

King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

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Courtesy of Chris Miller
Photo Credit: Parker Jones

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Fully Loaded

This modified F90 handles an active family of 7

by MeLinda Schnyder



At first take, it might sound like Chris Miller is still in the honeymoon phase when he says of the Beechcraft King Air F90 that he acquired in 2017, “It’s currently our only airplane and it’s going to be our only airplane. We absolutely love it.”

It is, after all, his first King Air. But when you find out more about Miller’s path to this point, it sounds like a level-headed statement. This is the airplane he knew he wanted before he even became a pilot, and while other aircraft better fit his needs until now, the King Air matches his family’s current lifestyle – one that doesn’t look like it will change anytime soon.



Chris and Jennifer Miller acquired the 1981 Beechcraft King Air F90 in 2017 and fly about 150 hours per year from their base in San Diego. (Photo credit: Parker Jones)



Chris and Jennifer Miller are raising five daughters between the ages of 4 and 12 in San Diego. They use their 1981 King Air F90 to handle commercial real estate and private equity investments and to pursue active vacations with their family.

Miller and his wife Jennifer are raising five daughters between the ages of 4 and 12 in San Diego while running a family office that invests in commercial real estate and private equity. Until a few years ago, Miller was traveling frequently between homes and business interests in California and Florida. They still have homes in both states, but the trips are less often and the work schedule less demanding.

Miller grew his career and capital beginning with multi-family apartments in Texas in the 1990s. The financial crisis in 2007-2008 was devastating to the housing industry and he came out of that storm with a single self-storage property in Jacksonville, Florida.

“We humbly made every mistake in the world and then we figured the business out,” he said. “We were at a moment in time with the talent to scale that company from one property to one of the largest self-storage companies in the world.”

iStorage was founded in 2008 and in 2016 sold its 66-facility portfolio in 24 markets across 12 states for \$630 million.

“I’ve worked since I was 14 years old and after we sold that company, I’ve been able to spend a lot of time with my family,” he said. “I can help raise these girls, be a good husband and I’m living a good, balanced life instead of working all the time.”

The winding path to his dream airplane

Miller grew up in Fallbrook, an area north of San Diego known for its avocado groves that some say make it the “Avocado Capital of the World.” He enjoyed watching airplanes take off and land from the local airport but it wasn’t until he went to college at Southern Methodist University in Dallas that he got a chance to be around airplanes and meet people who could afford to own them.

He called moving from Fallbrook to Dallas to attend SMU, a private

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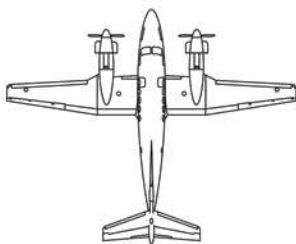
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college, an eye-opening experience. It was at the Addison Airport just north of downtown Dallas that he says he fell in love with the King Air – for its rugged look and the comfort, speed and power that pilots boasted about.

The real push into aviation, though, came from an experience flying with his wife's cousin, Bill Borgsmiller, who founded the ACI Jet facility at San Luis Obispo County Regional Airport about midway between Los Angeles and San Francisco.

"Jen and I were just married and we had come to San Diego," Miller remembers. "Billy flew down to Carlsbad in a client's Citation II and he told us to come to the airport and go to dinner with him. He said, in the Citation we could either fly down to Cabo San Lucas in an hour or an hour and a half or we can fly up to San Francisco or over to Phoenix. Both of our mouths hit the floor. So, 20 years ago we went to Roy's restaurant in Pebble Beach. I got to sit in the front and as soon as I experienced that, I told my wife that I have to learn to fly. We immediately got our pilot's licenses back in Texas, then I got my instrument rating and we started flying from there."

They became pilots in 2003 and in 2005 they purchased their first aircraft, a 2005 Cirrus SR22. The Millers put nearly 500 hours on the airplane, including cross-country flights, before selling it in 2007.

"From that point, my wife and I had five little girls over the next 10 years, so I put my head down in business and started working really hard," Miller said. "Over those years, we leased a lot of different airplanes: a Beechcraft Baron, a Beechcraft Bonanza and a Turbo Commander. We started working our way up and bought our first turbine-engine aircraft when I was 40, which was five years ago.

"Our first true turbine was a Citation 501, and I'll never forget making that purchase. Then after we recapitalized one of our companies, we bought a Gulfstream 100. Next, we bought the Lear 60 and, finally, we bought the King Air, the airplane I always wanted."

Queen of Kings

At the height of expanding iStorage into 12 states, the jets fit Miller's travel needs, which included frequent trips between San Diego and Tampa. Now, when needed, he flies to Florida on commercial airlines. The King Air is ideal for most of their missions that take them throughout California, surrounding states and down to Mexico.

On the business side, the Millers use the King Air for meetings related to real estate acquisition and companies in which they invest. Personal use includes taking the

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The King Air F90 is ideal for most of the Millers' missions that take them throughout California, surrounding states and down to Mexico. (Photo credit: Parker Jones)

family to outdoor destinations from Northern California down into Mexico and over to Arizona.

"We absolutely love the airplane because it has great power, it's the smaller fuselage but it has the big engines," Miller said. "For our lifestyle, we love to go down to Mexico and we love to go to the mountains. We go to the Sierras and Lake Tahoe, and we also go down to Gonzaga Bay in Mexico and land on a dirt strip. We really travel all around the region and we can throw all five kids in, fill it with bags, fill it with fuel and we can go and land anywhere we want."

Miller competes in the sport of desert racing, driving the No. 40 Trophy Truck in Southern California Off Road Enthusiasts (SCORE) events such as the San Felipe 250, Baja 500 and Baja 1000. He often uses the King Air to get to remote race locations.

"We blew a transmission and a third member on a truck we were racing down in Mexico, so we ran the King Air back up to San Diego and picked up a transmission and flew it back down really quick," he said. "That was very convenient."

Miller flies the King Air along with a second pilot, often his chief pilot Richard Hardoon. The two met eight years ago when Hardoon was managing several aircraft

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The Millers found a low-time King Air F90 that already had Raisbeck engine inlets, strakes, exhaust stacks and wing lockers. They added Garmin G600 avionics, Airtex, a new interior and a new paint scheme. (Photo credit: Parker Jones)



in Florida as well as flying. Miller leased the Twin Commander 690B-10 from him and “we flew it all over the U.S.,” Hardoon said.

A former U.S. Navy and airline pilot, Hardoon is now based in California along with the King Air at Gillespie Field Airport, northeast of downtown San Diego. He flies and manages the King Air, which Miller uses about 150 hours annually. Hardoon has about 22,000 hours and first got to know the Beechcraft product line while working at Hangar One in Florida in the 1980s while attending Embry-Riddle.

“We found LL-163 with low time, and it had every available airframe mod completed already: engine inlets, strakes, exhaust stacks and wing lockers,” Hardoon said. “Chris tasked me with the rest of the refurbishment job. We took it to Stevens Aviation in Nashville, who installed a new instrument panel with Dual Garmin G600s and Dual GTN-750s and a new interior. We then took it to Aerosmith Aviation in Longview, Texas, for a new paint scheme.”

The Raisbeck wing lockers have provided plenty of room for hauling surfboards, mountain bikes and skis



A new instrument panel was installed, by Stevens Aviation in Nashville, with Dual Garmin G600s and Dual GTN-750s. (Photo credit: Parker Jones)

along with luggage, and the other Raisbeck modifications have delivered the projected performance efficiencies. Those mods along with upgraded avionics have made the 1981 King Air F90 an amazing platform, both pilots said.

“Just this week we were returning from Cabo San Lucas, and the weather at Brown Field in San Diego was low-IFR,” Hardoon said. “We set up for the LPV approach

Miller's chief pilot Richard Hardoon (pictured here with his son Eddie) manages the F90 and often flies it with Miller.



Chris Miller competes in the sport of desert racing, driving the No. 40 Trophy Truck in Southern California Off Road Enthusiasts (SCORE) events. He often uses the King Air to get to remote race locations.

to Runway 8L and the autopilot and Garmin 750s shot the LPV approach with ease. It's rare having to use the LPV feature in real world conditions for us in So Cal, but it worked great."

