King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

AUGUST 2015 • VOLUME 9, NUMBER 8 • $4.50

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AUGUST 2015 Volume 9 / Number 8

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SUBSCRIPTIONS
King Air is distributed at no charge to all registered owners of King Air aircraft. The mailing list is updated bi-monthly. All others may subscribe by writing to: King Air, P.O. Box 1810, Traverse City, MI 49685, or by calling 1-800-447-7367. Rates for one year, 12 issues: United States $19.95, Canada $29.95 (U.S. funds), all other foreign $32.95 (U.S. funds). Single copies: United States $4.50, Canada/Foreign $6.50.

COVER PHOTO
Photo courtesy of the Beechcraft Heritage Museum. The photo is of former Beech Aircraft President Jack Braly's King Air F90.

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

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

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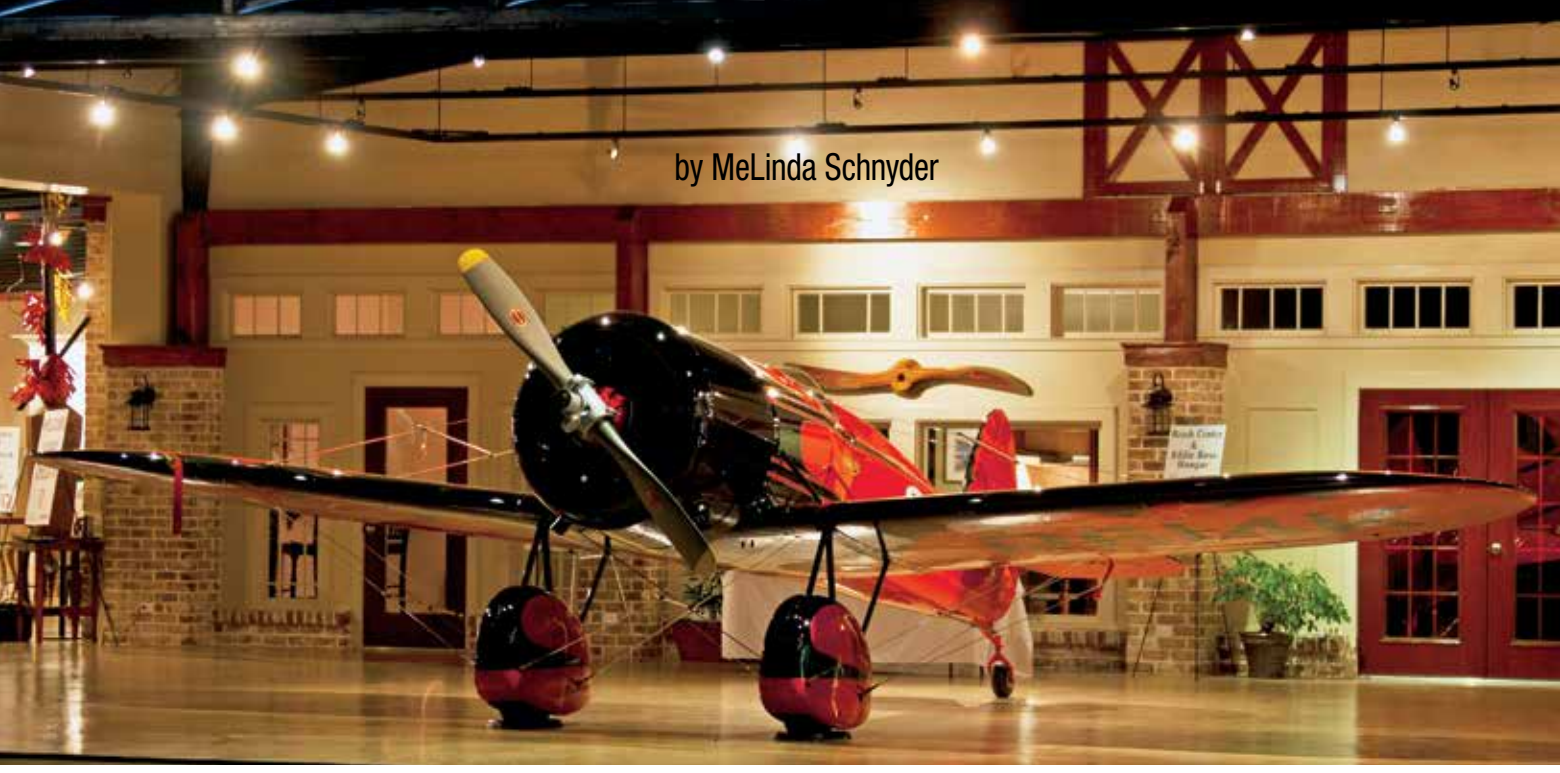
Beechcraft Heritage Museum

Unique Aircraft, Rare Artifacts

by MeLinda Schnyder



Olive Ann Beech was not impressed when first approached, in 1973, by the founders of the newly forming Staggerwing Museum Foundation in Tullahoma, Tennessee. She told the organizers she wasn't a fan of museums and that they were often underfunded ideas that lost steam.

The then-chairman of Beech Aircraft had a change of heart, though, when she saw that after several years the museum was continuing to grow and operate debt-free, without financial support from her or her company.

"No question the centerpiece of the collection is the first Staggerwing and the first Beechcraft product produced – a Model 17R," said Wade McNabb, curator and CEO of the Beechcraft Heritage Museum.

(PHOTO CREDIT: JONATHON CAMPBELL)

The full glass hydraulically lifting hangar door of the Beechcraft Heritage Museum is often open during Beech Party. In this photo, the open doors showcase the first Travel Air Mystery Ship. (MUSEUM PHOTOGRAPHER BOB BURNS)

Olive Ann became very supportive, having historical documents and artifacts related to the Staggerwing sent to the museum, and visiting the museum for dedications of new hangars and galleries. Her family, the company and many long-time employees have continued to contribute items to the museum. Thanks to those contributions, donations and loans from other aviation enthusiasts, the museum has grown into the Beechcraft Heritage Museum, promoting aviation education and preserving the heritage of all Beechcraft models from 1932 through the present. Last year the museum attracted more than 3,500 driving or flying visitors, not including local school groups and another 500 who attended the museum's annual Beech Party fly-in.

Why Tullahoma?

Walter H. Beech was raised in Pulaski, Tennessee, but the real reason a museum tracing the lineage of the company he founded in Wichita, Kansas, is located in Tennessee is that a group of Staggerwing enthusiasts happened to live in the middle Tennessee area when the idea for the museum came about.

A 1973 Staggerwing Club event in Tullahoma featured famed aviatrix Louise Thaden, who won the

King Airs are among the 125 aircraft that fly to Tullahoma, Tennessee, each October for the annual Beech Party at the Beechcraft Heritage Museum. (MUSEUM PHOTOGRAPHER BOB BURNS)

1936 transcontinental Bendix Trophy Race in a Model C17R Staggerwing. She mentioned that the group of enthusiasts led by Dub Yarborough, Jim Gorman and John Parish Sr. should consider a museum to preserve the Staggerwing's legacy and that she would donate her collection of trophies along with a lifetime of aviation memorabilia. (Editor's Note: Coincidentally, there is a historical article about Thaden starting on page 22 of this issue of *King Air*.)

The museum began that same year as the Staggerwing Museum Foundation. Parish Sr., today chair of the museum's board, donated the land on the field of the Tullahoma Regional Airport (THA). The first building was a small log cabin built to display Thaden's memorabilia. Glen McNabb, a corporate pilot and FBO owner, became the museum's curator.

Seventy miles southeast of Nashville and not far off of Interstate 24 near the midpoint between Nashville and Chattanooga, Tullahoma is a town of about 20,000. Many aviation enthusiasts have been drawn through the years to work at the town's Arnold Engineering Development Complex – the nation's largest complex of flight simulation test facilities. Established in 1951, it is on the site of the former Camp Forrest, one of the largest Army bases in the United States during World War II.

Today, original members are involved with the museum and many of the officers, board members and staff are second generation. For example, Wade McNabb, son of original curator Glen McNabb, is the current curator and CEO of the Beechcraft Heritage Museum.

Unique Aircraft, Rare Artifacts

What started as a narrow focus has grown into the most comprehensive collection of Beechcraft artifacts and aircraft in the world. The museum changed its name to reflect its scope in 2007, becoming the Beechcraft Heritage Museum. The original log cabin is now the Louise Thaden Library and is surrounded by 60,000 square feet of exhibit space housing nearly three dozen aircraft and thousands of pieces of memorabilia.

"We attract many people with or without an aviation interest, and those with an aviation interest aren't always Beechcraft owners," said Wade McNabb. "Anyone interested in airplanes will find it fascinating. The artifacts, the airplanes themselves, the architecture of our buildings and the campus – we have a comfortable place to come and see some really neat stuff."

A row of Staggerwings on display at the annual Beech Party. The Beechcraft Heritage Museum started in 1973 as the Staggerwing Museum Foundation. (PHOTO CREDIT: THOMAS HOFF)

Known as the Olive Ann Beech Staggerwing exhibit, this 1938 E17B is displayed without its fabric covering so visitors at the Beechcraft Heritage Museum can see the intricate design details. Olive Ann donated the original 1933 engineering artifacts used for development of the Staggerwing's retractable landing gear.

