybe some new avionics have been installed or the airplane has had an interior upgrade or exterior paint job. Often the shop you chose for the avionics or cosmetic work may be hundreds of miles away from your home base. How expensive it can become when multiple roundtrips must be made to resolve the problems that were not observed during the acceptance procedure! Again, budget enough time to check it out *very* thoroughly. One example: A paint shop failed to remove the paper with which it had covered the oil coolers to keep the new paint off the cooler's fins. The pilots missed that mistake during their exterior preflight inspection. Oil temperature quickly rose enough after takeoff to send them scurrying back to the departure airport.

I've said it before and I'll say it again here: **The most dangerous flight most of us civilian pilots will make is the first one after maintenance.** Now's the time to run the DOlists very carefully and completely.

But what about when the airplane has been operating regularly with no discrepancies showing up? How important is it to run the complete set of checklists

during the first flight of every day? I am quite certain that some angry feathers will be raised by my answer, but here goes: I don't think that running the complete set of checklist steps is important at all.

There are two reasons why I take this unusual position: first, **King Air systems are quite reliable and robust.** How often does the overspeed governor fail to test properly? How often does autofeather not function perfectly during its test? How often does a propeller not manually feather correctly? In my experience, the answer to all these questions is, "Almost never."

The second reason for my suggesting that every day running of the entire checklist is rather unimportant is this: **ANY system can fail at ANY time.** Just because autofeather functioned properly in the test completed five minutes ago, will it work if we experience an engine failure on THIS departure? How about flaps? If they cycled properly down and up in the run-up area, will they always extend/retract properly on the next landing/go around? That loose ground wire can totally disconnect whenever it "decides" to do so. That solenoid-operated oil dump on the overspeed governor, necessary for autofeather, can fail to function at any time.

So as for me, the complete, thorough running of all system checks is not normally a first-flight-of-the-day procedure that I will be doing. But, realizing that systems *can* fail – even though the failures are quite rare – we should not relegate the "full" DOlists to maintenance procedures only. How's this for the procedure? Namely, do ALL the checks no less than once every 25, or so, flight hours. In that much flight time, there will probably be one or more deadhead legs without passengers. That's the time to do *all* the system checks. Taxi to the run-up area and take the time required to do it all.

Yes, this means that a somewhat important system – such as autofeather – may be compromised for some time without being discovered. However, as I contended before, the chance of this is very rare.

Also realize that an educated, experienced, sharp pilot will pick up on many discrepancies during routine operation. "Hmmm, the left autofeather annunciator did not illuminate as I added power. I will easily abort this takeoff now at a mere 60 knots or so." Or, "Well look there – the differential pressure is holding at about 3.6 psid as I pass 15,000 feet and the cabin is climbing much faster than normal. We have a pressurization problem." Or, "Dang! The flaps stayed at approach after I put the handle all the way down."

Not realizing that a system is compromised is very unlikely to pose a serious threat to flight safety. Running out of fuel, misreading an instrument approach procedure and thereby descending too soon, penetrating a violent thunderstorm, experienced Power Lever Migration (PLM) because you failed to tighten the friction knobs sufficiently … these mistakes are much more critical than an overspeed governor not testing correctly!

"… another checklist is greatly important for day-to-day operation … one that covers the most important items that must be accomplished on every flight."

The Short Checklist

Surprisingly, I am going to advocate that another checklist is greatly important for day-to-day operation: A very short, homemade one that covers the most important items that must be accomplished on every flight. I call this the "short checklist." If it is not quite short, I guarantee that it will not really be used. Looked at? Sure. But truly acting to correct missed items? Not if it is used too casually or quickly.

On the opposite page is the one I use in LJ-1190, the 1988 C90A that I have flown and managed for many years. It fits on one 3.5-inch x 11-inch piece of paper (front and back) cut from the original 8.5 x 11 sheet after being printed on both sides and then laminated. The cockpit has two copies – one for each pilot. We always fly this airplane with a crew of two, so the PF (Pilot Flying) usually keeps his copy in the side pocket and the PNF (Pilot Not Flying) has his copy in a clip on the shaft of his control wheel. The "Before Starting" checklist and the "engine start procedure" itself are usually done by the left-seat pilot alone. Then the call for the "After Starting" checklist is made by the PF.

We do *not* insist on a challenge-response procedure when executing the checklist. The PNF can almost always see all the cockpit switches (although it may take some gymnastics to see the ones on the pilot's left subpanel) so if he/she can verify that a step has been completed then he/she is not required to make a verbal challenge and receive a verbal response. But we insist that each checklist section be verbally called for by the PF and then the PNF must state "After Start checklist complete," when it is. (Of course, using the name of the actual checklist section that was just completed.)

