

MEET YOUR VENDOR

Meet Patti at Whirl Wind Propellers

By Patti Rust

I am truly blessed to be part of this wonderful community of airboating enthusiasts. Even though I am separated by many miles from most airboats, I feel as if we are all part of an extended family. Throughout the years we have all endured hardships from time to time, lost loved ones, gained loved ones, lost jobs, gained jobs, had good times and bad times. While it is said that the world does not stop when you grieve, there is compassion and understanding from those who are part of your life. The airboating community is a part of my life, even with being miles away. I came into the airboating world in 2000 and fell in love with the community of friends and families that enjoyed airboating as recreation, as a sport, and as a livelihood.



"I don't know how to fly an airplane, but I can drive an airboat," Patti says.

Left: Jim and Patti Rust.

Below: Stan Floyd, Patti Rust, and seated in front, Jim Rust.



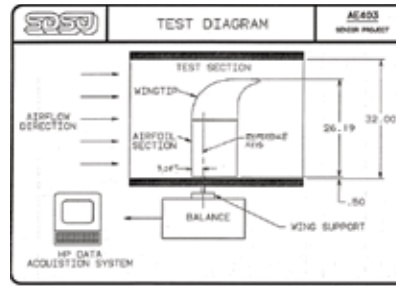
I was educated as an aerospace engineer and always dreamed of working on space programs. During college, I had the opportunity to intern for the International Space

Station program at McDonnell Douglas in Houston. It was also during my engineering college years that I met my future husband, Jim Rust (founder of Whirl Wind Propellers). My first job as an engineer was working in structures and acoustics for the F/A-18 Hornet Navy jet (C/D and development on the E/F model) in St Louis. I then moved on to work on the rocket program for McDonnell Douglas's Delta family of rockets in Huntington Beach. I defined shock, vibration and acoustic environments for spacecraft payloads, and also helped redesign the ducting of the Vandenberg Air Force Base launch pad to reduce noise. During this time (1995) Jim and I also started an aircraft composite propeller company. Next came marriage and a U.S. patent on our blade design. I left McDonnell Douglas (by that time they had become Boeing) and joined Whirl Wind Propellers full time. Somewhere in there I earned my master's degree in business administration.

We developed our first airboat propeller after numerous people from the airboating community encouraged us to adapt our patented composite aircraft blade for use on airboats. I am so glad we took on the challenge! We had designed some pusher-style propellers 32 Airboating Magazine

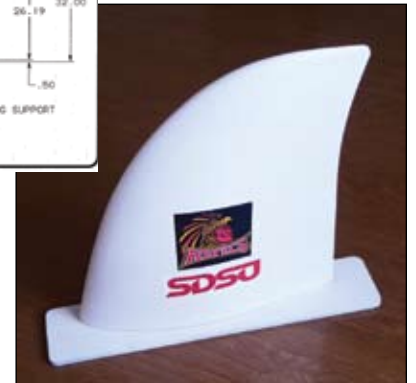
for aircraft, but airboating really requires a whole new approach to blade design for performance. Structurally, our blades have all the advantages of our light, strong, and durable aircraft blades used by professional and recreational pilots around the world. But the blade design itself – things most people really can't see, such as the process for airfoil selection, twist distribution, taper, diameter, width – was completely redeveloped in our engineering process. And this is a never-ending process, as we are constantly evaluating how we can make our designs better for the airboating community.

I never thought the results of a wind tunnel study I did back in 1990 would come to life in our airboat blade designs. I always thought I was headed for the space industry, not propeller design. As my final project to get my engineering degree at San Diego State University, I was required to conduct a wind tunnel study of various wing-tip designs to evaluate the different effects on performance of the wing. We also evaluated some of the NASA propeller swept-blade tip designs used on propeller blades to reduce cabin noise in aircraft – also known as the swept scimitar design.



*Left:
Wind Tunnel Test
Set-up Diagram*

*Right:
Wind Tunnel Model*



Well, as life goes, the things I learned from the wind tunnel testing and studying the NASA designs did not lead me to design the next space shuttle, but they did come to life in our airboat blade, the Whisper Tip.

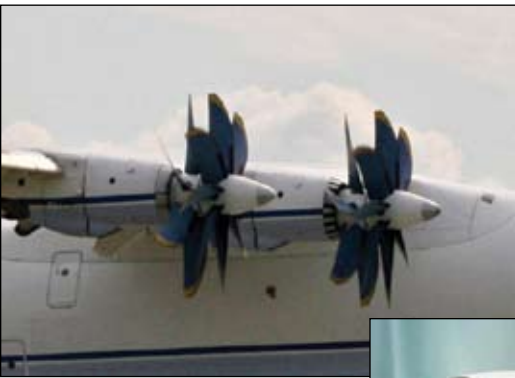
While the design of the Whisper Tip may look similar to other designs on the surface, the engineering is entirely different.