(PHOTO CREDIT: MELINDA SCHNYDER)

IF YOU GO

Beechcraft Heritage Museum
Tullahoma, Tennessee
Located on the field of the
Tullahoma Regional Airport (THA)

Hours
March 1 through Nov. 30: Tuesday-Saturday, 8:30 a.m.-4:30 p.m.
December through February: by appointment only

Admission
Adults: $10; Ages 12-17: $5
Ages 11 & under: free
Members: free

Membership
$50 annual dues or $1,500 lifetime

Beech Party annual fly-in
Oct. 14-18, 2015
Registration open to members and non-members

More information
(931) 455-1974
www.BeechcraftHeritageMuseum.org

Allow a couple of hours to explore the museum's eight exhibit areas, more depending on how much of the files you want to explore.

Pilots love the opportunity to park their airplane on the museum's lawn and walk up to the entrance, a pathway that evokes a runway. The front of the museum campus is stunning, with a full glass hydraulically lifting hangar door welcoming guests and showcasing a 1943 Model D17S Staggerwing.

Once inside, every hangar, gallery and hallway is full of one-of-a-kind artifacts: Olive Ann's original handwritten ledger from the factory, her corporate office furniture, hand-drawn aircraft paint schemes, bound collections of early photographs, wind tunnel models, the original landing-gear mechanism for the Staggerwing, aircraft cutaways, Thaden's competition certificate signed by Orville Wright, advertising replicas and much more.

The 35 aircraft on display across several hangars include a Staggerwing, Travel Air, Twin Beech, Bonanza, Baron, Duke and a Starship.

"No question the centerpiece of the collection is the first Staggerwing and the first Beechcraft product produced – a Model 17R," Wade McNabb said.

The first Beechcraft, a Model 17R registered NC499N, was test flown by Wilbur "Pete" Hill on Nov. 5, 1932, less than seven months after the company was founded. The aircraft served as the Beechcraft demonstrator until 1934, when the Ethyl Corporation purchased it. The aircraft was severely damaged in upstate New York in 1935. Nearly 50 years later, in 1984, museum member

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NBAA NAFA NARA MEMBER

Two Beech T-34 Mentors resting after an afternoon mission, as a light fog rolls into Tullahoma, Tennessee, home of the Beechcraft Heritage Museum.
(MUSEUM PHOTOGRAPHER BOB BURNS)

Stephen Pfister located the plane's wreckage where it had been buried and began the reconstruction effort. The Staggerwing Museum Foundation purchased the aircraft, completed its restoration and dedicated NC499N in honor of Pfister in 1990. Known as Staggerwing No. 1, the aircraft resides in the Walter H. Beech Hangar with other Staggerwing and Travel Air planes.

Beech Party Fly-In

The invite reads: "Whether you are a passionate aviator, an enamored enthusiast or own any brand of aircraft, please come to Tullahoma on the third week of October. You will find all ages of aircraft, from vintage biplanes through modern turboprops, and everything in between. Last year's gathering brought in over 125 airplanes, including a variety of Beechcraft treasures along with many other shapes, sizes and classic flying machines."

The annual Beech Party is Oct. 14-18 on the grounds of the museum, which you can fly into and park your airplane 100 feet from the entrance. McNabb estimates that 500 guests attended last year.

This year's theme is Women in Aviation, and special guest Fran Bera is scheduled to attend. Bera is an International Pioneer Hall of Famer and a seven-time winner of the All Women Transcontinental Air Race/ Powder Puff Derby.

Beech Party is a chance to spend quality time in the air (about 9,000 gallons of fuel were pumped at THA last year), as well as attend exhibits and educational seminars from industry leading companies, respected restorers and knowledgeable technicians. Tom Clements is returning by popular demand to share his King Air expertise and provide a personal book signing. Sarasota Avionics is conducting a hands-on Garmin seminar. Former Beechcraft executive Jack Braly will present a special program on the design, production and flying of the Starship.

One of the recent additions to the museum's collection, a 1943 Beechcraft D17S Staggerwing nicknamed Gilmore. (MUSEUM PHOTOGRAPHER BOB BURNS)

Museum members and non-members can attend. To register or for more information, visit *www.BeechcraftHeritageMuseum.org.*

King Air Society

After the museum started in 1973 with an emphasis on Staggerwings, the first major expansion came in 1995 with the addition of the Twin Beech 18 Society and the Bonanza/Baron division was launched in 2003. The museum formed the King Air Society in 2013 and made a push in 2014 to get more King Air owners to the Beech Party.

"We had about 10 to 12 King Airs show up, including Jack Braly, who has become a fixture at Beech Party, in his F90. (Editor's Note: Mr. Braly's F90 is featured on the cover of this issue of *King Air* magazine.) The idea is to build momentum on getting more artifacts and items here at the museum to support the history of the King Air," Wade McNabb said. "Ideally, you'd see a full line of Beech aircraft at the museum, including the King Air line. I'd love to see a 90, 100, 200 and even a 300 eventually."

The societies work as divisions or interest areas of the museum; a member can identify which Beechcraft model they are interested in when they join. As a 501(c)(3) nonprofit corporation, Beechcraft Heritage Museum operates on annual memberships, donations to the Friends of the Museum program and income from its investment portfolio. Annual membership dues are $50 and lifetime memberships are $1,500.

When asked when the museum might get its first King Air to display, McNabb answered playfully, "There are always things in the works that we hope to announce in the near future. I didn't envision that we would have a Duke and now we do, so I would anticipate a King Air in the not so distant future." KA

FAA Reauthorization Bill Deferred, NBAA Requests Call to Action

by Kim Blonigen

The House Transportation and Infrastructure Committee notified aviation groups that House leadership has delayed floor consideration for the FAA Reauthorization Bill until September. As a result, the aviation groups feel the bill may not be released until closer to the floor time. The bill was expected to be presented by Committee chairman, Bill Shuster (R-Pa.), in July. If the deferment stays, Congress would have little time to pass a bill before the FAA's current authorization expires on September 30.

While the bill has not been fully detailed publicly, in mid-July Shuster did outline some points of a proposed bill that included the creation of a privatized ATC system that would be funded through aviation user fees. NBAA President and CEO Ed Bolen noted that both of these standpoints run contrary to longstanding positions held by the business aviation community.

"The potentially dire consequences from such actions cannot be overstated," Bolen wrote in his personal appeal to NBAA Members. "Without Congress to ensure that our nation's air traffic system safeguards the aviation needs of the entire public – including the people and companies that rely on general aviation in small and mid-size towns – such sweeping authority would instead be granted to a group of self-interested parties."


NBAA President and CEO, Ed Bolen.

In March of this year, Bolen submitted written testimony to the House Transportation and Infrastructure Committee's Subcommittee on Aviation outlining nine "guiding principles" NBAA and its Members consider fundamental for ensuring that proposals offered in conjunction with FAA reauthorization support business aviation, which helps generate over a million American jobs and more than $200 billion in economic activity each year.

"The U.S. today has the best air transportation system in the world, but in order for us to be able to make that statement a decade from now, changes will be necessary," Bolen's testimony stated. "How we accomplish those changes is at the heart of the reauthorization debate. NBAA and its Members are committed to the changes needed to make NextGen a reality, but we will not support changes that fail to preserve business aviation's access to airspace and airports in a safe, predictable and affordable manner. The debate over how to get from where we are to where we want to go is one NBAA believes should be undertaken in the context of data, facts and guiding principles."

Bolen outlined those guiding principles as follows:

- **Make NextGen a reality.** The business aviation community supports a continuing transition to a Next Generation, or "NextGen," aviation system, but recognizes that the transition will continue to be met with significant challenges, and for America to retain its world-leadership position in aviation, change will be necessary. "Make no mistake about it: no one is content with the clarity, pace or cost of the transition to NextGen to date," Bolen's testimony noted. "We need to do better."

- **Keep congressional control over taxes, fees and charges**. In the FAA reauthorization debate, proposals are being offered that would put authority over the aviation system in the hands of structures consisting of non-elected officials. While a dialogue about finding a new governance structure is appropriate, the composition and scope of its authority remains a critical consideration. Congress must retain authority over taxes, fees and charges.
- **No user fees**. All of general aviation, including business aviation, pays for its use of the aviation system through a fuel tax, which is the most efficient, effective payment system. Congress has repeatedly written to current and former White House Administrations in opposition to per-flight user fees, and should continue to oppose them.
- **Ensure predictable, affordable access to airspace and airports**. The inherent value of business aviation is the ability of companies to fly where they need to, when they need to. Business aviation must have continued access to the nation's airports and airspace.
- **Protect the privacy of those in flight**. The Automatic Dependent Surveillance–Broadcast (ADS-B) technology, a cornerstone of the FAA's satellite-based NextGen system, does not currently include needed protections for operators' privacy and security.

Congress has agreed with NBAA that people should not have to surrender their privacy and security just because they travel on a general aviation aircraft. In past FAA reauthorization measures, Congress has included language requiring the FAA to provide an "opt-out" for those who do not want their aviation movements broadcast in real time, and lawmakers need to address this issue in the pending 2015 FAA reauthorization bill.

- **Protect the nation's airport system.** In some parts of the country, attempts are being made to close important airports. NBAA supports giving the Secretary of Transportation sufficient discretion to allow an airport to remain open for the purposes of protecting or advancing the civil aviation interests of the United States, if standard conditions become unenforceable.
- **Improve the certification and approval process.** The approval process for new aviation technologies and other products can be cumbersome, unnecessarily taking up time and resources. The FAA should constantly look for ways to keep or improve safety, while adopting more efficient, effective business-like processes.
- **Ensure the safe introduction and integration of new aviation technologies.** NBAA urges Congress to work closely with the Department of Transportation, FAA and the unmanned aircraft system (UAS) industry to integrate UAS into the national airspace system in a thoughtful, deliberative process focused on safety and security.
- **Ensure continuity of government aviation services.** Aviation aircraft and parts cannot be produced, financed, bought or sold without the written approval of the federal government. NBAA urges lawmakers to include language in FAA reauthorization legislation to ensure that the important aviation safety and security functions of the FAA Registry Office are protected from future government shutdowns.

