Wireless Telecom Group

25 Eastmans Road
Parsippany, NJ 07054 USA

T&M Satellite Solutions
Demo 1: Amplifier Noise Tolerance

Product Demo:

The demonstration begins with the Boonton SGX1000 Series RF Signal Generator, which is used to produce a low phase noise signal. This signal is fed into the Noisecom UFX7000B Programmable Noise Generator to introduce additive white Gaussian Noise (AWGN) onto the carrier. Noise levels can be manipulated and changed to create custom noise signals for specific testing needs, simulating real-world interference.

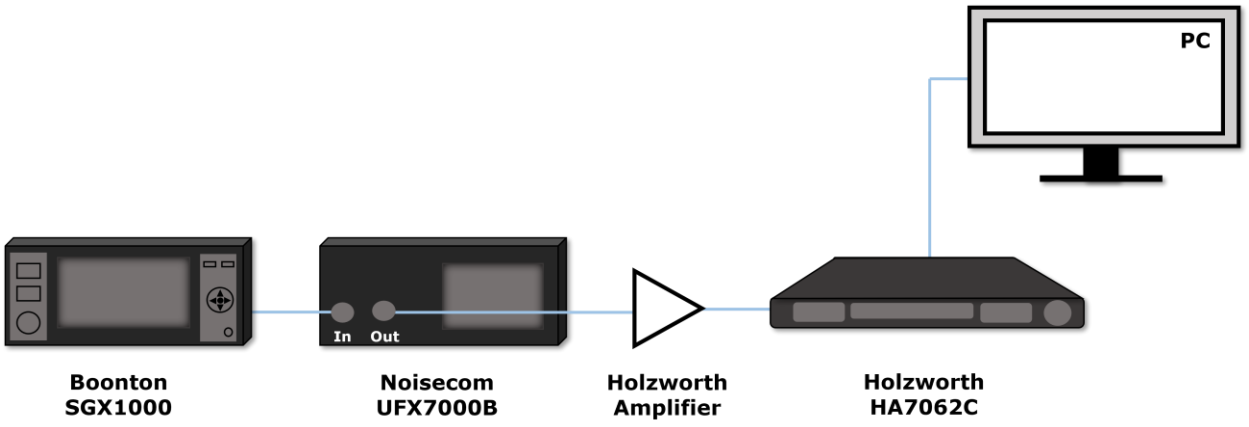
The output from the UFX7000B (carrier signal plus noise) then passes through a Holzworth amplifier, which is the device under test (DUT) for this demonstration. High power amplifiers (HPA) and low noise amplifiers (LNA) used to transmit and receive signals in satellite systems must perform at a high standard to maintain the integrity of the communications channel. Noise generation enables designers to quantify amplifier performance and gain a critical understanding of its noise tolerance capabilities.

Phase noise analysis is performed on the amplifier using the Holzworth HA7062C Real-Time Phase Noise Analyzer. Phase noise in satellite networks can threaten signal integrity and cause a spike in error rates along the communications pathway. Results from this demonstration are displayed on a PC.

Target Users:

Target users include design engineers, network developers, satellite communications providers, and government entities.

Test Setup:



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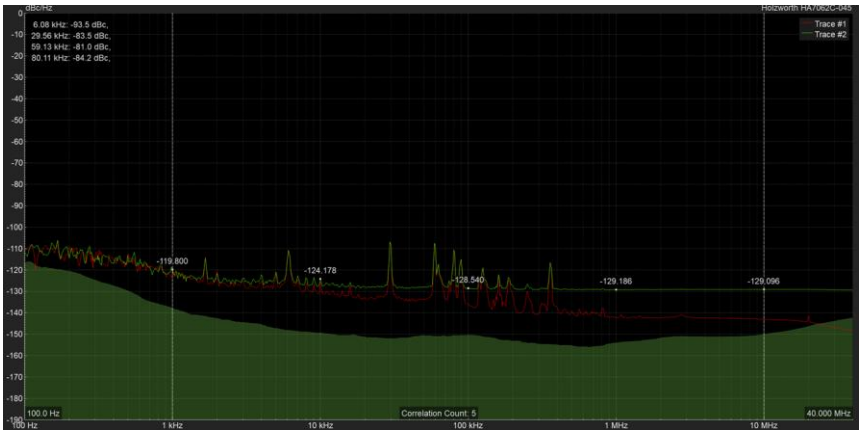
Results:



Red trace: SGX1000 Series output (1 GHz at +3.0 dBm), HA7062C measures 97 fsec jitter. Green trace: SGX1000 Series output combined with 30 dB AWGN, jitter measurement is 260 fsec. Phase noise changes as AWGN increases on the signal, creating jitter and timing problems.

About the Boonton SGX1000 Series:

The Boonton SGX1000 Series RF Signal Generator offers high-performance signal generation with an easy-to-use interface in a compact form factor. The SGX1000 utilizes a proprietary blend of direct digital and direct analog synthesis to provide ultra-fine frequency resolution, lightning-fast frequency switching, ultra-low phase noise and jitter, and superior reliability.

About the Noisecom UFX7000B:

The Noisecom UFX7000B Programmable Noise Generator has a powerful single board computer with a flexible architecture used to create complex custom noise signals for advanced test systems. Precision components provide high output power with superior flatness, and the flexible architecture allows control of multiple attenuators, switches, and filter banks.

About the Holzworth HA7062C:

Holzworth Phase Noise Analyzers utilize real-time, dual core engines for cross correlation speed, which are coupled with a pair of high performance internal LOs from Holzworth HSX Series RF Synthesizers. The reconfigurable front panel enables additional feature sets and customized measurement setups, including noise floor measurement capability of the analyzer.

More Resources:

Visit info.wtcom.com/satellite-2022 to learn more about T&M solutions for satellite communications from Boonton, Holzworth, and Noisecom.