Implementing Unitary Braid Division Multiplexing (UBDM) on a SATCOM Waveform
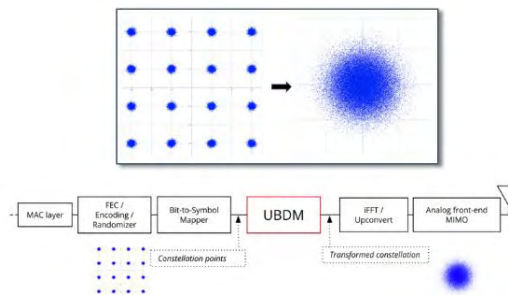
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THE CHALLENGE

With the growing sophistication of U.S. military adversaries and increasingly congested RF environments, the need for secure SATCOM for the warfighter has never been more acute. The waveforms used for communication today are susceptible to detection, analysis, exploitation, and classification by expert signal identification systems.

The Navy needs waveforms that address these threats without compromising reliability, throughput or performance. Methods for addressing this need with a low-cost solution that can be paired with existing communications systems are necessary to rapidly deploy these capabilities to the warfighter.

THE INNOVATION

Bascom Hunter Technologies, along with Rampart Communications, has proposed a solution to this problem using a novel technology referred to as Unitary Braid Division Multiplexing (UBDM) 2.0. UBDM is a software/firmware solution that takes baseband IQ and makes it difficult to detect and intercept.

THE NAVY BENEFIT

UBDM 2.0 addresses the critical need to secure communications and protect our forces from compromise. Bascom and Rampart have partnered with the Navy to socialize and demonstrate UBDM 2.0 in Software Defined Radios (SDRs), while Phase II efforts will include implementation of UBDM 2.0 into Field Programmable Gate Array (FPGA)-based radio transmitters with Hardware Description Language (HDL). Designing and developing the UBDM 2.0 for FPGAs will increase performance and decrease the space and power required for securing communications.

THE FUTURE

The next steps will be to develop UBDM for broader application with improved performance. Bascom and Rampart plan to fully productize UBDM 2.0 for use with existing modems and provide a 3U VPX, HOST compliant digital modem solution that houses UBDM 2.0. The integration of UBDM 2.0 with commercial modems will provide access to the public and private sectors while a VPX solution will allow for ruggedized applications in aerospace and defense.