"Another valuable modification is Airtex," Miller said. "It's an affordable option for electronic messaging while onboard, and it has bridged the communication gap that would exist for an hour and a half to three hours depending on his mission."

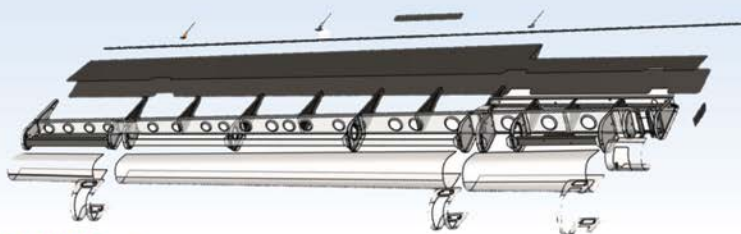
He can't think of anything else he'd want to add to this King Air.

"I say this, impartially of course, but it's an absolutely stunning airplane," Miller said. "It's probably the queen of the fleet of F90s."

"God has blessed us very much with letting us enjoy such a wonderful piece of machinery. We're thankful to Beechcraft and all the vendors who support the King Air and make it such a great airplane." **KA**

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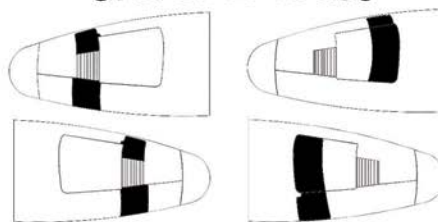
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Heated Argument – More on Prop Heat

by Dean Benedict

It's good to know that people are reading my articles. My last one, about prop heat in the February 2019 issue of *King Air*, generated some discussion in the King Air section of an online forum.

Ice Slams

A King Air pilot in Alaska shared his experience. Obviously, he gets into icing conditions all the time. Not only does he get ice slams on a regular basis, he welcomes them. He warns his passengers that ice slams will occur and not to worry when they hear thumps against the fuselage. Ice slams reassure him that his prop heat is working.

In that article, I suggested that ice slams could be a sign that your prop heat is not working 100 percent. But I also stated that if you get into a lot of ice, you'll get ice slams regardless of how soon the prop heat was deployed. I come at this from a maintenance perspective. When I see chipped paint and dents around the avionics bays, it *could* mean the prop heat system isn't working 100 percent. When a prop heat segment or boot isn't heating, it allows more ice to build up before the centrifugal force knocks it off. That makes more damage on the fuselage. So, when I see chips and dents, I want to check the prop heat.

If, in flight, you are watching the amp gauge for prop heat and you see a drop in amperage, you know for sure you have a segment or boot that is deficient; and if you're in icing conditions, you'll have ice slams on that side to corroborate your observation.

King Airs that get into icing on a regular basis can have ice shields installed to guard against the damage of the regular ice slams that are normal for that situation.

Cycles and Segments

With a single-segment system, all the boots on one side heat for 90-seconds, then the prop heat timer switches the current to the other prop – 90 seconds per side, back and forth. In newer King Airs the right prop heats first.

With a dual-segment system the outer segments and inner segments on each prop fire separately. The

maintenance manual specifies the heating sequence as R/H outboard, R/H inboard, L/H outboard, L/H inboard; but then it says: *“due to the fact that the timer does not return to any given point when the power is turned off, it may restart at any sequence point.”* [M.M. p/n 101-590010-19, Rev D2-11-1-2015].

So, in general, the outboard segments heat before the inner segments but there is no firm guarantee which segment the prop timer will pick when prop heat is turned on.

As for timing, the manual says each cycle is 34 seconds, so a full sequence of all segments on both props is two minutes 16 seconds in duration.

Deice or Anti-Ice

In reference to King Air prop heat, the FlightSafety manual for the King Air 200/B200 says: *“CAUTION – Although this system is called a prop deice system, pilot management of the system should be as an anti-ice system.”* I'm sure I've seen that in the POH as well. That sentence was burned into my brain many years ago.

So, we have a system designed to get rid of ice after it forms, and directions to deploy it before any ice has formed. I have no argument. I just want to add that in my experience flying King Airs I've seen the prop heat function as anti-ice, provided it was turned on well in advance.

If I know that icing is likely in my flight plan, I'll turn the prop heat on right after takeoff. The electrical load isn't a big deal. As those segments heat repeatedly over an extended period, the blade absorbs and retains a measure of that heat.

When icing is finally encountered, it never forms and there are no ice slams. Again, it's not going to work that way in chronically cold climates, so take my observation in the spirit in which it was intended.

I have a good friend that flies a 350 based in Colorado. He operates his prop heat in manual mode all the time. To avoid having to hold that switch forever, he uses a sturdy rubber band looped over a post light to hold the

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Control circuit breaker is for the INNER/
OUTER switch, depending on the model. The
PROP LEFT and PROP RIGHT circuit break-
ers control power to the prop elements in the
manual mode.

CAUTION

Although this system is called a
prop deice system, pilot manage-
ment of the system should be as an
anti-ice system.

PITOT HEAT

A heating element in each pitot probe pre-
vents ice and moisture buildup. There is no
thermal protection for the heating system ex-

From the FlightSafety manual for the King Air 200/B200
in reference to prop heat.

switch in the On position. This gives him continual prop
heating on both props simultaneously.

It's a simple work-around that, in essence, converts
a deice system to an anti-ice system. Of course, this
only works with the single-segment system. Manual
Mode in the dual-segment system requires that you
hold the manual switch down to heat the outboard
segments on both sides, then to push it up and hold it
for the inboard segments.

I wanted to mention the rubber band idea in my
previous article but I held off because it's procedural.
I'm trying to "stay in my lane" with my maintenance
perspective and tips and leave the procedural stuff
to Tom Clements. But then he sent me this in a
recent email:

*"To make (prop heat) truly an anti-Ice system I
taught – only partially tongue-in-cheek – to carry
a big rubber band with you and use it to hold the
Manual switch up by hooking the rubber band
between that switch and maybe a post light. That
works extremely well with no ice chunks being
liberated. (I think the only reason the system does
not work that way routinely is the desire to reduce
electrical load.)"*

I couldn't agree more. There are plenty of seasoned
King Air pilots out there that have developed routines
to accommodate the conditions they fly in regularly.
When it comes to ice protection, they have considered
not only props and boots, but windshield, pitot, fuel and
fuel vent heating as well.

I'm always looking for topics to write about, so don't
hesitate to contact me if you have any suggestions. Many
readers of this magazine have emailed or called me with

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their questions. I'm honored to be part of the unique family of King Air aficionados – the owners, pilots, and mechanics that work on these fine aircraft. **KA**

In the Maintenance Tip article titled "Prop Heat" featured in the February issue, the heating cycle for single segment systems is 90 seconds per side, not 60-90 seconds as stated. Also, the list of segments in the dual-segment system was not meant to indicate the heating order. As a rule, outer segments heat before inner segments and each one heats for 34 seconds, totaling 68 seconds per side.



I regret any confusion this may have caused.

Dean Benedict is a certified A&P, AI with nearly 45 years' experience in King Air maintenance. He's the founder and former owner of Honest Air Inc., a "King Air maintenance boutique" (with some Dukes and Barons on the side). In his new venture, BeechMedic LLC, Dean consults with King Air owners and operators on all things King Air related: maintenance, troubleshooting, pre-buys, etc. He can be reached at dr.dean@beechmedic.com or (702) 773-1800.

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Not only is the ramp full of owners' King Airs at the King Air Gathering, but also vendors showcasing their products which you can see up close.

Safety Theme Set for King Air Gathering IV

Registration Options Offered

by Kim Blonigen

King Air Gathering IV will have a set theme of Safety for its upcoming program being held Sept. 26-29, 2019, which allowed host, the King Air Academy, to offer options to those attending.

