



# Navy SBIR/STTR Success



## RF-over-Fiber Links for the Wideband Networking Waveform (WNW)

FORAX-HARC extends communication range at a fraction of the cost of free-flying comms relays, and implements the aerial layer without flying the radios.

**Topic Number:** N07-149

**SBIR Investment:**  
**\$1,309,826**

**Phase III Revenue:**  
**\$23,979,764**

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## About the Technology:

High antennas are necessary to achieve radio frequency (RF) communications over great distances, but it is generally undesirable – and sometimes impossible – to fly tactical radios high overhead on tethered aerostats, or to place tactical radios on tower-tops around Forward Operating Bases. The Fiber Optic Remote Antenna eXtension (FORAX) High Antennas for Radio Communications (HARC) connects a Joint Tactical Radio System Ground Mobile Radio to a wide band power amplifier using an optical fiber that can be kilometers long; normally the radio and amplifier must be within a few feet of each other. This enables the radio operating with WNW to be securely and conveniently located in a tactical operations center while communicating at distances greater than 50 km, because its antenna is high overhead on an aerostat or tower-top.

## Naval Benefit

An “aerial layer” of RF communications extends important intelligence, surveillance, and reconnaissance and command and control functions to the tactical edge. FORAX-HARC technology is relevant to any tactical communicator with wide-area RF networking requirements including U.S. Army, Navy and Marine Corps tactical communicators, U.S. Navy Littoral Combat Ships that need to talk inland, and disaster recovery communicators who need to operate after the commercial infrastructure has been disabled. Biometric, other intelligence, and emergency communication capabilities all rely on a high-bandwidth wide-area communications, which FORAX-HARC provides. These capabilities greatly enhance the warfighter’s situational awareness and ability to make decisions based on real-time knowledge.

## Transition

The FORAX RF-over-Fiber technology was initially developed for the U.S. Special Operations Command (USSOCOM). FORAX systems are now deployed around the world in mission-critical continuous operations with the U.S. and its allies. FORAX-HARC has been deployed down-range on Persistent Threat Detection System (PTDS) aerostats since early 2010 and systems now exist for most communication radios and waveforms including the Wideband Networking Waveform (WNW), Adaptive Networking Wideband Waveform (ANW2), Single Channel Ground and Airborne Radio System (SINCGARS), Enhanced Position Location Reporting System (EPLRS), etc., and aerostats.



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