The "After Takeoff" section is often not called for until well away from the departure airport. However, it is almost always completed by 5,000 feet or so above the airport.

LJ-1190 Short Checklist

BEFORE STARTING ENGINES

Exterior Check ..... COMPLETED
Baggage, Door, & Pax ..... SECURED & BRIEFED
Parking Brake ..... **SET**
Engine Anti-ice Switches ..... VERIFIED ON; RVSD
Power Quadrant Levers ..... SET
Nav, Beacon & Cabin Sign Sws ..... AS REQ'D & ON
Battery Switch ..... ON
DC Voltmeter ..... TPL FED CHKD (22V minimum)
Fuel Quantity ..... _____ POUNDS; SUFFICIENT
Weight & CG ..... CALCULATED (BOW = 7,300 lbs)
Boost Pump Switches ..... ON AT ENGINE START

AFTER STARTING

Transfer Pump Switches ..... AUTO
Generator Switches ..... VERIFIED ON
Inverter Switch ..... NO. 1 or NO. 2 SELECTED (*CHECK BOTH)
Avionics Master Switch ..... ON
Propeller Levers ..... FULL FORWARD
Bar Switch ..... AS DESIRED
Environmental Controls ..... SET AS DESIRED
Engine Instruments ..... NORMAL (≥**1100 RPM**; ≤660°C)
DC Loadmeters ..... PARALLELED
DC Voltmeter ..... NORMAL IN FIVE POSITIONS
AC Frequency & Volts ..... NORMAL
Parking Brake & Brakes ..... RELEASED & CHECKED

BEFORE TAKEOFF

Pressurization ..... SET; SWITCH IN "PRESSure"
Rudder Boost & Elevator Trim Switches ..... ON
Trim Tabs ..... ONE, TWO, THREE SET
Flaps ..... SET (usually UP)
Flight Controls ..... FREE AND CORRECT
Avionics ..... SET
Suction & Pneumatic Pressure ..... NORMAL
Autofeather Switch ..... VERIFIED ARMED
Fuel Quantity ..... RECHECKED; SUFFICIENT
Engine & Flight Instruments ..... NORMAL
Engine Control Friction Locks ..... TIGHTENED
Takeoff Data / Briefing ..... COMPLETED

RUNWAY LINEUP

Bleed Air Valve Switch(es) ..... OPENED
Light Switches (Strobes, Recog, Taxi, Landing) ..... ON
Ice Protection Switches ..... AS REQUIRED
Engine Anti-ice ..... AS REQUIRED (usually OFF)
Engine Auto-Ignition Switches ..... AS REQUIRED

AFTER TAKEOFF

Landing Gear ..... UP
Landing and Taxi Light Switches ..... OFF
Flaps ..... UP
Yaw Damp ..... ON
Propeller Levers. ..... SET (usually 2000 RPM)
Engine Instruments ..... CHKD (1315 ft-lbs or 695°C)
Pressurization ..... CHECKED (ΔP & rate)
Outside Check (wings & nacelles) ..... NORMAL
Cabin Sign Switch ..... AS DESIRED
Passing 10,000': Recog Light Switch ..... OFF
Windshield Anti-Ice ..... NORMAL
Passing FL 180 Altimeters ..... SET (29.92inHg)
Light Switches ..... AS DESIRED
Oxygen ..... ON / MASKS CHKD

CRUISE

Autofeather Switch ..... AS DESIRED
Propeller Levers ..... SET (usually 1750 RPM)
Power Levers ..... MATCH TORQUE (not to exceed 695°C, 300 pph, nor Maximum Cruise Torque)
Engine Instruments ..... MONITORED
Fuel Quantity ..... MONITORED
*Trend Monitoring ..... DATA RECORDED
*Coffee Drip Pan ..... DRAINED
Pressurization ..... SET FOR LANDING

DESCENT

Autofeather Switch ..... ARMED
Ice Protection Switches ..... AS REQUIRED
Altimeters (below FL180) ..... SET
Light Switches ..... AS DESIRED
Approach Briefing ..... COMPLETED
Transfer Pump Switches ..... OVERRIDE (AS DESIRED)

BEFORE LANDING

Cabin Sign Switch ..... NO SMOKE & FSB
Flaps ..... APPROACH
Landing Gear ..... DOWN; THREE GREEN, NO RED
Landing and Taxi Light Switches ..... ON
Engine Anti-ice Switches ..... ON
Condition & Propeller levers ..... AS DESIRED
Pressurization ..... CHECKED (low ΔP)
Flaps ..... DOWN
Yaw Damp ..... OFF
Propeller Levers ..... FULL FWD AFTER TOUCHDOWN