Option 1: General Attendee Package

DATES: Evening of Thursday, Sept. 26, Friday, Sept. 27, and Saturday, Sept. 28

PRICE:

- \$300 per attendee – due upon registration
- \$50 for guest which includes the cocktail party reception and other activities (no conference admission) – due upon registration

INCLUDES:

- Cocktail Party Reception – Thursday evening
- Conference with outstanding speakers and topics – Friday and Saturday
- Four-hour Thunderstorm Avoidance, NEXRAD – Critical Updates
Dr. David Strahle has spoken at past Gatherings and attendees requested more!
- Breakfast and Lunch – Friday and Saturday
- Access to leading King Air vendors
- Opportunity to converse with other owners, pilots and enthusiasts

Option 2: General Attendee Package PLUS Recurrent Training

Complete your first day of Ground School Training at the Gathering with Tom Clements.

This option is limited to “space available” on a first-come first-registered option and is expected to go quickly!

DATE: Sunday, Sept. 29

INCLUDES:

- Everything in the General Attendee Package
- Sunday Ground School Recurrent Training with Tom Clements, author of *The King Air Book*. Tom will be holding a very special session, you won't want to miss. Come learn from the master! (Breakfast will be provided by King Air Academy.) Tom's session at KAG IV will be considered part of your Recurrent Training at the King Air Academy with special pricing. To complete your Recurrent Training, you will need to attend one more day of comprehensive simulator and a “model-specific” ground session at the King Air Academy which must be completed before the end of the year.
- Two packages are being offered based on the type of simulator you choose to train in:
Package 1 – Standard Simulator Recurrent Training: \$2,750
Package 2 – Full-Motion G1000/NXi Recurrent Training: \$5,500

Go to www.kingairgathering.com to register for this unique event.

Due to popular demand and the uniqueness of being up close to all the King Airs parked on the ramp at the last King Air Gathering, the next event will again be held at the Hangar Hotel Conference Center located right on Gillespie County Airport (T82) at Fredericksburg, Texas.

At press time, a detailed agenda and keynote speakers had not been released.

The King Air Academy had a vision for the Gathering as a way to bring King Air owners and pilots together with experts in the industry and leading King Air vendors to offer a personal experience with the King Air community. Their vision has been accomplished and is so much more! A wealth of knowledge is shared in an intimate setting surrounded by leading King Air vendors you can ask questions and have a personal conversation with. Attendance numbers are limited to allow a more personal connection to the presenters and King Air vendors who will be highlighting their King Air products and services.

For more updated information and to register, go to kingairgathering.com. **KA**



The KAG cocktail party has moved to Thursday night and allows King Air owners/pilots to get to know each other, as well as the King Air experts and vendors who are attending.



Ground School Recurrent Training by King Air expert Tom Clements is being offered the day after the KAG.

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FAA Admin Nomination, New Contingency Procedures for NAT, Canada Decommissions VOR/ NDBs, FAA/NBAA Issue Reminder on ADS-B, New CBP in D.C. Area

by Kim Blonigen

FAA Administrator Nomination

On March 19, the White House nominated longtime Delta Airlines executive Steve Dickson to the position of administrator of the Federal Aviation Administration (FAA).

Dickson was with Delta for 27 years, retiring in 2018 as senior vice president of global flight operations. During his tenure with the airline, he was responsible for training, technical support, and regulatory compliance for more than 13,000 pilots. He is a graduate of the U.S. Air Force Academy and flew F-15s during his military career.

National Business Aviation Association (NBAA) President and CEO Ed Bolen stated, “Steve is a leader whose comprehensive understanding of our national air transportation system, and the efforts underway to keep building a ‘Next Generation’ system, are second

to none. NBAA has worked closely with Steve for many years, and we welcome his nomination.”

“We look forward to working with Steve in support of the continuing modernization initiatives that ensure America’s aviation system remains the world’s best,” Bolen continued.

Pending Senate confirmation, Dickson will succeed Dan Elwell, who has been serving as acting administrator for the past 14 months.

New North Atlantic Contingency Procedures Now in Effect

The NBAA recently published a noticed that new oceanic contingency procedures took effect March 28 for operators in the International Civil Aviation Organization (ICAO) North Atlantic (NAT) region, including New York oceanic airspace.

Referencing a new Information for Operators (InFO 19004) from the FAA, three NAT air navigation service providers may have started trials as early as March 28 of new separation minima using space-based ADS-B surveillance technology. Those Advanced Surveillance–Enhanced Procedural Separation (ASEPS) minima, which allow aircraft to fly closer to each other, conflict with established oceanic contingency procedures, prompting ICAO to develop new contingency procedures to ensure compatibility.

According to its website, the new procedures were published in ICAO’s NAT Ops Bulletin 2018_005 Rev 01, “Special Procedures For In-Flight Contingencies In Oceanic Airspace,” and in the Feb. 28 issue of the FAA’s Notices to Airmen Publication under the headline, “Procedures For In-Flight Contingencies In The New York Oceanic CTA/FIR During ASEPS Trial.”

NAT Ops Bulletin 2018_004 gives guidance to NAT operators on material they should include in pilot and dispatcher training programs and operations manuals to prepare them for NAT operations under ASEPS. The bulletin includes a description of a limited expansion of the performance-based communication and surveillance tracks.

“NBAA strongly urges members that fly in the North Atlantic region to ensure their flight operations teams are knowledgeable about these important changes,” said Brian Koester, NBAA’s senior manager for flight operations and regulations.

The changes to contingency procedures apply only to NAT airspace, not to Pacific or other regions. A single ICAO standard for contingency procedures is expected in November 2020.

Canada to Decommission VORs and NDBs

Nav Canada, the country’s provider of civil air navigation services, has finished a study of navigation aids and concluded that “given the comprehensive radar surveillance coverage, and the propensity of area navigation (RNAV) with global navigation satellite system (GNSS) equipped aircraft, many VOR and NDB navigation aids (navaids) are no longer required and should be decommissioned.”

The decommissioning process will be accomplished in 15 phases over the next seven years. Where a current NAVAID identified in the study serves as an instrument approach aid or anchors an airway segment, Nav Canada said it will “ensure that a RNAV/GNSS instrument approach procedures or RNAV airway segments are published, where required, before removal of the identified NAVAID.”

Aeronautical information circulars (AICs) will be published for each upcoming phase, Nav Canada said.

The first phase, consisting of decommissioning some 20 navaids are listed below and will start April 25. Corresponding aeronautical charts will also be amended.

- Deer Lake (DF) NDB
- Port Hawkesbury (PD) NDB
- Bonaventure (YVB) NDB
- Bromont (ZBM) NDB
- Chute-Des-Passes (DG) NDB
- Salluit (YZG) NDB
- Smiths Falls (YSH) NDB
- Campbellford (YCF) VOR
- Hearst (HF) NDB
- Hornepayne (YHN) NDB
- Pelee Island (PT) NDB
- St-Bruno-De-Guigès (YBM) NDB
- Ignace (ZUC) NDB
- Lansdowne House (YLH) NDB
- Ogoki Post (YOG) NDB
- Sachigo Lake (ZPB) NDB
- Aklavik (YKD) NDB
- Déline (WJ) NDB
- Lac La Biche (YLB) NDB
- Tulita (ZFN) NDB
- Williams Lake (WL) NDB

Nav Canada’s action follows the FAA’s decommissioning of legacy navaids that started in 2012.

FAA, NBAA Issue Joint Reminder on ADS-B Equipage Mandate

In late March, NBAA President and CEO Ed Bolen joined with Dan Elwell, acting administrator of the Federal Aviation Administration (FAA), to issue a reminder to the business aviation community to install Automatic Dependent Surveillance-Broadcast Out (ADS-B) equipment on their aircraft before the FAA’s Jan. 1, 2020, deadline.

The FAA first published its ADS-B rule in May 2010, as a significant step toward its Next Generation Air

Transportation System (NextGen), which will replace radar-based aircraft position reporting for air traffic control (ATC) with satellite-derived, GPS data.

As of January 2020, ADS-B Out will be required to operate an aircraft in much of the nation's controlled airspace, including at and above flight level 180 and in areas surrounding Class B and Class C airports. The FAA order also mandates ADS-B equipage for operations in Class E airspace throughout the contiguous United States at and above 10,000 feet MSL, excluding operations at and below 2,500 feet above ground level, and when flying at and above 3,000 feet mean sea level within 12 nautical miles of the U.S. Gulf Coast.

