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Aerospace Company On A Mission



Quest's Super Velocity Center 2000L from Mazak and Machine Shop Manager Keith Rutledge.

Beyond the shores of Lake Pend Oreille (pond-array), with more than 100 miles of rugged shoreline at the base of the Selkirk Mountains, in the little town of Sandpoint, Idaho, lies perhaps the world's most unique aircraft company. Quest Aircraft produces the Kodiak, a modern backcountry airplane packed with performance features. Customer response to date has Quest producing orders through 2008. The company's CNC production equipment, including a new Super Velocity Center 2000L and FH6000 horizontal machining center with 12-station Palletech System, all from Mazak Corp., are state of the art. Many manufacturing companies, however, make distinct, well-designed aircraft, and many possess modern and up-to-the-minute production methodologies. What sets Quest Aircraft apart is that the company is run entirely on donations.

"The underlying purpose of the Quest Aircraft Company is to design, obtain FAA certification, and manufacture a bush/utility aircraft specifically suited to the needs of not-for-profit missions and humanitarian organizations providing access to otherwise isolated, impoverished peoples in the most geographically challenging jungle, mountain, and desert regions of the world," says Bruce Kennedy, chairman of the Quest Board of Trustees. The aircraft is also seen as an important tool for those responding to humanitarian emergencies, such as tsunamis, earthquakes, hurricanes, droughts, and epidemics wherever they occur.

"At the dawn of a new century, the need is apparent for an even more capable aircraft featuring the advantages of universally available Jet-A fuel, turbine power, state of the art avionics, STOL (short takeoff and landing) performance, rugged construction, floatplane optimization, and field maintainability--to name a few," Kennedy says. It came as no surprise that such an airplane would lend itself readily to a multitude of commercial applications around the world as well. Thus, in the concept stage, the design of the KODIAK was tweaked to assure that it could develop an enthusiastic following in a variety of applications where its go-anywhere capabilities would be appreciated and effectively used.

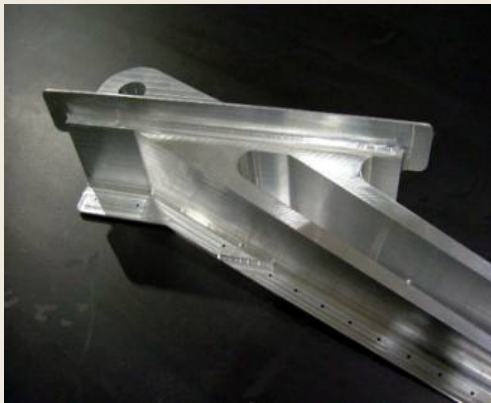
But turbine-powered airplanes are inherently more expensive than their piston-powered predecessors. Not-for-profit missions and humanitarian organizations already challenged by capital costs in the mid-hundreds of thousands of dollars for piston airplanes would be staggered by the million dollar-plus price tags of turboprop aircraft, no matter their many operating advantages. Thus, Quest Aircraft's founders determined to organize so that all the costs of the design, development, FAA certification and preparation for manufacture could be pre-funded by tax-deductible contributions to not-for-profit mission/humanitarian aviation organizations. As a result, when Kodiak manufacturing began, Quest would have no obligations to investors, and a minimum of debt. With fixed overhead costs kept low, the resulting higher profit margins on commercial sales would be used to cover the cost of roughly each tenth Kodiak produced, which Quest would deliver to the participating not-for-profit.

Cost-Effective Production

Inherent to such an operating picture is the necessity to keep production costs under control, which Quest was determined to do. According to Machine Shop Manager and Quest's third employee Keith Rutledge, more than 95% of the Kodiak's components are produced and assembled in-house on fixtures the company made itself -- everything from wing spars and structural frame parts to strut-attach fittings and parts small enough to be held in



Quest's Palletech and FH6000 Horizontal Machining Center



A multi-axis spare part cut on Quest's Super Velocity Center.

your hand.

The company literally started from scratch, Rutledge says, with the initial Kodiak prototype being made using a small vertical machining center, a router for drilling holes, a press brake, and a homemade hydraulic press. "Once the initial prototype was approved by the FAA, the idea from the founders was to replicate what we had to go into production – a lot of verticals and routers," Rutledge says. "But we time-studied each and every part we make and compared the data against long-bed traveling column machines and large-table horizontal machining centers. The upfront costs are sizeable, but the numbers prove that such a setup would be much more productive in time and costs over the long run."

Following the time studies, Rutledge solicited quotes from numerous machine tool manufacturers. He describes his setup of the Super Velocity Center 2000L from Mazak and the FH6000 Horizontal Machining Center with 160 tools and 12-station Palletech system as combining the best of performance and price. "They're best in class," he says. Prior to obtaining the Super Velocity Center, wing spars, or the support arms underneath the wings, took at least eight hours and two setups on the vertical machining center and router for drilling holes. Now, due in part to the Super Velocity Center's 4,724 inches per minute performance in the X axis and 133.86-inch table, each spar is machined complete in a single setup in about an hour and a half.

The FH6000 Horizontal Machining Center with 160-tool magazine, pallet changer, and 12-station Palletech system with one loading/unloading station allows setting up and running multiple jobs with maximum machine uptime. "We'll produce 12 airplanes in 2006, but with the setup we have right now, 50 airplanes a year would not be a problem if conditions warranted," Rutledge says.

Our Most Remarkable Achievement

Quest's Kodiak prototype made its first flight in October 2004, and it took delivery of its new CNC equipment in October 2005. One of the reasons they were up and running in a few weeks was the conversational Mazatrol CNC programming. "This was my first experience with the Mazatrol and its conversational programming format," Rutledge says. "I was born and bred on EIA and G codes. With the difficulty obtaining qualified people, the conversational programming is a big advantage. I only have to train my people once."

With the company now in production mode and commercial orders on the books through 2008, Chairman Bruce Kennedy calls the Quest's raising money through donations and delivering a modern backcountry aircraft specifically targeted at mission work as the company's most remarkable achievement. "While spending only \$14 million of largely-donated funds, the trustees have created a beautiful, versatile, rugged STOL (short take-off and landing) conforming prototype. The \$14 million figure includes the purchase of a 17-acre plant site, the construction of the Phase I plant and offices, and purchase of many of the implements required for aircraft production. Volunteer governance and astute, frugal operations have been the keys, while the processes employed are state-of-the-art."

Since then, and with additional funds, the company has added an expanded Phase II assembly facility of 57,000 square feet and has grown the entire Quest team to 60 employees. The mission spirit drives the company from the Board of Trustees, which serves without pay, to the shop floor. "We ask nothing for ourselves," Kennedy, a former chairman of Alaska Airlines, says of the Quest Aircraft board. "Each of us is a significant contributor of cash according to our individual means. Each of the trustees serves in that capacity without pay, covering our own expenses, and committing much time and effort to the endeavor. Our focus is entirely on those less fortunate by birth and circumstance than ourselves. The KODIAK is a tool that will serve hundreds of thousands of people in ways we are now well aware of, and in ways which may always be unknown to us."



More information on the Kodiak and Quest Aircraft are available at www.questaircraft.com.

The Kodiak prototype following a test flight. It is a 10-place single-engine turboprop utility plane, also designed to be float-capable



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