



## **Hypres, ViaSat and SPAWAR Systems Center Pacific Demonstrate Industry's First All-Digital Multi-Net Link-16 Receiver**

**Elmsford, New York (April 13, 2009)**— Hypres Inc., developer of the Digital-RF™ product line, with support from Space and Naval Warfare Systems Center Pacific (SSC Pacific) and ViaSat, recently demonstrated the industry's first all-digital Link-16 multi-net receiver prototype. This was the culmination of a multi-year development by the two companies sponsored by the Office of Naval Research, Washington, D.C., and Space and Naval Warfare Systems Command, PMW-150.

The receiver simultaneously digitized signals from two Link-16 radios operating on two independent Link-16 networks. The project was undertaken as part of a joint effort by the United States Navy and United States Air Force to develop innovative concurrent multi-netting solutions.

Digital-RF™ technology makes simultaneous, multi-net Link-16 reception in a single terminal feasible with a new technique called “digital de-hopping.” Current analog receiver designs are limited in their ability to provide the simultaneous high speed frequency hopping needed for multi-net operations.

“This was an excellent opportunity to demonstrate our all-digital advantage addressing one of the most difficult RF challenges in military datalinks” said Richard Hitt, Hypres CEO. “We’re looking forward to increasing the number of simultaneous nets served by a single system, as I know firsthand the importance of operating multiple Link-16 nets in theater operations,” said the retired Air Force officer and 20-year wireless industry veteran.

Link-16 is the primary high-speed, airborne tactical link used by United States and coalition forces for situational awareness and information exchange. It is designed to be resistant to electronic countermeasures. Up to now, Link-16 receivers required multiple analog synthesizers to handle the high speed hopping of the Link-16 signal, making performance improvements difficult and systems overly large and expensive. These limitations typically result in only one or two of a possible 127 nets operating at any one time in a theater of operation.

SSC Pacific's Advanced Tactical Data Link Concepts Group hosted the demonstration at the newly established Center of Excellence for Cryogenic Exploitation of RF. In addition to Hypres and ViaSat, the demo also was supported by SSC Pacific's GPS Navigation Systems Research and Development Group.

Key to the demonstration was the single superconductor analog-to-digital converter (ADC) chip from Hypres which was used to directly digitize the entire 969-1206 MHz Link-16 band. All subsequent processing of the signal in the digital domain was handled by ViaSat's Link-16 baseband processors.

Analog hopping synthesizers and down-converters were eliminated by digitizing the combined RF signal from the two Link-16 radios operating on two independent Link-16 networks. With programmable digital circuitry, two copies of this digitized RF signal were independently “de-hopped,” down-converted, and passed to two modified Link-16 radios, each with a direct digital baseband interface. In addition to the superconductor ADC, the prototype included a superconductor RF filter to excise the potential interference from Identified Friend or Foe (IFF) signals, and a commercial off-the-shelf field programmable gate array (FPGA). The demonstration highlighted the level of integration achieved in hybrid superconductor-semiconductor electronics, where cryogenic and room temperature components are optimized for overall performance.

The ONR has sponsored development of efficient multi-net Link-16 systems using Digital-RF™ for several years. In 2005, ONR established this development program with Hypres and ViaSat and has worked closely with both companies to refine the capability.

###

#### **About Hypres**

Hypres, Inc., formed in 1983, develops and commercializes superconductor electronics that provide unparalleled economic and performance advantages for government and commercial wireless markets, and a host of other applications. Hypres’ technology is widely recognized as the leading solution to achieve a single RF system that is interoperable across all required waveforms and spectrum ranges. Headquartered in Elmsford, New York, Hypres is recognized worldwide as the leader in digital superconducting technology with the most accomplished team of superconductor specialists in the world. Hypres has delivered more different and complex superconductor circuits than any other institution worldwide. For more information, please visit us at [www.hypres.com](http://www.hypres.com).

#### **EDITORIAL CONTACT:**

Karen Vaillancourt  
914.592.1190, ext. 7794  
[karenv@hypres.com](mailto:karenv@hypres.com)

Ken Zeszutko  
Zeszutko Corp on behalf of Hypres  
321-637-7080  
[zeszutko@hypres.com](mailto:zeszutko@hypres.com)