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# Nextant's Beechjet REDO

Remanufacturing moves upmarket with the 400XTi

BY THOMAS B. HAINES

**THE GENERAL AVIATION FLEET** may be aging, but that doesn't mean there isn't still a lot of life left in the airframes that have served us well for decades. At the lightest end of GA, the AOPA Reimagined 152 Sweepstakes project shows what can happen when you take a solid airframe and put it through a standardized remanufacturing process in a factory setting, in this case Aviat Aircraft. Yingling Aviation this summer rolled out its own version of the concept, using a Cessna 172 it calls Ascend. Similarly, Redbird is putting its Redhawk 172s through a remanufacturing process, but opting to swap the Lycoming engine for a Continental diesel.

PHOTOGRAPHY BY CHRIS ROSE



**VIDEO EXTRA**  
View the video.



## Stauffer declares the third phase as the most exciting, where the once hydro-mechanical airplane “wakes up” as an all-electronic airplane.

Remanufacturing is a \$50 billion-a-year industry in the United States that sustains some 200,000 jobs where workers disassemble and bring back to like-new condition everything from industrial diesel engines to earthmovers to photocopiers. Leading the charge at the upper end of the GA spectrum is Nextant Aerospace. The Cleveland-based company has been a dominant player in the industry since 2007, when it launched a plan to remanufacture the popular Beechjet/Hawker 400. The result is the Nextant 400XTi, a highly competitive twenty-first century business jet that can be owned and operated for about half the cost of a comparable new airplane. To date, the company has delivered 60 of the upgraded jets to a dozen countries.

Make no mistake, remanufacturing does not mean just new paint and interior and an overhauled engine. Remanufacturing is a thorough, standardized process of disassembling an aircraft, replacing life-limited parts, and upgrading throughout before

reassembling and putting it back into the marketplace with like-new warranties.

At Nextant, about 60 percent of the Beechjets modified are purchased by the company and resold at the end of the 140-day, 6,000-man-hour process. The balance are airframes brought to them by owners looking for more performance.

According to Kent Stauffer, vice president of operations and customer support, each airplane enters the remanufacturing process only after a thorough baseline testing process to understand its characteristics and performance. Everything from pressurization leak rates to trim tab deflection angles are measured. “It has to be a better flying airplane when it leaves,” he insists. Then a team begins the “deletion” phase, which includes removing the Pratt & Whitney engines, which are parted out or sold. Some 80 percent of the wiring is

removed, all access panels are opened, and life-limited parts are removed for replacement or overhaul; there is no life limit on the airframe itself. Then there’s an inspection phase in which all of the four Beechjet heavy maintenance inspections are done.

Stauffer declares the third phase as the most exciting, where the once hydro-mechanical airplane “wakes up” as an all-electronic airplane. Powering up the airplane that has been asleep for months takes several weeks of checks. But the result is an all-new digital flight deck that includes a Rockwell Collins Pro Line 21 avionics suite with dual flight management systems and all-glass displays in front of the pilots. At the same time, the full authority digital engine controls (FADECs) on the

**THE NEXTANT** remanufacturing process is most visually evident in the cockpit, where the Collins Pro Line 21 avionics suite supplants the Pro Line 4 found in many early Beechjets (below). Phase 3, the “wake-up” phase (right), is where the new cockpit and FADEC on the Williams engines come alive.





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new Williams International engines also come to life. Throughout the airframe, new digital systems start working together in a way that was unknown to the Beechjet.

According to Stauffer, the same team that disassembled the airplane stays with it the whole way through the remanufacturing process, including the flight test phase. After flight test, the airplane goes to paint and then gets a new interior.

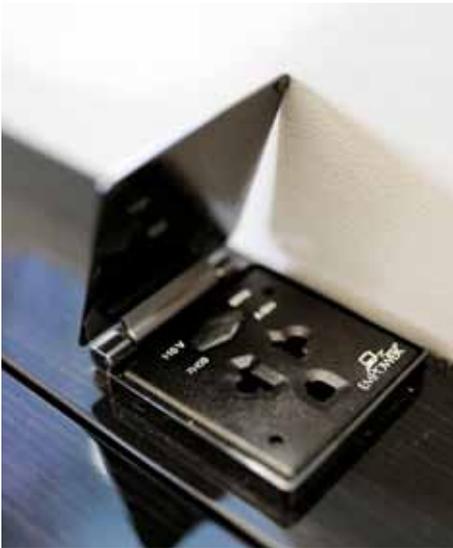
Nextant's goal is for the customer to experience what they would if they were buying a new airplane at a traditional factory, according to Jay Heublein, executive vice president of global sales and marketing. To support that, the company has developed a design center where customers work with Nextant staff to create paint and interior designs. The center carries dozens of types of carpets, laminates, fabrics, and leathers in hundreds of potential color combinations. If nothing suits your fancy, they'll find additional custom products that will.

