Meet My Move-Up

The Piper Navajo

Faster & Farther in Cabin-Class Comfort

Who knew that the workhorse of the Piper fleet could be the perfect family airplane?

Editor's note: "Meet My Move-up" *is a new series featuring owner-pilots who have made the move to a larger, more capable aircraft. In this installment, we follow the journey of an Ohio-based owner who searched, found and refurbished the perfect airplane for his active family of five.*

by **Craig S Bahner**
Photos by **Paul Bowen**

For the better part of the last decade, we were blessed to be part owners in a 1979 Piper Aztec. This plane fit the bill for our young family. The venerable Aztec was reliable, easy to fly, familiar to mechanics, and gave us many hours and many miles of great memories. Our three children grew up in that airplane, with each of the three transitioning in turn from car seats to iPods. But as the teenage years arrived, we noticed that the kids had kept growing but the Aztec had not. What once felt like a spacious aerial SUV now felt more like a sub-compact.

Also, our Aztec was getting a little "long in the tooth." My partners and I were meticulous with maintenance, but the paint and interior were just flat worn out. The panel was serviceable with a Garmin 530W, but it was far from state of the art. Alas, it was decision time. Upgrade the Aztec, likely to cost more than the value of the aircraft, or upgrade to the next level of performance, size, and capability.

The Navajo is easy to manage in the pattern with up to 40 degrees of flaps available. HID landing lights provide 1 million candle-watt power and draw only 5 amps.

For missions in the 400-600 nm range, the Navajo shines. Using a lean-of-peak engine operation strategy, Bahner routinely sees 185 TAS at 12,000 feet while burning a miserly 34 gallons per hour.

Owner-pilot Craig Bahner began searching for a larger, more capable aircraft to replace his aging Piper Aztec. His Navajo, fresh from a Mike Jones' Lock & Key conversion, has proven to be the perfect family airplane.

The Hunt

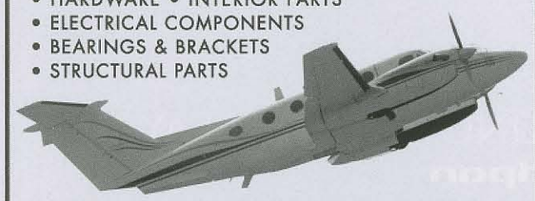
We started our search in the spring of 2008. My partners, who were in different life situations, didn't need or want more airplane, so I was on my own to figure out what would work best for our family. It didn't take long to narrow the search for a specific type of airplane as, realistically, there aren't all that many choices that would meet our mission requirements: a spacious cabin and ample payload for our family of five, improved capability and flexibility for all-weather flying, and improved speed and range versus our Aztec.

Of course, affordability was a major concern, so that led us to consider only pre-owned aircraft. But, we also wanted to avoid having the same issues of costly upgrades and significant downtime with a newly purchased aircraft that we were facing with the Aztec.

Soon, the Navajo emerged as the lead candidate. It met all the performance requirements, and I was somewhat familiar with the type having had some experience in it from years' prior. However, these airplanes were workhorses and many aren't exactly in mint condition. Could we find a specific airplane that would meet our criteria?

Fortuitously, in the course of my research, I ran across an article from this magazine that featured Mike Jones' Lock & Key Navajo (see *Twin & Turbine*; April, 2007, p. 6). Mike's program was intriguing: the upgraded size and performance of the Navajo, with the promise of a complete refurbishment that would minimize the hassles of owning a 30-year-old airplane. I needed to learn more.

After several telephone conversations, I arranged for my family and me to visit Mike at his home base in Murfreesboro, Tenn., (KMBT) to dig into the details of the program. Mike arranged to have both a Chieftain and its smaller sibling, the C/R, available for us to "try on." Without getting into a lengthy discussion on the merits of either version, suffice it to say that each has its own distinguishing strengths. Ultimately, we decided that the smaller C/R was the best choice for us. The cabin would provide the room we would need for years



to come, and the performance advantage versus the Chieftain (the C/R Panther utilizes the same Lycoming TIO-540-J2B 350-hp engines as the 500-pound heavier Chieftain Panther) was appealing.

