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Courtesy of the Woolsey family.  
Credit: Jordan Sanders

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# Three in a Mill



Roger Woolsey is flanked by daughter Allison Woolsey and son Chase Woolsey in front of the family's 2012 Beechcraft King Air 350i, parked at Million Air Houston at KHOU. The family owns the Million Air brand of fixed base operations known for personalized service, professionalism and luxurious amenities.

(Credit: Jordan Sanders)

# l lion



## Meet the Beechcraft-loving family behind the Million Air brand

by MeLinda Schnyder

**R**oger Woolsey became an entrepreneur in the aviation world while still a teenager. That early success – and his knack for tackling problems that needed solutions – propelled him to broaden his reach, from a pilot-for-hire to an air carrier, an air medical service provider, an FBO owner, FBO franchisee and eventually an FBO franchisor.

For much of his journey, at least one Beechcraft King Air has been in Woolsey’s tool kit. Here’s the story of the family behind the Million Air brand of fixed base operations.

### **A bold and lucky start in aviation**

Roger’s father was a pilot, but he died when Roger was 4. Instead, it was growing up near an airport in northwest Arkansas that mostly influenced his interest in aviation. After he got his pilot’s license, he began building hours in Beech 18 and Queen Air aircraft, among others. He found out a neighbor whose yard he’d mowed as a kid was a pilot, and that neighbor helped Roger get started as a charter pilot.

His first real job was flying Stevie Nicks on a world tour with her band

Fleetwood Mac when he was 18 years old, and that led to more artists and bands hiring him. He quickly realized that while these musicians were great at their art, they didn’t know much about choosing the aircraft that they then would ask Roger to fly. He wanted a hand in choosing the aircraft for them, leaving his clients to focus on their music.

In 1986 and still a teenager, he began his first FAA Certified 125 air carrier, Prestige Touring. Roger said at that time he was the youngest commercial pilot in the U.S. and he still holds the title as the youngest air carrier operator in United States history.

“I was 19 years old and I wanted to borrow a million dollars to buy a plane and fly rock ‘n’ roll bands around the world,” he said. “I got

Roger Woolsey started his first company in 1986 at age 19 and has successfully launched several more companies in the aviation sector. The third aircraft he ever owned was a 1972 King Air E-90, purchased in 1997, and he changed the tail number to honor his first director of maintenance.



laughed out of a lot of banks, but I finally found one crazy banker. He did the dumbest loan of his life but it ended up being the best one of mine.

“At 20 years old, I bought a Gulfstream 1 and started flying Duran Duran on their world tour. That’s where our company began and we grew it from there.”

By the time Roger was 23 years old, Prestige Touring had a fleet of eight aircraft based at Dallas Love Field (KDAL) and was considered the largest air provider for touring bands. Among his clients were Elton John, Billy Joel, Sting, Grateful Dead, U2 and Reba McEntire.

“A theme to our family is that we’ve never been about chasing money. Instead, we seem to notice a trouble area and feel like we’ve got to fix it,” Roger said. “My first fix-it started with rock ‘n’ roll bands and I had another one of those pivotal fix-it moments when we were on tour with a very famous country band. His wife broke her femur while skiing and the doctor wanted her to take

an air ambulance back to Nashville. The biggest piece of junk I ever saw showed up and I couldn’t believe the doctor was making Garth Brooks’ wife ride in it. After some research, we decided to get into the air ambulance business to put quality into that industry.”

He formed his second company, American Jet International (AJI), in 1991 and because he was focusing on the air medical industry he relocated to Houston, Texas. He started with a 1973 Learjet 25B, and that was quickly followed by a 1972 Beechcraft King Air E-90 to allow for medevac services in communities with short runways and unimproved airstrips.

The operation grew quickly, and Roger estimates that after two years, AJI was handling more than 95% of all flying medical patients and organ procurement teams from the world’s largest medical center in Houston, including Texas Children’s Hospital and MD Anderson Cancer Center, among others.



## Seeing another fix-it situation

While flying touring bands all over the world, Roger would be in and out of a different FBO nearly every night. He saw the good, bad and the indifferent across the globe, becoming a sort of connoisseur of the facilities.

Once he established AJI, he was flying in and out of Houston's William P. Hobby (KHOU) Airport daily and wanted a better FBO experience there – from avoiding hangar rash that was occurring too often to pulling airplanes quickly for emergency medical flights.

“We ended up buying our first FBO in 1999 because we decided we needed to control our own destiny,” Roger said. “We didn’t do it to make money. We just did it to fix it for ourselves and to take better care of our doctors who were going in and out of KHOU in what was by then the King Air 90 and two King Air 200s, along with some jets in the fleet.”

When the young entrepreneur acquired the FBO, it was selling the least amount of fuel at KHOU and had never held a single city or industry recognition, Roger said. Today, it outsells five competitors at KHOU and regularly places in the ranking of the Top 20 U.S. FBOs.

Maybe most important to Roger's career trajectory, though, was that within a year of acquiring the FBO, he decided to make it a Million Air franchise.