After Committee chairman Shuster's comments revealing some of the details of the proposed Reauthorization Bill, NBAA called upon its more than 10,000 Member Companies to make their voices heard in strong opposition to any legislative proposal that would strip congressional oversight of the nation's air traffic control (ATC) network in favor of a private entity funded through user fees.

Similar to past instances when legislative proposals represented potential threats to the freedom and mobility provided through business aviation, NBAA issued this latest call to action to inform NBAA Members about the implications of Shuster's remarks.

Bolen's message also advised how members of the business aviation community may encourage their elected representatives to oppose any legislation that would enact user fees, and take away the focus on the public interest that comes with congressional oversight of the nation's aviation system.

NBAA's Contact Congress online resource provides a quick, convenient means for people in NBAA's Membership to inform their elected officials that they oppose ATC privatization and user fees. "Members of Congress are most attentive to their constituents, who live and work in the states and districts they are charged with representing," Bolen noted in his call to action.

NBAA has also established a way for the business aviation community to use social media to make its concerns understood. NBAA Members with Twitter accounts can alert their lawmakers to the concern over that social media venue using NBAA's Twitter advocacy tool.

"Our industry cannot be silent or complacent against these threats," Bolen added. "We must once again make our united voice of opposition heard on this issue."

For more information and guidance on how you can contact Congress regarding the FAA Reauthorization Bill, go to www.nbaa.org/advocacy/contact/. KA

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KEEP YOUR COOL

Notes on King Air A/C

by Dean Benedict

It's August and it's hot, at least in my part of the world. So far this season, I've dealt with everything under the sun and in the shade when it comes to air conditioning (A/C) problems. I've solved these issues by looking first at the usual suspects – compressors, vent blowers, and low refrigerant levels. In other cases, it was the less common – condenser and evaporator.

Air conditioning is a topic unto itself and either you get it or you don't. There are plenty of very capable A&Ps out there who will tell you right off the bat that they're no good when it comes to air conditioning. Have respect for those guys; they are doing you a huge favor with their honesty. Unfortunately, there are some who say they can fix anything, but who really don't know what they are doing when it comes to air conditioning. Things can go from bad to worse more quickly than you would think, as in example B below.

Example A: The A/C is not working in a King Air. The compressor is found to be bad; in fact, it blew up (see photos)! Debris went through the system to the receiver dryer. We removed the compressor and the receiver dryer, flushed the system between those two points then removed the flush. We then installed a new compressor and receiver dryer, and replaced a couple other items as needed (belts, current limiter). Next, we serviced the system with the proper type and amount of refrigerant. It ran great on the ground run.

Example B: Another King Air's A/C is not working and its compressor, too, is found to be bad. The compressor was removed, the system was flushed, a new compressor was installed, but the A/C just blew hot air. The Freon level looked fine, and the shop wasn't sure what to

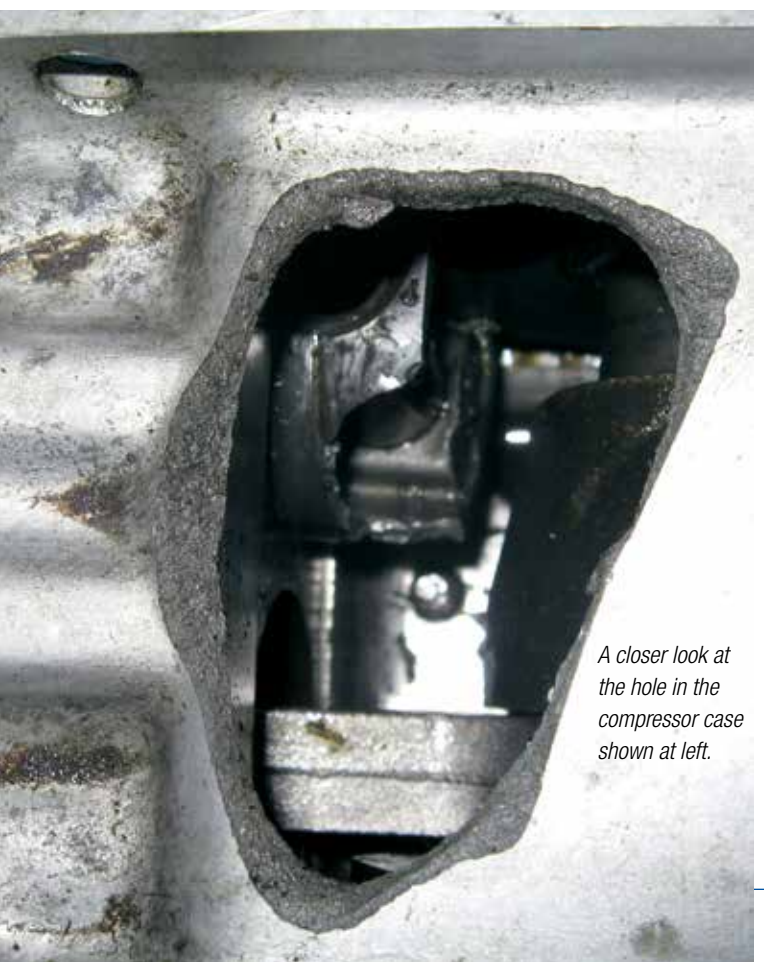
do next, so they began replacing components. Eight thousand dollars later (yes, $8,000!), the shop told the owner the next step would be to gut the interior and replace each and every line in the system; also to replace the evaporators and the condenser in order to find and fix the problem. Their estimate for this project was another $15,000. The owner refused this offer.

He brought the aircraft to me and we found the receiver dryer totally plugged with flush. When they flushed the system, they had flushed the *whole* system, including everything downstream of the receiver dryer! After drowning the system in flush, they failed to get it all out. It took three more receiver dryers to capture all that residual flush that was mucking up the system. Finally, once the system was completely purged of flush, we were able to properly service it with the correct type and amount of Freon. It's been blowing icicles ever since.

What's Driving It?

It's one thing to understand the principles of air conditioning, but that's just the beginning. King Air A/C systems are a bit convoluted. I hate to say it, but the A/C in a King Air is not its strongest point.

If you have a model 90 or 100, your A/C is driven by an electric motor in the nose. If you have a 200, 300 or 350 model, your A/C is driven by the right-hand engine. Three years ago, I wrote an article for this magazine on troubleshooting air conditioning problems; it was focused strictly on the engine-driven systems in the 200s/300s/350s. If you missed it, look for the May/June issue of 2012.



A closer look at the hole in the compressor case shown at left.

Electric Motor-Driven

Air conditioning in the King Air model 90s and 100s works pretty well as far as cooling the cabin is concerned. Plus, while you are pre-flighting the aircraft, you can plug in external power and run the A/C on the ground to pre-cool the cabin before the passengers arrive. This is positively blissful in triple digit temperatures. Another perk? It's easy to troubleshoot the system – just plug in the GPU.

The problem is the huge load this electric motor draws off the generators. Today I was performing a routine ground run on a C90. The generators were showing 15% until I turned on the A/C; then they showed 40% per side – quite a load. Beech was concerned that in instances of losing an engine, a massive load would be born by one generator, leaving little room for everything else needing juice in a clutch situation.

Another concern was that the motor-driven A/C worked hard all the time. That motor is either on or it's off. When it runs, it is always at the same speed, providing optimum output continuously, so these motors can wear out.

Early 90 and 100 models had a two-cylinder compressor. This was later changed to a five-cylinder compressor which used the same amount of juice off the generators, but it made colder air and it made it faster. No complaints there.

Engine-Driven

With the advent of the 200 series King Air, and the 300s and 350s that followed, Beech desperately wanted to shed the generator loads so they ran the A/C system off the right-hand engine. While on the ground and running, the condenser blower draws 40-50 amps, but as soon as you break ground, the condenser blower shuts off. The moment you are airborne, the scoop on the right side of the nose puts air across the condenser and that air cools the Freon.

Once in the air, the draw on the generators from A/C-related components is negligible. You would think that condenser blowers would last much longer in the engine-driven systems because they only run 20-30 minutes on the ground and never in the air; whereas the motor-driven systems are going on the ground and in the air (at least until your OAT goes below 50° F). In my experience, the condenser blowers in a 200 wear out as fast as they do in a 90. Go figure.

Automotive Ancestry

The A/C in the early model 200s had a six-cylinder compressor. It was an A6 compressor like those found in a Cadillac Coupe de Ville or a Chevy Monte Carlo. They worked pretty well considering they were cooling

12 feet of aircraft cabin – way more cubic feet than the automobiles for which they were designed. The A/C on all King Airs has its roots in automotive systems.

One of my favorite stories concerns an A100 owner out of Utah. He was in Las Vegas on business on a really hot day in June, and had no A/C. He heard about me and hopped over to my location. Right away I determined the system was out of Freon. I serviced it and got out my sniffer. Sure enough, I found a substantial leak at the compressor drive seal. While the owner fretted over an expensive part from Beech and time involved to ship it, I had other ideas.

