

# ANTENNA CONSULTANT BOOSTS MEASUREMENT CAPACITY WITH COMPACT VNA

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## Case Study: Antenna Consultant Boosts Measurement Capacity with Compact

Tim Milam has been the owner/operator of Custom Integrated Antennas (CIA) for 20 years. Using [CMT's S5085 2-Port 8.5 GHz Compact VNA](#), Tim was able to upgrade CIA's lab with quality performance that meets their ever-evolving client requirements at an affordable cost. Tim was immediately impressed with the capabilities of the S5085 and saved valuable time pulling measurement data with the help of Copper Mountain Technologies' technical support, demonstrating the value of a VNA solution that goes Beyond the Box™. Custom Integrated Antenna's applications for the S5085 range from impedance measurements, (Smith Chart, return loss, and VSWR) to antenna radiation pattern measurements using his onsite anechoic antenna measurement chamber, as well as various other 2-port measurements.

[Custom Integrated Antennas \(CIA\)](#) is a sole proprietorship currently based out of Johnson County Kentucky, specializing in antenna design and integration for small wearable, handheld, and otherwise portable wireless products. CIA's custom antenna technology has been integrated into notebook computers, various headset/ear bud configurations, specialized industrial grade wearable computing systems, IoT sensors, security systems, and much more.

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Tim Milam, Custom Integrated Antennas

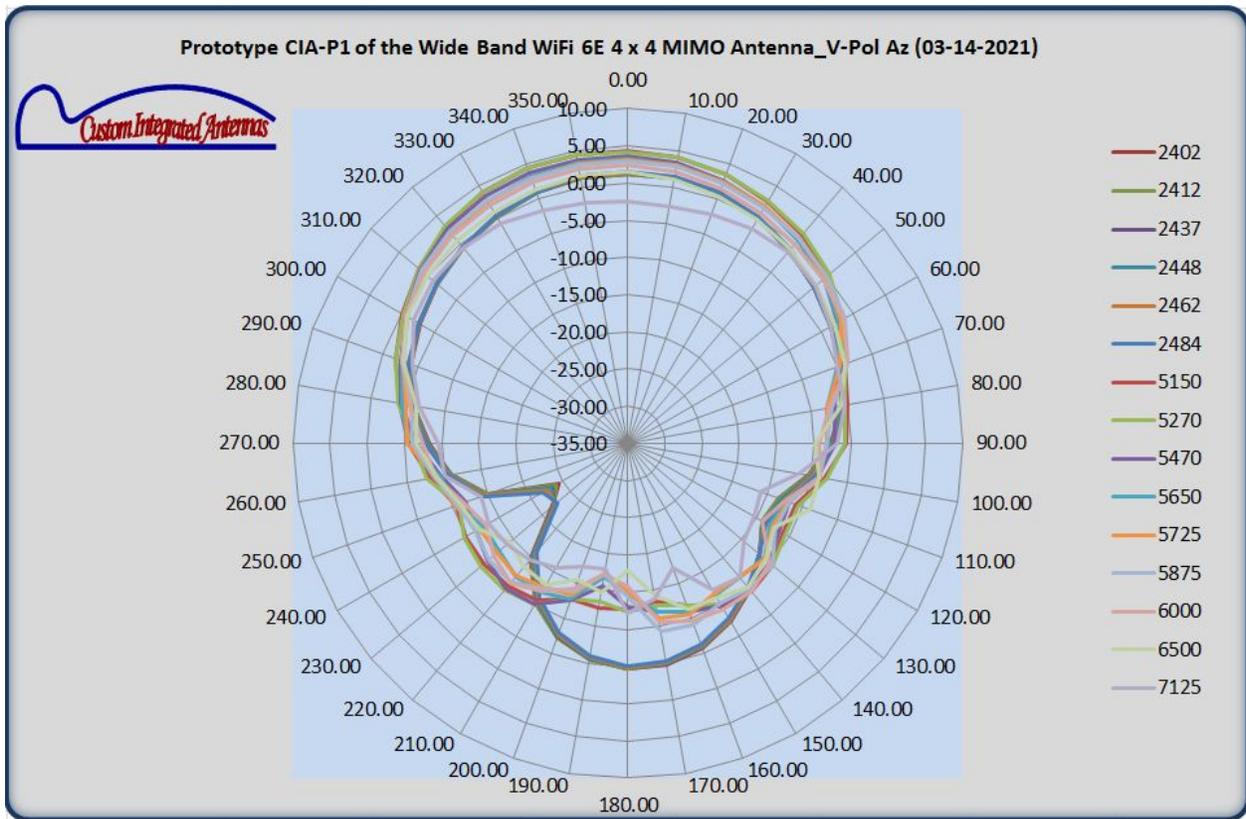


*Image #1: S5085 in use beside the Lab Bench station in the CIA Antenna Lab*

Tim has over 27 years of experience with small internal antenna design and integration, including six years of employment in deeply rooted wireless technology companies, where the foundation of his expertise developed. He founded Custom Integrated Antennas in 2001. CIA has a well outfitted engineering lab including a fully anechoic antenna measurement chamber with a 350 MHz to 8.5 GHz measurement span. Over the years, Milam has worked with a diverse range of clients from major industry players like Motorola, Dell, Intel, and Honeywell to various startups, product developers, and smaller companies like his own. CIA has traditionally done a lot of work with WiFi, Bluetooth, LTE, and various proprietary wireless technologies up to the 6 GHz frequency range. However, recent developments with the Wi-Fi 6E standard have created a new need for CIA. Wi-Fi 6E utilizes frequencies beyond 6 GHz and has increased bandwidth over legacy WiFi, creating a new standard for Wi-Fi throughput performance.

These Wi-Fi 6E developments and a dissatisfaction with other VNA solutions on the market led Milam to Copper Mountain Technologies, where he identified CMT's S5085 VNA as the best solution to satisfy his evolving antenna test requirements. "The performance specifications beat anything else I saw on the market," Milam stated. "The time domain measurement (TDR) and gating features that are included in the software were appealing," Milam continued. "Gating allows me to gate out reflections which many other instruments can't do, and the TDR allows me to keep a close check on my test setups, to detect possible cabling or connector issues as they arise."

In addition to the enhanced capabilities provided by the 2-port VNA, Tim has also been impressed with the support from Copper Mountain Technologies. “The technical support has been absolutely outstanding,” remarked Milam. “They were anxious to help in any way to smooth the transition to new equipment. As a small operation I rarely see that kind of responsiveness.” Milam was looking for a way to make data collection more automated, so the automation capabilities of the CMT VNA have proven especially beneficial to CIA. “The CMT team worked with me closely to automate data collection with the S5085. I am not a software engineer, so their help in this area was vital and has led to substantial time savings for the antenna pattern measurement process.”



*Image #2: Automated polar plot of the azimuth cut of one of the 4 antennas included as one element of a WiFi 6E 4x4 MIMO array inside the client’s product.*

For small operations like Custom Integrated Antennas, the ability to find affordable test equipment without sacrificing performance is crucial. Having an expert team of engineers at your disposal to provide general support, resolve complicated technical issues, or deliver automation scripts tailored to your specific needs also makes a tremendous impact for companies like CIA. Despite being a new CMT equipment user,

Tim has already become a proponent of the combination of price, performance, and support offered by CMT. “The software is easy to use and the S5085 has more capability than any other VNA I’ve ever used, including some of the big-name equipment” said Milam. “And the price point is very good compared to what is available on the market today.”