NAVY Transition Assistance Program

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N07-103 - Adaptive Dynamics, Inc

Submarine UHF SATCOM (25 kHz CPM) Narrowband Interference and Multipath Mitigation with Nonlinear Adaptive Filtering

NEED & CUSTOMER REQUIREMENT

Need: UHF SATCOM links are vulnerable due to narrowband interference and there is a critical need to develop capabilities to mitigate interference from the UHF communications channels without distortion of the communication signals of interest.

Value to the Warfighter: The value to the warfighter is that our product will dramatically increase the capability to establish and maintain reliable communication of mission-critical messages, even in the event of severe RF interference and hostile denial of service attacks.

Operational Gap: Military communication networks require specified data rates and capacities from the MIL-STD 188-181B UHF SATCOM links that connect the nodes of the tactical network. When the data rates and system capacites are degraded by RF and multipath interference, the system is unable to deliver mission critical communications. Our product restores the data rate and capacity of the UHF SATCOM links in order to close the gap in operational capability produced by the undesirable interference.

Customer Specifications: Develop and demonstrate prototype nonlinear adaptive filtering algorithms for 25 kHz CPM MIL-STD 188-181B signals. Hardware and software must be able to interface with current Navy radio rooms.

Technology Description: Adaptive Dynamics has developed a nonlinear adaptive filtering system, hardware and software, to mitigate effects of narrowband interference and multipath add to increase the effective number of available UHF SATCOM channels available to warfighters. The system maximizes the data rate achieved in real-life environmental conditions.

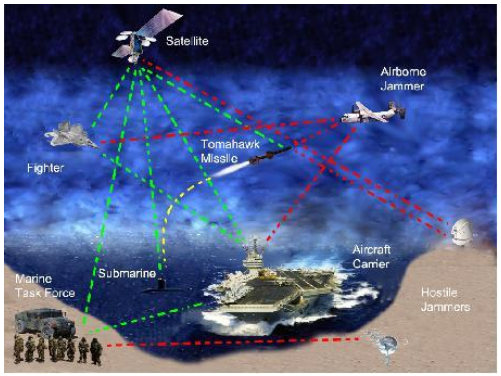
SPONSORSHIP of original SBIR/STTR Topic

SYSCOM: SPAWAR

Transition Target: UHF SATCOM MIL-STD 188,181B,C/182A,B/183A,B

Original Sponsoring Program: PMW 770 - Common Submarine Room, ACAT II

TPOC Phone Number: 619 553-7547



TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Basic Input/ Output (I/O) functionality	1	Low		12/23/09
Preamble Aware Interference Mitigation	2	Moderate		3/23/10
Preamble Aware Interference Mitigation capabilities with Equalization	3	Moderate		9/23/10
Complete initial prototype	4	Moderate		3/23/11
Optimized prototype demo	5	Moderate		9/23/11

Open contract: 9/23/09 ending 9/23/11

TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

Other Potential Applications: The initial systems are targeted to guarantee operability of legacy UHF SATCOM systems, but the fundamental technology is broadly applicable to virtually any type of communications system, including next-generation systems such as MUOS.

Business Model: We will develop standalone hardware filters to operate between the SATCOM downlink and the radio receiver. These filters will be transparent to the current system and deliver the communication to the legacy SATCOM receiver with the interference mitigation performed in our filter.

Objective: Adaptive Dynamics is seeking support from Primes and DoD Program Offices to further develop and test the system prototype in operationally relevant environments and advance the development to full insertion in DoD systems.

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