



Mobile Sound Ranging Array

The Mobile Sound Ranging Array (MSRA) is a **passive acoustic system** which detects and localises the Point of Origin (POO) of Rockets, Artillery and Mortars (RAM) shots and their Point of Impacts (POI). The technology of the MSRA is based on the **worldwide unique and extremely small Acoustic Multi-Mission Sensor (AMMS) technology** developed by Microflown AVISA.

The MSRA comprises of typically 10 **remotely operated ground AMMS Sensor Posts and a Command Post**. A sensor post consists of a single, lightweight, man portable sensor, which is equipped with a Geo-boom which makes the quick and automatic positioning and orientation possible. The sensor post has its own communication means as well. **Setting up takes a few minutes.**

The wireless connection allows remote operation of the sensors by the user at the Command Post. Once switched on, a sensor automatically sends a time-stamped report to the Command Post. The report contains pre-processed information of the direction of the acoustic event detected. This data package is small and requires a small band-width connection. The information coming from the multiple sensors is then centrally analysed at the Command Post. The calculated POO and POI are presented on the Command Post computer in both tabular form and on a map in real-time. The user can **continuously monitor the status of the deployed sensors** and (re)configure them and when required with the software provided.

A sensor post uses a standard military battery for powering, and due to the long lifetime changing or recharging is required once every five days (depending on the battery). The AMMS technology has **low Size, Weight and Power (SWaP)**. A sensor post has a total weight of 5 kg and can be carried by just one soldier due to its small size and the handgrip to the side.

The **small footprint** of the sensor node allows for **alternative ways of deploying**. One can think of deploying a **network on a vehicle or multi-copter**. Ideally one flies a multi-copter to a forward observation position thus improving (acoustic) situational awareness ("Perch and Listen").

Key Features

- Broad banded passive system with extremely small footprint
- Real-time localisation of Points of Impact and Points of Origin of Rockets, Artillery and Mortars (RAM)
- Immediate alarm of artillery explosion in designated area
- Quick and easy deployment due to automatic positioning and orientation
- Integration in third party C2 systems is possible
- Operates under all weather conditions (e.g. rain, snow and fog)

Technical Specifications

Acoustic Multi-Mission Sensor with a Geo-boom

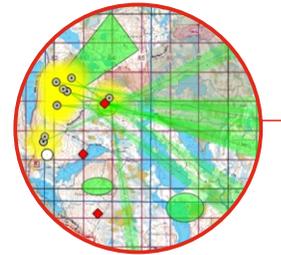
	AMMS	Geo-boom
Dimensions/ Baseline	10.0 x Ø 26.5cm	60cm wide
Weight	1.75kg	1kg
Assembly	Stainless Steel & Foam	
Powering	12V	
Power consumption	<2W	
AMMS Internal memory	Up to 32GB micro-SD	



Typical System Performance

Localisation accuracy	Artillery - 20km with CEP85 = 5% of the range ¹ Mortar - 16km with CEP85 = 4% of the range ² Rocket - 7km ³
Detection capability	Rocket, Artillery and Mortar

¹ - in a scenario with a single shot 122mm howitzer & good weather conditions
² - in a scenario with a single shot 120mm mortar & good weather conditions
³ - in a scenario with good weather conditions



AMMS C2 Software | Command & Control

Ruggedised laptop	Panasonic Toughbook
Remote sensor configuration	Incl. power on / off
Monitored sensor status	Incl. battery level



Communication

Frequency band	868 MHz / 900 MHz
Range	10 km - line of sight
Custom communication solutions such as wired or satellite communication on demand	



Rugged Battery Pack

	Standard Battery	mil 2590 Battery
Operational time	2 days	5 days
Battery type	Sealed Lead Acid / AGM	Lithium-ion
Voltage	12 V	14.4 V
Capacity	7.2 Ah	14.4 Ah
Weight	3.43 kg	2.49 kg
Ruggedised box dimensions	21.6 x 18.0 x 10.2 cm	



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