OverWatch & Spynel M Integration

O-SPY

Abstract

The United States faces an array of threats from near-peer competitors, China and Russia, that have not been seen since the cold war. As our nation's joint strategic priority shifts from counterterrorism to ensuring competitive advantage on a global stage - the sensors we use need to shift as well. Our near-peer adversaries have comparable sensors to our own and have advanced counter measures. Keeping our operators safe in the environments of the future will require new systems with capabilities not yet fielded. Aries Defense and HGH have partnered together to provide the next generation of force protection sensor that will simultaneously keep our operators safe as well as shorten the kill chain by enabling them to sense first, see first, and shoot first while not increasing the operator's signature.

Problem

Currently the existing fielded threat detection sensors are active sensors. These sensors emit some form of sound or energy in order to gain information about the enemy. Unfortunately, when used in this way they provide position/location information to our adversaries' sensors in return. The battlefields of the last decade afforded us advantage through a technological capability gap. We could use sensors without worrying about our emissions being used to counter locate. This is no longer the case verse near-peer threats because they have their own similarly advanced suite of counter sensors.

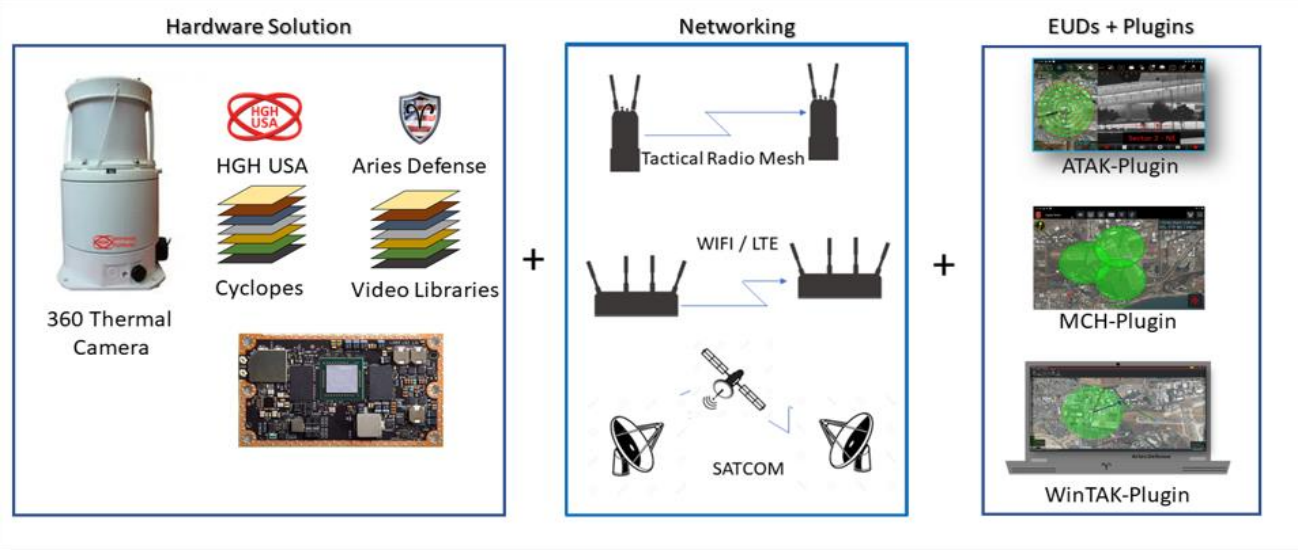
Near-Peer Defeat Sensor Requirements

- Passive
- Network Agnostic
- Integrated with Situational Awareness Tools
- Modular Mountable
- Man Portable
- Variable Length Deployment

The sensor must be passive and able to perform its job with no emissions while in the active state. The output of the sensor must be compatible with ATAK (SOCOM, Agencies) and the MAGTF Common Handheld (Marine Corps). The sensor needs to be compatible with all operational network to facilitate widespread situational awareness and force multiplication. These sensors should allow for the maximum number of deployable configurations. They should be man portable, able to be mounted on quads, armor, boats, and stationary objects. The power solution should be compatible with readily available battery types, daisy chainable for variable length missions, and hot-swappable for uninterrupted use recharging.