I knew from experience that a Ford F-150 had the same compressor. Remember the two-cylinder on the early 90s and 100s? In the days of yore at Beech West in Van Nuys, I used to rebuild those compressors with a kit from the auto parts store. So I got on the phone and found the seal I needed at a freightliner dealer across town. My wife zoomed over and got the part, I installed it, and he was good to go. I think I charged him $30 for the seal. He was flabbergasted that I knew what to do and ecstatic that I saved him so much money. We became friends on the spot. When he bought a second King Air, he brought them both to me for as long as he owned them. To this day, we get a good chuckle over that one.

Engine-Driven System Decreases Cooling Capacity

Although happy with the engine-driven system taking the burden off the generators, Beech wasn't a fan of the horsepower coming off that R/H engine. So, they took the same five-cylinder compressor they were using in the newer 90s and plugged it into the engine-driven A/C systems of the larger King Airs. Fortunately, it took less horsepower off the R/H engine. Unfortunately, it pumped less Freon. The cylinders on the new compressor were much smaller than those on the original six-cylinder unit. So fewer cylinders and smaller cylinders meant less Freon moving around. This made the expansion valves less effective in dropping the air temperature because there's less volume moving through the system. The result? Less cooling capacity than before.

To review: King Airs with engine-driven A/C have no air conditioning on the ground unless the R/H engine is running. And when the engine is running and the A/C is turned on, it doesn't cool the cabin very well because of the reduced capacity of the smaller compressor. Plus, the engine is not running at max power on the ground. It's just like running the A/C in your car while at idle – it blows much more cold once you get on the freeway. In a King Air with engine-driven A/C, it doesn't really kick in to cold until you are airborne.

The final blow was the switch from R-12 to R-134a refrigerant. That didn't do King Air air conditioning any favors. Even the motor-driven system is less effective.

The Air is Barely There – A/C in the 350

Anemic A/C is a common complaint with 350 owners. Beech's 350 added two feet to the cabin of the 200/300 series. I'm guessing this added roughly 30-36 additional cubic feet to be cooled, *but they kept the exact same A/C system*. The 350 made its debut after Beech switched its engine-driven system to the much smaller five-cylinder compressor, so it's no big surprise that the A/C in a 350 is a big disappointment.

There is a very expensive factory option for 350s (also available as a very expensive STC) which provides for an electric motor-driven A/C system. It ties in with the existing system to service the whole cabin. It can be used with a GPU to pre-cool a heat-soaked cabin on the ground before boarding passengers. It's not common and it's not cheap, but for a 350 it's very cool … literally.

Maintenance Tip – Find a Good A/C Guy

When your A/C goes out and it's beastly hot, your desperation level goes up and you may be tempted to go with what you can conveniently get. Frankly, you are better off putting a wet towel around your neck, gritting your teeth and flying home or somewhere that has a proven record with King Air A/C, than to try your luck with a shop you are not sure about. I'm not one to toot my own horn, and I'm not one to bash other shops, but I have seen many attempts to fix air conditioning go horribly awry in the hands of people who don't know what they are doing. Guesswork doesn't cut it.

To work on air conditioning, I must be licensed to buy Freon; I need the special gauges, fittings valves and oils that every air conditioning technician must have, and I need them for R-12 as well as R-134a; I need a sniffer for leak detection; I also need expensive machines to evacuate Freon from a system and save it until the system is ready to be serviced. Even though Freon is heavier than air, I mustn't allow any of it to escape, for fear that it fly 12-19 miles above the earth to assault the ozone layer (but that is a topic for another time and place). Here's my point: Whoever works on your A/C needs all the equipment needed. They also require a full subscription to the manuals for all King Air models (which aren't cheap) and an understanding of King Air air conditioning systems, quirks and all.

True story: A King Air 300 that comes to our shop regularly for phase inspections is based in another state. The pilot/manager relies on local sources if there's a squawk between inspections. He had what he thought was a simple A/C problem and an important flight coming up. He turned to a local shop which assured him they could fix it in a jiffy, but it turned into a nightmare. The pilot called me over and over, apologizing like crazy in his frantic attempt to troubleshoot the problem for the shop and get his King Air back in service. They didn't even know the proper amount of refrigerant required by that system, the pilot had me look it up for them!

The connecting rod that blew the hole in the compressor case, shown on page 12.

It got worse. After four days, the pilot had to yank his aircraft out of the shop for that important trip (with no A/C in triple digit temperatures). He managed to swing by my shop for a look-see, but he only had a few hours. With three guys we had it diagnosed in about an hour. Using the sniffer, we determined the system was *not* leaking, but we found other issues. First, it was still a tad low on Freon. Sometimes it's that last half a pound, or even a few ounces, that makes all the difference. Second, we found the switch that turns the A/C off below 50° F was inoperative. And third, we found the condenser blower was intermittent due to a loose terminal block.

This was good news considering the other shop had seen stains on the condenser and therefore assumed it was leaking Freon. They had no sniffer, so they were shooting in the dark.

Based on guesswork alone, they had recommended the condenser be changed. This is a very expensive part and an extremely labor-intensive job. Although the pilot couldn't stay for us to fix the problems we identified, he was thrilled to know exactly what was necessary to get that A/C system blowing cold again. He was even happier to know that their recommendation to change the condenser was completely unnecessary.

Moral

The moral of the story is this: Make darn sure you know what kind of Freon your King Air takes and find out the exact refrigerant capacity of its A/C system. Make a note of this somewhere other than the logbooks, because when your A/C goes out you probably won't have the logbooks handy.

The most common problem is that the system is a little low on Freon. This does not imply there is a leak somewhere. The maintenance manual states clearly that it is *normal* for the system to lose a few ounces per year. If you haven't serviced it in 18-24 months, it could be down just enough to compromise the cooling capability.

If it's more than just a low-Freon problem, then find someone that has a knack for air conditioning with King Air capabilities and equipment. In a cool King Air cabin, everyone's happier. KA

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

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

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Pressurization System Abnormalities

by Tom Clements

One of our readers suggested that I discuss some of the common failures that affect the King Air's pressurization system. I am grateful for his idea and this article will address those abnormalities.

Let me begin, however, by stating that the great majority of pressurization problems in King Airs are *not* the ones I will be presenting now! Lack of sufficient inflow – a weak flow pack or two, combined with excessive outflow, too many cabin leaks … these are the causes of the great majority of pressurization problems. I have said it before and I'll say it again: I would suggest that the most common, almost universal, weakness in King Airs is that they have leak rates well in excess of what Beech specifies. And you know what? I don't care! To find a leak rate – peak cabin climb rate when the inflow is stopped while at maximum differential pressure, ΔP – below 2,500 fpm is quite rare, although that's the specification Beech tells us is correct. But if I see 4,000 fpm or even more, I can happily live with that if (1) I can maintain maximum ΔP on one flow pack alone at cruise power, and (2) that I can reduce power back to the gear horn warning, with both flow packs operating, without the cabin starting to climb (due, of course, to less inflow than outflow).

No, this time we are discussing problems that may exist even with a wonderfully tight pressure vessel and with strong flow packs.

First, the basics: **Remember that both the outflow and the safety valves are spring-loaded to the closed position and require vacuum to suck them open.** Suppose that the line going to the throat of the bleed air ejector – the vacuum source – disconnects so that we have no vacuum. What will happen?

Well, when the Bleed Air switches are turned on, air flows into an essentially closed container – the pressure vessel, cockpit and cabin. With inflow taking place and no outflow happening (except for the leaks), the cabin is gaining air mass, pressure is increasing, and altitude is decreasing. With high power on the engines – such as at takeoff – it will be normal to see the cabin's rate-of-climb gauge hit the peg at -6,000 fpm! Whew, that gets your, and your ears', attention!

So before the cabin dives down too far, we'll grab the Cabin Pressure Control switch and move it forward to Dump, right? Well, sure, feel free to do that. However, in this scenario, it won't work. Why? Because we have no vacuum, no force to suck the Safety Valve – the dump valve – open.

If we cannot control the outflow, we need to stop the inflow. The solution to this runaway cabin dive is to turn off both Bleed Air Valve switches. With the inflow now stopped, the cabin will continue to leak air out until we become unpressurized as the cabin rises to the airplane's altitude. This could easily take in excess of 20 minutes.

If there are operators of straight 90, A90, or B90 models reading this, loss of vacuum affects your airplanes differently than what we have discussed which applies to the airplanes with flow packs. Your Flow Control Valve in the left wing center section – that regulates the flow from the supercharger by sending the proper mass flow into the cabin and dumping the rest overboard in the wing – needs vacuum to keep from dumping all of the supercharger's air overboard. Hence, a total loss of vacuum – the hose disconnecting from the bleed air ejector's throat – does not lead to a runaway cabin dive, but instead leads to a cabin climb. This is due to the fact that the Flow Control Valve stops sending any air into the pressure vessel, combined with the unavoidable pressure vessel leaks that exist.

The next malfunction I will discuss is failure of the Preset Solenoid Valve. This is the valve (not installed on B90 and earlier models) that goes from its Normally-Open (N.O.) state to a closed condition when we are on the ground and/or when we move the Pressurization Control switch to Dump. The purpose of this valve – as its name indicates – is to allow the pilot to *preset* the pressurization controller for the desired cabin altitude prior to takeoff. Most of us do this during our Before Takeoff procedure. Yet, with

the Preset Solenoid preventing suction from getting to the Controller until after we lift off, it cannot actually start sending the cabin to the desired altitude until we leave the ground.