The Refurbishment

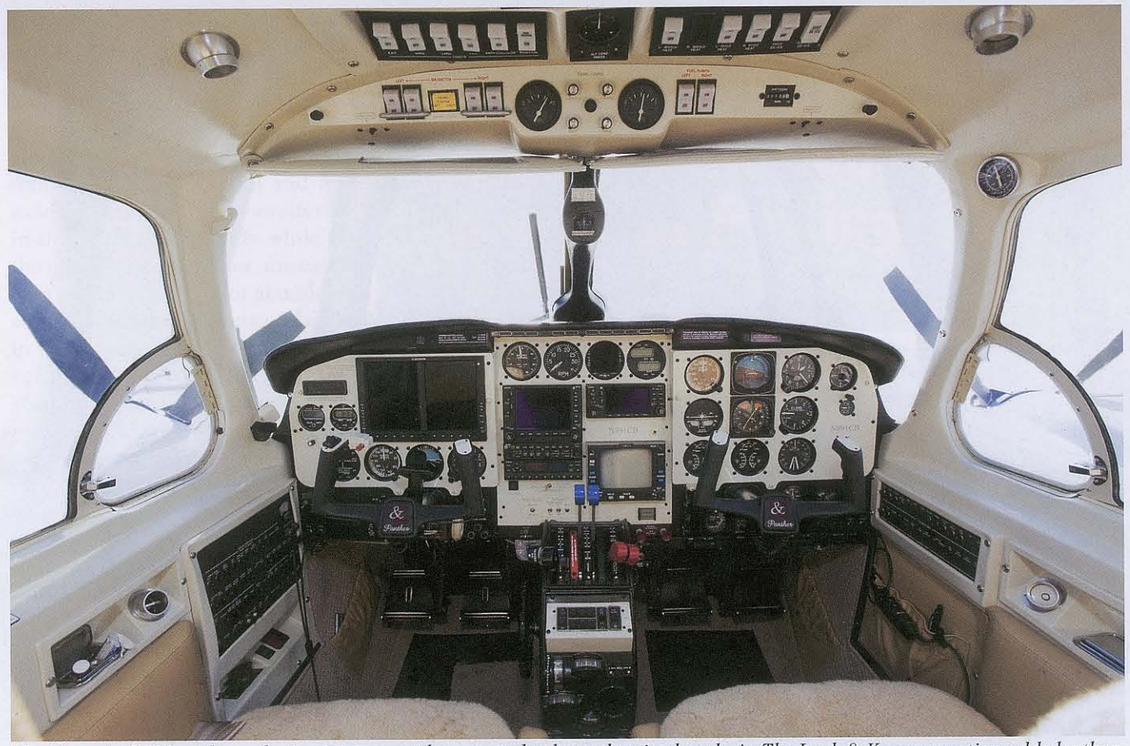
Mike had identified a very solid airframe that would be our project plane. The airframe had no damage or corrosion, and had complete logbooks so we could thoroughly evaluate its history. The 1980 Navajo had been fitted with the Colemill Panther conversion several years prior, and also sported American Aviation aftermarket intercoolers, both huge plusses. However, the engines were approaching TBO, the panel was outdated, and the interior and paint were tired. In short, we found the perfect Navajo to refurbish!

I won't dwell on the details of the project, since this was well documented in the T&T article noted above. I will say that Mike was service oriented and meticulous in his attention to detail throughout the process. Mike's goal is to please the customer, so we were able to specify the engines (Lycoming factory overhauls), panel, paint and interior completely to our liking. And, we were able to move the program to the next level in two areas. First, we took advantage of Garmin's newly certified (at the time) G600 to deliver a true state-of-the-art "glass" panel. This took a very nice avionics retrofit to an absolutely outstanding one. Second, we addressed my one concern about the airplane, a less than desirable range profile, by enabling range-extending lean-of-peak operation with the installation of Gamijectors and a JPI EDM-760 all-cylinder engine monitor (more on this later). In short, this project delivered a beautifully finished airplane that looks like new, and in terms of avionics and performance, is even better than new!