The letter further notes that many aircraft maintenance, repair and overhaul (MRO) organizations are reporting near-capacity ADS-B installation schedules, making it imperative that operators schedule equipage soon to ensure their aircraft may continue flying in controlled airspace after Dec. 31, 2019.

Those with questions about ADS-B compliance can contact NBAA Senior Manager, Flight Operations and Regulations Brian Koester at (202) 783-9454.

New U.S. Customs and Border Protection Facility in D.C. Area

A new U.S. Customs and Border Protection (CBP) facility at Virginia's Leesburg Executive Airport (JYO) has recently opened. Those in the industry believe the new facility will provide an alternative option for those clearing customs in the D.C. area and help alleviate congestion at other local airports.

The Greater Washington Business Aviation Association (GWBA) recently hosted a ribbon cutting and open house which included tours of the first remote air traffic control tower in the United States. The tower was a collaborative effort between the FAA, the Virginia Small Aircraft Transportation System Laboratory, and Saab Sensis and has undergone trials the last few years to evaluate the use of remote technology for non-towered airports.

The CBP facility will be open seven days a week from 6 a.m. to 9 p.m., but 24-hour advance notice is requested for clearance. [KA](#)

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Power Loss versus Engine Failure

by Tom Clements

Let's see a show of hands: How many of you have experienced an honest-to-goodness engine fire in a King Air? As I expected, no hands are up. How about an honest-to-goodness engine failure, such as a main bearing going bad, or the RGB (Reduction Gearbox) uncoupling, or the high-pressure, engine-driven fuel pump failing, or an FCU (Fuel Control Unit) runaway? Yes, I see a smattering of hands now. Finally, hold up your hand if you've experienced a significant rollback in power, a rollback that caused no engine damage. Wow! Now I see a lot of hands are raised! (You didn't know that I could see you through these pages, did you?)

For every true engine failure in the PT6-powered world, I believe there have been at least 10 times as many power rollbacks. Heck, maybe it's 100 times as many. Of these rollbacks, a sizable number have been due to mechanical problems beyond the pilot's control. These mechanical malfunctions include such things as: an open P3 supply line to the FCU, an open P_y line between the FCU and the fuel topping governor, a slipping connection between the power lever cable and the beta cam box, and some internal FCU metering valve malfunction.

However, compared to these reasons for a loss of engine power that are beyond the pilot's ability to control, there is one malfunction that leads to more rollbacks than any other and it is indeed within the pilot's ability to control. Most of you know what I am going to give as the reason, don't you? It is Power Lever Migration, the tendency for the power lever to spring back toward idle caused by a spring on its connection to the beta cam box.

The pilot action that prevents the spring from always pulling the power lever toward idle is ensuring that the power lever's friction control is exerting enough resistance to the spring force.

I have addressed the importance of proper power lever friction setting in *The King Air Book*, in past magazine articles, in classes that I have taught and in a lot of replies written on the great BeechTalk website. I won't belabor the point further here in this venue. Instead, I want to emphasize the proper steps of "The Drill" for when an engine problem is encountered in your King Air.

On the BeechTalk forum, in its Beech Twins section, there is a superb thread entitled *Martin Pauly Video, Twin Training, "The Drill."* Martin travels to Mason City, Iowa, to receive training with Doug Rozendaal in Doug's B55 Baron. Doug is an exceedingly accomplished pilot and instructor. Our getting to observe this training via the video is both enjoyable and educational. Even though it is dealing with a piston twin, King Air pilots will benefit from watching it. Take time to view it. It will be time very well spent.

<https://www.beechtalk.com/forums/viewtopic.php?f=3&t=162213&hilit=The+Drill>



The first four steps of *The Drill*.

The Drill starts with setting the proper pitch attitude and then doing the mantra most of us learned during our initial multi-engine training. It starts with: "Mixtures, Props, Throttles, Flaps, Gear." In the King Air, it has one less step: "Power, Props, Flaps, Gear." I call those "Your Four Friends" and I consider them so important that I made their discussion the very first chapter in *The King Air Book*.

Let's see what the POH has written concerning engine problems for the most populous King Air model, the B200. The first one in *Emergency Procedures, Section 5*, is titled "Emergency Engine Shutdown." Here is what the POH states:

EMERGENCY ENGINE SHUTDOWN

- ENGINE TORQUE INCREASE – UNSCHEDULED
(Ground or Flight)
(Not responsive to Power Lever Movement)
- ENGINE FIRE IN FLIGHT
- ENGINE FAILURE IN FLIGHT

Affected Engine:

1. Condition Lever – FUEL CUT OFF
2. Propeller Lever – FEATHER
3. Firewall Shut-off Valve – CLOSED
4. Fire Extinguisher (if installed) – ACTUATE
(if required)

There are four more steps that deal with shutting off the generator and some other things.

Now let's look at this procedure from that same section of the POH:

ENGINE FAILURE AFTER LIFT-OFF (If Conditions Preclude an Immediate Landing)

1. Power – MAXIMUM ALLOWABLE
2. Airspeed – MAINTAIN (takeoff speed or above)
3. Landing Gear – UP
4. Propeller Lever (inoperative engine) – FEATHER
(or verify FEATHER if autofeather is installed)
5. Airspeed – VYSE (after obstacle clearance altitude is reached)
6. Flaps – UP

The POH procedures for other models are usually almost identical to the ones written here.

Where is *The Drill* in these procedures? In the second one, an argument could be made that at least most of the steps in *The Drill* are there. First step – Power? Yes, that is step one. But if you already know that an engine failure has occurred – and it seems as if the checklist writers assume this to be the case since "Engine Failure" is in the title – then it seems that ensuring power is at "Maximum Allowable" would involve only the remaining powerplant. If this "failure" is due to Power Lever Migration and we attended to only the other engine's power lever, we have not addressed this easily-correctable problem! Not to mention, of course, that autofeather requires

both power levers to be well-advanced for *either* side to automatically feather.

Second step of *The Drill* – Props? Nowhere to be seen here. "Don't be a nitpicker, Tom! The prop levers are already full forward for takeoff!" Are they? A lot of model 300 pilots have made a takeoff with them back at the minimum speed decent (1,450 RPM) because the POH tells you (quite stupidly in my opinion) to have them there for all ground operations.

Third step of *The Drill* – Flaps? This doesn't get mentioned until Step 6, but I am satisfied with that. The takeoff performance charts are quite thorough for the 200-series and if we have decided to use approach flaps for takeoff – to gain the benefit of a lower V_2 speed and a shorter accelerate-go distance – then it is proper procedure to leave them alone until attaining both 400 feet and VYSE.

Fourth step of *The Drill* – Gear? Yes, it's in the procedure correctly.

Now let's examine the first of these two POH procedures that I have presented: Emergency Engine Shutdown. The first two reasons for doing this procedure make good sense: Torque runaway and fire. (I am still waiting to hear of any in-flight PT6 fire.) The third reason, "Engine Failure in Flight," however? How do we (already a bit shook up by a loss of some power) really know that the engine has failed? What if it is merely a case of Power Lever Migration that would be immediately corrected if we only did Step 1 of *The Drill*?! Would it not be horribly embarrassing to pull the condition lever into fuel cutoff when the only thing wrong was that the power lever slipped back a bit?

"You're being OCD about this, Tom! Any pilot is going to notice the power lever moving back and will then push it forward!" Oh, how I wish you were correct on that opinion! Yes, I bet seeing the migration and reacting properly to it has happened thousands of times with no bad outcome at all. What about that one-in-a-thousand times, however, when the motion was not seen? When the pilot was looking out the windshield or at the instruments intently when he moved his hand away from the power levers to reach for the landing gear handle and hence missed seeing the motion? I am convinced more than one fatal takeoff crash has resulted.

This is why I emphatically wish that we were always the first four steps when a loss of power is suspected. If, after moving both power levers and both prop levers fully forward and making sure the flaps and gear are where you want them to be, we now still have an obvious lack of power, then proceed with the rest of *The Drill* ... the "Identify, Verify and Feather" steps.