While the bulk of the remanufacturing is done inside a yawning hangar bay at Cuyahoga County Airport just east of Cleveland, next door, technicians toil at making all-new wiring harnesses, replacing some 30,000 wires with new ones meeting the latest safety standards. In the machine shop, engineers work on airframe upgrades, the most obvious of which is a new engine mount and pylon design that solves a serious cracking problem on Beechjets while improving performance.

The original multipiece engine mount is replaced with a solid stainless steel bracket that looks like a piece of art. It is partnered with a new pylon design that moves the engines several inches farther out from the fuselage and changes the angle of the thrust line. As it turns out, the original design created significant drag at the pylon during high speeds. While a fully area-ruled complex curve in the empennage would be an even better solution—something you'd find on a newly designed



**THE OLD ENGINE** mount (above left) seems downright flimsy compared to the new stainless steel version (right). Nextant adds its own data plate next to the Beechjet original (top).



**USB AND POWER PORTS** were unheard-of luxuries in the Beechjet's original configuration (above). A plethora of laminate and fabric options give customers many choices (below). A three-seat divan (below right) allows for plenty of seating while opening up the aft club configuration.

airplane—such a change is not practical in a remanufacturing process, according to Heublein. However, the new design results in a major improvement.

Nextant's sister company Flight Options operates more than 150 Beechjets that have accumulated hundreds of thousands of flight hours, so the company knows the airplane's weaknesses, most of which have been addressed in the four STC packages that make up the bulk of the upgrades during the remanufacturing process. In addition to the engine mounts, for example, the company has also reengineered the internal rib structure of the horizontal stabilizer—an area known for cracks.

All of the internal and behind-the-scenes improvements are nice, but what does the customer get to experience? For that we launched with Nextant on a real-world cross-country mission. The mission was to move five passengers and gear, including multiple sets of golf clubs, from Cleveland to Alpine, Wyoming, and back. With crew of two, including yours truly in the left seat, we loaded about 4,500 pounds of fuel on board and headed west. The passengers got to enjoy the newly designed 400XTi interior, which includes a three-seat side-facing divan opposite the wide

entry door. In the back is a club configuration with what Heublein describes as the “most foot room of any light jet.” Farther aft is a fully enclosed lavatory. Nextant certified the divan to replace the more traditional club-plus-two or double-club configuration, which felt cramped for all passengers all the time when most trips consist of only three or four passengers.

For those of us up front, the FADECs make life much simpler, as does the modern avionics suite. Touch the buttons to light the fires. Slam the thrust levers forward for takeoff and hang on. The Williams engines generate 3,050 pounds of thrust, just 55 pounds more than the old Pratts, but the new FADEC engines weigh 240 pounds less and burn 32 percent less fuel—while carrying a 4,000-hour TBO, 400 more than the Pratts. In effect, the Williams extend the 400XTi range by about 50 percent compared to the Pratts.

As a result of the improved range, on this challenging mission we had hopes of making the 1,300-nm trip to Wyoming nonstop despite the expectation of strong headwinds. But leveling off about 30 minutes after takeoff at 43,000 feet, the nonstop prospects were not good. Headwinds of 100 knots had us looking at Rapid City,



South Dakota, as a likely stop. Later, however, the winds slacked off to only 72 knots. Running at 420 knots true airspeed while burning 450 pounds per side, we began to have hope of nonstop Alpine. My co-pilot, Nathan Marker, says he plans to burn 1,100 pounds the first hour on long-range cruise or 1,200 to 1,250 pounds for high-speed cruise. Expect less than 900 pounds the second hour and less than 800 pounds the third hour. Long-range cruise will range between Mach 0.67 and 0.71, or about 400 knots.

Some 125 miles before Rapid City, we made the call to continue to Alpine and completed the trip with more than Marker's plan of 650 pounds on board at landing. As Heublein points out, the 400XTi opens up new city pairs not possible with a Beechjet.

During the 3.9-hour trip, one of the most noticeable improvements to the airplane was the low noise level. For much of it we did not wear headsets. Heublein says the 400XTi's new interior shell knocks 12 decibels off the usual interior noise signature.

At a well-equipped price of \$5.5 million, which includes WiFi and in-flight entertainment, the 400XTi is a little more than half the price of a comparable new light jet. For Beechjet owners, the remanufacturing process will lower direct operating costs by about 50 percent, Heublein says.

The company is flight testing winglets that it plans to make available to all existing customers. Other enhancements are in the works. Meanwhile, Nextant is nearly finished with a project to remanufacture King Air 90-series turboprops, including replacing the PT6 engines with new GE engines and a unique single-lever power control, in effect bringing FADEC-like capabilities to a turboprop—a real workload saver for single-pilot operations.

With companies like Aviat and Yingling pushing up from the bottom and Nextant pushing down from the top, remanufacturing may be at least a partial solution to an aging fleet.

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**NEARLY FULL-SPAN** double-slotted Fowler flaps on the swept wing help drive down landing speeds. Spoilers atop the wing serve for both roll control and as speed brakes.