

Topic: N163-D01

Triton Systems, Inc.

True Awareness Hearing Protector

A recent report estimates that only about 7% of Marines insert earplugs correctly. Blast and Noise-Induced Hearing Loss (B/NIHL) and tinnitus are the top two disability claims for US soldiers and veterans [GAO Report, GAO-11-114]. The USMC wishes to reduce these numbers by developing an improved hearing protection device. Triton Systems, a technology development company providing innovative solutions to the government and industry, is developing the True Awareness Hearing Protector, which uses a passive acoustic filter that allows low level noise through while blocking harmful loud noises. The design minimizes the effects on the warfighters' situational awareness and their ability to detect and localize low level noise. Our goal is to integrate and transition this technology into government and commercial markets by licensing our Intellectual Property to manufacturing partners.

Technology Category Alignment:

Satellite Communications (SATCOM)

Robotics/Automated Material Handling Equipment

Shipyards/Shipbuilding

Supply; Storage

Satellite Communications (SATCOM)

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Supply; Storage

Supply; Storage

Satellite Communications (SATCOM)

Shipyards/Shipbuilding

Robotics/Automated Material Handling Equipment

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Robotics/Automated Material Handling Equipment

Protection, Sustainment, and Warfighter Performance

Medical Chem-Bio Defense

Military Infectious Diseases

Propulsion and Extreme Environments

Fixed Wing Vehicles (includes UAS)

Survivability

Maintainability/Sustainability

Unmanned Ground and Sea Vehicles

Corrosion

Advanced Computing/Software Development

Networks and Communications

Modular/Open/Reconfigurable Architectures

RF Components for sensing, transmission and communication

Electronics Integration

Broadband/Multispectral Components and Systems

Sensors, Electronics and Photonics

Radio Frequency (RF) (non-EW)

Survivability

Broadband/Multispectral Components and Systems

RF Components for sensing, transmission and communication

Radio Frequency (RF) (non-EW)

Networks and Communications

Guidance, Navigation & Control (GN&C) and Data Links

RF Components for sensing, transmission and communication
Networks and Communications
Cognitive/Adaptive Capabilities
Preemptive/Proactive Effects
Broadband/Multispectral Components and Systems
Advanced Computing/Software Development
Networks and Communications
Personalized Assessment, Education, and Training
System Interfaces & Cognitive Processes
Aircraft Propulsion, Power and Thermal
Modeling, Simulation & Test Infrastructure
Rotary Wing Vehicles
Fixed Wing Vehicles (includes UAS)
Fixed Wing Vehicles (includes UAS)
Acoustic, Seismic and Magnetic
Rotary Wing Vehicles
Structures and Protection
Energy storage
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Mobility
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Synthesis/Analytics/Decision Tools
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Advanced Computing/Software Development
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Microelectronics and Nanoelectronics
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Sensors, Electronics and Photonics
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Human/Autonomous System Interaction and Collaboration
Maintainability/Sustainability
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Aircraft Propulsion, Power and Thermal
Power Generation/Energy Conversion
High Energy Lasers (HEL)

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Electromechanical conversion
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RF Components for sensing, transmission and communication
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Fixed Wing Vehicles (includes UAS)
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Protection, Sustainment, and Warfighter Performance

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Assuring Effective Missions
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High Energy Lasers (HEL)
EO/IR Components for sensing, transmission and communication

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Energy storage
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Aircraft Propulsion, Power and Thermal
Corrosion
Propulsion and Extreme Environments

Readiness

Sensors, Electronics and Photonics

Structures and Protection

Electronics Integration

Networks and Communications

None

None

None

None

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None

Department of the Navy SBIR/STTR Transition Program

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MCSC-PRR-2449

Topic # N163-D01

True Awareness Hearing Protector

Triton Systems, Inc.

WHO

SYSCOM: MARCOR

Sponsoring Program: USMC

Transition Target: PM ICE

TPOC:

sbir.admin@usmc.mil

Other transition opportunities:

US Army - PEO Soldier

Notes:

PEO - Program Executive Office

PM ICE - Program Manager Infantry

Combat Equipment



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WHAT

Operational Need and Improvement:

Situational awareness in a combat mission is crucial for military safety and cannot be compromised. To maintain the ability to hear and localize soft noises in the field, personnel will often forgo hearing protection, leading to later noise induced hearing loss. For this reason, a hearing protector that maintains nearly true hearing in the absence of loud noises and automatically engages to attenuate louder sounds such as gunfire is crucial to stemming the increasing percentage of military personnel with hearing loss.

Specifications Required:

The new earplug must provide better situational awareness than the legacy earplugs in low noise environments. The new earplug must also provide at least 25 dB peak insertion loss against impulsive sources at 170 dB. The new earplug must perform in a military operational environment without any user interaction or electronic components.

Technology Developed:

Triton Systems has developed an acoustic filter that passively attenuates high amplitude impulsive noise while maintaining the user's situational awareness. The Marine will have significant hearing protection but still be able to detect and localize low amplitude noise sources.

Warfighter Value:

Triton's True Awareness Hearing Protector will help prevent noise induced hearing loss without sacrificing situational awareness. These earplugs will provide improved situational awareness to the open ear in combat situations because they will prevent temporary threshold shifts caused by gunshots.

WHEN

Contract Number: M67854-17-C-6542 **Ending on:** March 26, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Human subjects localization testing	Low	Measure ability to locate acoustic sources to near unoccluded performance	4	4th QTR FY18
Shock tube impulse protection measurements	Low	Measure at least 25 dB peak insertion loss at 170 dB	4	4th QTR FY18
Third party evaluation of prototypes (DRILCOM testing with Dr. John Casali)	Low	Verify improved performance of prototypes over legacy earplugs	4	1st QTR FY19
Manufacture 250 deliverable prototypes	Low	Produce 250 pairs of earplugs that could be manufactured at less than \$20 each	5	2nd QTR FY19

HOW

Projected Business Model:

Triton Systems' goal is to license the IP to a manufacturing partner.

Company Objectives:

Produce the True Awareness Hearing Protectors and sell to the military through the GSA.

Potential Commercial Applications:

Hunters
Law Enforcement
Intermittently loud noise environments where situational awareness is required

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