Sawtooth Outdoor Products: An Entrepreneurial Calling

Photo: myrockymountainpark.com

Dan Ady didn't start out wanting to *make* a better elk bugle; he just *wanted* a better elk bugle. Nothing on the market mimicked the true elk sound he was hearing in the mountains, which got him wondering just how that sound is made in a bugle. After nine patents, seven successful products, and an eighth product about to hit the market, Dan knows a lot about mouthpieces, bugle contouring, air flow dynamics, and vortices, thanks to his countless hours of experimentation and up-close field testing in elk country.

Background

Dan introduced elk bugle calls to the market in 1995 when he developed an early-rut bugle and patented the design. When he approached Montana-based equipment distributor E.L.K. Inc., they were interested but less than impressed with his model made out of pliable plastic that he heated up and contoured with his thumb. "They were blown away by the sound," Dan recalls, "but my plastic model didn't look like anything they'd want to take to market." Dan went to a local machine shop and they turned his drawing into a better prototype on their CNC machines. That got E.L.K. Inc.'s full attention, and Dan's *Power Bugle* was launched.

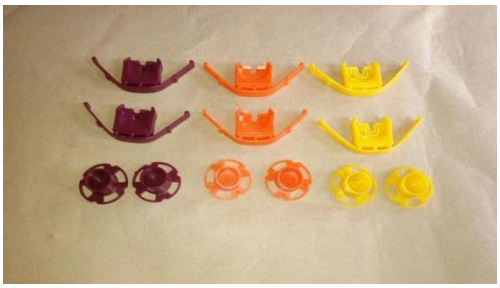
When Dan got the idea for a second bugle to mimic the mid-rut sound, he was more directly involved in machining the prototype. E.L.K. Inc purchased the *Royal Bugle* as well, and took it to market in 2007.

3D Printed Prototyping

In 2014, Dan started working on the late-rut bugle and formed Sawtooth Outdoor Products shortly thereafter. This bugle is more complex with subtle features to the mouthpiece, baffle,

and tube to achieve the unique sound of a bull elk who has spent the season bugling and fighting. Creating a prototype that captured just the right deep and raspy tone turned out to be challenging. "First we tried 3D printing the model with my filament printer, but the surface quality was poor and the mouthpiece just wasn't right. The machined-version was only a little better, and we were at a bit of a loss as to how to create this prototype." A friend happened to read a newspaper article in early 2015 about a newly-launched 3D printing company in Boise, and he and Dan paid Intermountain 3D a visit.

"Dan was one of our first customers," said Brian Hoffmann, president of Intermountain 3D, "and we are grateful that we got to try out our 3D printing skills with an innovator like him. He tested out every service we offered, and some we created because we learned from him what was valuable."



Mouthpieces and baffles

"Not only was I creating a brand-new mouthpiece for the late-rut and modifying the early- and mid-season pieces, but I also made them all able to mimic cow elk," Dan explained. "The complexity of the project was at times overwhelming." Over the next several months, Intermountain 3D printed over 100 different mouthpieces representing countless design modifications. "I knew in my mind how these bugles should sound, and I really needed the iterative 3D prototyping process to get there," says Dan. "One thousandth of an inch in the contour makes a huge difference in sound."

After seeing the high quality results, Dan realized that he could use 3D printing for his bugle tube, as well; however, he first needed a proof-of-concept model. "I had been searching for just the right tube shape and had tried out all kinds of tubes. One day, I saw this old vacuum cleaner attachment and inserted the mouthpiece into it just for fun—it was great!" laughs Dan. With the basic external shape in mind, Dan developed the internal airflow system that is critical to sound production.

Reverse Engineering

Intermountain 3D printed several bugle tube prototypes and, once Dan determined he had the correct design, his wife Laurie stepped in to create the look and feel of the tube. With her artistic eye and skill, she textured the tube to give it the appearance of an elk antler. The texture was critical to the final design and had to be incorporated into the CAD drawing for final production. Jesse Helms, service bureau lead for

Production Bugle Tubes

Intermountain 3D, took on the challenge of reverse engineering the prototype using advanced Geomagic 3D blue light scanning and software. "Because we had printed the prototype in the first place," explains Jesse, "we had the overall design. But in order to represent Laurie's skin design, we had to scan in her prototype and ensure we captured all the fine details of her texturing."

Other parts of the assembly were also designed and prototyped. In the end Dan had three distinct mouthpieces, a baffle insert, a tower, a bugle tube, and a cap and holder in final form to take to production. E.L.K. Inc. couldn't be happier with the end result and will shortly announce distribution plans for the *Lil' Big Horn* with several major sporting goods retailers.

Lil' Big Horn from E.L.K. Inc

Intermountain 3D and Dan both say they had a great learning experience, and a lot of fun along the way. "Our neighbors must have really wondered what this new business was when Dan came in weekly to test out his bugles," chuckles Brian, "but we looked forward to hearing his new sounds." If you notice some elk footprints outside Intermountain 3D's window one day, you'll know Dan's working on another new idea!