“Mary Kay Ash was the wonderful Texas entrepreneur behind Mary Kay Cosmetics, and she used to fly customers and sales reps in her pink jet to the Mary Kay headquarters in Dallas,” Roger said. “Back in 1984 she had had a similar situation – she wanted a better experience at the airport for her guests so she bought the FBO at Addison

**“We absolutely love the King Airs. Our primary mission with them is having them on the Million Air charter certificate, and probably 80% of the charter work in those King Airs is heart, lung, liver organ transports.”**



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The two King Airs that are on the company's charter certificate – a 1989 King Air 350 (left) which is managed and a 2012 King Air 350i (right) owned by the company – shown here parked in front of Million Air Houston (KHOU). (Credit: Jordan Sanders)

Airport (KADS). She called it Million Air and put in granite countertops, marble floors and had models at the front desk wearing her cosmetic line. It became the No. 1 FBO in the country because there was nothing else like it, everything else was just a gas station.”

Other airports were interested in the concept, and since it wasn't the company's primary business, they offered Million Air as a franchise. Roger became a franchisee in 1999, and after one year he was frustrated that customers were having disparate experiences at Million Air facilities across the country. He flew to Dallas to meet with Mary Kay and explain why he was going to exit the brand.

“I know you didn't ask but I want to do an exit interview with you because I am probably your only





franchisee who has actually flown all over the country and I've seen nearly every FBO from the perspective of a pilot," he recalled telling her. "We're leaving because if you have a bad experience in one city, it takes away from the others. I gotta tell you, you've got some really good ones but you've also got some really bad ones. I'm gonna go do my own thing."

He said her reply to him was: "Well, why don't you buy it and fix it?"

Thirty days later, Roger owned the Million Air brand. His three King Air aircraft soon went from purely charter operations to being flown around the country to move Million Air from a rent-a-sign type of operation to a true brand with operational standards and a consistent culture.

"I started flying to all the Million Airs to check on them, train them, upgrade them," Roger said. "It took about five years to turn it into a real brand. We traveled a lot in those days so my kids, Allison and Chase, were always around aviation while they were growing up, including riding in the back of the King Airs."

There were 25 locations in 2001, including the single company-owned facility at KADS, and today there are 36 Million Air locations (including 13 company-owned) throughout the U.S., Canada and the Caribbean. Million Air is still the only franchise FBO network and is the only FBO network that is privately held and family operated by pilots.



## Woolsey 2.0

Roger serves as the owner and chief executive officer of REW Investments Inc., the umbrella company for these four divisions: the network of 36 Million Air FBOs; the Part 145 repair stations via five U.S. locations and an AOG mobile team; American Jet International, the charter and management arm; and Million Air Interlink, the segment focused on branding and marketing across the network.

Like Rolex needs to spend as much time on imaging as watchmaking, Roger said, there's a need to spend as much time on the Million Air brand as on the operations.

“Our business is very technical and it's easy to forget the art and the beauty of the brand, so it is

---

Roger, Allison and Chase Woolsey are fans of all the Beechcraft aircraft they've flown. They spent quality time flying this 1988 Beechcraft Bonanza A36, which they still own, from Budapest, Hungary, to Houston, Texas, in January 2019.

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important to me to break that out from the rest of the business,” he said.

Roger refers to his children’s involvement in the business as Woolsey 2.0. Allison got her pilot’s license in 2017 and Chase followed in 2018. In 2019, the family bought a 1988 Beechcraft Bonanza A36.

“Dad, Allison and I flew that Bonanza all the way home to Houston from Budapest, Hungary, in the winter across the Atlantic in January 2019,” Chase said. “When we got it home, Allison and I would fly the Bonanza all over the place to look at locations and we built our ratings in that aircraft.”

Allison has a degree in public relations, advertising and business from Texas State University, and she maintains her private and instrument ratings. She has about 300 flight hours, mostly in the family’s 1988 Beechcraft Bonanza A36 alongside her father and brother.

“For me, flying is a family hobby,” Allison said. “I love flying with the two of them and that’s as far as I wanted to go with my license. I’m glad to have that quality time and bonding experience with them.”

She’s been with the company for a dozen years and serves as chief brand officer for Million Air Interlink, the segment of the business focused on franchising

Million Air FBOs. She leads a team responsible for the strategy and implementation of branding, marketing, training programs, safety and business development across Million Air’s 36 locations.

She said one of her proudest accomplishments is cultivating and sustaining a corporate culture centered around service and servant leadership, which the family credits with helping the Million Air brand garner numerous accolades, including the No. 1 ranking for the past 12 years in Professional Pilot magazine’s annual ranking of Large FBO Chains.

Chase caught the flying bug and continued building hours and certifications while working in a variety of sectors of the business. He worked on the line, servicing and refueling aircraft at Million Air’s Houston facility; he quoted, scheduled and dispatched charter and air medical trips as part of the flight dispatch team for American Jet International, the charter division; and he advanced to the roles of account manager and sales rep for AJI. With CE-500 and BE-300 type ratings, Chase has been a captain for American Jet International for the past three years. He has accumulated 2,500 hours, mostly in the company’s Cessna Citation jets and Beechcraft King Air B300 turboprops.

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The Woolsey family flew the 2012 King Air 350i, which they managed at the time but now own, to Fernando Luis Ribas Dominicci Airport the day after Hurricane Maria's 2017 landfall in San Juan, Puerto Rico. At the time, there was a Million Air FBO franchise at the GA airfield and the Woolseys wanted to support their employees as well as the community. They brought a FEMA-grade satellite they procured at their own cost along with technicians they hired who were able to use the equipment to establish communications with the mainland. It was the start of multiple daily flights in the King Air to bring generators and supplies to the island, as well as transporting residents back to the mainland for medical care.







Roger Woolsey snapped this selfie with his daughter Allison and son Chase in the 2012 Beechcraft King Air 350i the family owns.

