BroadSim Wavefront
Software-Defined CRPA Simulation System

A Powerful and Proven Platform
Protecting your GNSS systems from jamming and spoofing is more critical now than ever before. Leveraging the same proven software-defined architecture as our BroadSim platform, Orolia Defense & Security developed BroadSim Wavefront to enable easier and more affordable CRPA receiver testing.

Why Develop a New Wavefront Simulator?
• High-end PNT systems are using AJAS - very few Wavefront simulators exist
• Existing simulators are not prepared to adapt to future needs (Alternate PNT signals and sensors)
• Jamming/spoofing is often not a part of the solution - the user must integrate additional hardware
• Scenario creation is complicated and limited - requiring trained, expert PNT engineers

Pictured Above: 7-Element BroadSim Wavefront System
### STATUS QUO
- Calibration takes hours/days and is not automated
- Physically large and not scalable
- Custom one-off solutions
- Limited or no API control
- Limited spoofing and repeating capabilities

### WITH BROADSIM WAVEFRONT
- Automated calibration process takes minutes!
- Commercially available and scalable
- Easy to use and calibrate
- Robust API: C++, C#, and Python
- Jamming, spoofing, and repeating

#### Scalability
- 4 to 16 tri frequency antenna elements
- 4 outputs / element (Ex. GNSS L1/L2, Interference L1/L2 - enables higher dynamic range)

#### Software-Defined System
- IQ generated in GPU not FPGA
- RF generated in SDR (Software-Defined Radio)
- Flexible, affordable, scalable
- Rapid development cycles

#### Operational Features
- 1,000 Hz iteration rate
- Simulate 600+ signals/element
- Space simulation: LEO and GEO
- Multipath (3 echo's/PRN/Code)
- PXE (pixie) system architecture - single computer operation

#### Continuous phase calibration
- Real-time automated calibration
- Phase Offset: ±1° 1σ

#### Automatically Calculate
- Propagation delays
- Doppler shift due to dynamics
- Power loss

#### GNSS Simulation – 1000 Hz
- GPS C/A, L1C, L2C, L5, P, Y, AES-M, MNSA
- GLONASS G1 and G2
- Galileo E1, E5a and E5b
- BeiDou B1 and B2
- SBAS L1 and L5

#### Interference
- Integrated into the software (GUI and API)
- Simultaneously simulate multiple threats
- Dynamic transmitters, user-defined waveforms
- Jamming, spoofing, repeating

#### Choose and Control
- Interference location and trajectory
- Antenna locations, pattern and orientation

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