For example, let's say we are departing from a sea level airport and have the desired cabin altitude for cruise set for 7,000 feet. After a couple of initial surges, we should observe the cabin climbing obediently toward 7,000 when we check the gauges after takeoff. If the rate of climb is too fast or too slow, we adjust the Controller's Rate knob appropriately.

If the Preset Solenoid had a loose connection and did not energize closed on the ground as it should, the result after takeoff would be the cabin climbing right along with the airplane: Same climb rate; zero ΔP. Oops. After consulting the checklist and verifying that the Bleed Air Valve switches are on and that the Pressurization Control switch is not in the Dump position, we have just about decided that we'll need to return to the departure airport to have our mechanic find the problem when – Voila! – the cabin stops climbing, ΔP starts increasing, and all is well once again.

What happened here is that the Controller began trying to climb the cabin to the selected altitude as soon as we set it during our Before Takeoff procedure. Since the actual cabin altitude may never be above the airplane's altitude – that would represent a negative ΔP value, which is impossible to have – what I call a "Phantom Cabin" exists somewhere above us, that the Controller is trying to reach. Only when we climb above this Phantom Cabin, do things start working 100% normally. Unless you took off quite quickly following your setting of the Controller, in most cases you will fly all the way up to the selected cabin altitude – 7,000 feet, in our previous example – before the cabin stops its unpressurized climb and levels off.

Until the loose connection or bad solenoid valve gets repaired, this problem is relatively easy to abide: Simply leave the Controller where it had been for your landing at this airport and don't dial in the new cabin altitude for cruise until after departure. This is exactly what the 90, A90, and B90 pilots must do routinely, since those models have no Preset Solenoid.

If the Preset Solenoid valve can fail open as we have just discussed – the more likely scenario since that is its de-energized state – then it can also fail the other way, stuck in the closed position, failing to open after liftoff. Now what?

The closed valve prevents suction from reaching the Controller so it, in turn, cannot regulate that suction and modulate the Outflow Valve with it. Hence, the Outflow Valve remains in its normally-closed position

and we again have the runaway cabin dive after liftoff … just as we did with no vacuum at all. The only difference between these two situations is that now the Dump switch will work. So we have two methods for depressurization: Dump – allowing vacuum to suck the Safety Valve wide open – or turn off the Bleed Air Valve switches and allow the cabin leak rate to gradually depressurize the airplane.

The next malfunction I will discuss is the Dump Solenoid valve itself. Like the Preset Solenoid valve, this receives power when the airplane is on the ground but is unpowered after liftoff. However, it is the opposite type of valve as compared to its Preset cousin: Normally-Closed (N.C.), and using electric power to go open.

If a wire to this valve comes loose in flight, we will observe nothing amiss. It remains in its de-energized, closed state. Only if we chose to move the Control switch to Dump – perhaps responding to heavy smoke in the cabin – would we find anything unusual when no dumping took place.

Ah, but after we land…now there is an interesting and potentially dangerous situation!

On the ground, both the Preset and the Dump solenoid valves should be energized, each going to their proper positions: The Preset Solenoid going closed, preventing any vacuum from reaching the Controller, and the Dump Solenoid going open, allowing vacuum to reach the Safety Valve and suck it wide open.

If the Dump Solenoid has a loose wire and does not energize like it should, then neither the Outflow nor the Safety Valve can receive vacuum and they both go to their spring-loaded, closed position. If the Bleed Air Valve switches are on, air is now flowing into an essentially closed box and we will begin gaining air mass in the pressure vessel, meaning that cabin pressure is going up and cabin altitude is, consequently, going down. Although this is an unregulated cabin dive, it is not as severe nor as noticeable as the runaway ΔP after takeoff, since the engines are at Idle and not much air is being supplied by the Flow Packs. More than one crew has taxied in after landing with the cabin slowly re-pressurizing yet did not notice it due to the rather gradual rate of cabin descent.

The shutdown is completed, someone steps back to open the cabin door, wonders why the release button is a little more stiff than normal, pushes it harder, rotates the handle, and finds himself sailing through the air onto the hard tarmac, having been unceremoniously ejected from the pressurized cabin. Realize that even 0.5 psid will cause the door to experience about 700 pounds of opening force!

Although preventing the cabin from re-pressurizing as we taxi in is *not* the primary reason for turning off the Bleed Air switches prior to shutdown, it is one more advantage of doing so. Some pilots make a habit of always opening their cockpit vent window prior to heading back to open the cabin door, to know for sure that no ΔP remains. That may be a little excessive, but it surely isn't a bad idea! Another method is simply to check the ΔP gauge and make sure it's showing 0 psid before anyone operates the door.

The next pressurization abnormality I will mention is one that I'll wager a lot of you have experienced. It's not dangerous, just irritating, and somewhat uncomfortable. This phenomenon is almost exclusively experienced in the E90- and F90-series, later members of the C90-series, as well as in the 100-series.

There you are, enjoying a satisfyingly high ground speed as you descend near the barber pole redline airspeed on this smooth flying day. Then, boom! What was that?! Why is the cabin showing a dive of 2,000 fpm or more! Even after things stabilize, the cabin is still descending rapidly and the rate knob on the Controller has no effect. Dang!

You just joined the "I Blew Open the Ram Air Door" club. The ram air door that allows outside air to get into the pressure vessel – via the air conditioner's evaporator plenum beneath the avionics bay on the left side of the nose wheel well – is normally prevented from opening by three things. First, there is a spring. Second, there is an electro-magnet helping keep it closed. Third, in most cases, there is enough ΔP to also force it closed. Yet when the airspeed is near redline – and the F90, with its higher VMO is the most notorious offender here – while ΔP is close to zero, the ram air force overcomes the spring and the magnet. That sudden inrush of outside air surely does dive the cabin!

Although you could avoid this by flying slower, who wants to do that on these rare smooth-air days?! Instead, you must make sure that ΔP doesn't get too low – like below 1 psid – while zooming along near redline. How do you do this? By keeping an eye on the pressurization indicators during your descent and, specifically, making sure you are using sufficient cabin rate of descent so that the airplane's altitude is not catching up to the cabin's altitude. It's having the airplane "catch the cabin" that is causing the problem.

It is tempting to use too low of a cabin rate-of-descent in an attempt to treat the passengers' ears as gently as possible. That's a great goal, but we must not overdo it. Unless you use a 400 to 500 fpm rate of cabin descent, there is an excellent chance that you may experience the irritating situation that we are discussing. There are exceptions to every rule – i.e., if you are landing at Aspen or Lake Tahoe, the cabin has so little altitude to lose that a low cabin rate-of-descent will probably work out fine – but sticking with the 400 to 500 fpm rate is almost always safe and not problematic for most passengers' ears.

I am sure you have noticed also that to achieve a 500 fpm cabin climb and a 500 fpm cabin descent, it is the rare Controller in which the rate knob can remain in the same position! Invariably, a higher setting – maybe 1:00 o'clock – will be needed to get the climb but a lower setting – maybe 11:00 o'clock – will be needed for the descent. Sorry to increase your workload, but it is a fact of King Air life.

Have you noticed the little access panel in the upholstery on the right side of the baggage compartment down just above the floor? Know what's inside? Well, looky there, it's a petcock drain of some sort, just like the static line drains behind the right side upholstery in the cockpit.

But this is not a static line drain. Instead, it is a drain at the low spot of the line between the Controller in the cockpit and the Outflow Valve on the back wall of the baggage compartment. If it is inadvertently left open, then all of the carefully-regulated vacuum that the Controller is using to modulate the Outflow Valve gets overwhelmed by cabin pressure leaking into the line. The controller loses its ability to work the Outflow valve correctly. Although the most typical result is runaway ΔP to maximum – turn off the Flow Packs when you are ready to depressurize for landing – we have also heard of cases in which cabin altitude merely "stuck" at one value and could not be raised or lowered.

I will close with this reminder: Both the Outflow and the Safety valves have self-contained Maximum Differential Pressure and Negative Differential Pressure relief functions. It is almost impossible for these functions to fail so long as the valve is installed in the aft pressure bulkhead correctly. That is the reason this discussion of abnormalities has not mentioned what to do if you exceed maximum ΔP…it just won't happen.

To repeat what I wrote at the start: The malfunctions I have reviewed here, although possible, are quite rare. But being unable to reach maximum ΔP because of lack of sufficient inflow and too much outflow – leaks – that's where the bulk of pressurization problems lie. KA

About the Author: King Air expert Tom Clements has been flying and instructing in King Airs for over 43 years, and is the author of "The King Air Book." He is a Gold Seal CFI and has over 23,000 total hours with more than 15,000 in King Airs. For information on ordering his book, go to *www.flightreview.net.* Tom is actively mentoring the instructors at King Air Academy in Phoenix.