Flying the Navajo

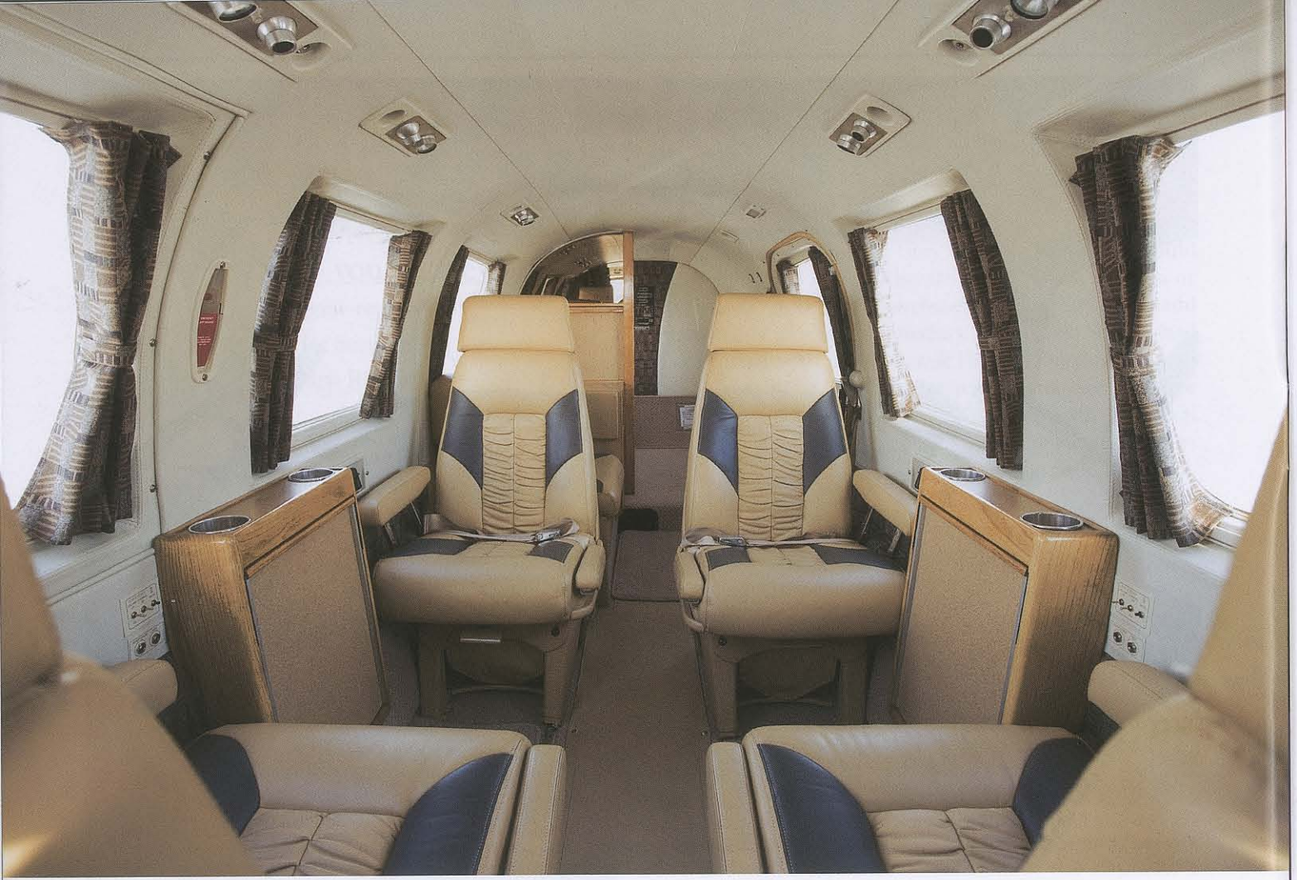
While the Navajo is not a particularly difficult airplane to fly, flying it to "professional" standards of precision and safety does take preparation and practice. I took this part of the project very seriously. After all, I'm flying the most precious cargo I possibly could on a regular basis: my family!