The Woolsey family currently owns a 2012 King Air 350i based at KHOU and manages a 1989 King Air 350 based at KADS. Both aircraft are on the company's charter certificate, and the 350i is also used for Million Air business, from visiting facilities to moving personnel and scoping out new projects, and Woolsey family personal travel.

"We absolutely love the King Airs," Roger said. "Our primary mission with them is having them on the Million Air charter certificate, and probably 80% of the charter work in those King Airs is heart, lung, liver organ transports. We're part of the teams out there making a difference, saving lives, and the King Airs are the heart and soul, the workhorse of that."

They purchased the 350i about six years ago, after managing it for a Texas energy company that bought it new from the factory. Like the purchase of his first King Air, the E-90 in 1997, Roger said the 350i was a lot of airplane for his wallet.

"But we've had so much success with the King Airs over the years and our clients really loved the 350i, so we found a way to afford it," Roger said.

Father and son said they both enjoy flying the King Airs as much as their passengers love them.

"I don't understand how they've done it, but every Beechcraft we fly feels the same," said Roger, who holds an Airline Transport Pilot (ATP) pilot's license with more than 25,000 flight hours. "If you fly a Bonanza, you fly a Baron, you fly a King Air 90 or you fly a King Air 350i – the yoke, the way they turn, the elegant, solid feel. It's pretty wild how an A36 Bonanza has so much in common with the King Air 350i." **KA**

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# FAA News

## Mental Health and SMS

### Mental Health FAA Committee Releases Recommendation Report

The Mental Health & Aviation Medical Clearances Aviation Rulemaking Committee (ARC) recently released their Recommendation Report. The ARC was formed in December 2023 to mitigate potential aviation safety risks due to mental health.

The ARC provided a forum for the U.S. aviation community to discuss the barriers preventing pilots and air traffic controllers (ATC) from reporting and seeking care for mental health issues. The forum included the ARC members, observers and contributors consisting “of a broad representation of people, including aerospace medicine, psychiatric and psychological medical experts from the Federal Aviation Administration (FAA) Office of Aerospace Medicine (AAM), FAA Flight Standards Service (AFS), the National Transportation Safety Board (NTSB), U.S. aviation industry trade associations, pilot/controller representative organizations, academia and international aviation industry associations and civil aviation authorities (CAAs).”

The ARC also reviewed mental health guidelines and procedures in place at other international regulatory

agencies, acknowledging their experiences can help inform revisions to FAA’s approaches. Other potential barriers identified by the committee include culture, trust, fear, stigma, financial, knowledge and information gap.

“In total, the ARC report includes 24 recommendations to the FAA and aviation stakeholders,” said Mark Larsen, NBAA’s director for safety and flight operations and an ARC member. “If fully implemented, these recommendations would help ensure those in the aviation community seek out appropriate resources and treatment to address mental health concerns.”

A summary of the ARC’s recommendations:

- Create a non-punitive pathway for disclosing mental health conditions and treatments.
- Revise and evaluate the requirements for reporting and certification/qualification of psychotherapy (talk therapy), depression/anxiety, attention deficit hyperactivity disorder and post-traumatic stress disorder.
- Ensure that aeromedical screening protocols and requirements are based on Safety Management System principles (i.e., proportionate, relevant



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and risk-based), and appropriately communicated to applicants.

- Expand the use and promotion of Peer Support Programs.
- Develop mental health literacy, education and awareness campaigns.
- Increase mental health training and improve quality assurance for Aviation Medical Examiners (AMEs).
- Modernize the FAA's Management Information System/Aviation Medical Certification Subsystem.

Larsen also noted the report and its recommendations were adopted unanimously by ARC members. "This shows a deep understanding and broad desire from the aviation community to reduce the barriers that keep pilots, air traffic controllers and others from seeking mental health care," he said.

"We applaud the FAA, and specifically the Office of Aerospace Medicine, for convening the ARC to bring industry and government together to address this important safety issue," Larsen added.

The FAA said it is assessing the report and "will determine next steps after reviewing the recommendations."

## FAA Releases SMS Final Rule

The FAA recently released a final rule expanding FAR Part 5 requirements which calls for certain certificate holders to develop and implement a safety management system (SMS). The new rule requires all Part 135 operators, certain Part 21 certificate holders and §91.147 air tour operators to implement an SMS, as well as adding some new mandates to Part 5.

The rule explains, "a safety management system (SMS) provides an organization-wide approach to identifying safety hazards, assessing and managing safety risk, and assuring the effectiveness of safety risk controls. An SMS provides a set of decision-making processes and procedures that can improve safety by assisting an organization in planning, organizing, directing and controlling its aviation-related business activities."

According to the National Business Aircraft Association (NBAA), in response to specific input given from their organization, the rule ensures scalability for the smallest operators, eschews unduly burdensome Part 5 mandates for single-pilot operations and provides a more reasonable timeline for implementation of SMS requirements, from 24 to 36 months.

The FAA is publishing this rule in part to address a Congressional mandate as well as recommendations from the National Transportation Safety Board. **KA**

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*-Henry Maier, President and CEO, FedEx Ground*



# High BP and the FAA

by Dr. Jerrold Seckler

**A** healthy 35-year-old man, who is also a pilot, was found to have high blood pressure at a recent physical. He has no symptoms, and his blood pressure is now controlled with medication. How does the Federal Aviation Administration (FAA) deal with this issue?