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

Walter's "Wonder Woman"

Louise Thaden's dream of flying became a reality in 1927 when Walter H. Beech set her on a path to earning her wings and a reputation as one of America's foremost female flyers

by Edward H. Phillips

"I want you to meet Warren, our new Pacific Coast distributor. Warren has agreed to take you out to San Francisco. Your salary won't be high, but he will teach you this aviation business and see that you learn to fly." Walter Beech's words struck a young and vivacious Louise McPhetridge like a thunderclap. She stared in disbelief, first at Beech, and then at Warren. The 21 year-old girl from Bentonville, Arkansas, could hardly believe what she had heard. It took nearly an hour for the two men to convince her that they were serious: Her dream of flying was about to become a reality.[1]

Walter H. Beech was already an accomplished aviator in 1925 when this candid photograph was captured of the former Tennessee farm boy standing by a Travel Air Model "A" biplane. He saw potential in a young girl named Louise Thaden, who often hung around the Travel Air factory and yearned to fly. Beech was solely responsible for launching her career in a fledgling industry dominated almost entirely by men. (MARY LYNN OLIVER)

During 1927 and 1928, Louise Thaden not only became a competent pilot and sales person at D.C. Warren's Travel Air dealership in California, she also began to set records for altitude, speed and endurance for women flyers. She cuts a dashing figure in this photograph, posed beside a Travel Air Type 3000 biplane. (EDWARD H. PHILLIPS COLLECTION)

Warren was visiting the Travel Air Manufacturing Company in Wichita, Kansas, to take delivery of a Model "B" biplane (later redesignated as the Type 2000) for his new distributorship. On April 2, 1927, she and Warren departed Travel Air Field, located east of the city and headed west. Less than two years later, Louise had not only become a competent pilot, but she was placed in charge of D.C. Warren's satellite office in Oakland. It was a lot of responsibility for a young woman, particularly one who had recently married an aeronautical engineer named Herbert von Thaden.

In December 1928, Thaden set an altitude record of 20,200 feet flying a Travel Air Type 3000 powered by a Wright/ Hispano-Suiza V-8 engine. After landing, Thaden watched anxiously as an official of the National Aeronautics Association checks the sealed barograph.

(EDWARD H. PHILLIPS COLLECTION)

Louise was anxious to make her mark in aviation, and one of the best ways to do that was to set a record for female pilots. In 1928 she had a lot of competition: Ruth Nichols, Viola Gentry, Bobbi Trout, Elinor Smith, Amelia Earhart and Florence "Pancho" Barnes, just to name a few. By that time, the number of women aviators was growing, but the "records" they were setting for altitude, speed and endurance were not officially sanctioned or recognized by the Federation Aeronautique International (FAI) until December 3, 1928, when Gentry attempted to break the existing record for endurance held by male pilots (60 hours). Although she was forced to land because of bad weather, Viola had managed to stay in the air over Long Island, New York, for slightly more than eight hours.

Louise (fourth from left) posed with a group of friends and fellow pilots in Oakland, California, where she was responsible for a satellite branch office of D.C. Warren's Travel Air organization. Note the wide variation of flying attire as well as Thaden's favorite mount – the trusty Type 3000.

(EDWARD H. PHILLIPS COLLECTION)

Two weeks later, Bobbi Trout broke Gentry's record, and three weeks after that Elinor Smith set a new mark of 13 hours, 16 minutes. Women were increasingly setting and breaking each other's records at what seemed like a breakneck pace. As more women began to fly and obtain state-of-the-art airplanes equal to those flown by their male counterparts, records tumbled in quick succession. Ruth Nichols, herself a widely recognized flyer known for her skill at the stick, commented, "More girls should get good ships and keep setting new marks. It has long been my theory that if women could set records often duplicating the men's, the general public would have more confidence in aviation." [2]

Louise was quick to realize that setting records was her ticket to advancing her career in aviation. She began planning an endurance flight of her own, choosing one of Warren's Travel Air Type 3000 biplanes powered by a high compression, 180-horsepower Wright/Hispano-Suiza V-8 engine. Louise worked hard with the mechanics to prepare the ship for the challenge that lay ahead. The engine was tuned to perfection, fuel and oil tanks were closely inspected for any sign of cracks or leaks, and the airplane's rigging was checked and rechecked. Finally, the Travel Air was deemed ready.

Louise took off from Oakland and remained aloft for 22 hours, three minutes – a record! Unfortunately for Louise, her mark stood for only 30 days before 17-year-old Smith grabbed it back with a time of 26 hours, 21 minutes. Undaunted, Thaden set her sights on beating the existing women's unofficial record for altitude, and to be successful she would have to officially exceed 20,000 feet. A barograph, sealed by a representative of the FAI, was installed in the fuselage to record the maximum altitude achieved by Louise. In addition, a makeshift breathing system consisting of a hospital mask and an unheated cylinder of oxygen, would help her to remain conscious and alert during the flight.

Clothed in a thick winter flying suit and helmet, Louise took off on December 7, 1928, and began a slow, deliberate climb upward into rarified air. By the time she had reached 15,000 feet, the outside air temperature (OAT) had plummeted to zero. It was becoming increasingly difficult to breathe and Louise was feeling tired. Without hesitation she wisely donned her improvised mask and opened the valve of the oxygen cylinder with a pair of pliers borrowed from a mechanic. The flow of nearly pure oxygen revived her senses, and as the Type 3000 passed through 20,000 feet Louise opened the valve further. At that altitude it was about 16 degrees below zero, and she was flying in an open cockpit. Cold, wet moisture began to collect inside the mask and clung to her chin, but she continued to climb, struggling to hold the best climb airspeed in an effort to eke out every last shred of lift from the wings.

One hour after takeoff, one of two altimeters indicated 27,000 feet, the other 29,000 feet! The OAT had dropped to 24 degrees below zero. Thaden peered over the cockpit combing and looked down on Oakland, which had slowly shrunk to little more than a mere speck far below. Louise knew that altimeters were often notoriously inaccurate, particularly at those heights, and she gave little credence to its display. What the altimeter indicated made no difference, however, as the

Travel Air had become rebellious. The ship stubbornly refused to climb another inch as it hung on the verge of a stall, quivering and shuddering in the frigid air. The engine was gasping for breath, its power spent. Worst of all, however, Louise had failed to detect that she was gradually losing consciousness. The loud ringing in her ears went unnoticed. She slowly slumped in the cockpit.

The next thing she knew the airplane was hurtling earthward in wide circles at high speed, its Hispano-Suiza powerplant screaming in protest. Fortunately, oxygen-rich air at the lower altitudes had succeeded in reviving her. She quickly regained control and continued a slow descent back to the airport, where she landed without incident. When the barograph was removed and the tracing analyzed by the FAI official, he declared that Thaden had set a record – the first *official* altitude record for women pilots, of 20,260 feet. It stood for five months before Marvel Crosson shattered that mark by reaching an official height of 24,000 feet.[3]

Known on the West Coast as an up and coming aviatrix, Thaden set a women's endurance record of 22 hours, three minutes, in March 1929, flying a Type 3000 equipped with additional fuel and oil tanks. The fuel tank mounted forward of the cockpit was crudely faired with sheet metal. The fuel line was routed into the cockpit where a wobble pump fed the gasoline to the fuselage tank. (EDWARD H. PHILLIPS COLLECTION)

In addition to briefly holding the altitude record for women pilots, in 1929 Thaden set a speed record flying a Travel Air Type 3000. The biplane was equipped with the new "speed wings" developed by engineers at the factory in Wichita that not only featured a different airfoil section that reduced drag, but allowed a modest increase in maximum and cruise speeds. When the freight truck arrived at the Oakland office, the wings were carefully unloaded and slowly unpacked from their crates. Not long after the wings arrived, so did a letter from Walter H. Beech. It was addressed to Louise: "We believe the wings to be sufficiently strong, but since they are a new development, we do not want you to take any unnecessary risks or chances." [4]

Although the wings had been shipped to Thaden for the specific purpose of setting a speed record, as preparations for the attempt began Walter wrote more letters to Louise, all of them continuing to "urge care and caution." Soon the wings were installed and the ship rigged according to engineering directives. It was time to "take her up and see what she could do." As Thaden recalled, "It was fast, the fastest commercial airplane on the West Coast. Pilots whom I had heretofore envied, now envied me. They stood in admiring groups about the sleek-looking ship, extolling her streamlined cleanness, all but drooling at the mouth to fly her. My popularity zoomed to a new high. It was very gratifying to my vanity." [5]

Louise chose the smooth air of the early evening to execute her attempt. Officials recording the flight reminded her that she was to fly a total of four passes, two in each direction, across a measured mile course that had been laid out on the Oakland airfield. A large crowd had gathered to witness the event, and Louise could only hope that she would not make a mistake.

The Travel Air's Hispano-Suiza engine roared as Thaden put the biplane into a dive. She slowly leveled off at 300 feet as the ship flashed by the course marker at the west end of the field. Louise played the controls with as much precision as she could muster, trying hard to keep the airplane in level flight. In a matter of seconds the finish marker at the east end of the airport was behind her. She pulled up, rolled the Travel Air into a tight 180-degree turn and completed a second pass in the opposite direction. The buildings and people rushed by in a blur. "I was exalted with speed, with swift, powerful, unobstructed flight, cutting the air with knife-edge ease. Mastery, accomplishment, freedom, ego; verve, vitality; I was ready to burst with the joy of being so thoroughly alive – for the ability to fly." [6]

Thaden made two more passes over the course and landed, hoping she had set a record that would be difficult for her female contemporaries to beat. When Louise walked into the office where officials were busy calculating time and speed, they announced that she had set a record of 156 mph. Privately, Thaden was disappointed, but she consoled herself by realizing that she had flown faster than any woman in the world up to that time. In addition, she had held not only the speed record, but also the records for endurance and altitude.

