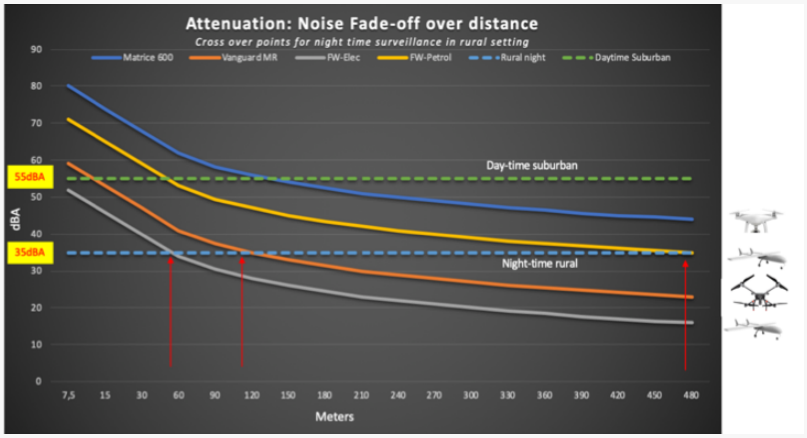
Selecting the best Security Drone

The addition of low altitude sUAS for Remote Sensing in Surveillance and Security operations



Drone noise fade-off profiles against background noise levels

CAPE TOWN, SOUTH AFRICA, July 27, 2020 /EINPresswire.com/ -- SELECTING THE BEST SECURITY DRONE

Security Drones are being used in a wide variety of security applications, from patrolling borders and conducting 24/7 surveillance of huge sectors to responding to early warning triggers and conducting initial assessments.
But there are a few things prospective enterprise drone customers need to know if they want to select the best drone for their needs.

Low altitude sUAS fills a particular gap in UAV airspace by bringing the power of previously Space-borne, High or Medium UAVs, or Terrestrial remote sensing technologies airborne to within less than a few hundred meters of identified targets.

With these security drones early warning and real-time Situational Awareness (SA) is delivered at a fraction of the cost of above alternatives which tend to provide delayed, ‘after the fact’, information.

As an example: Some of the advantages of low altitude Security Drones for Border Control:
-UAVs provide a rapid response and fast "eyes on" to the target area with live updates to control stations on land AND water
-The speed, size, manoeuvrability and additional technologies make UAVs the ideally suited for ISR or rapid SA for BOTH ground- or water-borne units to detect and monitor potential threats from a safe distance.
-Stationary cameras - have blind spots
-A physical wall (or infrastructure) - once built, cannot be redeployed, or adjusted.
-Border patrol agents would take an hour, on land or water, to reach a trigger event 10kms away, - a drone can be there, AND overhead, within minutes.

THE 3 MAIN AREAS THAT SECURITY DRONES IMPROVE SURVEILLANCE AND SECURITY

The ISR process which is often also represented by the OODA model (OBSERVE, ORIENT, DECIDE, ACT) benefit greatly across all its phases from drones.

1.) Being able to bring more powerful sensors closer to the target/s than before enables higher levels of DRI (Detect, Recognise, Identify) during the OBSERVE phase.
2.) This in turn leads to higher levels of SA (Situational Awareness) insight during the ORIENT phase.
3.) And much faster and more effective responses during the DECIDE and ACT phases.

THE 4 MOST IMPORTANT FEATURES OF A SECURITY DRONE

1. NOISE FOOTPRINT

Most surveillance missions are their by their nature discreet and it is important to understand the noise footprints of various drones and what your requirements are in terms of location and level of detail to be captured.

For both security and wildlife monitoring operations in a Rural setting, the ideal drone noise range would be 35 – 45dBA. In a Suburb: 45 – 55dBA and in a CBD 55 – 65dBA.

QUIET DRONE DESIGN
Given the importance of stealthiness in surveillance applications, some commercial drone manufacturers specialize in silent drone design by using specific motors, propeller and aircraft body designs to gain significant reduction in noise levels of up to 10dBA.

The following list compares the design objectives of certain classes of drones:
- Consumer drones (Typically designed to meet certain price points)
- Quiet Commercial drones (Designed for noise reduction as well as endurance, efficiency and flexibility)
- Fixed Wing UAV – Electrical (Designed for energy efficiency)
- Fixed Wing UAV – Petrol (Designed for endurance)

The accompanying graph depicts the noise fall-off rates over distance for a selection of UAV configurations and compares them to certain levels of ambient (background) noise:
UAV Model/Acoustic Footprint/AGL required to achieve 35dB at ground level
Fixed Wing Electrical/52dB/60m
Quiet Commercial Multirotor/59dB/120m
Fixed Wing Petrol/71dB/480m
Consumer Multirotor/80dB/1,340m

2. ENDURANCE

Longer flight-times reduces the time wasted with landing and relaunching as well as exponentially increasing the potent strike range for every extra minute in the sky.

Flight limitation/Flight time/Flight distance (60km/h)/Potential area of coverage (strike range)
VLOS/30 seconds/500m/0.79km2
EVLOS/1.5 minutes/1.5km/7.07km2
BVLOS/30 minutes/30km/2,827.43km2
*Extended/Beyond VLOS (Visual Line of Sight)

3. RANGE

When drone endurance (Flight-time) translates into flight distance or area covered long Range for Telemetry and Video Feedback to Command and Control stations is essential.

4. PAYLOAD

The right capabilities need to be brought to identified target areas. The best security drones benefit from being able to integrate a variety of previously space- or terrestrial-borne, remote sensing technologies into SWAP (small size, weight, and power consuming) designs for low altitude sUAV platforms.

For Security Drones specifically the following sensors are most effective:
1.) ELECTRO-OPTICAL SENSORS like infrared sensors, visible-light cameras, multispectral, and hyperspectral sensors
2.) Small power-efficient RADAR SYSTEMS suitable for unmanned vehicles,

ELECTRO-OPTICAL SENSORS

These sensor payloads are used in various surveillance and reconnaissance applications from counter-drug operations, homeland security, search and rescue border control, military, and a variety of civil applications. They comprise compact multi-sensor gyro-stabilized surveillance system for SWaP platforms.

RADAR

Most importantly about these systems operates day or night, in rain, snow, fog, dust, or smoke to enable detection, location, and classification of targets.

Radar systems, using artificial intelligence (AI) algorithms to provide situational awareness for safe unmanned aircraft operations, provides detailed real-time aerial radar images, while delivering precision air-to-surface targeting accuracy and superb wide-area search capabilities.

Operating Modes for SAR
- The GMTI mode helps locate moving vehicles, while DMTI enables operators to detect very slow-moving vehicles and people on foot.
- MWAS mode detects ship and boat traffic in various sea states; and is suitable for coastal surveillance, drug interdiction, long-range surveillance, small target detection, and search and rescue operations.
- UAV based SAR can detect resolutions as low as 0.3 meters and with a detectable range of up to 10 kms.

5. SPEED

Speed is often overlooked in the assessment of drone performance where the focus tends to be on flight time (endurance), especially for high endurance, long range UAVs.

At 60km/h, conventional UAVs cannot achieve much efficiency if they reach long range targets belatedly. At 200km/h, high-speed low-altitude drones would reach a target 60km away in 15minutes, a conventional UAV would still be 45km away.

Airborne Drones is a specialist manufacturer of long range UAVs

MR GP Gerber
Airborne Drones
+27 87 550 4319
email us here