

CASE STUDY

GROUND-BASED AIR SURVEILLANCE

> **Passive Detection Solution with SPYNEL® 360 Infrared Search and Track**

During a conflict between two states, the first attack strategy is to establish air superiority by destroying the Air Defense systems and military infrastructures throughout the enemy country. To maintain airspace sovereignty, Command and Control (C2) centres rely on surface radars to provide them with a real-time air surveillance picture. Nevertheless adversaries now have unprecedented means to render 2D or 3D radar inoperable. Stealthy aircrafts or low altitude targets are also hardly detected by radars.

SPYNEL® Infrared Search and Track (IRST) is a passive electro-optical system providing automatic detection, tracking and classification of a large variety of threats including aircrafts, helicopters and drones while remaining undetectable. With its real-time thermal panoramic video stream of the air space, SPYNEL® is a reliable and mobile solution to alert and protect land forces in emergency situation. It can be easily used with Very Short-Range Air Defense (V-SHORAD) systems to provide a fully passive Air Defense solution - from detection to reaction, undetectable by the enemy.

> **Background**

To effectively protect air sovereignty, Air-Defense Radars are used as early-warning devices because they can detect approaching enemy aircrafts or missiles at very long distances. Nevertheless with the deployment of threats including electronic countermeasures, missiles and cyber warfare, **radars can be rendered inoperable** by the adversary. Moreover, radar solutions have their own weakness: since they emit electromagnetic waves, they can be easily detected and geolocated by the enemy who can then schedule precisely a massive attack targeting the radar stations.

Without any operational Air Defense systems, the aerial warfare can start, endangering the civilian population and troupes.



Spynel-X solution deployed on tripod

A fully **passive and mobile** solution, coupling **V-SHORAD systems with 360° Infrared Search and Track system** can help ground forces to **regain control of the air**. SPYNEL® panoramic thermal camera acts as a **passive radar**, rotating at 2Hz for an efficient detection and tracking of all air and surface threats in the panorama.

> **Benefits**

- Passive solution, undetectable, not jammable by the enemy
- Compact and robust
- Easy to operate, to transport and to deploy
- Flexible use: mounted on a tripod or on a vehicle
- Automatic detection, tracking and classification of multiple threats simultaneously
- Early warning alert for fast decision making
- Real-time 360° situational awareness of the theatre of operations
- Reliability for 24/7, day/night surveillance

> Solution

SPYNEL®-X is a passive IR Search and Track sensor, ITAR free, to be rapidly deployed in a crisis situation. With a 20° vertical field-of-view, the system is designed to perform panoramic surveillance of the airspace, night and day with automatic detection, tracking and classification ranges of air targets **compatible with the shooting ranges of Very Short Range Air Defense missile launchers**. Driven by the easy-to-use Cyclope software suite, SPYNEL® provides unique capabilities to detect and track **multiple threats simultaneously** including aircrafts, helicopters, drones, low air targets and highly manoeuvrable targets thanks to its 2Hz fast scanning rate.

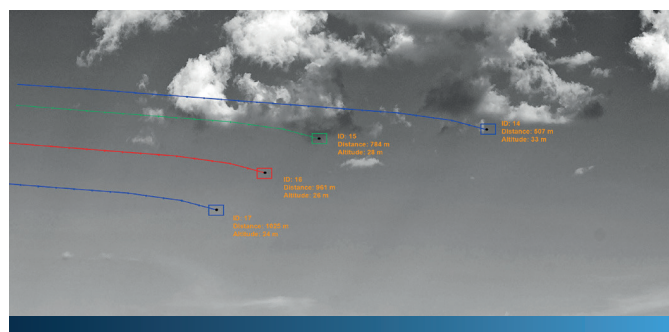
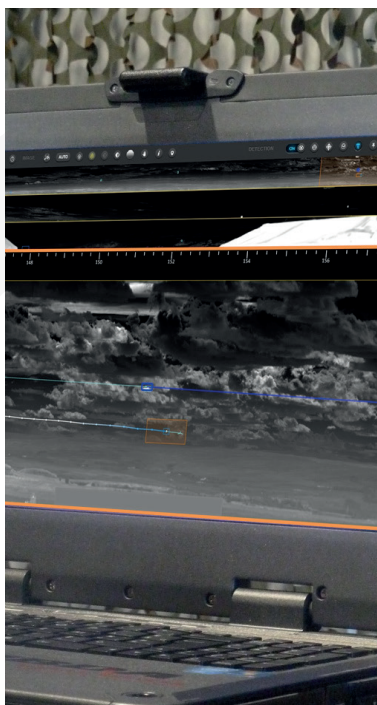
Delivering real-time video analytics, soldiers understand easily the situation by **visualizing the threats on the GUI**. An alert is sent automatically as soon as a threat is detected.

Fully Passive Air-Defense Solution - From Detection to Reaction

The coupling of Very Short-Range Air Defense system with SPYNEL® IRST provides ground forces a **fully passive GBAD solution. This solution can be deployed in just a few minutes and remain undetectable by the enemy**. SPYNEL® provides elevation/azimuth angle to localize precisely the direction of the targets.

3D Target Location Capability

With CYCLOPE Software's Triangulation Plugin, the **exact distance and altitude of each target is automatically calculated**. Two SPYNEL® sensors are required, and installed at a short distance from each other, to get the 3D location (GPS/altitude) of multiple targets in a fully passive mode. This creates a "protective bubble" around a very wide area, and provides the V-SHORAD with very accurate information on the targets.



3D detection and tracking of multiple targets

"In a warfare context, regaining national airspace sovereignty is of paramount importance. A combination of V-SHORAD systems with SPYNEL® IRST can be easily operated by land forces to counter the enemy.", said Edouard Campana, Wide Area Surveillance BU Director.

> Conclusion

To support airspace protection mission and maintain resilience in times of conflict, SPYNEL® Infrared Search and Track provides reliable detection, tracking and classification of multiple threats. Highly mobile, SPYNEL® reinforces situational awareness while remaining undetectable by the enemy.

Temporary Surveillance

Fully flexible, SPYNEL® offers a lightweight solution and is readily adaptable to the specific operational needs of Ground-Based Air Defense (GBAD). Mounted on a tripod or on a vehicle, SPYNEL is easy to **transport and to deploy. Compatible with urban environments**, SPYNEL® can be deployed on the roof of a building, for example.

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