Passive Radar for Covert Detection and Tracking

Invisible Advantage Through Passive Sensing



We are combining our decades of engineering knowledge and experience to provide our customers with an innovative new passive radar capability.

In today's battlespace, situational awareness often comes with a trade-off: the act of detecting targets can increase the detectability of the sensing platform itself. Conventional radar systems emit signals that can reveal their position, making them vulnerable to attack, disruption or suppression. BAE Systems' passive radar capability provides a covert alternative, enabling military operators and critical infrastructure providers to detect and track airborne threats without broadcasting a detectable signature.

By exploiting existing radio frequency (RF) signals, including television and cellular transmissions, our passive radar capability can identify and track everything from small commercial drones to larger aircraft. Because the system remains electronically silent, operators gain valuable situational awareness while denying adversaries visibility of the sensing capability itself.

We provide passive sensing capabilities that deliver operational advantage across contested and complex environments through:

Covert Detection

Detect and track aerial threats without emitting radio frequency signals, allowing operators to maintain situational awareness while remaining hidden from adversaries.

Enhanced Decision Advantage

Provide accurate 3D target tracking data, enabling commanders to make informed decisions faster and move through detect, decide and deploy effectively.

Layered Defence Integration

Seamlessly fuse and deploy sensor data into wider command and control (C2) and counter-drone ecosystems, strengthening defence against evolving airborne threats.

As uncrewed air systems (UAS) proliferate and operating environments become increasingly contested, the need for persistent, low-signature sensing has grown significantly. Passive radar addresses this challenge by leveraging ambient RF signals already present in the environment. Through advanced analysis of reflected signals from objects moving through the battlespace, the system generates a detailed picture of aerial activity, without requiring dedicated spectrum allocation or transmitting its own signals.

How it works:



Passive RF Exploitation

The system uses existing television, radio and cellular transmissions as illuminators of opportunity rather than generating its own signals.

Advanced Signal Processing

Reflected signals from airborne objects are analysed to detect, locate and track targets in real time.

Three-Dimensional Tracking

Operators receive accurate information on target range, azimuth, speed and elevation to support threat assessment and response.

Integrated Battlespace Awareness

Track data can be combined with command and control (C2) systems and other intelligence sources to provide enhanced situational understanding.

Operational Benefits:

- Provides covert surveillance without revealing sensor locations.
- Enhances situational awareness across military and civilian operating environments.
- Detects and tracks a wide range of airborne threats, including small drones through the use of commercially available technology.
- Reduces acquisition and operating costs through commercial technology.
- Integrates seamlessly into layered air defence and wider surveillance architectures.
- Supports rapid deployment through a modular, scalable design.

Use Cases:

Counter-Drone Operations

Detect, track and monitor small UAS before they can threaten personnel, infrastructure or operations.

Critical National Infrastructure Protection

Provide persistent airspace awareness around airports, energy facilities, transport networks and other critical national infrastructure.

Military Force Protection

Enable covert monitoring of airspace around deployed forces and critical military assets.

Border and Maritime Security

Support wide-area surveillance and early warning against airborne and seaborne incursions.

Layered Air Defence

Integrate with electronic attack and counter-drone capabilities to detect, identify and defeat threats using the most appropriate response.

Supporting Layered Defence

Passive radar is not intended to replace active radar systems. Instead, it provides an additional layer of awareness that compliments existing sensor networks. By contributing a covert surveillance capability to wider air defence architectures, passive radar enhances resilience, improves threat detection and helps commanders maintain situational awareness even in contested electromagnetic environments.

Its ability to integrate with existing command and control systems enables operators to combine passive sensing data with information from active radars, intelligence sources and other sensors, creating a more complete and reliable operating picture.

The BAE Systems passive radar capability is underpinned by decades of experience delivering trusted digital and data solutions across defence and security environments.

Discover how Passive Radar can enhance situational awareness, strengthen layered defence capabilities and deliver covert detection across defence and critical infrastructure environments.

Passive Radar is currently in development and will undergo a series of live trials throughout 2027, demonstrating and further maturing the capability in operationally relevant environments. We welcome conversations with customers and partners interested in learning more about the system and its applications. Please contact us for further information.



Digital Intelligence & Land is a fast-paced hub within BAE Systems, home to 6,000 experts across 13 countries. Our advanced cyber, digital and manufacturing capabilities are dedicated to keeping vital infrastructure running, national security protected and armed forces prepared.

From transforming complex data into actionable intelligence to delivering next-generation capabilities for the battlespace of tomorrow, our agile teams leverage AI to help customers move from data to delivery at mission speed. We empower militaries, government departments and critical national infrastructure to detect risks and emerging threats, decide and plan the right course of action, and deploy mission effects with agility and precision.

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