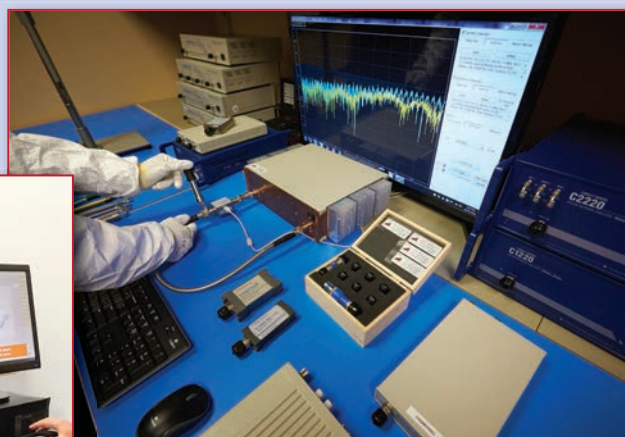
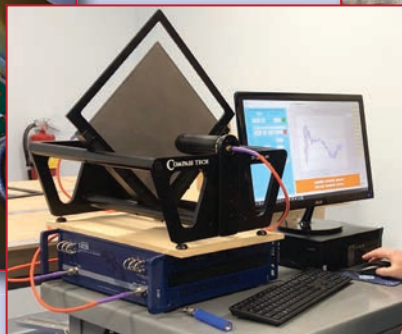
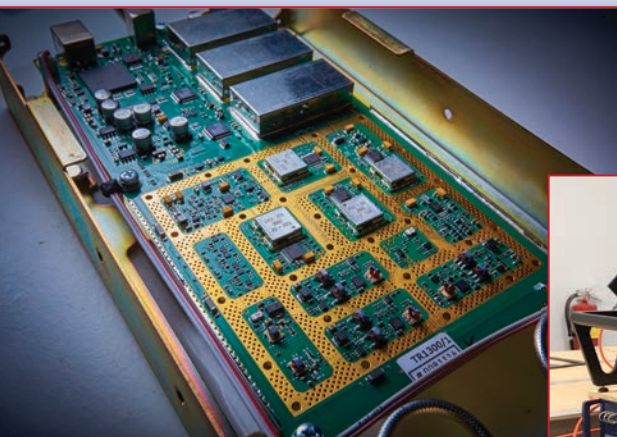


# FAB S and LAB S

## Copper Mountain Technologies — Affordable, Metrology-Grade VNAs



Frustration and insight led to the birth of Copper Mountain Technologies (CMT). Three of the founders were “heavy” VNA users, frustrated that VNAs were expensive, so expensive they had to be shared among projects, if not by an entire company. With so many users, no one could be sure the equipment was being carefully protected and maintained, essential for accurate data. At some point these frustrated engineers asked, “Can’t we just build our own VNA?”

While pursuing this DIY project, they realized there must be an untapped market of frustrated engineers who needed an affordable instrument to make accurate S-parameter measurements. Their next insight was recognizing the life of microwave hardware is far longer than the currency of a computer. All commercial VNAs at the time had embedded computers and no way to upgrade without buying a new expensive VNA. So, the VNA would come with software but no computer, to avoid being locked into an obsolete processor. That same choice to separate the computer from the measurement hardware would enable the VNA to be small, even portable, and eliminating possible PC and peripheral failures would yield a lower lifetime cost.

The third insight the founders had was recognizing that a small upstart entering an industry dominated by large, established players needs instant credibility. In test and measurement, that means metrology: the new company’s equipment and measurements must be traceable to national standards, so users have no doubt about the quality of the measurements.

From the founders’ initial frustrations and subsequent insights, Copper Mountain Technologies was officially born in 2011, introducing the first low cost, metrology-grade, USB VNA. The company now offers more than 30 models with frequency coverage to 110 GHz — above 300 GHz using third-party extenders.

CMT is devoted to accurate measurements and the engineering precision required to achieve them. With a VNA, this is determined by the directional coupler, mixer, frequency source and step attenuator. Digital interfaces and basic measurement software complement the RF/microwave hardware, simplifying the measurement complexity for the user. Users can develop custom test routines in many languages, controlling the VNA with SCPI commands.

Building on a strong design foundation, CMT has a staff of five metrologists to assure the measurement quality of its VNAs. The company is accredited to the ISO/IEC 17025 standard for testing and calibration laboratories and has been certified by the National Institute of Standards and Technology (NIST) and the International Laboratory Accreditation Cooperation (ILAC).

You might think a low cost VNA offering high measurement quality would be sufficient. For CMT, that’s just a start, seeing itself as an extension of the customer, its lab an extension of the customer’s lab. CMT provides a measurement solution, not a product, and the team is not satisfied until the customer’s measurement needs are met — even modifying equipment to support unique requirements when required. Thousands of VNAs have been shipped to global customers, quite a few to customers CMT assisted in developing a whole test solution.

During the almost 10 years since introducing that first USB VNA, CMT has grown to some 65 on staff — and growing — with headquarters in Indianapolis and a large development team based in the Ural Mountains of Russia, near The Copper Mountain, the oldest mine in the Urals. Customer feedback clearly shows the company is succeeding: meeting a market need for affordable, accurate vector measurements across the RF to mmWave spectrum.

[www.coppermountaintech.com](http://www.coppermountaintech.com)