AFTER LANDING

Condition Levers ..... LOW IDLE
Engine Auto-Ignition Switches ..... OFF
Engine Anti-ice Switches ..... VERIFIED ON
Ice Protection Switches ..... OFF
Light Switches ..... SET (Ldg, Recog, & Strobes off)
Trims ..... RESET FOR TAKEOFF
Flaps ..... UP
Bleed Air Valve Switches ..... CLOSED
About one minute prior to shutdown:
Vent Blower Switch ..... LOW or HIGH
Cabin Temp Mode Selector ..... OFF (Check for ITT < 585°C)

SHUTDOWN

Oxygen Control ..... OFF
Transfer Pump Switches ..... OFF
Crossfeed Switch ..... VERIFIED CLOSED
Bar Switch ..... OFF
Cabin Sign Switch ..... OFF
Parking Brake ..... AS DESIRED
Avionics Master Switch ..... OFF
Inverter Switch ..... OFF
Vent Blower Switch ..... AUTO (Off)
ITT ..... STABILIZED AT MINIMUM TEMPERATURE (≤585°C) FOR AT LEAST ONE MINUTE
Power Levers ..... VERIFIED AT IDLE
Condition Levers ..... CUT-OFF
Propeller Levers ..... FEATHERED (@ < 600 RPM)
Light Switches ..... OFF; NAV ON
Boost Pump Switches (below 10% N1) ..... OFF
Battery & Generator Switches ..... OFF
Control Locks ..... AS REQUIRED
Parking Brake ..... RELEASED WHEN CHOCKED

Revised November 2021

I am sure this normal checklist of mine will raise some questions. You will notice that some rather critical information is stated. For example, the minimum idle speed for a four-blade propeller is a very critical limit to observe. Also, you may be surprised to see that the pressurization is set for landing as the last step of the "Cruise" list, not early in the "Descent" procedure.

I have a suggestion: Any step that seems strange/unusual to you will be explained/justified by me in a future article. All you must do is email me at *twcaz@msn.com* with your question(s).

Let me direct you to this article's title: *A Suggested Checklist "Cycle."* What I am trying to emphasize is that when new to the airplane and when going into or coming out of the maintenance shop, the complete, laborious, time-consuming checklist must be utilized and usually in a DOlist manner. Also, it makes sense to run complete run-up checks on deadhead legs, at least once every 25 hours or so. However, if a short, well-constructed checklist is not used for routine flights, then I fear that the chance of missing an important step is likely to be overlooked.

I will close with something I have observed hundreds of times during my King Air recurrent training flights. I will often do something "sneaky" before takeoff such as moving the pressurization switch to "Dump" or failing one engine's oil pressure and/or temperature gauge. As we climbed after takeoff, with the failed item very often not observed, I would suggest the pilot redo his/her After Takeoff checklist, slowly and carefully. Sadly, the item was very commonly missed again even after this methodical procedure had been completed by the trainee. I have seen pilots run their fingers right down the vertical stack of engine instruments and still not notice that one side's oil temperature and pressure gauge had two needles sitting at zero. Folks, as I have written before, ***Looking*** is not ***Seeing***! Use *Judicious Suspicion*, slow down, and really **See** what you **Look** at. Amen? Amen! KA

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

by Edward Phillips

In the late 1950s, the U.S. Army's inventory of the versatile L-23/U-8 Seminole series of light military transports ended with introduction of the L-23F – the versatile Beechcraft that set a new standard for fixed-wing Army aviation.

Thirteen years after the end of the bloodiest conflict on earth known as World War II, Americans were riding the crest of a major postwar economic wave that put a car in every garage and Dwight D. Eisenhower in the Oval Office. It was a time like no other. Consider just a few of the distant memories from that generation: Detroit's GM, Ford and Chrysler went wild with tailfins, loads of chrome and gas-guzzling V-8 power. Drive-in theaters dotted the landscape, Wonder® Bread was in every kid's lunchbox, Elvis was swinging his hips (but not on national TV!); nuclear fallout shelters were all the rage, pretty girls on roller skates served food to cool guys in "hot rods," and color television was the technological marvel of the day.

In addition, the "Atomic Age" ushered in by the bombing of Hiroshima and Nagasaki in 1945 had slowly given way to the "Space Age," with the United States and the Soviet Union vying to put elementary satellites into earth orbit while quietly racing to see who would be first to successfully launch a man into outer space.

It was also an uncertain time when the Cold War between the two nuclear superpowers was heating up and would eventually come to a high-stakes stand-off in Cuba in 1962 that threatened to plunge humanity into a global nuclear holocaust.

