

SSS DEFENCE

VARAHA CUAS SYSTEM

COUNTER-UNMANNED AIRCRAFT SYSTEM



VARAHA is SSS Defence's next-generation Counter-Unmanned Aircraft System (CUAS), designed to detect, localize, and neutralize drone threats using AI-enabled acoustic signal processing and coherent sensor fusion

The increasingly dynamic nature of conflicts has evidenced that drones represent an asymmetric threat. In asymmetric warfare, the adversary's advantage and the threat that is posed remains the same whether they are traditional forces or non-state actors. Real intel gathered from battlefields across the globe show that unmanned aerial vehicles and their under-sea counterparts have become increasingly common, cheaper and easier to build with minimal technical competence. At the same time, adversaries have also become very competent in miniaturising the drones and finding solutions to make them resistant to jamming. This is why Counter Unmanned Aircraft Systems (CUAS) have to evolve much faster along with appropriate hard-kill solutions. In addition, the importance of deploying passive sensors not detectable by enemies has also become apparent.

The early detection of drones is immediate news of the hour, as it provides the warfighter time to seek cover or activate counter measures quickly. Existing sensors, such as RF detection systems, may fall short when a modified drone does not emit such signals, or operates in areas with radar-shadow or clutter. To make matters worse, drones have a very small RCS (radar cross-section) to begin with, which leaves Radars ineffective against drones. Unlike Radar based methods, acoustic signal processing can monitor all types of UAV's irrespective of their use of communication channels or their small radar cross-sections. Additionally, with the use of machine learning algorithms and training, it can achieve a wider detection range than radar infrastructure at fixed cost. Leveraging sound, a fundamental aspect of every natural system, coupled with an AI-enabled parallel-processing algorithm, this alternative provides a cost effective and scalable alternative.





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FEATURES & TECHNOLOGIES

Feature	Description
Detection Modality	Directional acoustic arrays using AI-driven pattern recognition
Detection Signature	Passive (non-emitting), immune to RF jamming
Signal Processing	Coherent signal processing with parallel AI compute nodes
System Interface	Browser-based or Machine-to-Machine (M2M) API
Localization Accuracy	Precise acoustic triangulation with <2 sec response time
Operational Mode	Passive & Active (for naval variant)
Hard Kill Integration	Compatible with autonomous weapon platforms
Mobility	Fixed, vehicle-mounted, or man-portable (SF variant)
Sensor Fusion	Integrates with radar and EO systems for cueing & precision
Electronic Emission Profile	Minimal to none; stealth-focused operations
Deployment Model	Scalable distributed sensor network

TECHNICAL INSIGHT

Acoustic-Driven Detection: Unlike radar, which fails against low-RCS drones or in radar shadows, acoustic systems detect all drone types regardless of comms use or stealth.

Parallel AI Compute: Distributed sensor arrays feed data to a powerful AI engine capable of instant localization.
Stealth Mode: Emits no electronic signature — operates undetected.

System Redundancy: Eliminates single points of failure through distributed design.

Naval Use: Fully adaptable to underwater environments for UUV and torpedo detection.



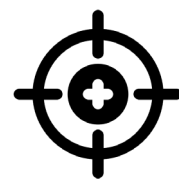
VARAHA NETWORK FUNCTIONING



Detect



Localise



Eliminate

Distributed Acoustic Sensors → Detect drone presence.

Coherent Data Recombination → Real-time triangulation.

Operator/UI/API Notification → Immediate threat alert with GPS fix.

Target Engagement → Cue hard-kill systems or radar/camera for final action.

USE CASES

Mission Profile	Capabilities
Base & Airfield Protection	Early warning against low-RCS kamikaze or ISR drones. Forms kill chain when integrated with EW/kinetic solutions.
Special Forces	Miniaturised variant offers portable, hemispheric passive detection via body-worn device UI.
Advanced Perimeter Defence	360° sensor fusion array triggers alerts on anomaly detection, integrates seamlessly with hard-kill platforms.
Naval Operations	Subsurface monitoring via passive/active variants; supports torpedo/UUV detection.
Mobile/Mechanized Units	Vehicle-mount variant for on-the-move protection against aerial threats.

TACTICAL ADVANTAGES

Covert Operations: No electronic signature makes it ideal for stealth missions.

Scalable Coverage: Protects vast terrain with fewer, strategically placed nodes.

Fail-Safe Architecture: No critical node dependencies — continues working even if some sensors are compromised.

Integration Ready: Works alongside existing EO/IR/Radar setups, improving system longevity & survivability.

INTERFACE & CONTROL

Browser Interface – Real-time feed of sensor activity & threat visuals.

Machine-to-Machine API – Automated workflows with 3rd party command & control systems.

Multi-Platform Support – Available for use on laptops, tablets, or soldier-carried devices.



**100% Passive
Detection System**



**Miniaturised SF
Variant Available**



**AI-enabled Acoustic
Intelligence**



Naval Adaptability



**Hard Kill Integration
Ready**



Radar & EO Cueing

VARAHA

COUNTER-UNMANNED AIRCRAFT SYSTEM (CUAS)