Your blood pressure measurement consists of two numbers – systolic and diastolic – expressed as a fraction e.g., 130/70. The higher number (systolic) represents the pressure in the artery as the heart contracts and the lower number (diastolic) is the pressure

as the heart relaxes. Over the last few years, the guidelines for what constitutes a normal blood pressure have changed. The current guidelines from the American Heart Association and American Stroke Association are shown in Figure 1 (below).

The FAA has a remarkably liberal standard for blood pressure. Anything <155/95 is acceptable for all classes of medical certificates. So even though you may be significantly hypertensive by medical standards, your pressure may still be acceptable to the FAA.

If your blood pressure during the FAA exam is above 155/95, the AME may ask you to return on at least three days during a one-week period to recheck the pressure. If all those pressures are <155/<95 the AME may issue your certificate with no further testing. If they are not, the AME can send you back to your regular doctor for initiation or change of anti-hypertension medications. After seven days on the new medications, if there are no side effects and the pressure comes down to acceptable levels, the AME can issue the certificate. It

Blood Pressure Categories			
BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

« Figure 1: Blood pressure guidelines by category. (American Heart Association/American Stroke Association)



is important to note that any deferral by the AME to see if the pressures come down must be completed within 14 days of the AME's initial examination.

The vast majority of medications used to treat hypertension are acceptable to the FAA; a pilot can be taking up to three antihypertensive medications and still meet the FAA requirements.

For renewal of your certificate, it is a good idea to have your primary physician prepare a note within 90 days of your aviation medical exam stating that 1) your pressures are stable, 2) you have no complications related to hypertension and 3) you have no side effects from any antihypertensive medications you are taking. With that information, the AME should be able to issue your certificate without any problem.

One final note: Hypertension is a serious condition. It is sometimes called the silent killer because it usually causes no symptoms, yet it is a significant risk factor for stroke, heart failure, myocardial infarction and kidney disease. The FAA is quite liberal in its blood pressure

standard. If your blood pressure is high, get treated either with lifestyle changes (exercise and weight loss are often quite effective in returning blood pressure to normal levels) or medication. Don't worry about the FAA. Worry about your heart. **KA**

---

Dr. Jerrold Seckler is a retired urologist and former FAA AME. He holds an ATP and CFII certificates and is the recipient of the FAA Wright Brothers Award. Seckler owns a Cirrus SR22 and has flown it for almost 4,000 hours. He is an original member of the Cirrus Owners and Pilots Association (COPA), serving on the COPA board of directors and the COPA Safety and Education Foundation board of trustees, as well as instructing at COPA Pilot Proficiency Program events.

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# Why Feather at Shutdown?

by Tom Clements

It's going to do it anyway, right? Since the feathering springs and blade counterweights are always trying to move the propeller blades to high pitch – and the extreme of high pitch is the feathered position – and propeller oil pressure is what prevents the springs and counterweights from succeeding in their job, then as the (PT6) engine stops turning and hence oil pressure is lost the blades must feather. Right? So why does the checklist tell us to feather them ourselves?

There is a one-word answer to this question: Safety. Let me explain.

The engine's oil system serves four functions. First, as in all engines, it provides vital lubrication and cooling for all of the engine's moving parts. Second, it is used

in measuring the torque being supplied to the output (propeller) shaft so that the amount of torque may be displayed in the cockpit. Third, it is used to heat the fuel, to decrease the likelihood of liquid water that may be suspended in the fuel from turning into ice crystals



that could clog filters and passages. Lastly, it is used to make propeller blade angle changes. The oil that is used for all four of these functions is the same oil, most commonly the “2380” turbo oil variety that has had many different names over the years: Esso 2380, Exxon 2380, BP (British Petroleum) 2380 and now Eastman BP 2380. As the oil is pumped from and scavenged back to the integral oil tank, a molecule that was in the oil-to-fuel heat exchanger a moment ago may now be in the propeller dome and one that was in the propeller may now be spraying onto a bearing.

However, just because this is all the same oil does not mean that it is at the same pressure. The single oil pump that sends the oil to everything *except* the propeller has a discharge pressure – depending on the exact PT6 model – of between 60 and 135 psig (pounds per square inch gauge). The oil inside the propeller dome or hub is at a much higher pressure to be capable of overcoming the springs and counterweights. The engine’s oil pump supplies oil from the tank to the Primary Propeller Governor (PPG). This device is mounted on a pad at the front of the engine, on top at the 12 o’clock position. In

addition to the speeder spring, flyweights and oil passages it also contains a pump that takes the incoming oil and increases its pressure up to about 400 psig. The position of the governor’s pilot valve determines the exact pressure inside of the dome.

Since the PPG is mounted on a drive pad at the front of the engine, it is rather obvious that it is geared into the propeller shaft (whose speed is represented by the symbol  $N_p$ ) instead of into the compressor or gas generator shaft,  $N_1$  or  $N_g$ .

You’ve heard that a PT6 may be started while the propeller is restrained from turning, right? It’s true. If a rope – or a gutsy person – is preventing propeller rotation, then the pump inside the PPG is also not turning so the propeller dome receives no high-pressure oil. The blades remain feathered. Only when the propeller is allowed to start turning is the oil pressure created that permits the blades to flatten their angle or “bite.” Watch carefully when a PT6 is started normally. This is especially obvious when you stand looking parallel to the propeller disk. You will notice that rotation begins while the blade angle is still in the highest pitch, feathered



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position. Then its rotation creates the oil pressure that flattens the blades. As the blades flatten, the lesser air bite means less rotational resistance so the propeller speed rises until normal idle conditions are met with the propeller now on its Low Pitch Stop (LPS).

