APS advanced protection systems

BIRD AND DRONE THREAT MITIGATION

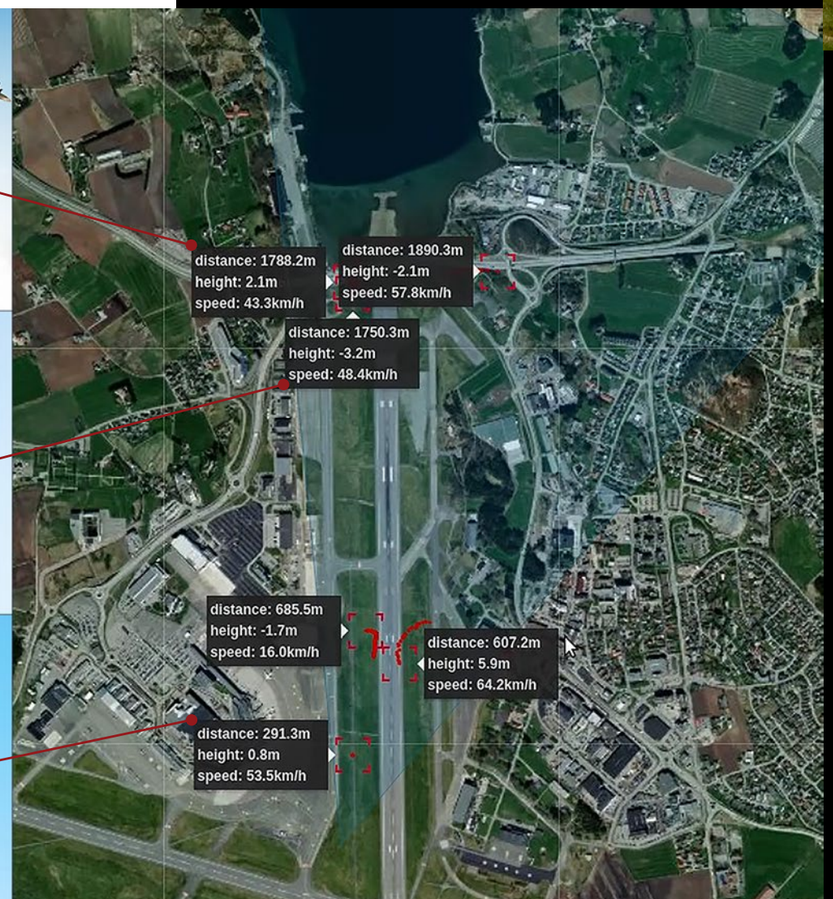
ACCURATE ■ MODULAR ■ AFFORDABLE ■ PRACTICAL

BIRD DETECTION

All aerodromes are similar, but every aerodrome is also unique, and each has its own environmental challenges and specific habitats. It is therefore important to understand when and why birds are moving into the critical flight areas. An avian radar is an invaluable tool to monitor bird activity in and around the aerodrome 24/7, providing constant intelligence of bird movements within those critical airspaces. Avian radar enables birds to be detected in 3D space at considerable distances and in all weather conditions.

Avian radar data informs the airport operator:

- **WHERE** and **WHEN** there is a likelihood of species of concern being active in, or close to, the critical airspace
- **WHICH** factors are influencing the likelihood of these species of concern being in the wrong place at the wrong time
- **HOW** to build an objective, evidence-based database to demonstrate good practice in safety management and compliance with all national and international regulatory standards
- **WHAT** is the risk level and appropriate action to mitigate that risk



OUR SOLUTION – BEYOND RADARS

Our system provides not only radar technology, but most importantly – reliable and actionable information, which can be instantly applied in a practical way.

Solely offering excellent technology does not instantly solve your challenges. That's why APS provides that extra step forward by assisting the aerodrome operator in deciphering the radar data into practical information. This information can be instantly used to mitigate wildlife strikes and enhance flight safety. For this reason, APS works closely with the most experienced international Subject Matter Experts (SMEs) available. Years of operational expertise in aerodrome wildlife hazard management, technology, and research, combines to offer not only practical solutions to mitigate the risks, but also true value for money to the aerodrome operator.

