Department of the Navy SBIR/STTR Transition Program

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MCSC-PRR-4451

Topic # N183-140
Small Arms Long-Range Human Electro-Muscular Incapacitation (HEMI) Munition
Harkind Dynamics, LLC

WHO

SYSCOM: MCSC

Sponsoring Program: Joint Intermediate Force Capabilities Office

Transition Target: U.S. Marine Corps

TPOC: sbir.admin@usmc.mil

Other Transition Opportunities: The Small-arms, Pulsed Electronic Tetanization at Extended Range (SPECTER) munition provides valuable complementary capabilities to lethal systems and enables Warfighters and other U.S. Agencies to use the most appropriate tool in confrontations. Each Service within the DoD has a capability gap to disable an individual at extended range using HEMI. SPECTER's intent is to fill this gap across all Services.

Image courtesy of Harkind Dynamics, LLC (2022)

But SPECTER can provide advantages to other U.S. Agencies, like the Department of Homeland Security, federal law enforcement, the intelligence community, and the State Department. All of these agencies would benefit from an intermediate force munition that can disable an individual target at extended range for extended periods to demonstrate adaptation to diverse threats, promotion of security, and projecting an image consistent with strengthening our global network and achieving strategic objectives.

Notes: SPECTER has three times the range of any other small-arms HEMI device ever tested. The diversity of threats to U.S. security and vital interests will increase the need for our forces to prevent conflict and shape security environments. While the ability to shape security environments through the threat of punitive action will remain important, our forces conduct positive actions essential to reassuring allies, influencing neutrals, and dissuading adversaries.

WHAT

Operational Need and Improvement: Intermediate Force Capabilities (IFC's), which exist between presence and lethal effects, enable U.S. and allied forces to deliver accurate, tailorable, and compelling effects in complex and ambiguous scenarios while preventing unintended escalation of hostilities, unnecessary loss of life, or destruction of critical infrastructure. In response to the growing complexity of the modern battlefield, there is a growing appreciation for these munitions and devices in irregular warfare operations like counterinsurgency, counterterrorism, stability operations, and counter-piracy. SPECTER extends the non-lethal engagement range between U.S. forces and suspect personnel and provides valuable time and safety for operators to maintain situational awareness, assess hostilities, measure appropriate use of force, and react appropriately in ambiguous and mixed civilian-fighter environments.

Specifications Required: Key performance requirements for SPECTER are an extended operational range out to 100 meters, prolonged target incapacitation, more reliable target attachment, and unit cost commensurate with these capabilities and realized performance enhancements.

Technology Developed: SPECTER is initiated when fired from a shotgun and begins utilizing a miniature radar to actively establish target range when it leaves the muzzle of the weapon. A parachute is deployed within a predetermined target range to slow the munition by more than 60 percent within only 5 meters of flight. Novel electrodes capable of penetrating outer clothing are then ejected forward within a second predetermined distance. As the electrodes attach to the target, the Pulsed Power System is activated and delivers an effective HEMI waveform which causes the target to lose posture. SPECTER then automatically monitors target movement as operators subdue the incapacitated individual and put them in custody.

Warfighter Value: SPECTER improves the DoD's ability to compete below the level of armed conflict and helps seize the initiative to expand the competitive space, particularly in "gray-zone" and mixed civilian-fighter environments where varying levels of force application are required. It creates new capabilities in confrontations short of war with other powers and will demonstrate U.S. resolve while limiting the risk of unwanted escalation. It also creates value in full-scale combat as a precise tool to prevent civilians from entering a combat environment while maintaining the ability to achieve strategic goals, ultimately aligning with key initiatives of the Secretary of Defense to minimize civilian casualties. Operationally, it extends non-lethal engagement distance between U.S. forces and suspect personnel and integrates directly into the Warfighter supply chain deployable from well-known weapon systems with minimal training.

WHEN

Contract Number: M67854-21-C-6510 **Ending on:** Jan 03, 2023

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Test Readiness Review	Low	Instrumentation and Test Plan Complete and Ready for Prototype Bench Tests	4	4th QTR FY22
Prototype Laboratory Tests	Low	Performance Criteria Met in Relevant Environment	5	1st QTR FY23
Range Testing and Validation	Medium	If Option Exercised - Range Verification Test	6	3rd QTR FY23
Limited Military Utility Assessment	Medium	If Option Exercised - Limited Range Assessment Utility Exercise	6	4th QTR FY23
Transition	N/A	Phase III Transition and Commercialization Effort	6	2nd QTR FY24

HOW

Projected Business Model: Harkind Dynamics, LLC can support low-rate initial production (LRIP) capacity up to several thousand units per year under it's Type 07 Federal Firearms License and prototyping capabilities. Scaling these production capabilities to meet future demands from multiple Services or licensing SPECTER intellectual property and production rights for full-rate production are both possibilities to meet Service needs and ensure product quality. Licensing this technology to a supplier with all manufacturing infrastructure and quality assurance is primary.

Company Objectives: Harkind Dynamics, LLC seeks to transition SPECTER from SBIR Phase II prototype to a production-representative unit at Technical Readiness Level (TRL) 6 by the end of 2023. As this technology is adapted into the military supply chain and gains acceptance through operational performance, Harkind expects this technology to proliferate into civilian law enforcement.

Potential Commercial Applications: How prolific are Conducted Energy Weapons (CEW), like TASERs, in the military and law enforcement communities? These devices only have an effective operational range of 25 feet or less and requires users to carry an extra weapon. SPECTER has commercial application in all areas where CEW are used currently, like military and civilian law enforcement, intelligence, border patrol, and search and seizure. The global non-lethal weapons market is expected to nearly double by 2027 and a munition which can fill key capability gaps for multiple organizations is a primary benefit of SPECTER technology development.

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