As long as the propeller is rotating then the pump inside the PPG keeps supplying the necessary oil to the dome to prevent the blades from

feathering. To demonstrate this, I often have a new King Air pilot *not* pull the propeller levers into feather after we pull the condition levers into fuel cutoff as we shut down. Usually it is well over one minute before the propeller finally stops turning. At this point we can observe that the blade angle is quite large, in the order of 45 degrees, half-way to feather. As we watch, we can actually see the blade angle slowly becoming

larger as the feathering springs force the remaining oil out of the dome and back into the engine's nose case. Often I will then ask the pilot to pull only one propeller lever all the way back into the feather position. When this is done – opening the passage in the PPG to allow oil to return freely into the nose case – the blade angle moves rapidly the rest of the way and the blades stop moving when they reach the metal-to-metal stop at feather. It takes in the order of two seconds for this to happen. The other side may take another five minutes or more to leak into the fully feathered position.

Try it yourself. Pick a deadhead leg and make sure the ramp is empty of nearby people when you shutdown. Leave the propeller levers alone and watch what happens. It takes a l-o-n-g time for the propeller to stop, eh? In fact, I have done this facing into a strong Kansas “breeze” and the propeller never stopped rotating! There was sufficient windmill effect to keep the not-yet-feathered propeller turning indefinitely.

Do you see why I stated the reason for feathering is “safety”? The lineperson waiting to install your nose chocks, a curious bystander or the poorly briefed passenger rushing to get to the meeting ... there is a lot more chance of someone getting hurt by a rotating propeller than by one that has stopped. When we make the propeller blade angle go to its maximum bite position immediately at shutdown – yielding the maximum amount of rotational resistance – it lessens the dangerous rotating time immensely.

Can you think of a situation in which feathering manually at shutdown is *not* a good idea? Yes! You are correct: When parked on a very slippery, icy ramp, the thrust that the propellers provide as the blade angle suddenly increases can cause the airplane to slide forward with no control whatsoever. It's best here to let them coast to a gentle stop on their own.

By the way, do any of you feather first and pull the condition levers

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second? Believe it or not that was how the checklist procedure was written for many years in the early days of King Airs. Back then, the Environmental Protection Agency (EPA) was not yet in existence and there were no restrictions on turbine airplanes dumping a little fuel out at shutdown. As fuel pressure decreased, a dump valve would return to its spring-loaded open position and allow residual fuel to dump onto the ramp instead of into the hot combustion chamber liner – “burner can” – where it caused smoking and coking problems. (“Coking” refers to leaving deposits of carbon in the fuel nozzles.)

In King Airs, this fuel dumped out of the oil breather tube that terminated just behind the oil cooler ... and directly in front of the main tire(s). Prop wash tended to blow this kerosene back onto the tires, leading to their decreased service life. Around 1974 was when King Airs began being manufactured and retrofitted with fuel drain collector systems – usually referred to as “EPA kits” – to prevent fuel from dumping onto the ramp at shutdown. Shortly thereafter checklists were revised to feather *after* the fuel is cut off.

There is certainly no harm done by doing it the old way. In fact, feathering while taxiing at idle is a great way to keep the airplane quiet and avoid brake usage, especially when on a long, straight taxiway with a strong tail wind. However, there is a very definite momentary increase in thrust as the blades move through the big bite position on their way to feather. You can feel the acceleration for a moment while rolling down the taxiway.

Likewise, if we feather before – or too soon after – we have cut off the fuel at shutdown, there is enough airflow through the engine that again thrust increases. We won't feel it as acceleration – unless the brakes aren't set – but the nose strut will do a noticeable compression bounce. I have found that pulling the condition levers and then waiting for the propeller speed to



hit 600 RPM before feathering is both very smooth and yet gets the props stopped in a reasonable, safe timeframe.

Before I wrap this up, I want to emphasize the fact that the propeller feathering itself at shutdown is purely a ground, not flight, phenomenon. Remember when I said the propeller never feathered in the strong Kansas wind? Well, imagine the strength of the relative wind when flying. Unless you are doing slow flight while fuel is cut off in flight, the propeller doesn't even slow down! In fact, do you know why 140 KIAS is specified as the minimum speed for a windmilling airstart? It's because that is the airspeed at which maximum propeller rotational speed can be achieved while the prop is being driven by windmilling force only, with no fuel, no exhaust gases driving the power turbine.

Some alert pilots have asked me this question: “How does the oil keep getting supplied to the PPG and its pump? If the engine is shut down and the No. 1 shaft, compressor shaft, is not rotating, then the engine's oil pump is also not turning. So how does oil get to the prop governor?”

Excellent question. The answer is “Because the N<sub>1</sub> shaft usually does not stop rotating.” Unless

some bearing jammed and indeed caused the compressor and all of its accessories to not be turning, then eventually the oil to the governor would no longer be supplied and feathering would have to occur. But in a more normal situation of a shutdown due to fuel starvation, the ram air through the engine keeps N<sub>1</sub> turning. In my experience, the windmilling N<sub>1</sub> in flight, with a windmilling propeller, varies between five and 15%, based upon altitude and airspeed. That is plenty for the engine's oil supply and scavenge pumps to circulate the oil to and from the governor.

Get it? Got it? Good! **KA**

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King Air expert Tom Clements has been flying and instructing in King Airs for over 50 years and is the author of “The King Air Book” and “The King Air Book II.” He is a Gold Seal CFI and has over 23,000 total hours with more than 15,000 in King Airs. For information on ordering his books, contact Tom direct at [twcaz@msn.com](mailto: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](mailto:editor@blonigen.net).