Overall System Architecture

OverWatch Spynel M System: O-SPY



The OverWatch Spynel-M (O-SPY) kit is comprised of a modified HGH Spynel-M600 Sensor leveraging Graphics Processors and Aries Defense's video libraries, a networking solution, and ATAK/MCH Plugins. The kit allows the user to deploy a passive thermal sensor in remote areas. The sensor will detect and track thermal signatures and alert users on tactical networks when detection occurs. The system is integrated with The Programs Of Record to allow users to receive alerts and view/record video on their EUD or laptop computers.

Sensor

The Spynel-M600 is a thermal imaging sensor that provides a 360-degree coverage area with live full motion infrared video.

Spynel-M600

This sensor is **passive**. There are no emissions like Radar, Lidar, or Laser based systems that could compromise the sensor or the operator's location. The O-SPY system is an EMCON compatible solution.

Using the 360 degree nature of the sensor the video can be geo-rectified and analyzed to produce early warning threat detections.

Networking

True to Aries Defense product lines, the O-SPY system is network agnostic.

Supported Networks:

- Ethernet / Wifi
- LTE: Cradlepoint or Banshee Tactical LTE
- SATCOM: Viasat, Intellisat, MUOS, etc.
- Tactical Radio: Trellisware, Persistent Systems, Silvus, DTC, Thales, Harris, Etc

Situational Awareness

PLI

Each O-SPY system will broadcast its position location information (PLI) in a periodic Cursor on Target (CoT) message via the tactical network. This will be displayed in mapping applications as a Sensor Point of Interest (SPI) with a 360-degree Field of View (FOV).