Thaden achieved another goal in the summer of 1929 when she obtained her Transport License, which required a total flying time of 200 hours and specific cross-country experience. At that time she was one of only four female pilots that had achieved that high level of skill and knowledge. She would soon put that skill to work, but only if she could convince Walter Beech to build her an airplane for the upcoming Women's Air Derby. The Derby was planned as a precursor to the 1929 National Air Races

"I AM BLOWN AWAY BY THE EXPERTISE ELLIOTT AVIATION PROVIDED ON MY GARMIN 1000 INSTALLATION, FROM START TO FINISH. ALTHOUGH I KNEW THE G1000 WAS THE BEST AVIONICS SYSTEM ON THE MARKET, I HAD SOME FEARS ABOUT HAVING A PROJECT OF THIS SIZE COMPLETED THOUSANDS OF MILES FROM HOME. ELLIOTT AVIATION QUICKLY PUT ME AT EASE BY PROVIDING EXCEPTIONAL QUALITY OF INSTALLATION, ALL IN JUST 15 DAYS. ELLIOTT AVIATION'S PROFESSIONALISM, COMMUNICATION AND EXPERIENCE MADE ME ONE OF THEIR MANY SATISFIED CUSTOMERS FROM ALL OVER THE WORLD."

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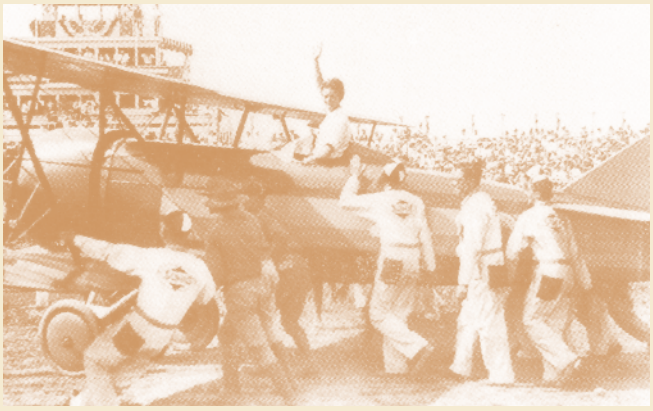
and would be flown from Santa Monica, California, to the site of the races in Cleveland, Ohio.

It was the first competition of its kind in the United States, and the press soon dubbed it the "Powder Puff Derby." The race would begin on August 19 and end one week later in Ohio, 2,800 miles away from California. The winner would take home the tidy sum of $2,500. Louise was among 18 pilots that qualified for the event, along with the likes of Amelia Earhart, Mary von Mach, Gladys O'Donnell, the flamboyant "Pancho" Barnes, Ruth Elder and the highly respected German aviatrix, Thea Rasche. Thaden knew that each of these women had the ability to win, and they would be flying airplanes fully capable of making the long, arduous journey.



In August 1929, Louise achieved one of her greatest victories when she won the first Transcontinental Air Derby flying a Travel Air Type D4000 equipped with speed wings. The event thrust Louise onto the national stage and firmly established her as one of America's foremost female aviators. The photograph shows Thaden waving to a cheering crowd of thousands after landing in Cleveland, Ohio, site of the 1929 National Air Races. (EDWARD H. PHILLIPS COLLECTION)

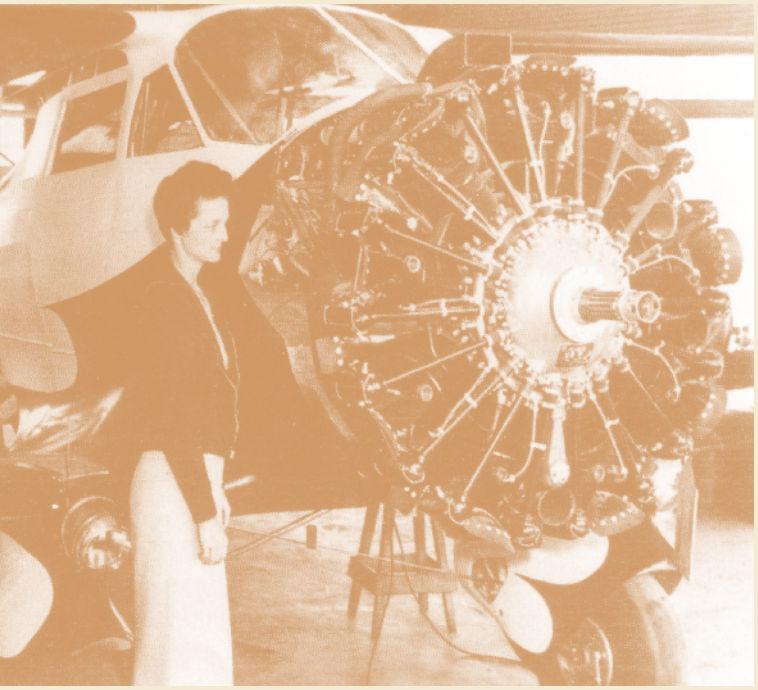
Meanwhile, back in Wichita, Walter Beech finally relented and despite an already overburdened order book for other customers, agreed to build not only one Travel Air for the race, but five. All would be fitted with speed wings and powered by Wright Aeronautical static, air-cooled radial engines ranging from 225-300 horsepower. In addition to Louise, Marvel Crosson, "Pancho" Barnes, Blanche Noyes and Mary von Mach received new ships ready for the race. The Derby got off to a good start, but the press was quick to malign the race and the women who were flying with all their skill and grit to win it. One newspaper exclaimed, "Women have conclusively proven they cannot fly," while another paper proclaimed that women "have been dependent on man for guidance for so long that when they are put on their own resources, they are handicapped." Despite the malicious and unfounded accusations hurled by irresponsible editors and reporters, the women flew on, even after the death of Marvel Crosson whose Travel Air crashed in the desert near Phoenix, Arizona.

As one day led to the next, the strain on all of the contestants was beginning to take its toll. That was the hardest aspect of the race – to keep going despite one obstacle after another that had to be overcome, including bad weather, inaccurate road maps, high, gusty winds, bad fuel, blowing sand, and fatigue. The Travel Air team was no exception and experienced more than their share of troubles. "Pancho" Barnes "cracked up" her Travel Air when it struck a stray Chevrolet that had wandered onto the active runway in Pecos, Texas, and Blanche Noyes was out of the running after she received serious burns when her ship caught fire in flight and was damaged in a forced landing.

It was anybody's guess as to who would cross the finish line first at Cleveland, but Louise managed to keep her Travel Air from serious harm and captured the $2,500 reward for her efforts. Thaden summed up her hard-earned victory this way: "The indisputable fact that I was first into Cleveland, winner of the Derby, could not penetrate. Before the ship rolled to a stop, a crowd swarmed around us. Alarmed, I cut the [magneto] switches. Sunburned mechanics grinned…picking the Travel Air and me up bodily, they carried us over in front of the grandstands." Louise had barely left the cockpit when she was thrust into the public spotlight and asked to address the throngs of spectators in the bleachers. Speechless, she just stood there silently. Suddenly an impatient official poked her in the side and told her to say something. Struggling to find the words, she finally blurted out, "I'm glad to be here. All the girls flew a splendid race, much better than I. Each one deserves first place because each one is a winner!" [7]

For Louise, the glory and notoriety of the Women's Air Derby quickly faded away. All the women resumed

Walter Beech and Louise posed for the camera following her victory at Cleveland. In addition to Thaden's triumph, Travel Air's sleek Type "R" monoplane annihilated all of its competitors, including the best the United States military could offer, in the free-for-all race averaging a stunning 196 mph. Walter was delighted with Thaden's performance, and she would make him proud once again in 1936. (EDWARD H. PHILLIPS COLLECTION)



A slender and lightweight Louise McPhetridge von Thaden posed by the massive, supercharged, 1,000-pound Wright SR-1820F3 static, air-cooled radial engine installed on the Beechcraft A17FS in September 1934. She was scheduled to fly the bullish biplane in the MacRobertson International Trophy Race from London, England, to Melbourne, Australia, but was forced to withdraw because of a lack of funding. (COURTESY WILLIAM AND PAT THADEN)

their daily lives. Some went on to great fame. Some did not. One disappeared over the vast Pacific Ocean. Louise Thaden, however, was destined to earn even greater notoriety in 1936 flying an airplane that bore Walter Beech's name, but that, as they say, is another story.KA

NOTES:

1. Thaden, Louise; *"High, Wide and Frightened,"* Air Facts Press, New York, New York; 1973.
2. Holden, Henry M., and Griffith, Captain Lori; *"Ladybirds – The Untold Story of Women Pilots in America;"* Black Hawk Publishing Company, Mt. Freedom, N.J.; third printing, December, 1993.
3. Ibid.
4. Ibid
5. Ibid
6. Ibid
7. Ibid

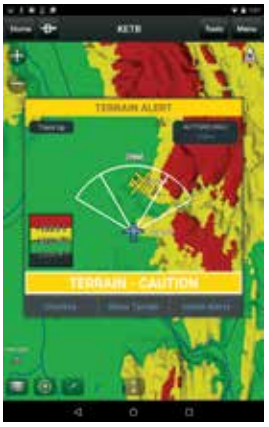
About the Author: Ed Phillips, now retired and living in the South, has researched and written eight books on the unique and rich aviation history that belongs to Wichita, Kan. His writings have focused on the evolution of the airplanes, companies and people that have made Wichita the "Air Capital of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

Garmin Pilot Adds Obstacles and Terrain for Android

Garmin has announced an updated version of the Garmin Pilot app for Android, which incorporates the display of both terrain and obstacles overtop Garmin's dynamic navigation maps, VFR Sectionals, and IFR high and low en route charts. These terrain and obstacle overlays display visual alerts of potential hazards and enhance situational awareness, particularly in unfamiliar environments. In addition to terrain and obstacles, version 4.3 for Android supports X-Plane 10 and other compatible simulators, offers the option to display density altitude information and now includes a new subscription options.