## “Grizzly!”

In 1945, Beech Aircraft Corporation built the most powerful ground attack aircraft of World War II – the mighty XA-38 Grizzly. Armed with a 75-mm cannon and six machine guns, the twin-engine gunship was large, powerful and fast, but the war ended before the enemy could feel its offensive punch.

by Edward Phillips

In 1944, Beech Aircraft Corporation answered a U.S. Army requirement for a multi-purpose attack aircraft capable of destroying tanks, entrenched fortifications and support vehicles, as well as carrying heavy loads of ordnance across long distances to the targets. Dubbed the *Grizzly* by company officials and “XA-38” by the Army, the aircraft traded its namesake’s deadly claws for a 75-mm fully-automatic cannon, six 0.50-caliber machine guns and a tough hide capable of absorbing battle damage and keep on flying.



« The XA-38 was the largest Beechcraft built up to that time and could carry a powerful punch of offensive weapons and ordnance. Demand for its two Wright R-3350 radial engines for the Boeing B-29 heavy bomber program was a major reason the program was canceled in 1945. Only two airplanes were built. Unfortunately, neither survived for future generations to admire. (Edward H. Phillips Collection, courtesy Beechcraft Corporation, Special Collections and University Archives, Wichita State University Libraries)

In addition to its formidable weaponry, the XA-38 was capable of speeds up to 375 mph at a gross takeoff weight of 32,000 pounds (it may surprise King Air owners/operators to know that the *Grizzly* remained the largest and heaviest airplane designed and built by the Beech Aircraft Corporation). When it first flew in 1944, Beechcraft's "flying cannon" clearly outclassed every other ground attack aircraft in the world. Its speed, firepower and load carrying abilities were unmatched. If the airplane had been developed a few years earlier, it would have played an important role in the U.S. Navy's island-hopping campaigns across the Central Pacific.

Designing the XA-38 was no easy task for company engineers. They had to create an airplane that could deliver a devastating offensive punch, absorb damage, be reasonably maneuverable for its size, and possess a passive defensive system that was effective against attacking fighters. One fact was inescapable – speed and structural integrity were high on the list of design imperatives. No effort would be spared to reduce drag and build a lightweight, but strong, aluminum alloy airframe. The decision was made to use flush riveting and butt-join all exterior surfaces wherever possible.

As the design process progressed during 1943, the Army exchanged the name *Grizzly* for *Destroyer*. After the first prototype was completed and tested on the ground, veteran company test pilot Vern Carstens took the big Beechcraft aloft for the first time May 7, 1944. An employee who witnessed the event remembered that when Carstens attempted to land the *Destroyer* after a successful flight, he flared about 10 feet above the runway and the airplane stalled. It hit the pavement with a resounding "thud" and bounced back into the air. Instinctively, Carstens gunned the two 18-cylinder Wright radial engines and went around the field for another approach. Vern skillfully rolled the XA-38 onto the runway.

At the heart of Beechcraft's gunship was a Type T15E1, 75-mm cannon fitted with a Type T-13 feed mechanism. Mounted in the nose section, the weapon featured a

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The Model 28 Destroyer would have lived up to its name had it been deployed to the Pacific Theater of War in 1945. The nose-mounted 75 mm cannon could fire up to 20 rounds of various high explosives and the twin 0.50-caliber machine guns would have further multiplied the XA-38's impressive firepower.

(Courtesy Beechcraft Corporation, Special Collections and University Archives, Wichita State University Libraries)

circular magazine holding 20 rounds. When the pilot pressed a button on the control wheel, the cannon would automatically fire, reload and continue firing at a rate of one round every 1.2 seconds. To expedite rearming, the front streamlined housing surrounding the weapon was hinged on a set of counterbalanced springs and opened to expose the installation. Designed as a package, the cannon could be removed and replaced with various armament assemblies to deal with combat situations in the field. The cannon worked well during testing, and noise level in the cockpit was deemed acceptable by Army pilots conducting the tests.

To ensure that a pilot could hit the enemy with those hard-hitting shells the airplane was equipped with a Type N-6 reflector sight. Because the cannon was designed and mounted as an extension of the airplane's longitudinal axis, the pilot simply aimed the XA-38 at the target and fired. The Type N-6 reflector, however, did assist in acquiring a reasonably accurate sight picture. As for the *Destroyer's* six 0.50-caliber M-2 machine guns, two were installed on either side of the cannon in the nose section, and the other four were mounted in two remotely-controlled turrets, one above and the other below the fuselage. Each gun had 500 rounds of ammunition available.

The blister-type turrets, built by General Electric, were operated by a gunner who sat in the aft fuselage. He could not control the firing arc of the guns, particularly if both turrets were firing simultaneously. To resolve that problem, an interrupter device would automatically cease firing whenever any part of the airframe came in conflict with the firing arc. The lower turret protected the airplane from below, but the upper turret required a more complex interrupter sequence because of the twin vertical stabilizers, wing tips and propellers. To increase offensive firepower, the pilot could command the gunner to rotate and lock the lower turret in the forward position. According to Beech Aircraft records,

the XA-38 was only vulnerable to attack from the rear, but to cope with that possibility the top turret guns could be aimed to fire between the two stabilizers. That capability, coupled with the airplane's high speed, was thought sufficient to limit any enemy fighter to only one firing pass.