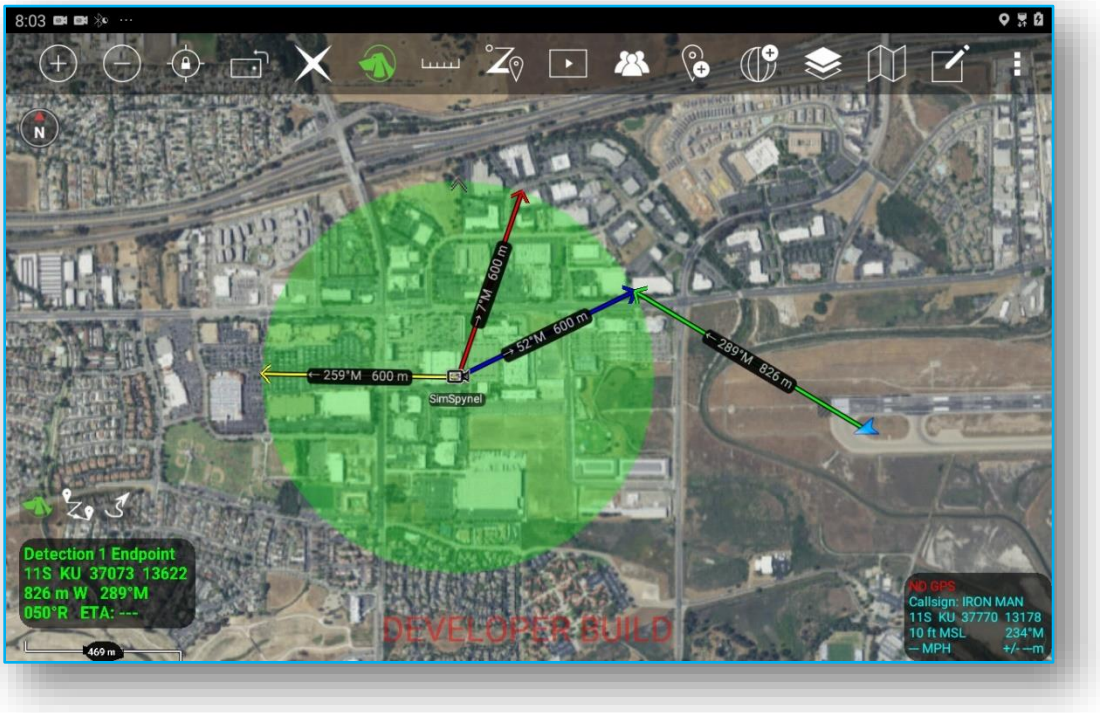
Detections

LoBs

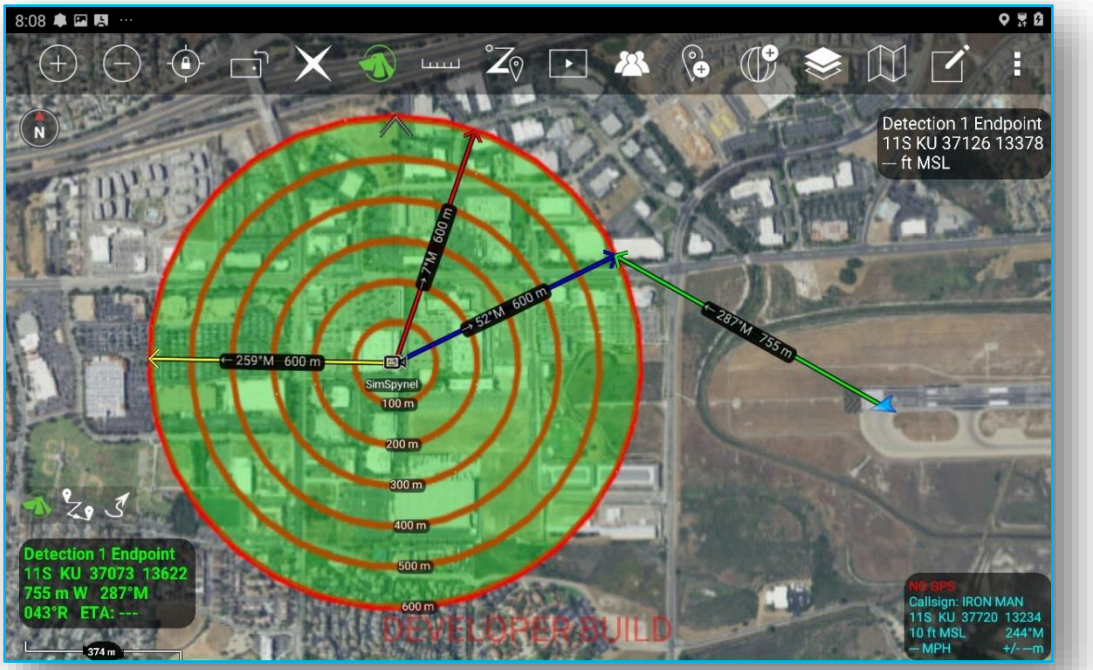
As the sensor detects changes it generates tracks. Each track is sent over the network as either a CoT message or aggregated into a Json Array and then sent over the network. This will be displayed in mapping applications as Lines of Bearing (LoB). The operators will be able to determine that there is a detection along the LoB.

Points

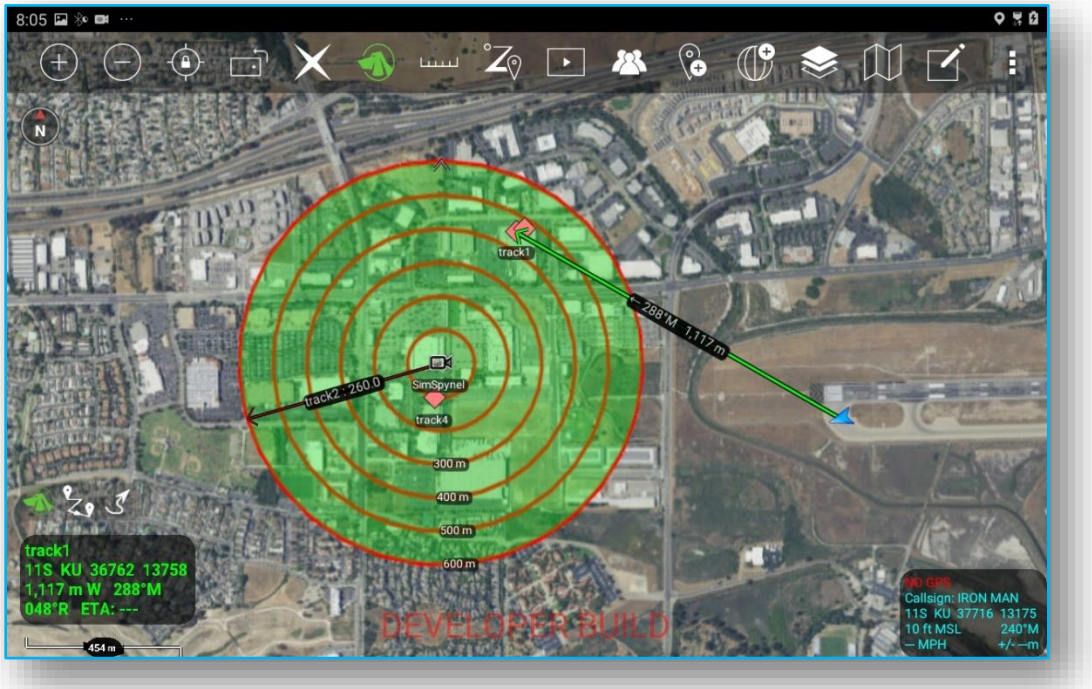
Should the sensor be able to get a full detection it will determine the distance of the event. With the addition of range to the LoB the track now becomes a point. These point tracks can be plotted on the map.