Well before delivery I began the work of becoming a proficient Navajo pilot. I purchased a Pilots Operating Handbook (POH) reprint to study the systems. I downloaded manuals for the G600 and other equipment that was to be installed. And, I researched and read everything I could find on turbocharged engines and intercoolers, since my experience with both was limited. About a month before I took delivery, I completed my Initial Transition Training at Recurrent Training Center in Champaign, Ill. This was a 3.5-day course that included a comprehensive review of the aircraft's systems, and then 10 hours of simulator



The Garmin G600 with synthetic vision provides a completely modernized cockpit. The Lock & Key renovation adds leather-covered control wheels, new internally lit overhead rocker switches, and panels with lettering etched into the surface.

Entering the Navajo is an easy task thanks to large clamshell airstair door. Ample storage space is available in the aft cabin, wing lockers and forward nose compartment.



Who knew that the workhorse of the Piper fleet could be the perfect family airplane? A complete interior refurbishment included luxurious leather seats and headliner, worktables and cabin lighting that would rival many light jets.

time to experience every possible emergency and malfunction.

Finally, my in-aircraft checkout was thorough and included several hours of instrument work to become accustomed to both the aircraft itself as well as flying behind the G600, and a cross-country at oxygen altitudes to get experience with the oxygen system and descent planning.

Our typical mission profile is an IFR cross country of 400-600 nm, and the Navajo shines in this context. Rotate at 77 KIAS and the Navajo accelerates quickly past Vyse of 104 KIAS. I bring the gear up, set climb power at 38 inches MP and 2400 RPM, and accelerate to a cruise climb of 140 KIAS for good visibility and cooling.

The airplane is very stable and I typically hand-fly to altitude, even in actual IFR. At level off, I engage the KFC-200 autopilot and accelerate before setting cruise power of 34 inches MP/2200 RPM and leaning to 50F LOP. At 2200 RPM, the Hartzell four-blade, 74-inch diameter Q-tip propellers deliver a low vibration, relatively quiet ride. The GPS Steering (GPSS) functionality of the G600 enables the autopilot to fly a perfect flight plan while I monitor the big picture of weather, fuel, systems, and air traffic control.

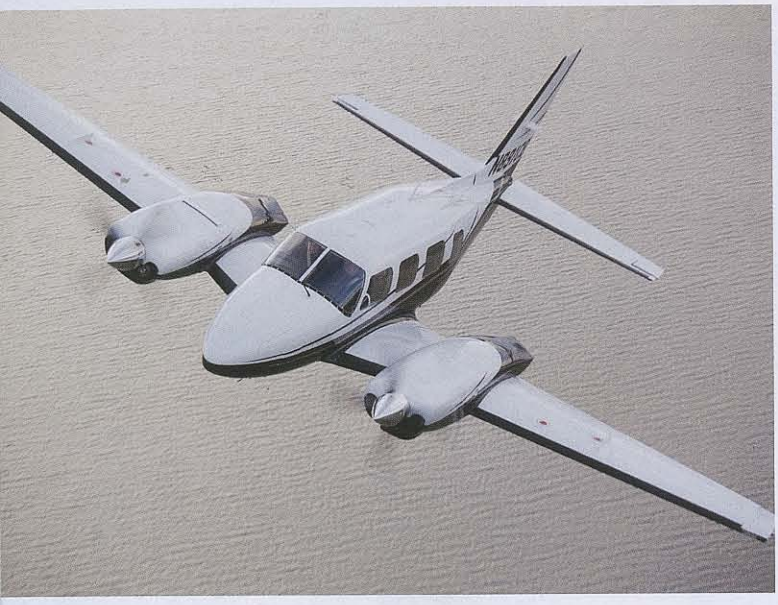
When it's time to descend, I push the nose over a few degrees and enjoy gravity's impact on my groundspeed until it's time to slow for the approach. The airplane is easy to manage when flying an approach either by hand or with the autopilot. Set MP at 25 inches, apply approach flaps (15 degrees) and watch the airspeed settle in at a comfortable 120 KIAS. I select gear down at the FAF and descend with minor power and pitch changes to maintain airspeed and glide path. On short final, I recheck gear down, bring in landing flaps (40 degrees), and squeeze the throttles back. It takes some moderate back pressure to establish the appropriate landing attitude, and the airplane makes me look good upon landing more often than not.