Having a wingspan of 67.08 feet, a length of 51.7 feet and standing 8 feet tall from the ground to the cannon barrel, the *Destroyer* was not a small airplane. Contrary to "hearsay history" and myth, neither was it based on the Model 18 Twin Beech, but was a totally clean-sheet design that approached medium bombers such as the Martin B-26 *Marauder* and Douglas A-26 *Invader* in size and weight. Weighing in empty at 23,300 pounds with a design gross weight of 29,000 pounds, the XA-38 could carry external stores including drop tanks, bombs, depth charges and even torpedoes, as well as a variety of fuel loads that increased maximum allowable weight to an impressive 36,332 pounds.

The landing gear and flaps were powered hydraulically by pumps driven from the accessory section of each engine. If the pumps failed, the gear and flaps could be lowered using a hand pump in the cockpit. A conventional landing gear configuration was selected because it was well suited to operation on crude, rough airfields such as those commonly found on Pacific islands. The main gear featured conventional oleo-pneumatic shock struts and hydraulic brakes, while the slotted-type flaps could be lowered to 45 degrees. A 24-VDC electrical system was powered by dual, engine-driven generators, and an auxiliary unit located in the radio compartment could be controlled by the pilot and was used to start engines and remained active during takeoff and landing.

The fuel system was a marvel of engineering and innovation to suit the mission. Because the *Destroyer* was designed specifically for a ground attack role, it would always be forced to operate in close proximity to the enemy. All tanks, including engine oil tanks,



were self-sealing but what set the XA-38 apart from its contemporaries was the innovative design of those cells, which greatly influenced the overall layout of the fuselage and wings. To reduce the fuel system's vulnerability to damage, specially-designed tanks were installed, and required unusually close cooperation between Beech engineers and subcontractors to achieve the correct configuration.

All of the tanks could be easily and quickly removed and repaired or replaced, and thanks to cooperation by manufacturers of the fuel pumps there were no outlets or fittings in the bottom of the fuel cells. Instead, pumps were mounted in the top of the cells, significantly reducing the time required to change a pump in the field under combat conditions. These advantages meant mechanics would not have to drain fuel to replace components, as was the case with many aircraft of that era.

Four tanks were located in the wings and held 640 gallons of fuel. Two additional tanks behind the cockpit held another 185 gallons. In normal operation, the system fed fuel to each engine from separate tanks and a cross-feed system fed fuel to both engines, or could feed either powerplant if one engine was inoperative.

Considering restraints of the airplane's overall design, Beech engineers went another step further by designing as much safety as possible into the fuel system. A key aspect of this design approach centered on making battle damage survivability an integral part of the design. For example, if a tank was ruptured by enemy fire any fuel leak would be stopped by the self-sealing capability of the cell, but if damage to pumps or connections between tanks occurred, the airframe structure could be flooded with raw fuel ready to explode, blowing up the airplane. By installing pumps, connections and fittings in the top of the XA-38's tanks, minor battle damage would contain the leak within the tank, not the airframe.

The XA-38's wing featured an NACA 2300-series airfoil section designed by the National Advisory Committee for Aeronautics (NACA) that provided good high speed performance yet allowed an acceptable low approach and landing speed to enable the gunship to operate from short airstrips. Total wing area was 625.9 square-feet with a taper ratio from wing root to tip of 3.07 to one. Angle of incidence was established at 4.39 degrees at the wing root decreasing to 1 degree at the wing tip, while aspect ratio was 7.19 with a wing dihedral of 5 degrees determined at the quarter chord point on the airfoil.

If the gunship's booming 75-mm cannon was the offensive focus of the airplane, then its two Wright *Duplex Cyclone* engines were its fire-breathing heartbeat. The GR-3350-43 18-cylinder, twin-row, air-cooled static radial engines were equipped with a reduction gearbox and produced a thundering 2,300 brake horsepower each at takeoff. That raw power was created by feeding the thirsty powerplants high-octane avgas through Chandler-Evans Model 58 CPB 4 Hydro-Metering pressure carburetors. The massive engines featured a

two-stage supercharger, but flight testing soon revealed that operation in high-blower mode caused detonation and further operations were limited to low-blower only.

In addition, each engine was fitted with an anti-detonate injection system having a water capacity of 52 gallons. When activated, such as during takeoff with a heavy load requiring maximum available horsepower, the system injected water vapor into the cylinders to prevent detonation. A water injection regulator worked in conjunction with the engine's auto-boost control to reduce manifold pressure to 54 inches Hg when the water supply was exhausted. The system was deactivated anytime manifold pressure decreased below 54 inches Hg.

Each engine turned a Hamilton Standard Model 33E60 propeller that measured 14 feet in diameter and featured three blades. These constant-speed, full-feathering units proved highly satisfactory during service tests. To keep the Wright engines cool, NACA cowling embraced the engines, and cowl flap position was controlled by an ingenious system created by General Electric that automatically positioned the cowl flaps based on cylinder head and oil temperatures. A manual backup system also was installed.

A second XA-38 was built and both airplanes entered company flight testing during the spring and summer

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of 1944. These were followed by Army flights later that year. It quickly became apparent that when it came to speed, the Beechcraft design team had created a winner. With 4,600 horsepower on tap, the *Destroyer* was not only aerodynamically clean but on one flight attained a maximum speed of 376.5 mph at a takeoff weight of 32,000 pounds, albeit using war emergency power.

