

Topic: N142-086

Hyperion Technology Group, Inc.

Ad-Hoc Ground Based Counter-Fire System

Hyperion Technology Group has developed a system that utilizes a network of listening post arrays (LPs) each containing sensors to detect and localize rocket, artillery, and mortar fire Points of Origin (POO) and Points of Impact (POI). The LPs communicate wirelessly with a central Command Post (CP) which uses a geo-positioning algorithm to pinpoint the precise location of the POO or POI. This technology was developed for the Marine Corps which is currently seeking a replacement for their Ground Counter Fire Sensor. The new, demonstrated technology can outperform the current system by integrating improved acoustic sensors, improved signal processing, and improved space, weight, and power characteristics, thus allowing for greater accuracy, faster set-up times, and reduced false alarms. This leads to improvement of war-fighter effectiveness, reduction in operation and maintenance expenses, and increased operational availability.

**Technology Category Alignment:**

Acoustic, Seismic and Magnetic

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**SYSCOM:** MARCOR

**Contract:** M67854-17-C-6500

# Department of the Navy SBIR/STTR Transition Program

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## WHO

**SYSCOM:** MARCOR

**Sponsoring Program:** PfM Ground Combat Element Systems (GCES), Program Manager Fires (PM Fires), Ground Counter Fire Sensor (GCFS) Program

**Transition Target:** Ground Counter Fire Sensor (GCFS)

**TPOC:**

[sbir.admin@usmc.mil](mailto:sbir.admin@usmc.mil)

**Other transition opportunities:**

**Notes:** The system has been successfully demonstrated at the Yuma Proving Grounds.

GCFS - Ground Counter Fire Sensor  
LP - Listening Post  
CP - Command Post  
O&M - Operation and Maintenance  
POO - Point of Origin  
POI - Point of Impact  
SWaP - Size, Weight and Power



U.S. Marine Corps image 170222-M-WQ703-033, available at <https://www.marines.mil/Photos/igphoto/2001705369/>

## WHAT

**Operational Need and Improvement:** The USMC is interested in replacing the existing Ground Counter Fire Sensor (GCFS) with a more flexible system that reduces operational burdens on the user and offers significant SWaP-C improvements. Objectively, the system will also permit the attachment of acoustic sensors directly to maneuver platforms.

Develop improved, advanced-processing algorithms, to be utilized in the Command Post of the GCFS system to enable the gathering and processing of sensor data from either static or dynamically placed listening posts.

**Specifications Required:**

- Detect and localize IDF points of origin and impact using passive acoustic sensors
- Detect POO/POI with 90% probability
- Determine POO and POI location to an accuracy of 2% of range between closet listening post
- Display information on a map overlay and digitally export for use by other systems

### Technology Developed:

Hyperion has developed a replacement for the USMC GCFS System

- Greatly reduced SWaP-C over current system
- Easier to emplace, reducing employment time
- Reduced expertise required of Warfighters deploying system
- Reduced false alarm rate

**Warfighter Value:** - Improved SWaP-C saves O&M money

- Saves fuel costs, reducing logistics tail
- Improved signal processing reduces false alarms & increases Operational Availability
- Reduced burden on user, faster to emplace system, reduced embark footprint

## WHEN

**Contract Number:** M67854-17-C-6500

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Complete Geo-location algorithm	Low	POO/POI determined w/ +/- 2.5 meters	3	2nd QTR FY17
Complete Listening Post Hardware/Software	High	Integration of Hardware/Software successful	5	3rd QTR FY18
Complete Graphical User Interface (GUI) for the Command Post (CP)	Med	GUI successfully integrated into CP architecture	5	3rd QTR FY18
Demonstrate integrated system at Yuma Proving Ground (YPG) during live fire exercise	Med	System successfully meets all requirements identified in SOW	6	4th QTR FY18
Conduct Limited User Test	Med	System passes all required test and is accepted by USMC	7	3rd QTR FY19

## HOW

**Projected Business Model:** Hyperion Technology can begin production for the Marine Corps' Ground Counter Fire Sensor Program immediately after all specifications are met. If several other military or commercial applications for this technology present themselves and high-volume production becomes necessary, Hyperion Technology will partner with a manufacturing firm in order to meet demand.

**Company Objectives:** Hyperion Technology is a nine year-old, growing company that focuses on designing specialized technology solutions for both military and commercial applications. Because highly specialized technology is contract-based and often does not require large volume production, limited focus has been placed on manufacturing up to now. However, if this technology provides a solution for other applications, and high-volume orders are required; then Hyperion will begin scaling up to manufacture this system.

**Potential Commercial Applications:** - National Weather Service  
- Tornado Chasers

Due to the integration of low frequency acoustic sensors, this technology has the capability of pinpointing tornadoes at long ranges.

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