In the world of commercial aviation, however, the late 1950s saw the "Jet Age" mature with introduction of jet-powered airliners such as the British Comet and the Boeing 707. The market for small, piston-powered aircraft was enjoying strong growth and production lines were humming at Cessna Aircraft Company, Piper Aircraft Corporation and Beech Aircraft Corporation. Beech, in particular, was strengthening its grasp on the business aviation segment that had begun in 1932 with the bullish Model 17R1, evolved into the affordable and efficient Model 17 Staggerwing during the mid-1930s and hit its stride after the war with strong sales of the twin-engine Model 18 Twin Beech.

The U.S. military had long been an operator of Beechcraft airplanes and the company's successful Model 50 Twin Bonanza had donned the uniform of the U.S. Army in 1951 with introduction of the L-23 Seminole. The light transport proved to be a rugged, versatile addition to the Army's fixed-wing inventory, and the L-32A was soon followed by a series of upgraded and modified aircraft over the next seven years culminating in the L-23D of 1957.[1]

Although the Army brass were more than pleased with the overall L-23 design, by 1958 it needed a larger airframe to cope with evolving mission requirements that included increased VIP transport, rapid troop deployment and myriad liaison duties. What the next generation Seminole needed, according to the Army, was more interior volume and horsepower, and in 1958 the Army sat down with Beech engineers to lay out the basic requirements for a follow-on design to the L-23.

Fortunately for the Army, the solution was just beginning to roll down the Beechcraft production line – the Model 65 Queen Air. First flown in August 1958, the Model 65 differed significantly from its Model 50-series predecessors because of its redesigned fuselage and that included a cabin that had been completely regenerated in

An L-23F was caught in its element on a photographic mission. Compared to earlier versions of the Seminole, the new airplane's chief attributes were its larger cabin, extended wingspan and more powerful engines. A total of 71 airplanes were delivered to the U.S. Army. (Special Collections and University Archives, Wichita State University Libraries)

terms of length, width and height. Those modifications gave the new Beechcraft the type of true multi-mission capability the Army needed.

For example, in its high-density cabin configuration, the airplane could deploy up to seven combat-ready soldiers and their gear. By removing the seats, up to 1,350 pounds of cargo could be loaded, and the airplane lent itself well to further modifications such as the RL-23F that featured battlefield surveillance radar systems to collect combat intelligence information.

As part of the fuselage redesign, three large windows were added to the cabin for increased visibility with a smaller, fourth window in the aft cabin section. In 1959 when Beech Aircraft began delivering the Queen Air to customers, the Army acquired three airplanes designated as the L-23F.

From the Army's viewpoint, the latest generation Seminole was a heavy-piston, twin-engine airplane with a maximum gross weight of 7,368 pounds (increased later to 7,700 pounds) with a wingspan of 45 feet, 10.5 inches. The airplane was powered by six cylinder Lycoming fuel-injected, geared, supercharged, opposed piston engines each rated at 340 hp (Lycoming IGSO-480 -A1A6, -A1B6 or -A1E6).

As mission demands continued to evolve over the years and performance improvements became available, in 1984 the Army's National Guard Bureau upgraded the engine installations in a majority of the L-23F/U-8F aircraft to eight-cylinder Lycoming fuel injected, opposed engines fitted with three-blade Hartzell propellers (the modification also included installation of new engine mounts). These changes were part of an FAA-approved, major modification to the original Beechcraft design, and was developed by Excalibur Aviation Company in San Antonio, Texas.

As the decade of the 1950s faded into history, aviation propulsion technology had progressed to the point that turbine power was coming of age for business aircraft such as the Queen Air. The Beech Aircraft Corporation was among the first to take the bold step of installing a turboprop engine in a modified Model 65 airframe, thereby creating the legendary *King Air*. But that is another chapter in the Beechcraft story. KA

Endnotes:

1. Phillips, Edward H.; "*Beechcraft—Pursuit of Perfection*;" 1992, Flying Books
2. Harding, Stephen; "*U.S. Army Aircraft since 1947*;" 1990, Airlife Publishing, Ltd.

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

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Wing Aviation Selects Bluetail's Modern Aircraft Records Platform

Bluetail announced that Houston-based Wing Aviation, a Part 135 on-demand charter and aircraft management company, has selected its leading modern aircraft records platform to digitize all of the maintenance and operational logs for its current fleet of over 30 business aircraft.

"The on-demand segment has grown to unprecedented levels over the past 24 months, with no sign of any significant slowdown," stated Bluetail COO and Cofounder Stuart Illian. "We are extremely proud that Wing Aviation, one of the companies at the forefront of this growth, has put their faith and trust in what Bluetail can do to make their operations even more efficient."