Obstacles and Terrain Information

Garmin Pilot version 4.3 provides pilots with the option to overlay terrain and obstacles simultaneously on the moving map page, while retaining the ability to view pertinent in-flight navigation information. Terrain and obstacle information can be overlaid and viewed in track-up format, ensuring flight plan information is upright and easy to read. Pilots also have access to a dedicated terrain page, so they may view terrain and obstacles in an arc or 360-degree view.



With a premium upgrade, intuitive colors incorporated within Garmin Pilot help pilots easily discern their proximity relative to terrain. Pilots are provided visual caution or warning alerts when operating near obstacles or terrain that may be of potential conflict. Terrain data leverages highly detailed data found within Garmin avionics and portables and is available in various resolutions to provide pilots the flexibility to select the level of detail they prefer for their device.

Simulator Support

Garmin Pilot now supports X-Plane 10, as well as a variety of other compatible simulators. Customers may launch X-Plane and connect Garmin Pilot to the simulator. Once the connection is made, Garmin Pilot conveniently sends AHRS information to display flight plan information within the application and the simulator.

Density Altitude

Pilots can optionally display density altitude information within Garmin Pilot in the METAR widget. By viewing widgets in split screen mode, density altitude is calculated and displayed to provide pilots information that is critical to aircraft performance.

New Enhancements and Pricing on Optional Upgrade Packages

The features of its upgraded packages have been enhanced to include visual and aural terrain and obstacle alerting. New packages include:

VFR Premium – $49.99 annually, which adds geo-referenced SafeTaxi diagrams along with terrain and obstacle alerts

IFR Premium – $74.99 annually, includes features within VFR Premium along with geo-referenced FliteCharts

The latest version of Garmin Pilot for Android is available now in the U.S. as a free update for existing Garmin Pilot subscribers. For new customers, Garmin Pilot is available in the Google Play store as a free trial for the first 30 days. For more information, visit *www.garmin.com/apps*.

Banyan Air Service Announces Expanded Maintenance Operations

Banyan Air Service announced expanded maintenance operations at its Fort Lauderdale Executive Airport (FXE) location. It has added a second shift to provide extended maintenance services, seven days a week. The new hours of operations will be Monday through Friday 8:00 a.m. until midnight, and on Saturday and Sunday from 8:00 a.m. until 6:30 p.m. The company said it expanded its hours to better serve customers and minimize downtime.

Banyan Air Service currently has 44 maintenance technicians and support staff employed and is

actively recruiting for additional positions. The company provides a full range of maintenance services, including airframe and avionics capabilities, and is well known for maintenance of turbine powered aircraft, including the King Air. Along with its FAA Repair Station and EASA Repair Station Certificates, Banyan Air Service also holds certificates in several Island nations and Latin American countries, including Argentina, Brazil, Cayman Islands, Chile, Columbia and Venezuela. In addition, Banyan has a mobile maintenance unit to support customers throughout Central and South Florida.

For more information, visit *Banyanair.com*.

Rockwell Collins introduces new features to ARINCDirect℠ Flight Operations System for business aviation operators

Rockwell Collins announced a series of updates to its ARINCDirect℠ Flight Operations System (FOS®), including the ability to integrate with new tools and the launch of a new vendor alliance charter management program.

The latest FOS release features a more intuitive, mobile-friendly, touch-screen user interface for tablets and smart phones.

In addition, by being integrated with Rockwell Collins' ARINCDirect safety management tools, FOS now provides access to flight risk assessment and fatigue risk management tools provided through the Pulsar Infomatics Aviation Fatigue Meter suite and the SAFE tool developed by Fatigue Risk Management Science Limited. With these enhancements, customers can instantly identify fatigue hot spots across their scheduled operations, design effective fatigue migration strategies and view interactive data reports.

The company also launched the Rockwell Collins Vendor Alliance for Charter Management. The program allows charter operators who use FOS to make the marketplace aware of empty, transient and home base availability.

ARINCDirect is the single most comprehensive portfolio of flight support solutions in the business aviation industry. It offers its more than 3,500 flight support services customers around the globe the latest in intuitive flight planning using state-of-the-art online and mobile platforms; award-winning regional and international trip support; comprehensive weather services; a full spectrum of cabin connectivity options; and flexible and integrated flight operations and scheduling services.

Asset Insight and SAI Valuations Enter Collaborative Agreement

Asset Insight, Inc. and SAI Valuations, LLC announced that they have entered into a collaborative agreement to provide aircraft owners, buyers, sellers, financial institutions and others with a uniquely complete picture of an aircraft's value and maintenance risk. Together, SAI and Asset Insight will provide clients with an unbiased opinion of an aircraft's value and maintenance risk, based upon empirical data, actual maintenance history and anticipated exposure of a specific aircraft serial number.

Such a complete value picture has, until now, been unavailable in the aircraft marketplace in one, simple to understand but comprehensive illustration of a specific aircraft's value and risk. Sales and financial professionals and aircraft owners could, previously, seek the counsel of an accredited valuation organization, such as SAI Valuations, LLC and, by separate analysis, engage Asset Insight to conduct a maintenance exposure evaluation, but the two pieces of the value-landscape have not been available together.

Now through a single, simple-to-use, web-based application, existing and prospective aircraft owners are able to:

- Acquire Asset Insight's analytics rating of an aircraft's maintenance – on a standardized scale, valuing its current maintenance equity and future maintenance exposure, and comparing it to the maintenance condition of similar aircraft listed for sale; and,
- Obtain a SAI *e*Values™ product providing Fair Market Value (FMV), or Fair Market Value and Orderly Liquidation Value (OLV) with or without a Residual Value Analysis and projected next quarter value utilizing SAI Valuations' extensive market and valuation knowledge and state of the art statistical modeling.

This capability is now available through each company's website (*assetinsightinc.com* and *saivaluations.com*). An interested party may contact either company to obtain maintenance analytics and valuation data for a specific serial number aircraft. Subscription/quantity discounts are available for frequent users from both SAI Valuations and Asset Insight.

Air Capital Interiors Receives FAA Repair Station Certificate

Air Capital Interiors, Inc. received its Federal Aviation Administration repair station certificate on July 1, 2015, for maintenance, repair and refurbishment of aircraft interior panels, cabinets, seats, floor coverings and interior-related components. According to the company, the repair station certificate provides the FAA's approval to sign their own work back into service, which makes it more efficient and effective for customers.

AIR CAPITAL INTERIORS
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Air Capital Interiors has performed a variety of aircraft interior repairs, ranging from simple component refinishing to complete interior refurbishment/replacement, on 35 different aircraft models since its inception in late 2013. For more information, contact Rodney Wilson at (316) 633-4790 or visit *www.aircapitalinteriors.com*.

King Air Communiqué 2015-4

Issued: July 2015

ATA 34 – Reduced Vertical Separation Minimum RVSM Capable

In 2005, Reduced Vertical Separation Minimum (RVSM) became a requirement for aircraft operating in the airspace from Flight Level 290 to Flight Level 410 in the United States. Currently, RVSM airspace can be found all over the world. Aircraft operators operating U.S. registered aircraft are required to have authorization from the FAA in order to make use of RVSM airspace.

Operators wanting to make use of RVSM airspace have been required to show the FAA that:

1. The aircraft they are operating is RVSM certified.

2. Their aircrew meets the applicable RVSM-Knowledgeable Pilot requirements.

3. Operators must have an RVSM Maintenance Program approved by the FAA.

A few attempts have been made to help smooth the RVSM authorization process; the most well-known being the 2014 revision of the FAA's Flight Standards Information Management System (FSIMS). The focus of that revision was to streamline the current RVSM process, suggesting that operators be able to make use of prior approvals in order to gain a new RVSM authorization. (See FSIMS; 8900.1; Volume 4; Chapter 10; Section 1)

Now another change is under consideration – 14 CFR 91; Appendix G; Section 3 (Operator Authorization) currently requires operators to have an approved RVSM Maintenance Program, (one of the three requirements for the RVSM authorization listed above). A Notice of Proposed Rulemaking (NPRM) attempting to remove that requirement [was] open for comment until July 27, 2015.

The reason for the proposed changes is the General Aviation industry has successfully integrated RVSM into their daily operations. Some of the special treatment and attention that RVSM compliance caused in the past is no longer needed.

RVSM maintenance is common enough now that many older aircraft have been modified and are flying in RVSM airspace. Newly manufactured aircraft are RVSM capable as well, with the compliance integrated into Master Minimum Equipment Lists (MMEL's), Maintenance Manuals, Illustrated Parts Catalogs, and any other applicable Instructions for Continued Airworthiness (ICA).

If successful, adoption of the NPRM should ease the RVSM approval process currently placed on the FAA and aircraft operators alike. If the NPRM makes it through the process as currently envisioned, operators wanting an RVSM authorization would need to demonstrate that:

1. The aircraft they are operating is RVSM-Compliant.

2. Their aircrew meets the applicable RVSM-Knowledgeable Pilot requirements.

While the NPRM may ease the approval process, a few questions remain to be answered. For example, what happens to existing RVSM Programs? Also, operators currently seeking an RVSM authorization may wonder if the effort of putting together an RVSM Maintenance Program is worthwhile if it will no longer be required by the time it is reviewed by the FAA.

Currently, a lot of "what ifs" need to be addressed. The comment period ending July 27, 2015, is likely to have some effect on the RVSM authorization process going forward.

Pending the final outcome, it's possible that getting your next RVSM authorization may be a smoother process than expected.

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

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