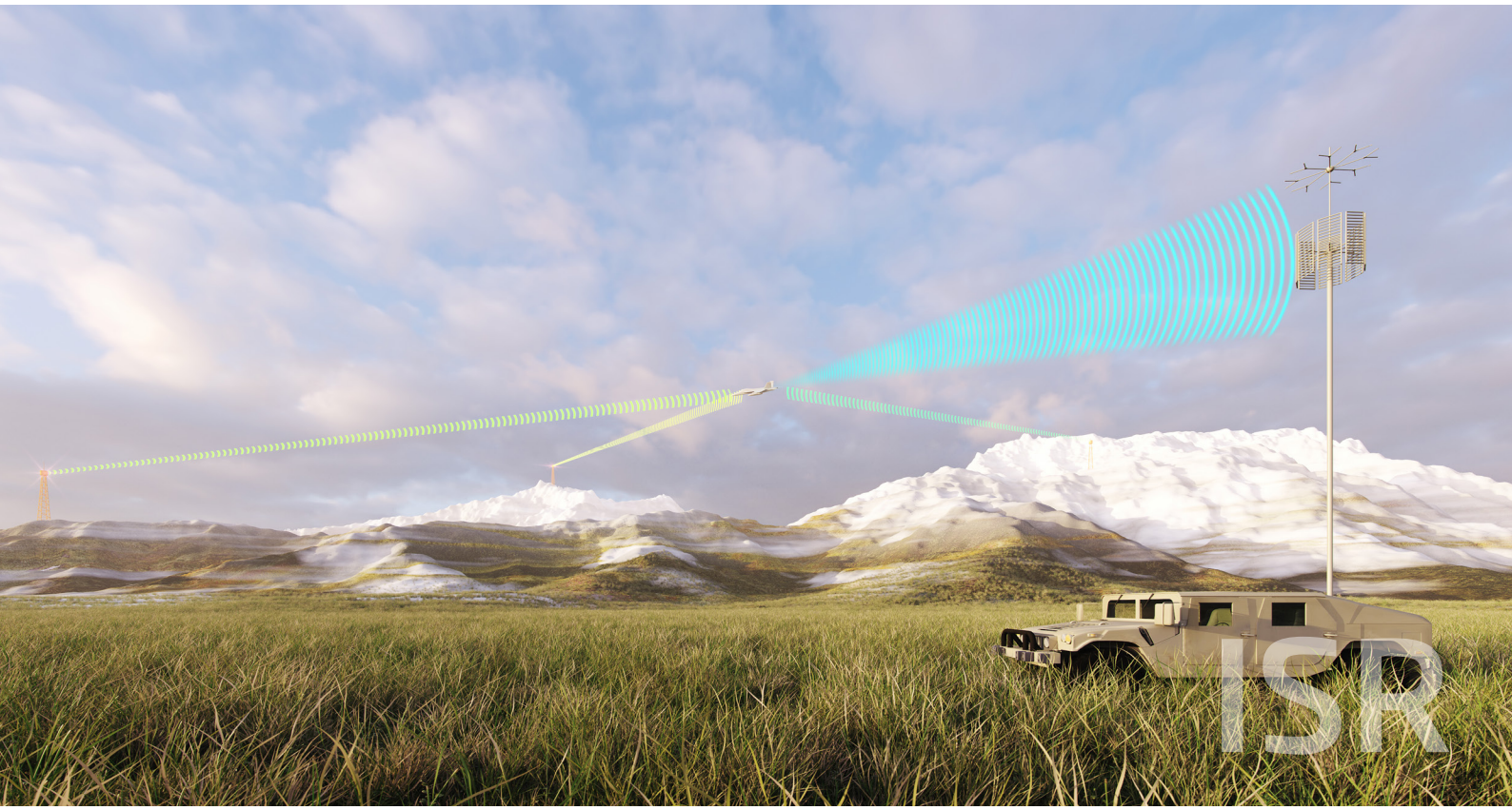
Patria

Patria MUSCL

Passive Radar System



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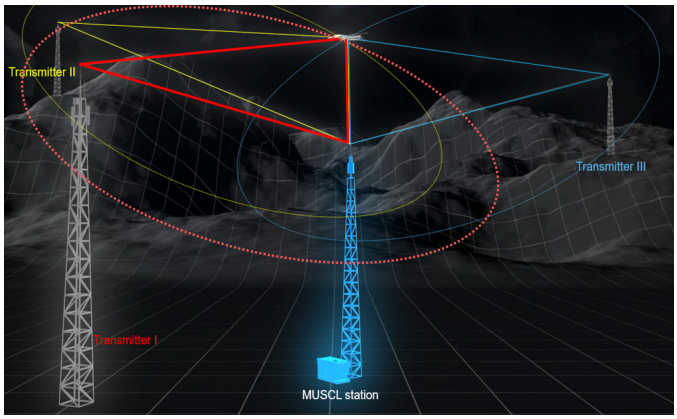
Patria MUSCL - Passive Radar System

Patria MUSCL passive radar system is a resilient, covert and easily deployable air surveillance system. The system provides affordable area and point surveillance for various applications, such as military air surveillance, drone detection, counter artillery sensor, border control and critical infrastructure protection.

