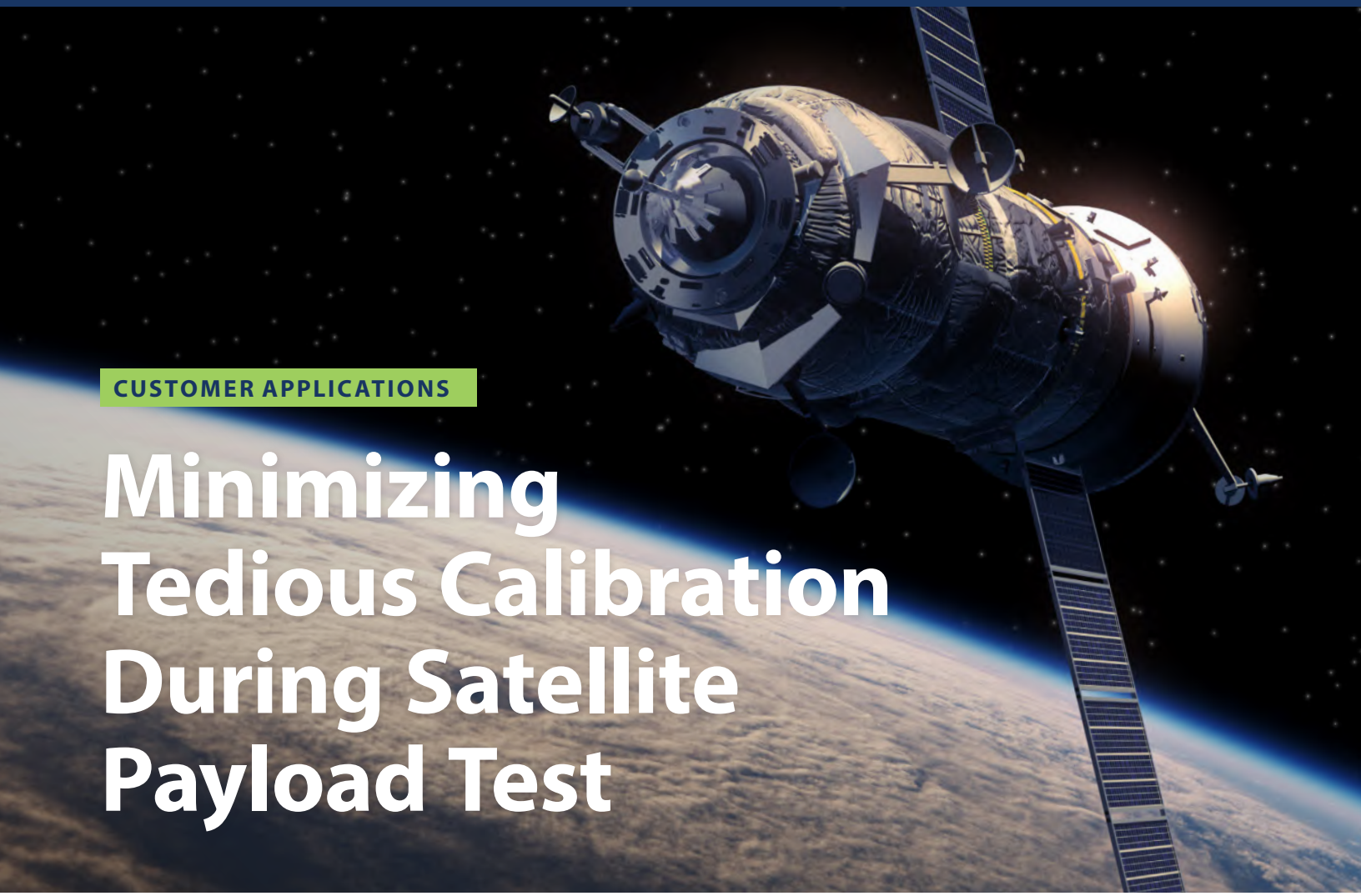
Spectrum Defender®



CUSTOMER APPLICATIONS

Minimizing Tedious Calibration During Satellite Payload Test

A MAJOR DEFENSE PRIME designed a national security satellite payload requiring precise calibration. Accurate, multi-channel RF phase alignment was essential to meet operational goals.

A team of highly-skilled engineers was working against the tight deadline of a rocket launch. They needed a turn-key, ready-to-use instrument that would not waste time on frequent recalibration.

Problem Background

The defense prime built a satellite payload valued at billions of dollars for national security purposes. It was impossible to make repairs once the satellite was launched, so the test phase needed to be accurate, reliable and conclusive.

Key Engineering Requirements

The team of engineers determined the **four most critical factors** to meet for a successful mission.

1 – Extremely tight phase coherence across all system channels (+/- 0.5 degrees at RF frequencies).

2 – Arbitrary waveforms with unlimited complexity and long duration.

3 – Minimal need for recalibration in the field.