The scimitar swept tip design has been



79" Whisper Tip Propeller

around for years, and was even used on propellers of some World War I fighters. The scimitar design we most often see today is the one studied extensively by NASA in the early 1980s for cabin noise reduction and fuel efficiency when jet fuel prices were going through the roof. The research projects were tabled when jet fuel prices fell at the end of the 1980s. The pictures below look very similar to the Whisper Tip, huh?



*Left:
Progress D27 Propfans
fitted to an Antonov
An-70 ENGINE*



*Right:
NASA / GE
Unducted Fan Engine*

Photo Credit:
NASA Glenn Research
Center (NASA-GRC)

Learn more:

<http://en.wikipedia.org/wiki/Propfan>

The swept scimitar design was a natural fit with the needs of airboats. I knew we had to incorporate what I learned in my wind tunnel test and study of the scimitar design, but I have to admit we were slow to market. Keeping all our engineering, product development and production in-house, we stay very busy. Daily we are working on new designs and production improvements for both our aircraft line and our airboat line. Before designing the Whisper Tip, we were recently preoccupied with developing a super quiet aircraft propeller.

In 2006, we designed an aircraft propeller that won the NASA-sponsored aviation Personal Air Vehicle (PAV) competition in the categories of Lowest Noise and Maximum Speed. And yes, those are typically two diametrically opposed categories. That propeller design was developed in concert with one of the few living propeller experts, published author Jack Norris. The plane's owners also received a \$65,000 cash prize for winning both categories.

To date our airboat propellers operate all over the world (Australia, Brazil, Canada, Finland, Germany, Iraq, Japan, Mexico, Russia, Sweden, Vietnam and, yes, there are even airboats in California). We have proudly supplied the U.S. military, commercial workboats, ice boats, tour boats, rescue boats, police boats, fishing boats, racing boats, and the American family for recreational boats. We have several new designs in the works, including the adaptation of our constant speed hydraulic control aircraft propeller technology to create an "in-flight" adjustable airboat propeller.

I am so glad we have been blessed to join this community of airboaters. I feel more connected to most airboaters than most of my own blood family. I lost my father in 2006, and that was a very hard year for me, but the world did not stop. I was comforted by



David and Dianne Anders, winners of the \$65,000 Noise and Speed Prize, in a highly-modified RV-4, achieved a noise level three times quieter than most small aircraft. That this astonishing feat was accomplished while also flying 192 mph is truly a significant advance in reducing noise. A special, low-noise Whirlwind composite propeller combined with an Ultramet Ceramic Foam muffler were key components of the noise reduction modifications on this RV-4.

Learn More:

<http://cafefoundation.org> and click on "PAV Technology Library" to see the 2007 Results and the Noise Technologies section.

the compassion and understanding of those I knew in the airboating community. While I miss my father terribly, he lives on in my daily life as I remember the lessons he taught me and the principles he instilled in me. He constantly told me I had to give 110 percent to whatever I was working on. There are times I find myself wondering what he would do in a situation, and memories that make me smile in the middle of the day. When we lose a loved one, they live on in the way we approach the world with the incorporation of their life in ours. God is good, even in our bad days, and I am very thankful there is a better day coming when we can be reunited with those we love through Christ.

I really just wanted to reach out and say "Hi" to airboaters who read this, and say thank you for the support and encouragement throughout the years. I am glad I did not end up in the space industry. I hope there are many years to come that I can be a part of this wonderful community. I look forward to your phone calls each day. I can always be reached by phone or e-mail, and I love hearing the stories from the weekend, the ups and downs of life, and meeting new people on the phone. When I'm lucky enough to get out of the office and travel to an airboat show or event, I'm in seventh heaven seeing you in person. ♥



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Photo Credit Sources:

GE Unducted Fan

<http://nix.larc.nasa.gov/info;jsessionid=2jo0nhvj94dev?id=C-1984-05117&orgid=2>

Propfan:

[http://en.wikipedia.org/wiki/File:Progress_D-27_propfan_\(Antonov_An-70\).jpg](http://en.wikipedia.org/wiki/File:Progress_D-27_propfan_(Antonov_An-70).jpg)