

Boeing Moves Advanced Military Communications Technology from Theory to Practice

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Soldiers on the battlefield soon may be able to conduct successful combat operations more quickly and effectively with new communications technology from Boeing [NYSE: BA].

In a recently completed field test, Boeing demonstrated that its new mobile theater-of-operations directional communications technology can provide soldiers with secure intelligence data from a variety of sources at speeds three orders of magnitude (or 1,000 times) faster than existing systems.

Called Directional Network Waveform (DNW), the new technology is being developed by Boeing to provide war fighters the knowledge they need from all elements of the battlefield, whether the information comes from decision centers, soldiers, fighter aircraft, ships, unmanned air vehicle sensors, weapons, or other communication nodes in the theater.

"These successful tests move the Directional Network Waveform from theory into a practical application needed to build a secure, mobile Internet Protocol network a thousand times faster than operational tactical military communications systems in use today," said Mike Maurer, director of Advanced Network Communications Systems in Boeing Phantom Works.

The recent tests involved a military model HMMWV (or Humvee) equipped with a DNW terminal and a fixed DNW tower mounted terminal and work station. During testing, the network demonstrated ground-to-ground IP mobile directional networking with standard applications performed simultaneously; multiple bidirectional video streams, text chat, web browsing and other IP applications; and voice-over IP -- all of which are needed for communications with various information sources.

In addition, operators demonstrated that they could remotely direct electro-optical sensors from any work station in the network. The field test also proved network effectiveness in areas with potential communication blockages caused by trees and other vegetation.

A next step in the testing will involve a DNW terminal on a mountain top, which will simulate an airborne DNW node, and a HMMWV equipped with a DNW terminal attached to a workstation conducting on-the-move electronic support measures operations.

The objective of this test and potential subsequent demonstrations will show how the wideband directional capabilities of DNW apply to the real world operational need to share large amounts of data with little to no data latencies. Operational capabilities enhancements could include sharing of detailed imagery, raw radar and electronic sensor data, and large amounts of other data that current systems are not capable of exchanging today, as well as exchanging large amounts of friendly and hostile track information.

Keys to the communications advance are Boeing's development of a broadband space-time division multiplexed access communication protocol integrated with electronically steered phased array antennas. Together they will provide efficient spectrum reuse and extremely high data rates at long range, while retaining necessary military characteristics of jam resistance and difficulty of detection.

The DNW technology is being developed by Boeing Phantom Works, the advanced research and development unit and catalyst of innovation for the Boeing enterprise. Through its Integrated Defense Advanced Systems group, it provides leading edge systems and technology solutions to Boeing Integrated Defense Systems, one the world's largest space and defense businesses. Headquartered in St. Louis, Boeing Integrated Defense Systems is a \$27 billion business that provides

systems solutions to its global military, government and commercial customers. It is a leading provider of intelligence, surveillance and reconnaissance; the world's largest military aircraft manufacturer; the world's largest satellite manufacturer and a leading provider of space-based communications; the primary systems integrator for U.S. missile defense; NASA's largest contractor; and a global leader in launch services.

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