The "Four Friends" that I have been discussing here in relation to a suspected power loss also lend themselves perfectly to three other King Air procedures. For an IFR

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missed approach or a VFR Balked Landing, "Power, Props, Flaps and Gear" is a great procedural memory jogger. An emergency descent uses the same four steps, albeit with some different actions.

Let me tell you of an event I observed in which a perfectly good engine was shut down by mistake. One of my King Air recurrent training students – an experienced, capable pilot – was flying "under the hood" during our recurrent flight training session. I asked him to pretend that we were encountering icing conditions so he turned on all of the ice protection items. I pulled the left condition lever into fuel cutoff and after a couple of seconds pushed it back up to low idle. Since auto-ignition was armed and hence the ignitors had started sparking as torque went below 400 ft-lbs, the engine did a lovely windmilling relight and was spooling up to normal operation. As soon as the sudden loss of power was felt, the pilot began by doing *The Drill*. Both power levers got advanced, both prop levers went full forward, and the flaps and gear were verified up. Meanwhile, the left engine had returned to normal operation, matched with the right. The pilot was still pushing quite hard on the right rudder pedal and the skid ball was well to the left.

I am sure some will accuse me of doing a "dirty trick" and certainly I realize that the pressures of flying on instruments during recurrent training – when you know bad things are going to happen because of that evil instructor beside you! – are a huge factor. Nevertheless, forgetting to extend the ice vanes in icing conditions could lead to ice ingestion causing a flameout followed by a relight. That is what I had tried to replicate here.

In the student's mind, having felt the sudden loss in power, he "knew" that I had given him an engine failure and he proceeded with the rest of *The Drill's* steps: Identify, Verify, Feather. Identify? There was no dead engine now but

there was a dead foot since he was still stomping on the right pedal, causing a very uncoordinated flight condition! The poor fellow pulled the left power lever back – failing to notice that indeed power was being reduced dramatically – pulled the propeller lever into feather, and even continued to start to pull the condition lever into cutoff. I blocked his hand to prevent that from taking place, took the controls, and had him remove the hood. I pointed out the condition we were in ... a perfectly good left engine at idle with its propeller feathered, turning about 400 RPM.

The big mistake was not executing the “Identify” step of *The Drill* correctly. I think, in his mind, he had identified the left engine as the dead one the instant he felt the initial yaw toward the left. He never considered that the sneaky CFI (me!) would reintroduce fuel and the engine would come back to life.

Another one of my students was almost snail-like in conducting *The Drill* when I gave him an engine failure during cruise. He did each step so very, very slowly, it was almost excruciating to watch. But you know what? I never saw him make a mistake in the procedure throughout our numerous training sessions over the years. What’s the adage? “Haste Makes Waste.” Golly, is that ever true!

I am realistic enough to realize that my opinions and beliefs will not cause every POH’s emergency procedures to be revised, maybe not even one. Nevertheless, in my dreams I would prefer the concept of “Engine Failure” be replaced with the concept of “Suspected Power Loss.” Until you’ve done *The Drill* how do you know that the engine has truly failed? Give it a chance to return to normal operation before you shut it down!

The article entitled “The Amazing History of BB-1” that appeared in the January 2019 issue included mention of when she was used as an air ambulance mock-up. Gerald Mobley – whom I had tried to contact, without success, while writing the report – read the article and was thoughtful enough to offer a more accurate history of this phase of BB-1’s life. Here is what I should have written:



“In the 1980s, Gerald Mobley was chief pilot and director of aviation for Deaconess Medical Center in Billings, Montana, an air ambulance operation that was using two King Air 200s and two C90s.

Mobley approached the medical center with the idea that they could increase their air ambulance and doctor outreach flights if the general public realized the planes being used were state-of-the-art, not the small, cramped, unsafe, lightweight aircraft perceived by the public. He was convinced that if Deaconess could display a mock-up of the actual King Air 200 ambulance interior to the end-users – exhibiting the stabilized stretcher installation and showing the roominess of the cabin, including seats for the flight nurses and a patient relative – the medical center could attract patients from many areas of Montana and neighboring states.



In his quest to find a 200 fuselage to make into a mock-up, Mobley contacted Beech – from whom he had just purchased two B200s to use in this program – and convinced them to give him BB-1. The wings and tail were removed, the left side of the fuselage was cut away and it was housed in a specially designed trailer that traveled to rural clinics and hospitals as well as health fairs. Mobley reported that the program was quite successful in alleviating the public’s concerns.” [KA](#)

King Air expert Tom Clements has been flying and instructing in King Airs for over 46 years, and is the author of “The King Air Book.” He is a Gold Seal CFI and has over 23,000 total hours with more than 15,000 in King Airs. For information on ordering his book, 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.

A New Beginning — Part One

In 1934 amid the United States' worst economic calamity, the Stearman Aircraft Company unveiled the utilitarian Model 70 – a landmark design that saved the company from extinction.

by Edward H. Phillips

Throughout the early 1930s Ben Selvin and the Crooners could often be heard on the radio belting out the popular song, “Happy Days Are Here Again.” It was so popular during the Great Depression years that Democratic presidential candidate Franklin D. Roosevelt chose it to be the theme song of his 1932 campaign to win the White House, and it would go on to become the Democratic party’s unofficial song for years to come.

The Model 6 was one of the final designs completed by Lloyd C. Stearman before he resigned from the company that had borne his name since 1926. Utilitarian but rugged, the humble *Cloudboy* was the company’s entry-level product. (Kansas Aviation Museum)

By 1934 the aircraft industry in Wichita, Kansas, which had been crippled for the past four years by the nation’s economic woes, was finally experiencing a painfully slow, but authentic, recovery. Southeast of the city more than 100 men and women were working feverishly to build parts and assemblies for the all-metal, twin-engine Boeing Model 247 airline transport. East of town, the infant Beech Aircraft Company was beginning limited production of the Beechcraft Model B17L cabin biplane, and on Franklin Avenue Dwane Wallace and his brother Dwight were fighting a battle to wrest control of the



defunct Cessna Aircraft Company from the incumbent board of directors. They were successful, and in January 1934 the two men forged ahead with plans to reopen the factory and manufacture the Cessna Model C-34 monoplane. Although the Beech, Cessna and Stearman companies were competitors, their leaders knew full well that it was in the best interest of them all to keep Wichita at the forefront of the country's struggling but viable light airplane manufacturing segment.

In the wake of company founder and President Lloyd C. Stearman's resignation in 1931, Walter P. Innes, Jr., took the reins of leadership until 1933 when Julius E. Schaefer was elected. The company remained a subsidiary of the powerful United Aircraft & Transport Corporation (UA&TC), which probably saved the business from extinction at the hands of the Great Depression.

In addition to contracts building target gliders for the Army Air Corps, the company was rebuilding 34 Boeing Model 40 cabin biplanes that had been decommissioned by United Air Lines when it began operating the Boeing 247 airliner. Schaefer planned to sell the airplanes to mining companies in Mexico, South America, small airlines in the Latin American region, as well as private individuals.

Amid all the contract work for the Army and Boeing, late in 1933 Stearman Chief Engineer Mac Short and his staff were busy completing the design of a new training biplane that company officials hoped would appeal to the United States Army Air Corps and the U.S. Navy. It was not the first time that the company had been interested in building military trainers. During 1932-1933 there was little or no business prospects for building new commercial airplanes, but the Army's aging fleet of Consolidated PT-3 biplanes needed replacement.

More than 460 of the stout ships had been built and the type had rendered excellent service since the mid-1920s. Before his departure in 1931, however, Lloyd Stearman had designed the Model 6 *Cloudboy* – a utilitarian, two-place, open-cockpit biplane intended to be the company's entry-level product. The Model 6 met all of the Army's requirements, but only four (designated YPT-9) were built for evaluation and service testing. Unfortunately, the YPT-9 was rejected, along with other competitors, in favor of the Consolidated YPT-11.