From my family's point of view, the cabin is spacious and comfortable. The two-piece air-stair door and center aisle eliminate the wing-walking and maneuvering required to board the Aztec. Everybody enjoys the club seating arrangement, and my wife makes full use of the fold out writing table to catch up on her correspondence while the kids enjoy sports or music on XM Radio, or watching a movie on a portable DVD player we bring along. In the summer, the air conditioner works quite well and is a welcome upgrade from sweltering in the cabin, particularly while on the ground. In the winter, the cabin heat is adequate but not abundant, so we keep light blankets on-board in case somebody gets chilly. The seventh seat is a side facing potty seat. We keep the potty ready for use in an "emergency," and fortunately have had to press it into service only once over the past year. It seems like a small thing, but having a relieved daughter without having to make a time-consuming, unscheduled stop was very nice.

The main baggage area is in the very back of the cabin, and is easily accessible via the cargo door, which is immediately aft of the main cabin door. Center of gravity considerations generally dictate that the main baggage area be loaded first, with the huge wing lockers and nose baggage compartment adding significant supplemental storage area. All in all, the airplane has been an upgrade in every way for both pilot and passengers.

The Performance

The Navajo was one of the few airplanes to meet our criteria for payload and performance. Even then, all airplanes involve some level of compromise. We liked the cruise speed and climb rates of the C/R Panther, but its gross weight limitation of 6,500 pounds was a concern. Mike addressed this by installing a BLR Vortex Generator kit, which among other benefits, yielded an increase in gross weight to 6,700 pounds. Now, with a full-fuel load of 183 usable gallons, we are left with about 730 pounds of payload. Fortunately, our family is fit but with the five of us aboard, the 730 pounds is consumed with people. We would need to leave out



The Navajo is fitted with the Colemill Panther Lycoming TIO-540-J2B 350-hp turbocharged engines and also sports American Aviation aftermarket intercoolers. Hartzell four-blade, 74-inch diameter Q-tip propellers make for a quieter ride.

some fuel, perhaps 20-25 gallons, to be able to haul a realistic amount of luggage for a typical vacation. This left us to solve for a second constrant: a suitable range profile.

Allow me to step back for a moment. The POH calls for "best power" at 125 degrees Fahrenheit rich of peak EGT. Using the EDM-760, I could lean precisely to this recommendation. At a typical "mid-cruise" power setting, this yielded a fuel flow of 46 gph. Do the math: with anything less than full fuel, and protecting my personal one-hour fuel reserve, we would have less than three hours before we would need to be on the ground. I didn't feel comfortable leaning any closer to peak on the rich side because CHT's rose to an uncomfortable level (consistently greater than 400F).

After thoroughly researching my options, I settled on a strategy to operate the engines lean of peak EGT at cruise. Again, the EDM-760 allows me to lean precisely to 50F lean of peak —which is permitted by the POH — and the Gamijectors provide a balanced fuel/air mixture across cylinders such that the engines to run smoothly at this fuel flow. The results are jaw dropping. At a similar mid-cruise power setting, fuel flows drop to 34 gph, and much cooler CHT's allow me to fully close the cowl flaps under most conditions and recover airspeed: I'm giving up less than 5 knots between the LOP and ROP scenarios. The table on page 14 contains a sampling of the performance data I have collected over the past year. This is actual real-life data, not sales literature propaganda:

Perf @ 12,000; 183 gal	Fuel Flow (gph)	TAS	Range/No Wind	Endurance w/ 1-hr reserve
125 ROP	46	190	530	2.8
50 LOP	34	186	700	3.8

I file for an honest 185 KTAS at 12,000 feet. I plan fuel at 50 gallons for the first hour and 34 gph thereafter. My engines are running cleaner, cooler, cheaper and greener. In addition, our range is almost always limited by full bladders rather than empty tanks!

