New Tech Advisor Don Gutzmer

My Staudacher Shop Experience

By Don Gutzmer

In February 2011, Gougeon Brothers, Inc. hired me as a technical advisor. I graduated from Delta College with an associate's degree in Mechanical Engineering Technology in April 2008. I am privileged to say I have worked alongside a very talented builder over the years. If the name Jon Staudacher sounds familiar, then you probably know of some of the innovative projects he has designed and built—over 100 race boats and more than 30 airplanes, not to mention building his own race car.

I began working at Staudacher Hydroplane in Kawkawlin, Michigan, in 2003 on my time off from school. One of the first projects I was involved with was the Staudacher S600F. Jon was looking to design a monoplane capable of performing aerobatics and also having cross country utility. We started by creating a wood fuselage plug which we used to build fiberglass female molds to build the composite parts for two planes. The finished parts were hand laid with three layers of fiberglass cloth. Jon fabricated the fuselages by tig welding together 4340 chromoly tubing, and I assisted in the build of the wooden wings.

First we built the spar, and then tested it to see if it could withstand a high load without failure. The spar could support the loads because many layers of carbon fiber provided the majority of its strength.

The fuel tanks were built into the leading edge of the wings. We coated the inside of the leading edge with WEST SYSTEM® Epoxy 105/205 and 423 Graphite Powder for a barrier coat to protect the wooden tanks from the fuel. Aviation fuel doesn't have ethanol in it, so there was no worry that the epoxy would break down over time.

The outer skins of the wings were ⅛" Okoume plywood scarffed and glued with WEST SYSTEM 105 Resin/205 Hardener and thickened with 406 Colloidal Silica filler to bridge any gaps. I had the job of rib stitching the fabric onto the tail section of both planes. The fabric on the fuselage and tail section needed to be stitched onto the plane so all the stress exerted onto the plane wouldn't tear the fabric away.

The planes were powered with a 300 hp Lycoming engine and the total empty weight was 1,380 lb. After both projects were completed Jon offered to give me a ride in the plane in the photo above. I was amazed how responsive the plane was when moving the stick back and forth; I have to say I probably will never forget the experience. It took just under one year from the time the wood plug was built to complete both planes.

Over the years I helped Jon build and repair 2.5 liter hydroplanes. The race boats we built were all wood construction, and the wood worked well to maximize the strength-to-weight ratio. Jon designed his new 2.5 liter hull to have a low center of gravity by keeping the engine and driver position low to contribute to a low propeller shaft angle, which in turn made the boat more aerodynamic. The design has three sponsons, and one advantage of the center sponson was to keep the driver lower in the boat.

Jon started this project by lofting the boat full scale. I helped cut all the wood patterns needed to frame the hull, and then we built a jig to mock the boat up on. The boats were built upside down, and then turned over to skin the top side. We used ⅜" Okoume plywood for the bottoms and ⅛" for the top skins. The entire boat was held together with WEST SYSTEM 105 Resin/205 Hardener and 406 Colloidal Silica filler was used to thicken the epoxy. The filler was versatile enough to use for the entire project.

It took roughly 10 weeks to build a new hull. I assisted with all the phases, from gluing the frames to spraying the final clear finish. The only thing I didn't help with was the design.

Working for Jon was a great experience. I am grateful for the many things I learned from him through the years. I look forward to applying what I learned from hands-on building experience and from my college education, when advising individuals using WEST SYSTEM Epoxy in many different building and repair projects. ■