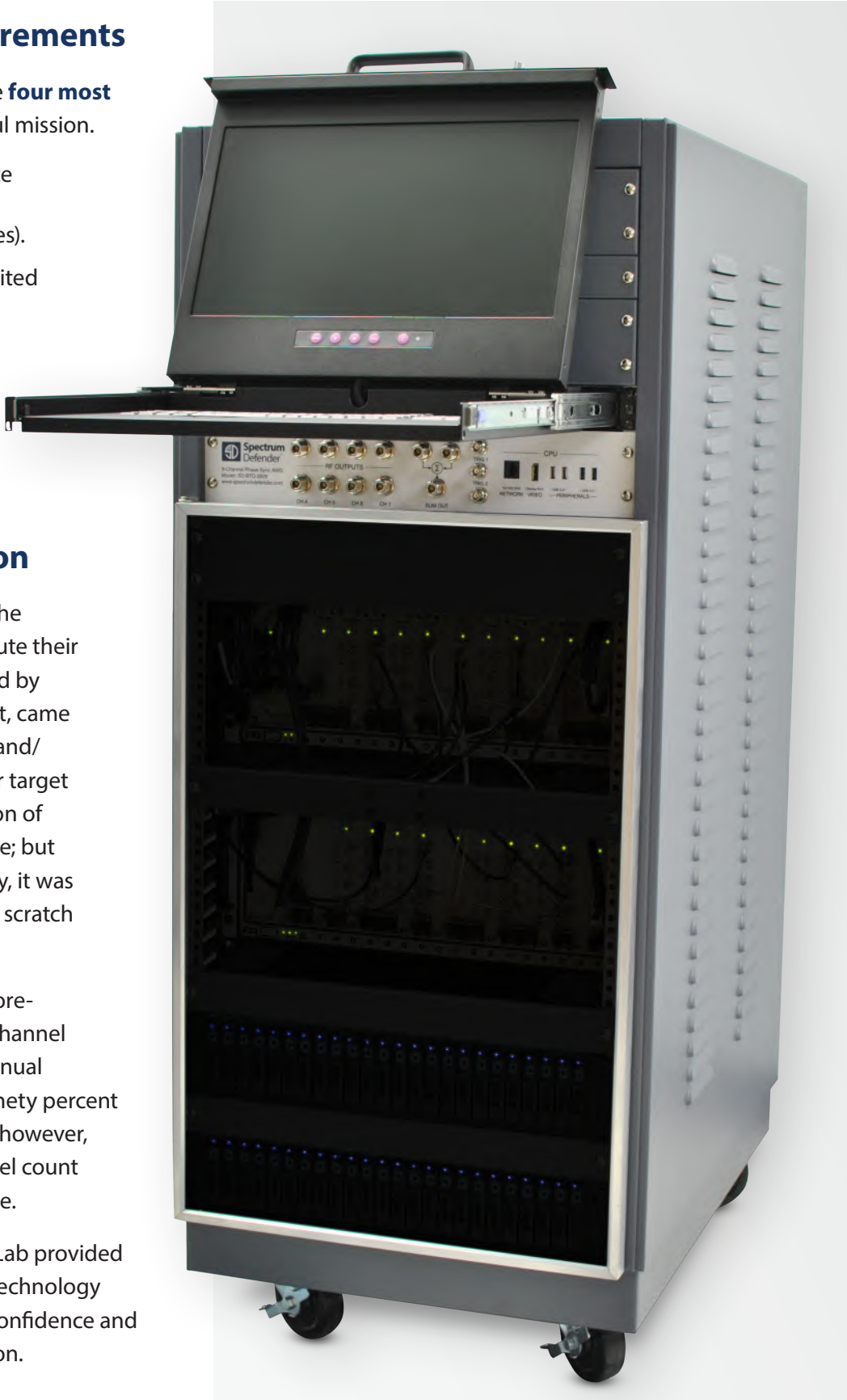
4 – Calibration that holds across power cycles, reboots and extended time periods.

Discovering the Solution

The engineers at the prime surveyed the market for the test instrument to execute their critical mission. The solutions proposed by other vendors were either over-budget, came with an unacceptably long lead-time, and/or the requirements did not meet their target specifications. They explored the option of building their own instrument in-house; but time was of the essence and, ultimately, it was decided that creating something from scratch wasn't the best use of resources.

Finally, the defense prime found the core-technology they needed to do multi-channel phase coherent streaming without manual calibration in Spectrum Defender®. Ninety percent of the solution existed in the product; however, the satellite required a different channel count and a different remote control interface.

During the evaluation phase, Spectra Lab provided an on-site demonstration of the core technology which allowed the engineers to gain confidence and understanding of the proposed solution.



MODEL SD-BTO-3829

More Testing, Less Time Calibrating

Spectra Lab took this base solution and made slight modifications to deliver the exact fit the defense prime needed for their application. This eight channel, phase coherent RF player reproduced arbitrary waveforms with unlimited complexity and durations extending into hours or days without ongoing, manual calibration.

Spectrum Defender leveraged National Instruments NI-TCLK technology to synchronize and align RF output channels 1-8 to a common reference. This was accomplished by sharing Local Oscillators (LO's), sample clocks, and start triggers across every channel. The NI-TCLK technology ensured that trigger metastability issues did not arise, and that every trigger resulted in precisely aligned RF output signals. Spectra Lab also implemented a multi-dimensional, nonvolatile calibration table that allowed the system to cycle through multiple center frequencies without recalibration. This combination of NI-TCLK technology and multi-dimensional calibration was stable across system reboots, power cycles, and long periods of time.

The instrument was ready to use the moment it was delivered to the major defense prime. As the date of the rocket launch approached, the team of engineers was freed up to focus on execution of their mission.

The required tests were completed successfully without the need for continual calibrations.

Throughout the mission, Spectra Lab remained available for training and support, if needed. The defense prime is currently looking to incorporate Spectrum Defender into future test programs.

Find Your Multi-Channel Calibration Solution

Spectra Lab designs instruments with multi-channel RF signal acquisition and reproduction functionality. Our typical customer has a specialized test need which cannot be met by conventional RF instruments.

Spectrum Defender belongs to a new class of instrumentation compared to legacy RF signal generators. We have an existing platform, an existing code base, that's uniquely designed for simple adaptations and modifications. Without the risks associated with a full-custom design, we deliver an exact fit for your application.

Contact our experienced engineering team at **703-634-5290** to tell us about your calibration challenge. **We're here to help design the time-saving solution you need so you can just start testing.**

Spectrum Defender®

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