"We selected Bluetail for their in-depth understanding of business aviation," Frank Zimerman of Wing Aviation said. "The most significant value of an aircraft is in its maintenance records and history – adopting the Bluetail platform will help us maintain the value of the prime assets we manage while running one the safest and smoothest operations in North America.

Bluetail's capabilities are written around FAA Advisory Circular AC120.78A for electronic record keeping. Our maintenance teams can use the MACH Search functionality to search for granular data across specific FAA forms. You can't do that with anything else."

"We were invited to participate in the design and evaluation of Bluetail's MACH Conformity module and took that opportunity very seriously," Frank Zimerman said. "FAA conformity is a known bottleneck to the process. We've seen how the conformity software streamlines the entire process. Now any new aircraft can be added to our Part 135 certificate more easily and enter revenue services faster."

Bluetail is the leading modern aircraft records platform. The company enables aircraft owners, operators and flight departments to move away from paper-based records and digitize, organize, search and share all aircraft records (back-to-birth) from anywhere on any device. Their customers experience the peace of mind from knowing every aircraft logbook, document and history is professionally scanned, indexed and secured with our FAA-compliant, cloud-based SaaS platform so they can focus on running and growing their business. Learn more at *https://bluetail.aero.*

Bose Unveils A30 Digital ANR Aviation Headset

Bose, the leader in premium aviation headset technology, announced its latest innovation: the new A30 Aviation Headset.

Bose engineers designed the A30 as a completely new platform supported by a modern architecture, inspired by decades of research and pilot input. The A30 features reduced clamping force for comfort, improved clarity and a new digital active noise reduction system that enables three modes of user selectable noise cancellation for use in different flight environments – a first for around-ear aviation headsets.

The new Bose A30 Aviation Headset features:

Reduced clamping force: Building on the success of the A20, largely considered the industry's best aviation headset, the new A30 retains the iconic center pivot spring design in the headband but now boasts a 20% reduction in clamping force. Additionally, engineers shifted the headset's center of gravity to ensure stability. Together, these features reduce hot spots and improve fit across a wider range of head sizes, making long flights more comfortable.

Toolless side swappable down cable and mic: Pilots can transfer the A30's boom mic and down cable to either side of the headset without tools to improve cockpit ergonomics. The headset's improved down cable is lighter and more flexible for easier movement and storage.

Three modes of user selectable noise cancellation: The Bose A30 is the first-ever around-ear headset with three modes of user selectable noise cancellation. The high, medium and low modes will benefit pilots in nearly all flying use cases and environments – from piston aircraft to commercial airliners. When enabled via a user selectable switch setting, the A30 also allows pilots to double-tap the earcups for easy talk-through communication off intercom.

New digital architecture for improved audio and noise reduction: The most significant advancement in technology, the digital active noise reduction system provides full attenuation in even louder environments compared to the Bose A20. Incoming signals are automatically shaped and equalized for enhanced clarity and intelligibility, providing renewed balance and unmatched audio clarity.

Precision-focused noise canceling microphone: Engineered for aircraft with "hot mic" or PTT systems, this feature increases clarity and reduces background noise during transmission.

Robust design: As part of Bose's research and development, the A30 passed a rigorous process of more than 145 separate tests to ensure the headset will successfully endure the harshest cockpit environments. These tests included extreme heat, electricity, explosive atmosphere testing, extended wear and many more.

Industry certification: The Bose A30 is FAA TSO and EASA E/TSO-C139a certified and has been thoroughly tested in various aircraft. The Bose A30 also meets many military specifications, ISO standards, CE standards and the requirements of aviation regulatory groups worldwide, including ARINC.

Enhanced headset performance: A new fully digital active noise reduction system enhances the headset's performance with a minimum of 45 hours from two AA alkaline batteries in typical aircraft noise.

***Bluetooth*® audio (for select models):** Users can connect wirelessly to mobile devices, audio systems and electronic flight bags. Bluetooth audio can be mixed with intercom audio or have intercom transmissions mute Bluetooth temporarily.

Pilots across general aviation, business aviation and commercial aviation flew with the headset and provided valuable feedback that shaped the final product. The result is a headset developed and engineered to perform in high-intensity flight environments.

The Bose A30 Aviation Headset will retail for $1,249 in the U.S. and can be ordered online or through the worldwide Bose dealer network. The A30 comes with a five-year warranty that covers parts and labor. Additionally, Bose offers a 30-day flight trial to allow customers to experience the Bose A30 in their own flying environments.

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