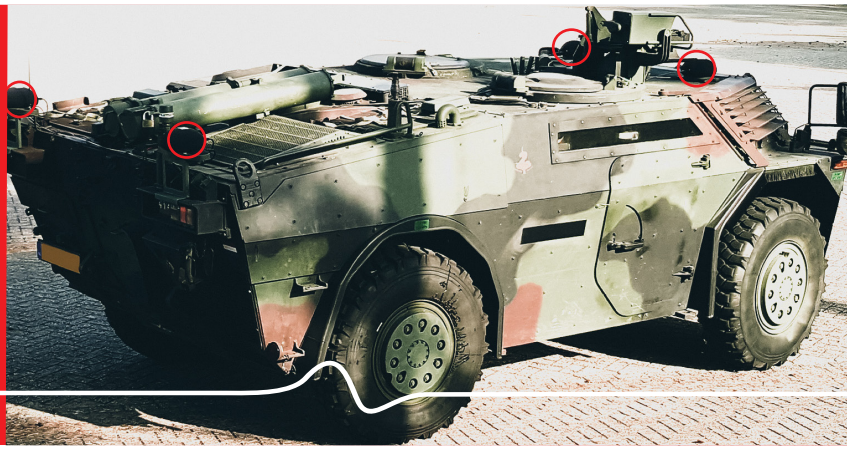
Microflown AVISA
3D Acoustic Situational Awareness

MOBILE SOUND RANGING ARRAY (MSRA)



THE MSRA FIRMWARE, BASED UPON A DISTRIBUTED MESH NETWORKED ARRAY OF PASSIVE VEHICLE MOUNTED CASTLE SENSOR POSTS, IS DESIGNED FOR COUNTER BATTERY PURPOSES.

The MSRA capability can be used for:

- Alerting and cuing a weapon location radar, reducing its uptime to the bare minimum
- Replacing a weapon location radar in two modes:
  - target acquisition
  - own fire control

Notably, in a peer-to-peer conflict, persistent aerial surveillance and the omnipresent RF direction finding capabilities will make active weapon location radars an easy high value target.

As compared to the well-known traditional sound ranging capabilities using triangular sensor posts of three microphones each, the MSRA brings two distinctive improvements:

- The small footprint of the CASTLE sensor nodes allows the installation on vehicles
- Apart from the acoustic signature of the muzzle blast during the launch of the shell, also the supersonic 3 D shockwave signal generated as long as the shell is travelling at supersonic speed is exploited

Installation on vehicles brings two benefits:

- High mobility, which is key to survive in a peer-to-peer conflict
- Low operational costs, as the sensor posts can be considered unattended

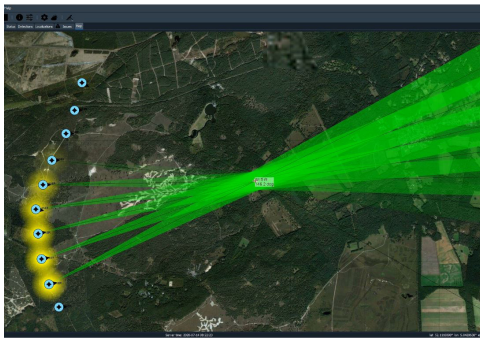
With the tendency for howitzers and rocket launchers to fire from longer distances, capturing their launch noise becomes difficult. And even when, with sound waves travelling relatively slowly, the information may not be obtained timely as shoot and scoot become the daily drill.

3 D shockwaves travel by definition faster than the speed of sound, in practice more or less reducing the time to obtain a localization by 50 %.

By reconstructing the ballistic trajectory of the 3 D shockwaves, longer detection ranges can be achieved. The CASTLEs can also be installed on unmanned platforms, taking positions closer to, or even across the Forward Line of Own Troops. This concept improves timeliness and accuracy of localizations.

BENEFITS OF MSRA

- **Passive, distributed andresilient sheer firmware defined Capability**
- **Using highly mobile sensor posts**
- **Low operational costs**
- **All weather, day and night- Requires no line of sight- Detection and localization ranges:**
  - Artillery: up to 20 km
  - Rockets: up to 7 km
  - Mortars: up to 12 km



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