ATAK Showing O-SPY Coverage and 3 Real Time Detection Lines of Bearing.



ATAK Showing O-SPY Coverage and 3 Real Time Detection Lines of Bearing with Range and Bearing Tool Range Rings Enabled.

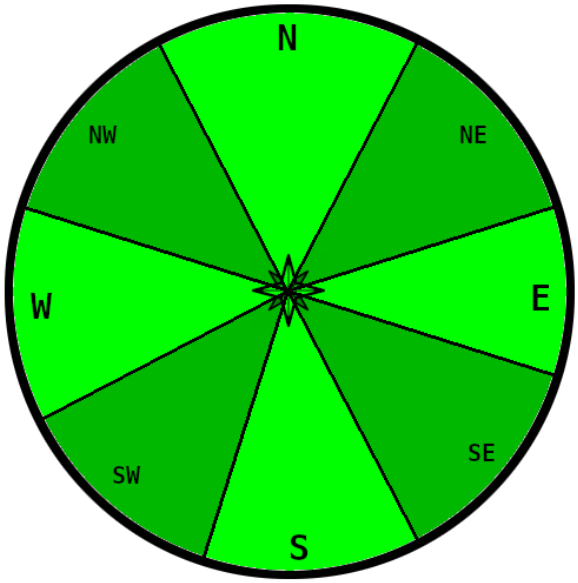


ATAK Showing O-SPY Coverage, Range Rings, a LOB Detection, and 3 Real Time Point Detections.

WinTAK Showing O-SPY Coverage and 3 Detection Lines of Bearing.

Alerts

The system will alert operators when a new track is received from the sensor. The alert will include a quick reference to a sector. A sector corresponds to the 8 cardinal directions. Operators can also see the bearing and distance (if available) when investigating the alert. The operators also has the option to open and view a live RTSP video feed of that sector.



Alerts, Detection, and Video Feed Zones

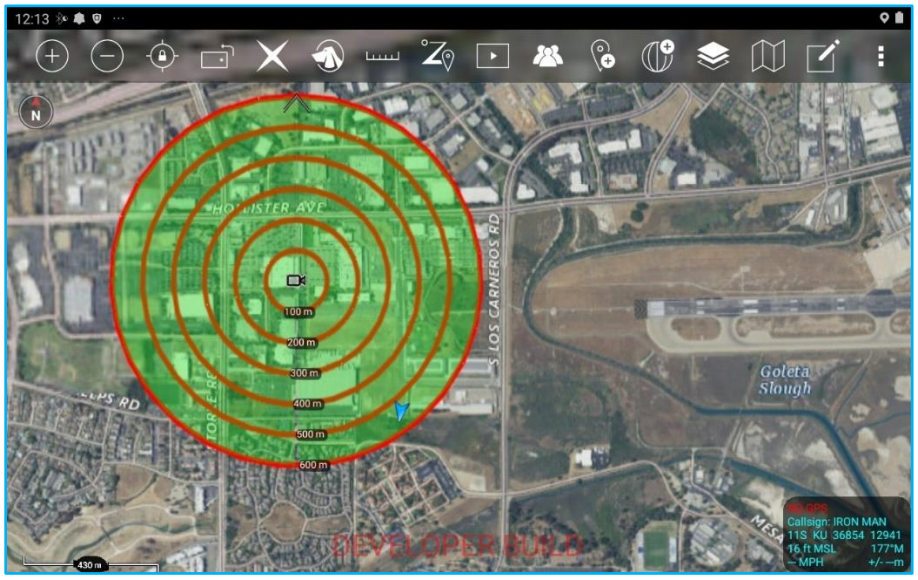
Video

The system will allow the operator to pull the video feed from each sector of the sensor. When an alert is received for a new track the operator can pull the sector video and visually determine what the detection is.

