



SUCCESS STORY

TOPIC NUMBER:
N112-170

SBIR INVESTMENT:
\$7,800,382

PHASE III FUNDING:
\$14,110,672



WIDEBAND RADIO LOCAL INTERFERENCE OPTIMIZATION TECHNIQUES

Bascom Hunter developed a unique active cancellation technique for interference removal, which provides improved and resilient communications, and paves the way for additional innovative technologies and capabilities to U.S. Navy systems.

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THE CHALLENGE

As wireless communications and satellite communications capabilities took off in the early 2000s, the Navy found it increasingly difficult to mitigate both intended and unintended interference, which degrade and disrupt communications signals. Focusing on achieving interference mitigation in wideband (5 MHz) ultra-high frequency (UHF) satellite communications (SATCOM) systems first, the Navy sought a solution via the SBIR program to develop methods and algorithms for Navy radios operating over Mobile User Objective System (MUOS) to minimize interference while maximizing the usable bandwidth.

THE TECHNOLOGY

Bascom Hunter Technologies developed an interference excision system (IES) solution, and its applications have gone far beyond the original intent. Unlike conventional radio frequency and digital interference mitigation or cancellation techniques, this technology provides previously unmatched levels of cancellation by using an electro-optic-based interference cancellation technique with more than 10,000 times the signal power range, all within a small package. This approach allows for the removal of strong interferers in the same channel as the signal of interest and allows for improved communications operations in a degraded or denied operating environment. This revolutionary effort paved the way for other interference excision devices and systems that target different types of interference for SATCOM systems. Additionally, it opens the door for new and advanced technologies and capabilities to improve resiliency to SATCOM systems beyond UHF.

THE TRANSITION

In 2019, Bascom Hunter received an SBIR Phase III contract award (N00039-19-C-0020) from the Naval Information Warfare Systems Command (NAVWAR) with a value of \$3.85M. Additional options were also awarded on the contract, which resulted in a total contract value of \$13.24M. This focus of this contract is to develop SATCOM preplanned product improvement (P3I) efforts in support of the Navy's

SATCOM terminals, such as the Navy Multi-band Terminal (NMT), which is the Navy's sole protected SATCOM terminal providing critical secure, protected, survivable, and interoperable military satellite communications enabling protected and wideband satellite communications. Under this Phase III, Bascom Hunter worked with a variety of different vendors (both small and large businesses) to create an assortment of capabilities that can be structured to modernize and bring added advanced features to Navy SATCOM.

THE NAVAL BENEFIT

Bascom Hunter's solution provides the Navy the capability to recover its signal despite interference from jamming, misconfigured radios, or other causes, such as parasitic users, thus improving communications capabilities and mission success. Other derived technologies from this effort will lead to the overall improvement resilient command, control, and communications (RC3) in all communications environments.

THE FUTURE

One near-term transition of the capabilities developed under this effort will be the Satellite Terminal (transportable) Non-Geostationary (STtNG), which is the Navy's universal terminal for proliferated Low Earth Orbit (LEO) and Medium Earth Orbit (MEO) satellites constellations. NMT modernizing efforts will likely adopt many of the P3I constructs developed under this project to yield more capable and highly obsolescence resistant satellite terminals.

"Developing advanced technologies that can be easily adapted, implemented, and integrated into both existing and future systems is key to delivering reliable and resilient communications capabilities to the warfighter."

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