

FAB\$ and LABS

Ultra-Low Phase Noise is Their Business at Holzworth



In 2004, Holzworth Instrumentation was born as a one person, 200 sq. ft. garage shop in Boulder, Colo. At that time, Jason Breitbarth, now president and CTO, was in the conceptual phase of creating something that would change the face of test & measurement equipment with a specific focus on phase noise analysis. Breitbarth was well versed in the challenges of making valid phase noise measurements using the limited number of high cost test set options that were then available for measuring phase noise at the time. In 2007, he teamed up with Joe Koebel, VP business development, and Leyla Bly, director of interface development, to help the company expand and refine the designs for production.

During the early development of Holzworth's first phase noise test set, the architecture needed a compact, broadband RF synthesizer module for use as a tunable LO within the analyzer. This RF synthesizer needed to have excellent phase noise and spectral performance. With no viable solutions available on the general market, Holzworth needed to do their own design. This early RF synthesizer requirement helped shape the company into what it is today, a well-known provider of innovative product solutions primarily in phase noise analysis and RF synthesis. The company now supplies phase noise analyzers, RF synthesizer modules, multi-channel phase coherent RF synthesizers, low noise amplifiers, mixers/phase detectors, power splitters, frequency dividers, frequency multipliers and electronic phase shifters.

Holzworth's manufacturing facility was setup to handle high volume throughput from original conception, to the current 6,000 sq. ft. facility. The founders knew that

long term growth and overall success would depend on establishing a low overhead manufacturing environment that could support high volume. Therefore, an automated test equipment (ATE) approach was adopted early on. By fully automating manufacturing processes from initial PCB turn on and burn-in, through full production testing, it allowed for the original staff of less than five employees then to focus on product design, rather than spending time on manual production test operations. The founders knew that if the big semiconductor manufacturers could handle volumes that can instantaneously increase by millions of any given chipset, it would have to work equally as well for a test equipment manufacturer.

Holzworth manufacturing relies heavily on U.S.-based, ISO certified contract manufacturers to build most of their PCBs, but does all of the integration, test and calibration at its factory in Boulder to ensure high quality. It is ultimately the dedication and skill set of both the Holzworth engineering and manufacturing teams that have created the level of success that Holzworth realizes today. The factory staff is 100 percent responsible for correcting any errors made by a contract manufacturer as well as the rapid prototyping of new designs. The ability to place 01005 sized SMT components as well as placing and reworking large BGA array assemblies in house with > 95 percent yields are just a few examples of the critical skills necessary for product development as well as maintaining timely customer shipments.

Holzworth's tag line is "Ultra-Low Phase Noise is Our Business," but the ability to manage high throughput manufacturing for timely delivery of high performance and highly reliable products is critical.

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