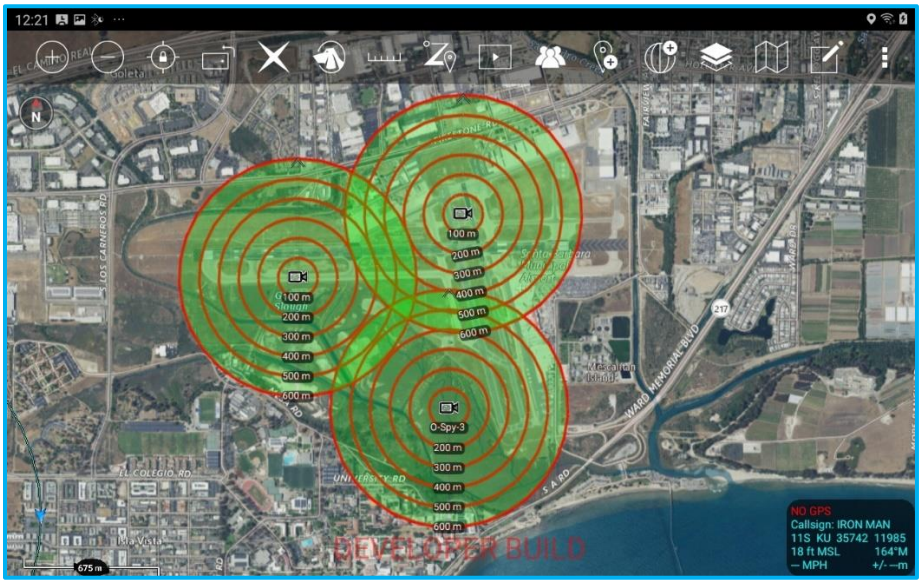
The system will allow for snapshots and recordings to be taken on the viewing end user device (EUD)

A Single Sector IR Video Feed.

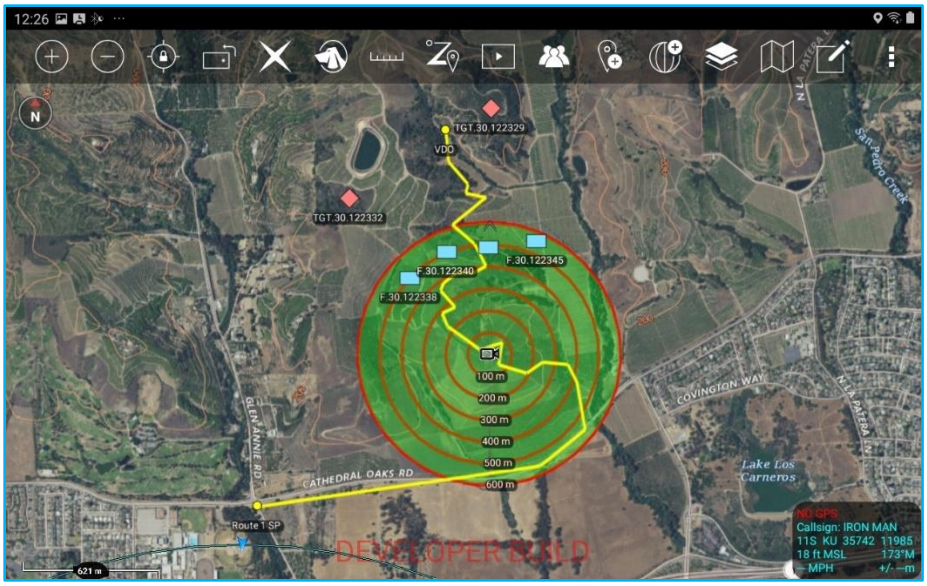
Use Cases:



Single Passive Sensor Emplacement.



Passive Infrastructure Protection.



Ingress/Egress passive route monitoring

Company Information

Aries Defense LLC

1982 Northgate Commerce pkwy Suite #7E

Suffolk, VA 23435

CAGE: 7VEL5

DUNS: 08-063-5835

Email: ariesinfo@ariesdefense.net

Electro Optical Industries

320 Storke Road, Suite 100

Goleta, CA 92117

CAGE:

DUNS:

Email : eoi@eoiir.com