A well-known anecdote to the XA-38's story stems from a flight aimed at calibrating the airplane's airspeed indication system. Plans called for flying a commercial, twin-engine Model 18 as a "chase" aircraft to document the tests and to photograph the latest Beechcraft. As airspeeds increased, however, the Model 18 proved woefully inadequate and soon fell behind the XA-38. To solve that problem, the engineers obtained a factory-fresh North American P-51B *Mustang* fighter and resumed the tests. Much to everyone's surprise, even the speedy P-51B could not keep pace with the big Beechcraft as speeds approached 375 mph!

Army pilot captain Jack W. Williams was among the service pilots who conducted a series of flights in the XA-38. From Oct. 13 to Oct. 24, 1944, he flew the first XA-38 at the Beech Aircraft factory. The 75-mm cannon and two machine guns were installed for these flights, which also checked operation of fire extinguishing systems. At a takeoff weight of 32,001 pounds and flaps deflected to 15 degrees, Williams calculated that the airplane should lift off at 105 mph but found that the airplane could be "flown off" at speeds as low as 91 mph. Normal takeoff procedure called for leading power application with the left throttle until an indicated airspeed of 55-75 mph was attained and the two rudders became effective, at which point both throttles could be advanced together.

Williams rated the gunship's overall controllability as "good for all normal conditions of flight." Although he noted that the elevator and rudder forces were "heavy at high speeds," he added that both flight controls were highly effective. "It is very maneuverable for an airplane of its size and handles well in making sideslips, skids, loops, half rolls on top of loops and slow rolls." Completing aerobatic maneuvers with that kind of ease was no mean feat for an airplane that was as large as a North American B-25 *Mitchell* bomber and weighed 16 tons! The attack aircraft's stalling characteristics were relatively straightforward, with generous buffeting of the empennage before the stall break occurred.

Williams wrote in his report that the *Destroyer's* landing characteristics were similar to those of the military C-45 Beechcraft, with good visibility thanks to plenty of window area in the cockpit. Typical approach airspeed was 125 mph, with flaps fully deflected to 45 degrees. The XA-38 also proved easy to maneuver on the ground, regardless of whether it was operating on smooth, paved taxiways and ramp areas or on rough airstrips.

The final phase of the gunship's evaluations by the Army focused on armament, particularly the 75-mm cannon. It was fired for the first time July 1, 1944, at the

Great Bend Army Air Base gunnery range in Great Bend, Kansas, but the majority of firing tests were conducted by the second airplane built. It first flew September 22, 1945, again with Vern Carstens at the controls. After completing a series of flight tests at Great Bend, it was flown to Eglin Field, Florida. During its time at Eglin the XA-38 was flown by a number of Army pilots who wrung out its weapon systems, particularly the cannon, for another 38 hours.

Flight testing clearly demonstrated that Beech Aircraft engineers had not only succeeded in meeting the military's specifications for a ground attack airplane, they had created an aircraft that had no peer. To add another feather to their cap, the engineers won praise from the Army when the second airplane accumulated a reputation for high reliability and availability during the tests.

Despite its advanced design, performance and potential as the world's most powerful ground attack aircraft, a combination of factors relegated the *Destroyer* to obscurity. First, Germany had been defeated and Japan was about to capitulate in the wake of its nuclear devastation. Second, the Wright radial engines that were essential to the XA-38 program were needed for the Boeing B-29 *Superfortress*. Third, the ground attack role had changed during the war and although the need for such a versatile aircraft continued, that task could be accomplished with single-engine airplanes such as the incomparable Douglas *Skyraider*.

One XA-38 was eventually assigned to Davis-Monthan Air Force Base in 1948 and was scheduled to be displayed at the Air Force Museum in Dayton, Ohio, but it never arrived. The fate of both airplanes has yet to be accurately determined. Apparently, at some point after the war both of the Beechcrafts fell victim to the cutting torch. One fact, however, is known: Beech Aircraft Corporation records state that all lofting and engineering information for the company's XA-38 program was destroyed June 2, 1955.

The *Destroyer* holds a special place in the history of Walter and Olive Ann Beech's company. It can be said that the XA-38 represented the pinnacle of Beechcraft engineering during the war, but it also contributed greatly toward the company's legendary reputation as an innovator and manufacturer of purpose-built aircraft. Its powerful cannon was never fired in anger, but Beechcraft's ultimate gunship will not be forgotten. **KA**

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Ed Phillips, now retired and living in the South, has researched and written eight books on the unique and rich aviation history that belongs to Wichita, Kansas. His writings have focused on the evolution of the airplanes, companies and people that have made Wichita the "Air Capital of the World" for more than 90 years.



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CEO of Elliott Aviation Dan Edwards said, "Elliott Aviation has always been dedicated to enhancing the in-flight experience through innovative solutions. Our partnership with Starlink allows us to offer our customers a quantum leap in connectivity, enabling them to stay connected, entertained and productive, no matter where they are in the world."

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For more information, visit [www.elliottaviation.com](http://www.elliottaviation.com) or call 800-447-6711.

## Registration Open for NBAA White Plains Regional Forum

The National Business Aviation Association (NBAA) is hosting their next regional forum June 12 at Westchester County Airport (HPN) in White Plains, New York. The immersive all-day event will feature engaging educational sessions, opportunities to connect with others in the business aviation industry, and over 100 exhibits highlighting the latest services, equipment and cutting-edge technologies shaping the future of business aviation.

For more information, go to: <https://nbaa.org/events/2024-nbaa-white-plains-regional-forum/> 



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