The system exploits FM radio and DVB-T/T2 TV broadcasting signals as illuminators of opportunity either separately or both signals simultaneously providing sector coverage of up to 360°.

Passive Coherent Location (PCL) technology is used to detect, locate and track targets. Therefore, the system does not produce a signal footprint making it practically invisible for adversaries' signal intelligence and anti-radiation missiles as well as enabling safe deployments and use in urban areas.

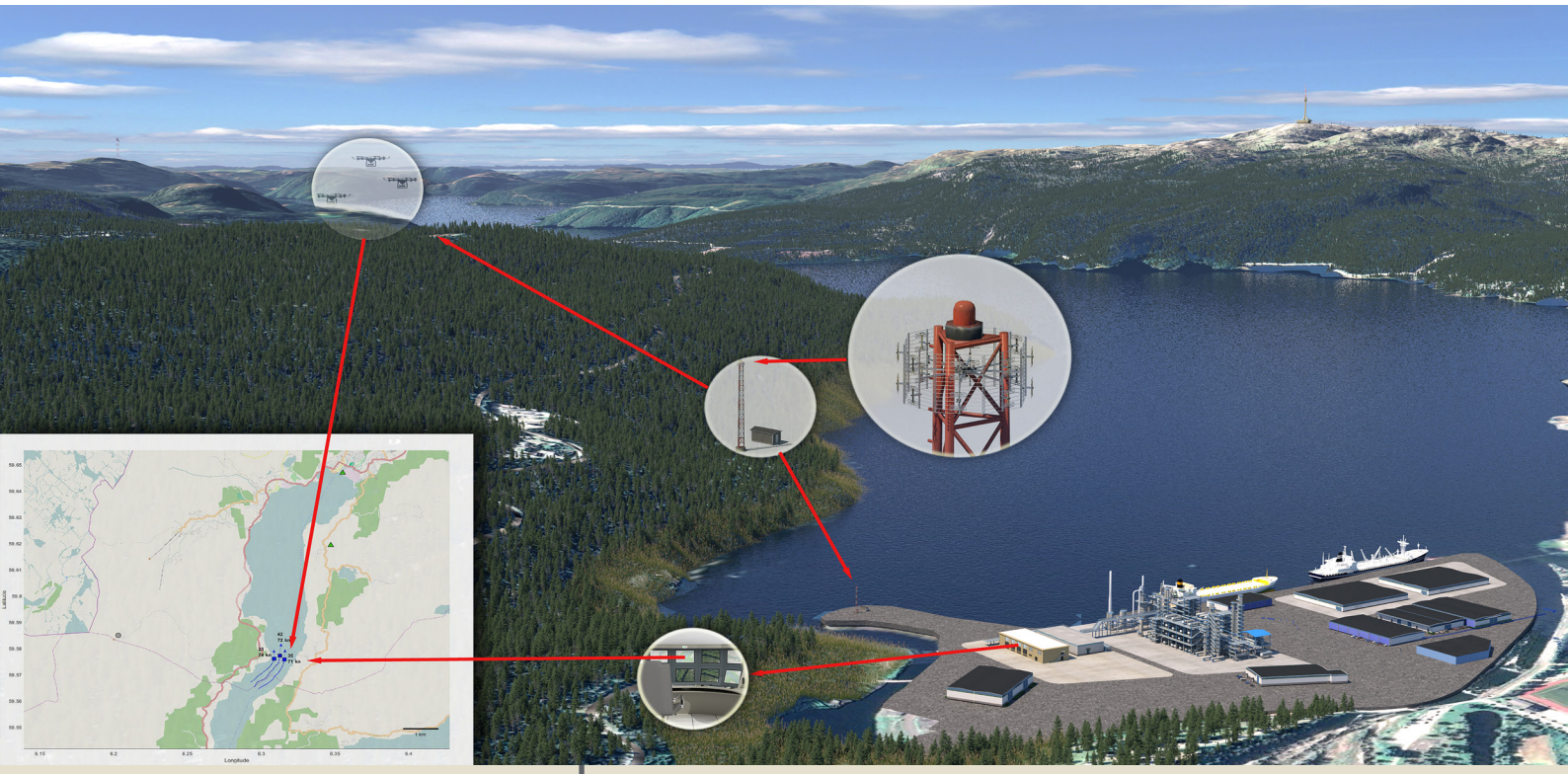


Operating principle of Patria MUSCL system

Target locating provided by Patria MUSCL system is based on measurements of the time-difference-of-arrival (TDOA) of the target compared to the direct path signal and the target azimuth angle of the arrival. The angular measurement capability enables operations in scenarios where only a single transmitter is available.

