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Oswego companies manufacture and repair airplane parts



Thomas Wieser, left, Director of Operations for Seginus Inc., and Erik Hatch, owner of AOG Aviation Spares, Inc. and Seginus Inc.

By Lisa Welz

Ever since he was a kid, Erik Hatch had a fascination with airplanes. He dreamed of one day being a pilot in the military, but when that time came, his eyes weren't good enough. For some, that news might have been a catalyst, veering them down a completely different career path.

For Hatch, a fairly quiet man who loves the Blackhawks and brings two little dogs, affectionately referred to as the vice presidents, to work, that news didn't end the game, it only changed its focus a bit, to flying planes for leisure. "My whole life has been one aviation experience after another," he said. "I went to university to become an aircraft mechanic and it evolved to where I am today. I also became a pilot, but always stuck in the maintenance end of it. I've always worked for aviation companies really."

His brother, Thomas Wieser, also loved airplanes and began his career with Lufthansa, a German airline. His background is in international business and economics and he spent 25 years with a company in Warrenville, before joining Hatch a few years ago as that company moved to Pennsylvania.

Hatch's first business was sourcing and brokering aircraft parts for airlines and companies in a niche industry that was a perfect fit for him thanks to the connections he had that aided his success. Those contacts also meant that if he didn't have a part in stock, he knew where to find one that he could buy and resell to his customer.

"That changed September 11, when we had the terrorist attacks," Hatch said. "That business subsequently went under, because commercial aviation basically stopped. After that I said, rather than stocking parts on spec and brokering parts, I decided to fix them, because no matter what,

everybody always needs them fixed."

A specialized repair business

It was then, in 2002, that Hatch started AOG Aviation Spares out of his airplane garage in Sandwich. He would eventually move it to Somonauk and then to its current location in Oswego as it grew and they needed more space and had greater power needs.

"I had gotten tired of paying other repair stations to fix my parts," he recalled. "You don't have any control over the costs, so that was another reason I decided to do the repair station. I would repair my own parts and if we still want to broker parts, then we can do that."

Being a repair station, he says, means they are certified by the Federal Aviation Administration (FAA). "You're under their surveillance, meaning they have access to your procedures and books and processes in your shop. You have drug testing. So you have to follow a certain set of rules in order to remain certificated. As you grow, it gets more complex, so you have to grow along with the system."

For instance, if they want to repair a coffee maker for an airline, they have to go through a certain set of procedures to show the FAA that they have the facilities and properly trained personnel to do the job. They also have to show that they have the proper repair manuals for each repair they perform.

"Are we, basically, qualified," he said. "With each part you add to your capabilities, you have to do that every time and you have to remain that way and then you have to keep your tooling calibrated. So, as it grows it's not necessarily more complex, but there's more to take care of."

In addition, there is initial and recurring training the FAA requires, although they

don't stipulate certain courses, but remain vague about it, Hatch said with a wry grin. "It could be human factors training. How do human factors affect the way your shop runs? And there are a lot of human factors—such as stress, not enough sleep, drug abuse, tension between employees. They want you to be aware of it and make everybody in the shop aware of it, and that's just one thing." Other trainings cover a multitude of topics such as use of tools, use of a power supply, are they safe on a lathe, etc.

The repair shop has two primary divisions—avionics, which is more electronics, and mechanical, which is working on blowers, generators, chillers and the like, using hand tools. Each division has its own set of qualifications and training procedure.

All repairs are done in their shop, meaning that their customers—airlines and owners of airplanes that are 40 passenger and larger—send their parts to AOG for repair. They don't ever go on site, although they might, on a rare occasion, be asked to have a same day turnaround, if the airline is able to get the part to them.

Most times, they explained, an airline will have spare parts to replace a faulty one, and then send the broken one to AOG for repair, without need for a quick turnaround time.

"It's fairly competitive, and is a market you would hardly know is there," Hatch said, adding, "If you get a coffee maker for an airplane, they're about \$18,000 apiece, and we can usually fix them for about \$1,000 or \$1,200, so an airline will fix them over and over and over, rather than putting a new one in. The whole industry is supported by repair stations like us and because the airline can't possibly do every item that's going to break in a

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Repairing airplane accessories offers international travel

from page one

plane.”

