D-FEND SOLUTIONS

WHITE NOTE

Traditional Drone Detection Technologies vs. RF Cyber-Drone Detection

There is a wide gap between traditional counter-drone technologies and cyber solutions when it comes to detection.

Traditional Detection	Main Limitations
Radar	False positives and signal refraction
Electro-Optical	Requires line-of-sight
Directional Finders	No GPS location
Acoustic	Ineffective in noisy environments

Radars

Radars are a popular legacy detection technology that offer long-range coverage. Older legacy systems, which were used mostly for the military or aviation industries, can detect larger aircraft but often cannot track drones, due to UASs diminutive sizes. More modern anti-drone radar systems use advanced technologies, such as electronically scanned array (ESA) and micro-Doppler, but they cannot always differentiate between small drones and birds, generating false positives. Radars can also be complicated to operate and to integrate with mitigation solutions, and are frequently costly.

Electro-Optical

These detection systems employ sophisticated electro-optical infrared thermal imaging (EO/IR) cameras to identify drones based on their visual and temperature-related identifiers. The recorded images can later be used as evidence to help authorities apprehend rogue drone pilots. The biggest disadvantage of EO/IR solutions for detection is that they require line-of-sight, which is not always available in crowded, sensitive or urban environments. Darkness can also hinder the effectiveness of EO/IR detection solutions.

Directional Finders

Directional finders utilize sensors to detect UAV remote controls/drones. They monitor common frequency bands that they can match to a library of drone control signal profiles to classify these types of signals. Using measurements from multiple sensors helps determine a precise location of the drone, which is helpful during the transition from detection to mitigation. But directional finders are unable to take the next step. They cannot identify specific drone models, or provide the live GPS location of drones.

Acoustic

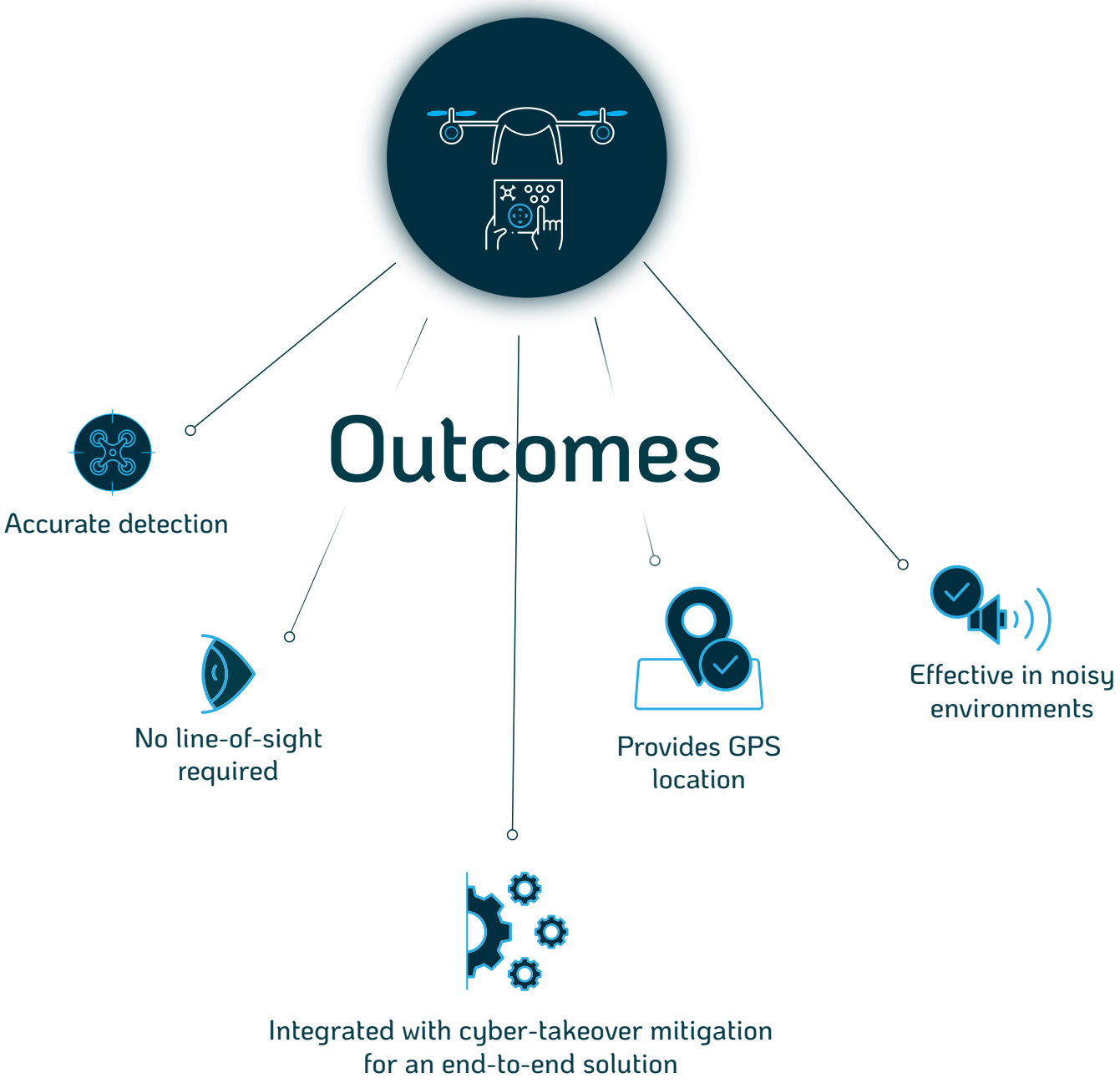
As the name implies, acoustic detection systems rely upon sound. Acoustic sensors can match the sounds that drones produce to a library of drone noises. One of its big advantages is that it is mobile and easy to deploy. The limitation of this technology is fairly evident: many of today's sensitive environments – such as airports, crime scenes, outdoor stadiums and arenas, etc. – tend to be loud. Acoustic solutions are ineffective in noisy environments.

RF Cyber-Detection

Advanced, anti-drone, radio frequency (RF)-based cyber solutions passively and continuously scan and detect unique communication signals used by commercial drones, without producing false positives. Once detected, the solution can extract the drone identifiers for classification process, to tag drones as authorized or unauthorized. The system can decode the telemetry signal to determine the type of drone and extract the drone position with GPS accuracy. This includes the take-off position near the pilot in real-time, which can help law enforcement officials apprehend criminals. Cyber solutions do not require a quiet environment or line-of-sight.

Cyber solutions are holistic, meaning detection and mitigation are integrated to offer an intuitive, end-to-end, counter-drone solution.

Next-Generation RF Cyber-Detection



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