Despite failure to secure its first military contract, the Stearman Aircraft Company, Julius Schaefer and Mac Short had learned valuable lessons that would soon help pave the way for future business with the U.S. Army and Navy. The new design, designated Model 70, was conceived on speculation and without any funding from the federal government. Although debate still rages within the ranks of Stearman aficionados as to exactly who designed the Model 70, the most likely scenario includes Short and two other engineers, Harold W. Zipp and J. Jack Clark. The trio took the Spartan Model 6

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The Model 70 was modified into the Model 73. In 1934 the U.S. Navy awarded the Stearman company a contract to build 41 of the primary trainers designated NS-1. (Courtesy Walter House Collection)

Cloudboy and upgraded the airframe by adding a number of features, some of which had not been employed on any previous Stearman aircraft.

Chief among these was a full cantilever main landing gear that provided a compact, uncluttered installation and reduced parasite drag. Next, the ailerons were mounted only on the lower wing panels and the fuselage's circular cross section generally resembled that of the handsome Model 80. Last, a new empennage design

was incorporated that featured adjustable trim tabs on the trailing edge of the elevator surfaces. Overall, at least on paper, the team believed they had succeeded in creating a modern, rugged and affordable airplane well suited for training fledglings.¹

The first and only Model 70 built was Stearman constructor number (serial number) 701 and was registered initially as X571Y (X=Experimental). The biplane not only boasted attractive lines but was designed to withstand



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In a photograph dated Aug. 17, 1934, eight Navy NS-1 trainers had wing center sections and Wright J-5 engines installed before entering final assembly. (Kansas Aviation Museum)

the rigors of military pilot training. The welded steel tube fuselage was stressed to meet Army Air Corps specifications of +12G and -9G, which allowed execution of the many aerobatic maneuvers that were standard fare for a flying cadet. To power the latest Stearman design, a nine-cylinder Lycoming R-680 static, air-cooled radial engine rated at 210 horsepower was installed.

When the ship was completed, assembled, rigged and fully prepared for its first flight, the company's test pilot David "Deed" Levy closely inspected every inch of the biplane. Satisfied that all was in order, he donned his parachute and climbed into the aft cockpit. Early on the morning of Jan. 1, 1934, the Model 70 took to the cold skies over Wichita. After wringing out the airplane, Levy landed and reported that it flew well and exhibited no bad habits.

Levy continued to fly the Model 70 and probed every aspect of its handling characteristics and performance. Late in January,

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however, Julius Schaefer was anxious to demonstrate the airplane to the military, particularly the Army Air Corps, which agreed to evaluate the ship. The epicenter of Air Corps flight testing and experimentation during the 1930s was Wright Field near Dayton, Ohio. Arrangements were made with the Army, and soon Schaefer and Mac Short arrived by rail in Dayton to witness the flights. The Air Corps and Navy pilots liked the Model 70 and had high praise for the airplane's handling, but they found its stall break much too gentle for a primary trainer – they preferred a sharp, unmistakable break so cadets could learn early in their training how to identify and recover from a full stall. From Ohio, Levy flew the ship to Naval Air Station Anacostia near Washington, D.C., and later flew south to the Navy's primary pilot training base in Pensacola, Florida, where the ship was evaluated further.

To eliminate the airplane's benign stall warning, Mac Short had his engineers design and install narrow, triangular strips of wood on the upper and lower wing panels along the outer span. Known as stall strips, at high angles of attack, the shape of the wood disrupted airflow across the wing surface forcing a more abrupt and unmistakable stall break.

Schaefer and Short were pleased that the Model 70 clearly had made a good impression on the Army Air

Corps. It was, however, the Navy that first showed serious interest in the airplane. Early in 1934 the Stearman Aircraft Company was invited to submit a quote for a primary trainer based on the Model 70 design. It would need to comply with Navy specifications and use the aging, but reliable, nine-cylinder, air-cooled Wright Aeronautical J5 radial engine that produced 200 horsepower. The Navy had a supply of the powerplants in storage and their use would save a significant amount of money, which a Depression-strapped Congress was reluctant to spend on the military.

Stearman officials submitted the lowest possible quote, and in May 1934 the Navy ordered 41 airplanes designated NS-1 (plus enough spares to build another 20 of the trainers.) The contract marked a turning point for the company and the *Wichita Eagle* newspaper also recognized the importance of the sale to the city: "Drama lies behind the simple, businesslike announcement of the factory, for Wichita, metropolis of the Plains, thus is accorded a large part in the buildup of the nation's sea forces more than a thousand miles away. Despite determined work on the part of Wichita plane builders and air enthusiasts, few large military contracts have been awarded factories here. The big order accorded the Stearman plant is thought to have broken down this barrier and to point the way to national recognition of Wichita as capital of the air whether in peace or war."²



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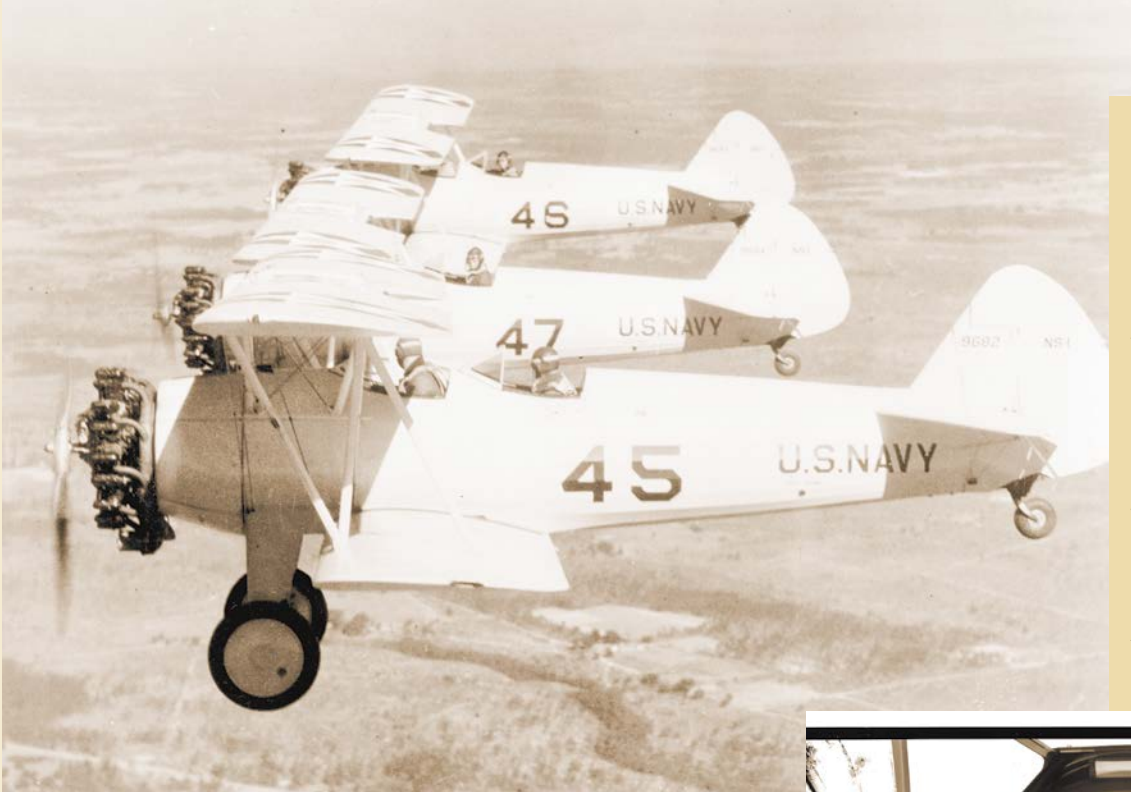
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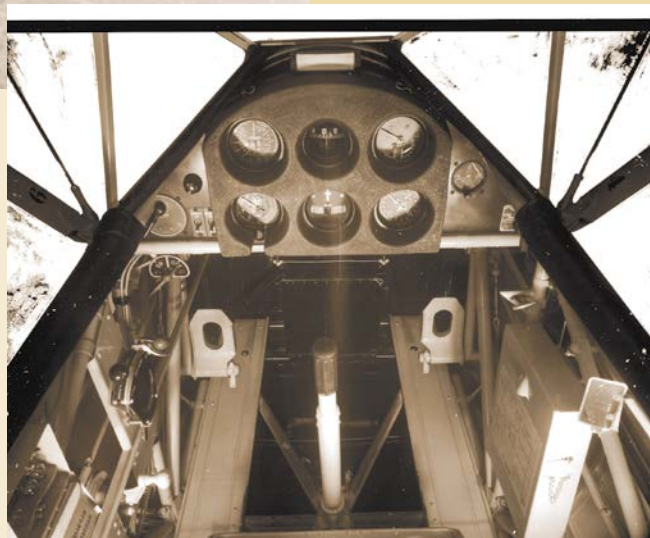