The Maintenance

Despite a complete refurbishment, this is still an airplane manufactured in 1980, so maintenance is a big concern. Mike Jones considered this and eases the burden by offering a 90-day warranty and a guaranteed cost on the first annual. The first few flights turned up a few minor post-delivery squawks that were covered under Mike's warranty and that my home shop easily rectified.

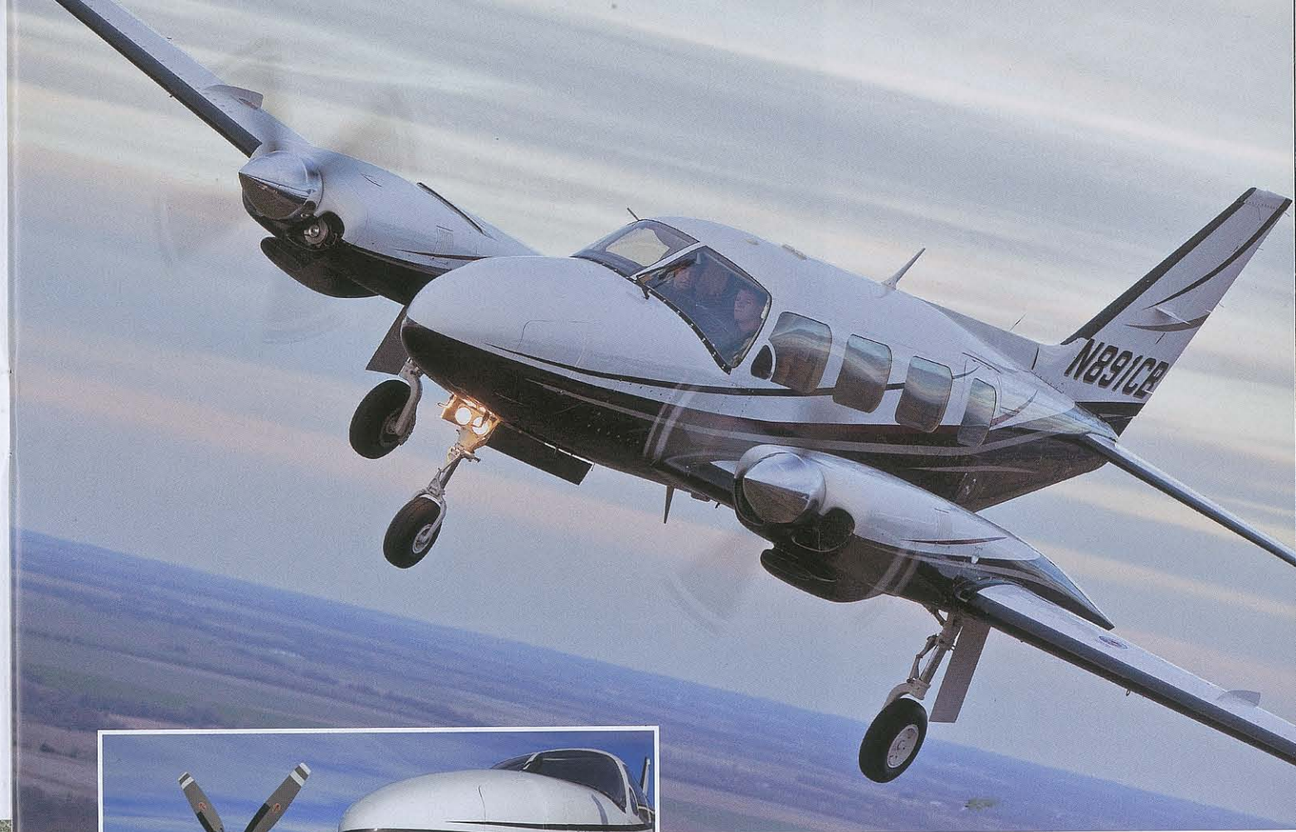
The biggest single issue we've had was that the left engine magneto pressurization was set incorrectly from the factory, which took a lot of hours to resolve and eventually led to the replacement of both magnetos. Fortunately, the engine warranty from Lycoming will cover this work. Garmin addressed a squawk on the 530W under warranty, and recently we added Garmin's Synthetic Vision Technology to the G600 behind their free upgrade program.