They specialize in accessories, while other shops may specialize in flight instruments, or landing gear or engines. Their specialty is considered non-critical components, Wieser said. None of the items they work on, should they fail, would jeopardize the safety of a flight. Restricting themselves in that way keeps down the liability their company could face, they said.

“One of our engineers says, go after the low-hanging fruit; there’s plenty of it,” Hatch commented.

While repairing blowers and the like might not seem all that exciting to some, it’s fulfilling for Hatch because it keeps him involved with his first love—airplanes. It also has afforded him the opportunity to travel all over the world, seeking out and visiting with clients in countries.

“Every trip I’ve ever taken has always paid off for more than the cost of the trip,”

he said. “You gain a rapport with the customer and you get to explore different ideas. You never know what’s going to pop up in a conversation. The dynamic is much greater in person. In the last year I’ve been in India, Nepal, Germany, England, Mexico City...it doesn’t stop.”

Getting into manufacturing

Seginus Inc. started in 2009 to manufacture parts, feeding specifically into AOG, Wieser explained. “We develop parts and sell them to AOG to improve the profit margin.

Original equipment manufacturers charge exorbitant prices for their parts. The FAA allows you to develop aftermarket parts, which they regulate and approve. We reverse engineer, we present it to the FAA, they approve it, and then we can manufacture and sell the aftermarket parts.”

It wasn’t long before they found there

was a great market potential for the aftermarket parts and now the company stands on its own, selling not only to AOG, but to a lot of other clients all over the world as well.

“Seeing it from its infancy to what it’s grown to now— and what its potential is going to be— is fascinating from a business standpoint,” Wieser said.

The company currently manufactures about 125 different parts and has several times that number in some stage of the reverse engineering/FAA approval process. The entire process to develop a part can take anywhere from six months to a couple of years.

To develop a new part, Hatch explained, “You need to know everything about it— what metal it’s made of, if it’s tempered, if it’s annealed or plated or coated, what kind of paint is on it, what is the thickness, what are the dimensions. If it’s plated, how is it done—electroless or done with electrodes? What is the surface finish? It’s in depth. You have to substantiate all of your claims. Then we have to test it.” Wieser added that they must meet or exceed the OEM part in its performance.

They also have an office in India, where some of their engineering is done, as well as material analysis, scanning, and manufacturing. Other suppliers are located, and manufacturing is done, in the U.S. as well, both locally and across the country.

“We can’t possibly do it all,” Hatch said, “So we outsource to experts who can. The final product is scrutinized here.”

The two biggest sellers are probably bearings and electrical contact brushes,

Wieser said. The brushes don’t really look like brushes, but more like a rectangular chunk of metal that Hatch explained is carbon and other materials that transfers electrical current from the spinning part of a generator back into the system of the airplane.

Quality. Cost. Delivery. Those three tenants, Hatch said, are of top importance to both companies. As they look to improve processes, or follow what some might term lean or Six Sigma manufacturing, employees follow Kaizen Principles, something Hatch discovered when reading about different business tactics or techniques.

Kaizen, he said, refers to a philosophy of continuous improvement of processes as well as organizing workspaces for efficiency and effectiveness while eliminating any activity that does not add value.

“The main thing is to try to improve a little bit every day, no matter what you’re doing,” Hatch commented.

Tour the shop, learn about 3D printing apps

Step beyond the office space into the warehouse at the rear of the business and one is hit with an immediate surprise. There are no oily dirt coatings on equipment, nor are there loud jarring noises.

The whole space is almost painfully organized, and so clean a family of four could sit down in the middle of the floor for a picnic without fear of contamination. Work benches are gleaming, testing equipment sitting quietly, rows of tools in bins,

continued on next page



Testing equipment used in the repair process for starter generators.



The bench used by the inspector to thoroughly evaluate parts, note which pieces need replacing, and calculate repair costs for customers who do not have contract pricing.

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AOG Aviation Spares ahead of the game with 3D printing

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or hung in proper spaces, and orders are in tubs with paperwork neatly tucked into clear pouches.

Once a part has been received, it goes through a rather intense series of evaluations, from the initial inspection and take-apart, to aluminum parts being dunked in a bright green liquid that once viewed under a black light will expose any cracks to the inspector, just as a similar process will do for other metal parts.

Every single part of the starter generator or blower or coffee maker or telephone handset or whatever part has come in is evaluated and measured with micrometers or other appropriate tools. The process for each piece is written in a manual and is painstakingly followed by the inspector.