YOUR PEACE OF MIND

APS will give you real peace of mind as we handle all the steps required for successful operation of the avian radar at your premises. From applying for the OFCOM radar permit to finding the most appropriate solution for your budget.

We support you in all stages of the process:

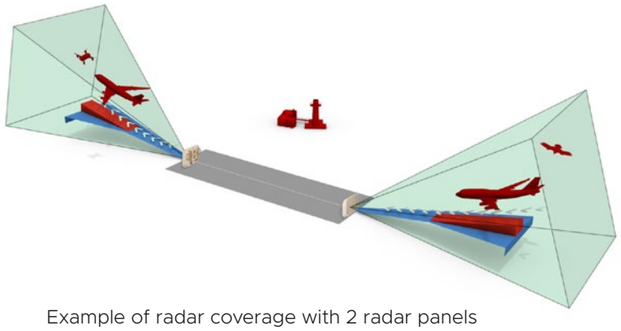
- Site survey – using our proprietary Predicted Detection Quality software
- Based on that data, designing an optimal system configuration, with performance and budget in mind
- Installation and integration with existing systems
- Operator training
- Technical support

AFFORDABLE

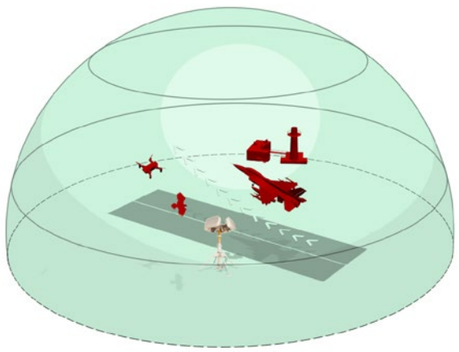
APS offers a 3D avian radar, which means that not only direction and distance, but the elevation is also logged for each individual target. This information can be viewed in real-time or off-line using a dedicated reporting software package.

Avian radars are usually priced far beyond the average safety budget of an aerodrome operator. Well, we have good news for you: thanks to the modular and scalable system, our pricing model brings the radar also into the budget capabilities of smaller, regional aerodromes and helideck operators.

APS's avian radar sensors can also be leased or offered as a service (RaaS).



Example of radar coverage with 2 radar panels monitoring the most critical flight zones (polygons).

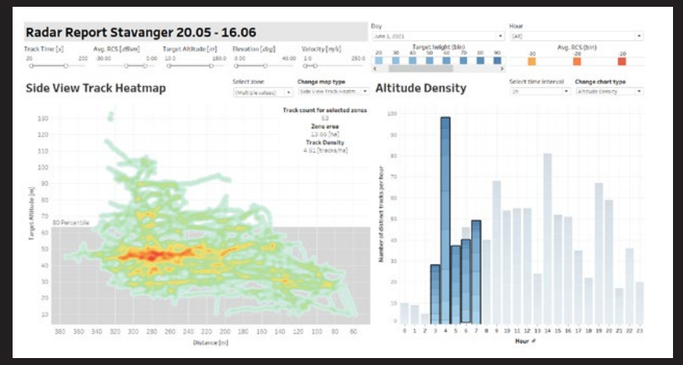


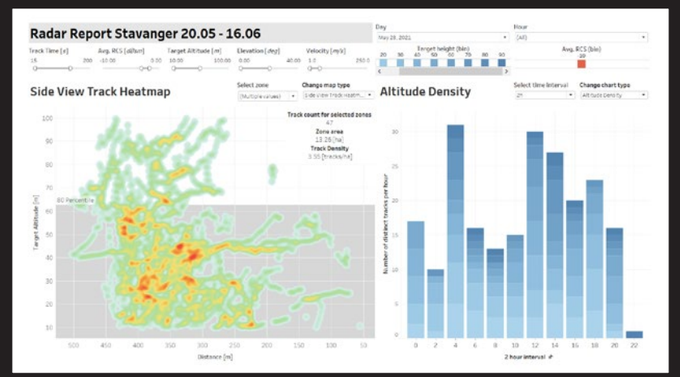
Example of full 360˚ coverage with 4 radar panels.