Exploitation of dense network of broadcasting signals enables detection of low altitude targets with comprehensive coverage. All this combined with multistatic receiving geometry and lower operating frequencies than those utilised by conventional air surveillance radars, enable superior capability to detect and track all aerial targets including stealth and Low-Slow-Small (LSS) targets from extensive ranges.

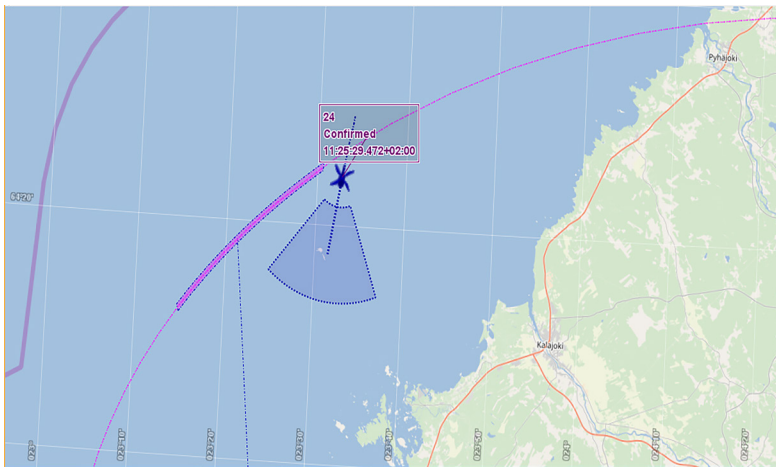
Case example: "Patria MUSCL is a state-of-the-art passive radar system that provides unique drone detection and tracking capability for various applications such as protection of oil refinery or port."



Key Use Cases	Applications and Customer Need
Air surveillance especially for active radar gap-filling and low-altitude surveillance	• Large-scale air surveillance with networked use of several MUSCL stations or as a target information provider for a large-scale C2 or surveillance systems • Regional air surveillance • Drone detection (autonomous UAVs included) • Coastal surveillance • Non-cooperative target recognition support
Area and border surveillance and protection	• Protection of critical infrastructure, e.g. airport, harbor, power plant, nuclear power station, oil refinery • Securing and monitoring public event with mass audience • Detection of air-based smuggling near the border
Tipping and early warning use cases without being detectable	• Air defence system support to secure active radar operations • Counter artillery sensor (detection of mortar bomb, artillery shell, rocket) • Early warning capability for main operating base protection against low-flying high-threat targets (UAVs, cruise missiles, etc.)

System Highlights, Benefits and Configurations

- Configurable and customisable radar system with no signal footprint for various military and civil applications
- 365/24/7 unattended remote operations
- Transportable and fixed system configuration for standalone and networked use scenarios
- External interfacing and integration to C2 networks for distributing air situation picture
    - ASTERIX messages
    - JREAP-C track messages
- Rapid deployment with transportable system and operability in harsh outdoor conditions

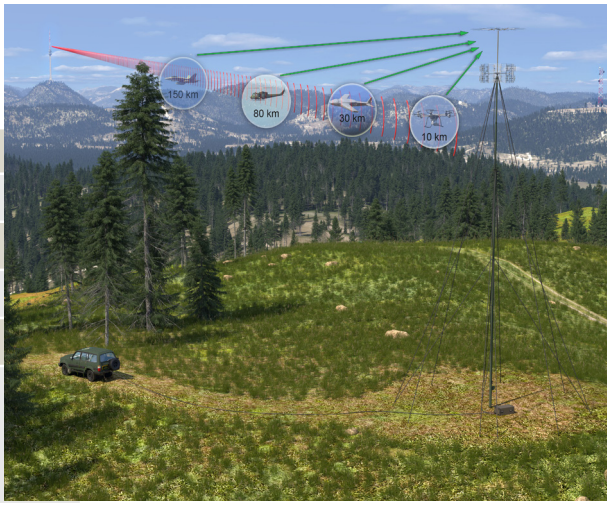


MUSCL UI - world-class graphical user interface providing versatile and easy-to-use operations

- Mission Preparation
- Air Situation Picture
- Recording and Playback
- External Interfacing
- Mission Analysis
- System Status

System Specifications and Performance Parameters

Signal compatibility	FM and DVB-T/T2 simultaneously
Azimuth coverage	360° or sectored
Tracking capability	> 100 simultaneous targets
Air situation picture update rate	< 1 second
Number of contributing illuminators	Up to 16 simultaneously
Detection range *	< 150 km for fighter aircraft < 80 km for helicopter < 30 km for UAVs (NATO Class 1, "Small") < 10 km for drones (NATO Class 1, "Micro")
Target classification	Fixed-wing or rotary-wing
Target identification support	Features extracted from rotor or propeller modulation



*Representative values. Detection ranges depend on the properties of the illuminators of opportunity and the measurement scenario.

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