Somewhere in the skies above NAS Pensacola, Florida, three NS-1 primary trainers flew in a tight wing-abreast formation that demanded full concentration by each pilot. Metal covers over the front-mounted magnetos of the Wright J5 radial engines had been removed on all three airplanes, possibly to ease servicing. (Archives of the Wichita Area Chamber of Commerce)

Fortunately for Julius Schaefer and his band of workers, the wisdom of UA&TC back in 1930 to build a new, larger factory was about to pay off. The company had more than enough square footage to easily meet the Navy contract and no additional workers were needed. The only personnel change was the appointment of a naval officer to oversee production and ensure each biplane complied with the Navy's specifications. With raw materials in hand, the same men and women who built the Model 70 now cut spruce and sewed cotton fabric to construct the first NS-1 (Stearman Model 73, c/n 73001, Navy serial number 9677) that was completed in December.

It is interesting to note that only a few months before the Navy contract was awarded, Schaefer and his associates were deeply concerned about the ramifications of the U.S. government's attempt to break up large holding companies such as UA&TC, charging that these organizations were by their very nature monopolistic and threatened to dominate entire industries. Corporate executives, however, quickly realized how to circumvent any prohibition against restraint of trade by creating holding companies that acquired securities and, therefore, control of member companies.

In response, Congress passed the Clayton Act and the Federal Trade Commission Act in 1934. The Clayton Act prohibited stock acquisitions that could lessen competition as well as forbidding price discrimination. As for the Federal Trade Commission, it was specifically tasked with the responsibility of preventing companies from engaging in unfair methods of competition. In the wake of these laws, UA&TC reinvented itself, with the Stearman Aircraft Company becoming affiliated with the renamed Boeing Aircraft Company.



Factory photograph of an NS-1's aft cockpit reveals simplicity of the instrument panel layout. Throttle and mixture controls were located on the left side. (Kansas Aviation Museum)

It was not surprising that the changes made by UA&TC sparked wild rumors in Wichita. Chief among these was speculation that the Stearman factory soon would be closed, everyone would be laid off and the company relocated to the East or West Coast. Julius Schaefer quickly doused such rumors and assured employees that the reorganization would result only in the company becoming a subsidiary of Boeing. Schaefer also told stockholders and the local press that Stearman's business "was found to be in splendid shape" with one large contract for the Navy's NS-1 trainer well underway with "prospects of other orders from the United States Army as well."³

Schaefer's prediction soon proved to be true when the Army Air Corps expressed serious interest in an improved version of the Model 73 primary trainer. Late in

the summer of 1934 Mac Short and his crew had begun modifying the Model 73 into the Model 75. It was identical to the Navy's NS-1 except for a new main landing gear and installation of a seven-cylinder, Wright Aeronautical R-760 radial engine rated at 225 horsepower.

The prototype (Stearman c/n 75000, registered X14407) was evaluated by the Army as the XPT-945. After the engine was changed to the nine-cylinder Lycoming R-680 radial rated at 225 horsepower, further flight tests were completed but no orders were forthcoming because the Air Corps had no funding to acquire training aircraft. By February 1935, however, the financial situation had improved and the Army issued Stearman Aircraft a specification and requested a bid. In April the company replied and the Model 75 was reevaluated by the service. Much to the delight of Schaefer and Short, the Air Corps signed up for 20 airplanes (plus spares sufficient to build another six trainers) designated PT-13 to be powered by the Lycoming engine.

Fortunately, by 1935 the modernization of America's air fleets by the Army and Navy was picking up momentum. Almost daily the newspapers told of Japanese aggression in Manchuria and Japan's dream of establishing an "East Asia Co-Prosperity Sphere" that would swallow up much of the Pacific Rim. As for Europe, Adolf Hitler had become "Fuhrer" – the undisputed ruler of Germany – and had set

his sights on expanding "lebensraum" (living space) for the German people, and to the south Italy's fascist dictator Benito Mussolini was dreaming of creating another Roman Empire in the Mediterranean region.

In the summer of 1935 Julius Schaefer went to Washington for a week of special conferences with Army and Navy officials. Of chief concern was whether Stearman Aircraft's manufacturing capabilities could meet the War Department's anticipated future demand for new training airplanes. While in the nation's capital, Schaefer met with Harry H. Woodring, President Roosevelt's assistant secretary of war and a former governor of Kansas. He informed Schaefer that the government would soon be awarding contracts to the company to build 46 aircraft – 26 for the Army Air Corps (total cost \$243,578) and another 20 for the Navy (total cost \$150,373). Stearman's president was elated and returned home to share the good news with his fellow workers and Wichitans. Including existing work to fill the Navy contract for 41 NS-1 ships, Schaefer expressed confidence that the two additional contracts would keep the factory busy for at least the next 18 months.

The latest orders from the War Department were part of an expansion program by the Air Corps to increase its strength to more than 2,300 aircraft from the existing 1,800. In 1935 Congress had appropriated

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The first production NS-1 was captured on film soon after rolling off the final assembly line Dec. 6, 1934. The large metal covers in front of the Wright J5 radial engine were intended to protect the magnetos from exposure to wet conditions. Note mesh-type air filter attached to the carburetor.

(Kansas Aviation Museum)

\$23 million for new armaments, including contracts to build bombers, fighters and transports, but the chiefs of the air and sea knew those appropriations fell woefully short of what the Army and Navy required to properly prepare for the next global conflict. As one newspaper put it: "Despite an unexpected increase of nearly 500 aircraft this year, War Department officials see little hope of materially increasing the Air Corps' strength until larger appropriations are made or funds allotted from other sources."⁴

To make matters worse, by 1936 it was becoming increasingly obvious to President Roosevelt, senior members of Congress and high-ranking military officers that the world was on the verge of becoming an unsafe place once again. There was little hope that the impotent League of Nations, born out of the horrors of World War I, would be able to defuse any potential flashpoints before they ignited World War II.

As the crippling economic crisis in American began to fade, Wichita's aviation industry, and particularly the Stearman Aircraft Company, were poised for a manufacturing renaissance unequaled since the reckless days of the "Roarin' Twenties." As the late 1930s unfolded, the city's aeronautical chieftains, Walter Beech, Dwane Wallace and Julius Schaefer, could not have

imagined the part each would play in making America the "Arsenal of Democracy." **KA**

Notes:

- ¹ Dwane Wallace and his engineers also designed a cantilever, fixed main landing gear for the new Cessna Model C-34, and other light aircraft of the day also featured similar configurations.
- ² Wichita Eagle, May 17, 1934, Page 5.
- ³ Wichita Eagle, Sept. 18, 1934, Page 5.
- ⁴ Wichita Eagle, July 4, 1935, Page 5.

