Interference Modeling and Simulation

CAST NAVIGATION

Dynamic GNSS/INS Simulation Systems

Emulate Interference Conditions and Threats

The CAST Navigation Jammers are designed to facilitate and support the testing, verification, and integration of single element Fixed Reception Pattern Antenna (FRPA) systems as well as multiple-element anti-jam antenna sub-systems such as Controlled Reception Pattern Antennas (CRPAs). These systems are an ideal solution for military and commercial laboratories where interference signal capability is required. CAST Jammer sub-systems provide precisely controlled signals for use in most types of GNSS testing applications. These testing applications can emulate interference conditions and threats that can occur in both urban and hostile environments.

CAST interference generation systems let users define and control multiple interference parameters, including output signal waveform types, output power level, jammer signal source location, speed, heading and motion. Each of the individual jammers can also be programmed to turn on or off (pop-up) during the execution of a scenario. The systems can support up to 8 individual antenna output elements, with each individual antenna output element programmable to generate interference signals from different locations and different power levels.

System Features

- Control multiple interference parameters including jammer location, speed, heading, motion, output signal waveform types and power levels
- Waveforms are created using CAST proprietary FPGA technology, producing a clean waveform with high output power and very low intermodulation noise
- Each output element can be programmed to generate interference signals from several different locations and at different power-levels
- Ideal solution for military and commercial laboratories where an interference signal capability is desired

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System Specifications

Output Frequency Bands L1, L2, L5

Jammer Vehicle Dynamics

Velocity:	1000 m/s
Acceleration:	+/- 150,000 m/s^2
Jerk:	+/- 150,000 m/s^3

Signal Level

Jammer Signal Range:	173dB
Jammer Signal Level:	-203dBW to -30dBW

Signal Accuracy

Pseudorange:	1 mm
Pseudorange:	Rate 1 mm/s
Delta Pseudorange:	1 mm
Interchannel Bias:	< 1 mm
Uncontrolled Bias:	< 1 mm
Bias Repeatability (initial):	< 1 mm
Bias Stability (operational):	< 1 mm

Modes of Operation

CW

Pulsed CW:

Rate: 0.01Hz-100KHz

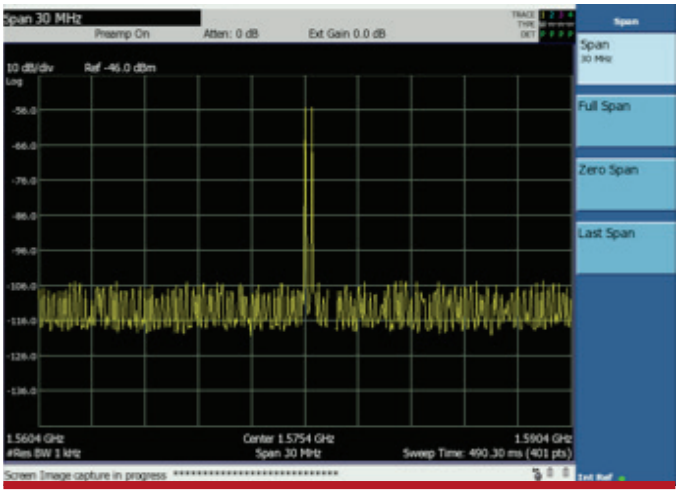
Swept CW:

Rate: 0.01Hz-100KHz, Duty Cycle 1%-99%

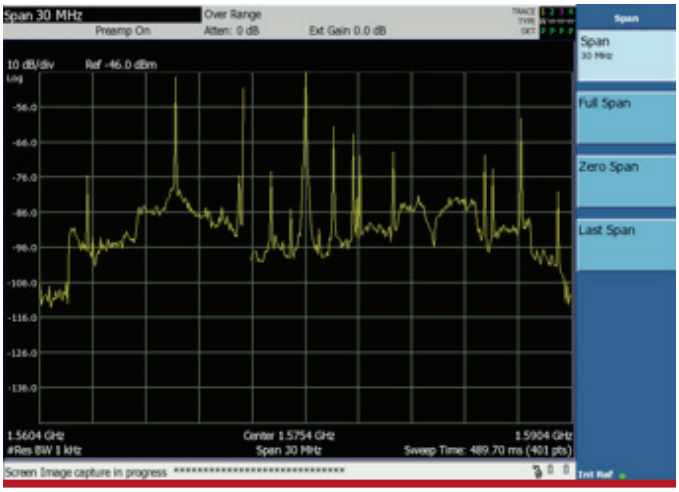
Swept CW:

Sweep Types: Sinusoid, Triangle, Ramp Up/Down

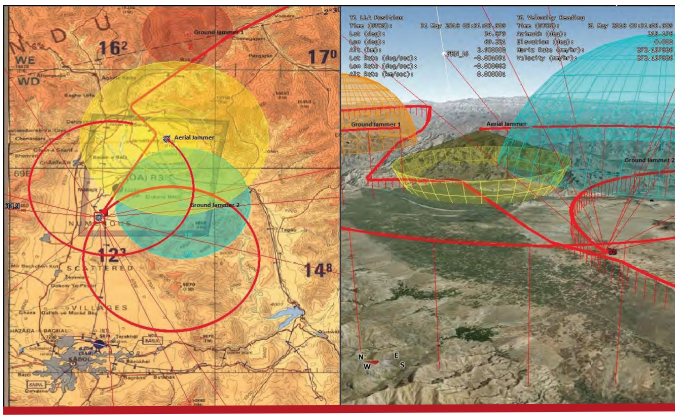
Swept CW:	Bandwidth: 0.01Hz – 24 MHz
FM Noise:	Bandwidth: 0.00Hz – 20MHz
WB Noise:	Bandwidth: 24MHz
Binary Phase Shift Key:	Bandwidth 24MHz



Example of CAST Dual CW Tone Waveform.



Example of Commercial CW Tone.



Simulation sample trajectory with range spheres.

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