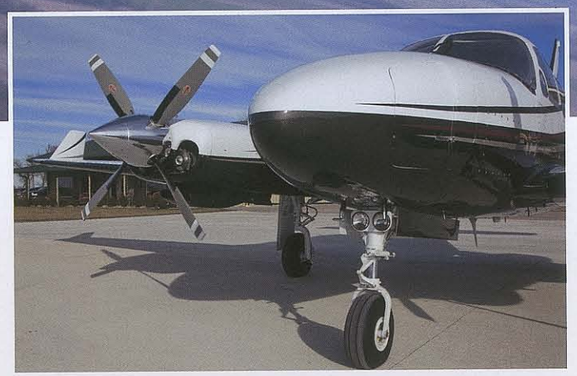
From a preventative maintenance standpoint, we change the oil and filters every 25 hours, with oil analysis conducted at each change by Blackstone Laboratories. So far, everything looks great. Finally, we just finished our first annual and are thrilled with the result: no major issues and a price tag within Mike's guaranteed cost.

The Destinations

I took delivery of the airplane, now christened N891CB, on December 19, 2008 a little over five months after signing a contract on it. We wasted no time in putting it to work. Two days after I brought it home we departed our home base of Warren County Airport (I68, just north of Cincinnati) for Boyne Falls, Mich., for some pre-Christmas skiing. From there, it was off to Des Moines for Christmas with my wife's family, and then east to Portsmouth, Ohio to visit my family, and finally back to Cincinnati. The inaugural trip encompassed 1,500 nautical miles in just over 9

With a true cabin-class aircraft with substantial range and performance capabilities, the Bahner family now ventures farther than ever before. Last spring, the Bahners flew their newly refurbed Navajo to Sedona, Ariz.





The Navajo is easy to manage in the pattern with up to 40 degrees of flaps available. HID landing lights provide 1 million candle-watt power and draw only 5 amps.

Hobbs hours, and encountered all kinds of weather (snow, ice, winds). The Navajo was proving itself a good choice from the get go.

We now venture farther than ever on our family trips. Spring break was to the Grand Canyon via Santa Fe and Sedona, a trip we'd have never tried to do in a week in the Aztec. In June, the Navajo took my son and I and a couple friends to Monterrey, Mexico for a church-sponsored service trip. We made it to Monterrey with only one stop, and returned with two stops only because U.S. Customs requires re-entry at the first U.S. border crossing, in our case Laredo, Texas. In between the big trips, destinations have included Hilton Head, S.C.; Washington D.C.; Traverse City, Mich., for a gorgeous Labor Day weekend; Ames, Iowa (wife's homecoming at Iowa State University); Ada, Okla., (Advanced Pilot Seminars); Fond du Lac, Wis., (annual Oshkosh pilgrimage) and many others. The Navajo has proven throughout the first year to be a comfortable, convenient, and reliable mode of transportation for our family.

A Dream Come True

Overall, we are thrilled with our Navajo. It's a dream come true in many ways. The Navajo transports our family in cabin class comfort on trips we would never have attempted in the Aztec. Innovations such as the G600 and the ability to safely operate lean of peak make this a truly modern airplane, with greatly enhanced performance vs. the original model. It really feels like a new airplane, from fit and finish, to the panel, to the maintenance program, for a fraction of what similar capability in a new aircraft would have cost. T&T

Craig Bahner has been flying since he was 19 years old and holds Airline Transport Pilot and Flight Instructor (instrument and multi-engine) certificates. Mr. Bahner is a graduate of Ohio State University and is a vice president of the Procter & Gamble Co. He resides in Cincinnati with his wife, Nancy, and three teenage children.