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

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¹ Prices vary depending on aircraft class and avionics configuration

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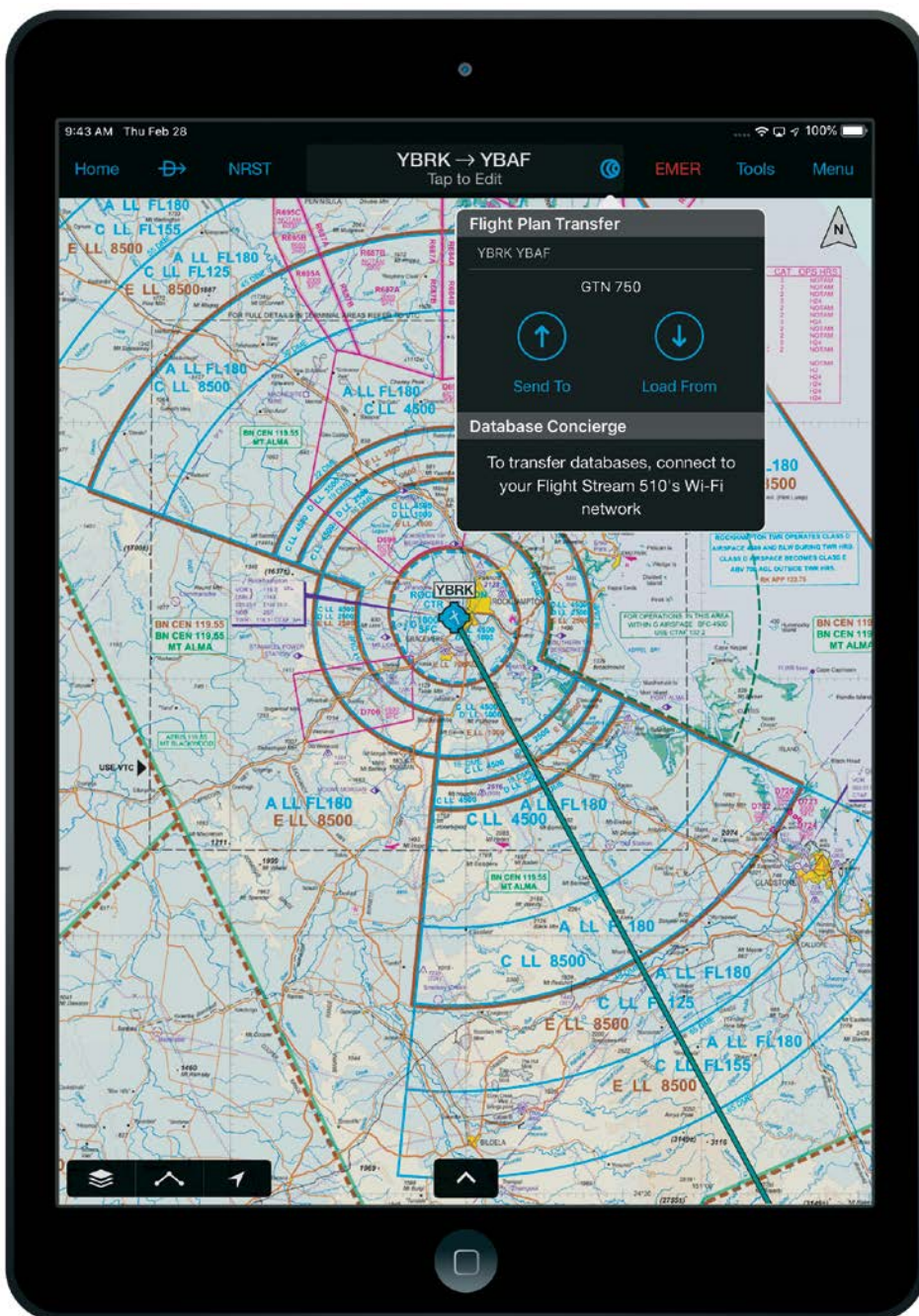


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From Multi-Engine Turboprop Communiqué ME-TP-0012

Date: March 2019

ATA 00 - Form 337 for Equipment or STCs Installed at the Factory

Technical Support receives requests for a Form 337 for equipment or STCs installed on King Airs at the factory. We have consulted with the Quality Department and they have provided the following explanation of why Form 337s are not issued.

Their explanation follows:

The FAA Guidance for issuing a FAA Form 337 exist under 14 CFR Part 43 Appendix B (14 CFR Section B43.1). However, the new aircraft manufactured under a Production Certificate is manufactured under Part 21. The newly manufactured aircraft do not enter into the (Part 43) Maintenance world or rules until it is issued a Standard C of A (FAA Form 8100-2).

FAA Order 8120.22 Rev A states the following in the applicability section:

3-1. Applicability.

- a. Part 21, subpart G, applies to any of the following persons who desire to manufacture a complete product and article(s) with benefit of a PC:

1. The holder/licensee of a § 21.21 TC.
2. The U.S. holder/licensee of a § 21.29 TC, if the licensing agreement clearly provides for the TC holder's and its Civil Aviation Authority's (CAA) control

over any design changes by the licensee. A working arrangement, associated with the respective bilateral agreement, must also be in place between the CAA and the FAA defining their respective responsibilities as State of Design and State of Manufacture.

3. The holder of a supplemental type certificate (STC) when:

- a. The STC will be incorporated prior to the issuance of an original airworthiness certificate (OAC) to the aircraft; or
- b. The STC will be incorporated after the issuance of an OAC to the aircraft. In this case, the PC would authorize the manufacturing of associated STC articles in accordance with Part 21. However, installation of the STC and return to service of the product is accomplished under the provisions of 14 CFR part 43.

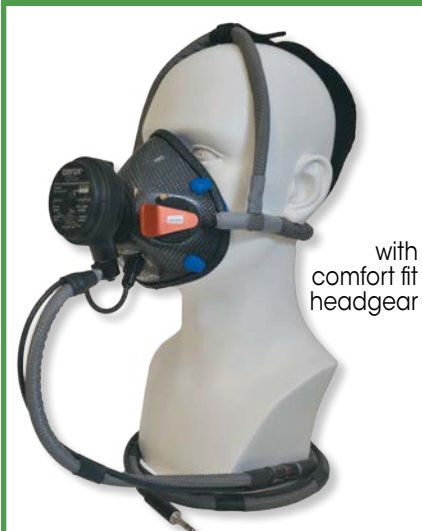
The further defines that there are three ways to incorporate an STC prior to issuance of OAC [two by means of Engineering (by merger/amending into the TC data or incorporation by reference in the TC Data) and one by incorporation under the PC which must be on our

Production Limitation Record]. These are as follows and are all under Part 21 rules and not under Part 43 rules.

5. STC Modifications Incorporated by a TC/PC Holder.

- a. When the holder of the TC seeks and obtains its own STC, or is licensed to use another person's STC data, the TC holder may amend the TC to incorporate the STC approval by reference. ▶

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Another party's STC that is incorporated during production and is referenced in and becomes a part of the TC need not be shown on the PLR. When a TC is amended to incorporate data approved under an STC, only the TC should continue to be shown on the PLR.

c. When the PC holder of a TC obtains an STC, or related licensing agreement, but does not make the STC an integral part of the TC, the PC holder may incorporate the STC in production products prior to OAC approval, provided that —

1. The PC holder makes application to the FAA to add the STC to its PLR,
2. The quality system data are revised as necessary, and
3. The engineering data submitted for the STC approval provide all the details necessary for manufacture and for making conformity determinations.

d. When a PC holder elects to use neither of the foregoing methods, the TC holder may incorporate an STC modification into production products only after OAC, in accordance with the provisions of part 43.

Only the last method after OAC requires the provision under Part 43.

Please note that at OAC we must list the STC incorporated at build that are installed by Method 2 (incorporation by reference in the TC Data) or 3 (addition to the PLR), we must list the STC on the application for airworthiness (FAA Form 8130-6), we must make a record in the aircraft logbooks, we must provide any applicable AFM/POH Supplements, and provide instructions for continued airworthiness.

Textron Aviation does not complete FAA Form 337 because we did not alter from aircraft at original build; but incorporated these STC at build. The FAA Record of these STC incorporated at build are listed in Block III of the original FAA Form 8130-6 which should be on file in the FAA's AFS-750 database. If they cannot find a copy in AFS-750 Textron Aviation can provide one from our archive records.

If the aircraft is exported without issuance of a Standard C of A then the STC will be listed on the Export C of A (FAA Form 8130-4) and on the Application for Export C of A (FAA Form 8130-1). Copies of both are filed with the FAA at AFS-750 in OKC. Same rules apply about providing the required STC documents for logbook entries, Supplements and ICAs.

***Editor's Note: We are aware of some discrepancies with the numbering and lettering, but the information is being published verbatim of what was on the Communiqué from Textron Aviation.*

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



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