Parts are ultrasonically cleaned, dried in an oven, machined, and repainted according to specifications and all parts are tested before being sent back out to the owner. Every step, from beginning to end, is regulated by the FAA, Hatch said.

Seginus' domain is found on the upper level of the warehouse, with all parts stored in neatly labeled bins, ready to be picked for an order, packaged, and shipped out. Also found upstairs is the company's 3D printer, a fascinating piece of machinery that has been gaining more attention in the media in recent months. For Seginus' purposes, they will take a 3D laser image of a part to be reverse engineered and that file is sent to the printer, which will then make a low-resolution, 3D prototype of the item.

Use of this technology, Hatch says, has cut the reverse engineering down significantly, by about three to six months. Instead of a machinist having to create

a model, only to be told to change something, and then take another week to recreate it, and so on, they can print a 3D piece in about a day.

The unit looks somewhat like a small mini-fridge with a glass front. Hatch explained that the printer then uses two different materials to make the piece. One is the plastic that comprises the final product, and the other is a support material that is used in any place where the plastic could collapse. The printer uses something that loosely resembles a glue gun to lay down the materials.

Once the item has been printed, it is then put into a liquid that dissolves the support material leaving only the plastic behind. The prototype, even with low-resolution, they said, is within thousandths of the measurements of the original part.

As an example, Hatch brought out a gear and another original part, together with their 3D counterparts. He also brought out a low-resolution 3D white prototype of a telephone, the type used by a flight attendant on an aircraft and a 3D black, high-resolution one made by a company in a north suburb of Chicago.

The plastic telephone housing, and receptacle that it snaps into, costs about \$1,800 from the original manufacturer. While the white, low-resolution telephone housing snapped together perfectly, and looks great, there are small grooves that can be seen and felt. The black one, as a high-resolution prototype is perfectly smooth to the touch and functions exactly as it's supposed to, Hatch said.

The goal of getting the high-resolution phone is to reduce the cost for the part. It is in the approval process with the FAA right now, and, once approved, will allow them to get a replacement that they have



Telephones and gears made in 3D printers compared to the original gears (front). The black phone was done on a high resolution printer, while the white phone was printed on the low resolution printer owned by Seginus.

to paint for only about \$200, saving money for not only AOG, he said, but also for the customer. The only difference between theirs and the OEM part, he added, is that theirs is printed while the OEM was made with an injection mold.

"The advantage of doing this is that it is a very expensive part, but the demand is low," Hatch continued. "To develop an injection mold is not really cost effective.

The idea is to print, on demand, low-volume, high-cost parts...They can print in metal now—gold, silver. You've got guys making jewelry. Right now, for us, it's a good market."

AOG Aviation Spares, Inc. can be found online at www.aogrepairs.com, while Seginus Inc. can be found at www.seginusinc.com. Either company can be reached by phone at 630-800-2795.

Cars, boats, trailers accepted as donations at Oswego Senior Center

The Oswego Senior Center is now accepting motor vehicles, boats, or trailers as deductible donation. All registered owners who donate motorized vehicles for disposition as scrap or resalable vehicles will receive full value federal tax donation letters.

All proceeds from disposition of

vehicles will help support area senior health education, meal programs and numerous events and activities at the Oswego Senior Center.

For more information, call the center at 630-554-5602, email info@oswegoseniorcenter.org, or visit www.oswegoseniorcenter.org.

Weekly games at Senior Center

Weekly team activities are available each week at the Oswego Senior Center at 156 E. Washington St.

Bean bag baseball is Wednesdays from 2 to 3 p.m., Wii virtual bowling is Fridays from 1 to 2 p.m. and bean bag toss or corn hole is available on Mondays and Thursdays from 10:30 a.m. to noon.

Call Sharon at 630-554-5602 for more information.

Weekly lunches for seniors

The Oswego Senior Center and Upper Crust catering host lunch every Monday and Thursday at noon at 156 E. Washington St.

Call by Friday at 10 a.m. to RSVP for Monday's lunch and by 10 a.m. Wednesday to RSVP for Thursday's lunch.

Seniors age 60 and older are invited to attend, and there is a suggested donation of \$5. Call 630-554-5602 for more information or visit www.oswegoseniorcenter.org.

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