Topic: N153-125

Cyan Systems

High Definition Small Arms Sensor

This 16-year old advanced infrared (IR) engineering company designs, develops, and delivers feature rich, high-definition (HD) Infrared Focal Plane Array Cameras that achieve unprecedented resolution and image quality for commercial and government customers. Our High Definition Small Arms Sensor (HDSAS) is the centerpiece for a revolutionary breakthrough that enables improved detection range and object Identification for detecting small arms fire (aka bullets and other munitions) at long ranges to enable the user to determine hostile fire even when the weapon or shooter is not in the line of sight. We have demonstrated the ability to detect small arms fire, drones, and other objects at significantly longer ranges than currently deployed sensors and verified that the IR sensor can use modified AI and Machine Learning algorithms to detect and ID objects at longer ranges – providing more lethality to the US Warfighter.

Technology Category Alignment:

Sensors
Command, Control, Communications, Computers, & Intelligence (C4I)
Weapons Technologies

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SYSCOM: MARCOR
Contract: M67854-18-C-6529
Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=M67854-18-C-6529

Department of the Navy SBIR/STTR Transition Program

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

MCSC-PRR-3587

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WHO

SYSCOM: MARCOR

Sponsoring Program: Program Manager Infantry Weapons (PM IW), PMM-140.2

Transition Target: Marine Advanced Rifle Sight

TPOC:

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Other transition opportunities: High Definition Drone Detection, Biometrics, Threat Warning, IRST



Cyan Systems High Definition Small Arms Sensor (HDSAS) Small Arms Test Measurement System. Courtesy of Cyan Systems

WHAT

Operational Need and Improvement: The Marine Corps desires to develop a system for locating the source of hostile small arms fire without the requirement for direct line of sight to the point of origin. Legacy systems utilizing lower resolution sensors with long integration times smear the munition and lack the small pixel focusing ability that the Marines desire. Cyan's innovative HDSAS system has demonstrated resolution that is several times better than legacy large pixel cooled IR sensors and accurately displays range, elevation and bearing of Small Arms and related threats over wireless/wired data links – thereby enabling revolutionary improvements in Small Arms ballistics detection and low latency shooter/marksman ID.

Specifications Required: High Definition (HD) IR sensors with high sensitivity. HD Sensor specified and designed to detect bullet rounds, display range, elevation, provide traceback / bearing of Small Arms and related threats over specified wireless/wired data links.

Technology Developed: Cyan has developed a prototype HDSAS that has demonstrated the ability to reliably and accurately detect Hostile Fire at ranges significantly beyond what has been demonstrated by existing systems.

Warfighter Value: Cyan's passive, expeditionary, low SWaP-C HDSAS technology significantly enhances engagement of combatants and the survivability of the warfighter. The detection capabilities demonstrated by HDSAS allows warfighter to passively detect small arms fire and bullets/munitions directly in real time. HDSAS will also provide real time traceback of rounds to the point of origin and enable engagement detection from multiple weapons – allowing the user to determine friend or foe, and provide threat prioritization when confronted with multiple, complex engagements. HDSAS increases situational awareness and provides a significant advantage in longer range and early detection of hostile small arms fire - enhancing the survivability and lethality of the Warfighter.

WHEN

Contract Number: M67854-18-C-6529 **Ending on:** June 23, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
HDSAS Concept	N/A	Detecting Bullets Thermally	2	4th QTR FY16
HDSAS Field Test Prototype	N/A	Demonstrate ability to Detect Bullets Thermally	3	2nd QTR FY17
Bullet Detection Algos	N/A	Good Signal/Noise	4	1st QTR FY18
Compact Small Pixel Sensor	N/A	Low Dark Current	5	3rd QTR FY20

HOW

Projected Business Model: Cyan evangelizing improved bullet detection to the US Army, Marines, Navy and Air Force - and has briefed USMC PMs on results. Acquire additional funding to cover costs of manufacturing and integrating semiconductor detectors, electronics, packaging, optics and testing to mature to TRL 7-9. Cyan will provide test support to validate, integrate, qualify and transition HDSAS for Marine Corps use..

Company Objectives: Refine manufacturing processes and for Cyan's HDSAS to become the technology of choice to acquire, display, and extrapolate small arms projectile tracks, passing at any angle within tactically relevant range of the observer, to the point of origin.

Potential Commercial Applications: Long Range Surveillance, Biometrics and Facial Recognition, Airport Drone Swarm Detection, Driverless Cars, Border Protection, Hostile Shooter early detection, Autonomous crowd security threat warning.

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