FLEXIBLE AND MODULAR

Thanks to a wide range of sensors available and a modular approach, APS can offer a bespoke solution to each and every aerodrome. For aerodromes requiring full coverage, a multi-panel setup provides a 360˚ view. For those in need of protecting and monitoring only the critical flight areas, directional radar sensors may be sufficient. The APS radar system is scalable — initial installation can be expanded with additional functionality and coverage at later stages. In this way, APS can offer the high-performance, yet affordable radar solution within everyone's budget.

RADAR DATA ANALYTICS SOFTWARE





The long-term data analysis trends reveal the key birds behaviours, and informs the operator why these birds are flying through the critical flight zone at certain times of the day. All data is clearly visible for personal review in a user-friendly **Radar Data Analytics Software Package**. This software reporting program is a part of the total **avian radar product** proposition that converts data into actionable, easily interpretable information visualised in charts, tables, and 2D/3D maps.

Our Radar Data Analytics Software Package provides the following key information:

- Number and type of bird tracks in given period within defined critical flight zones
- Flight direction distribution at particular times of the day per critical flight zone
- Height distribution of the recorded bird tracks for each critical flight zone
- Bird density within critical flight zones
- Heatmaps showing bird activity hotspots

LOW OPERATIONAL COSTS

APS's sensors represent a new generation of radar technology with their origins in the military. The radar has no moving parts and therefore does not suffer from the regular wear and tear characteristics of conventional rotating radars. That also means a significant reduction in the annual service and maintenance costs.

APS offers software updates to its clients for a small annual service fee. These updates and most servicing can be completed remotely.

BIRD AND DRONE DETECTION

APS 3D radar sensors have a unique capability not only to detect birds, but also drones. The system will offer an added value for aerodrome operators, as it covers the needs from a safety and security perspective. The radar software is able to discriminate between drones and birds at the given performance ranges, including the range at which birds are automatically sub-categorized into big birds and flocks. Drone and bird detection, and classification features, are offered as separate software modules.

BENEFITS OF THE APS 3D RADAR SYSTEM IN A NUTSHELL

- 3D radar (exact location, speed, distance, course, and altitude)
- Modular (flexible set-up; cost-effective solution)
- Bird and drone detection and classification capabilities
- A radar solution to everyone's budget capabilities
- Low operational costs due to lack of moving parts
- Comes with SME support, so you gain maximum efficiency from operating a 3D radar
- Will give you peace of mind, as APS provides comprehensive support from the planning phase to full operational capacity and after support

SYSTEM SPECIFICATIONS

Maximum detection range	
Birds	
Small/medium-sized bird (RCS 0.005 m^2)	5 km
Big bird (RCS 0.02 m^2)	7 km
Flock (RCS 50 m^2)	12 km
Aircraft	
Commercial airliner (RCS 100 m^2)	20 km
Micro UAV (RCS 0.01 m^2)	6 km
Range accuracy / Range resolution	3 m / 10 m
Minimum/maximum target altitude	1 m / 10 km
Coverage (azimuth/elevation)	45° / 20°
Frequency	X-Band
Technologies	AESA/MIMO
Power consumption	468 W @ 24 VDC
Connectivity	Ethernet

We protect the airspace

WHO WE ARE

Advanced Protection Systems S.A. (APS), is a Polish high-tech company, specialising in radar sensor technologies to detect, track and classify small airborne targets such as drones and birds. The company was established in Gdynia, Poland, in 2015, and employees over 50 highly skilled PhD scientists, engineers, and software developers. APS operates globally with its main markets located in Europe, Middle East and Asia.

The long list of international customers who trust APS include various European law enforcement and armed forces agencies, NATO armed forces, critical infrastructure and security customers in Europe and the Middle East.

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