

PROJECT SUMMARY



Bird and Drone Detection System

Client: Toronto Pearson International Airport (GTAA)

Location: Mississauga, Ontario, Canada

System: Accipiter® TS1-24D and TS1-8A Radar Surveillance Systems including Accipiter® ADS-B Sub-system

The Challenge

Operated by the Greater Toronto Airports Authority (GTAA), Toronto Pearson International Airport (YYZ) is Canada's largest airport facility with traffic of 49.5 million passengers and 473,000 flights a year (2018), utilizing thirty taxiways and five main runways.

It has been well understood and documented that bird (avian) activity in and around airports poses a significant impact on aviation safety, with over \$1B of aircraft damage and disruption occurring annually in the US alone, as a result of aircraft bird collisions. For many years bird strike incidents have been logged and reported routinely. While wildlife hazard management personnel / biologists operate at most airports, it was only when US Airways flight 1549 miracle landing on the Hudson in January 2009, did "bird-strike" become a household word. While birds continue to be a significant safety hazard, the explosion in popularity of drones for leisure usage has added another collision hazard creating risk for air travel and airports. Airports are now looking to technology as a means to addressing these combined risks. YYZ contracts the service of Falcon Environmental Ltd. to provide wildlife services at the airport. These services include habitat management, bird harassment, bird-strike evidence collection, birds of prey deployment and drone activity sighting.

However, understanding the behavior of birds 24/7/365 in varying light and weather as well as monitoring birds outside of the airport perimeter remain a huge challenge when not using radar technology. As a result of these challenges, YYZ, through Falcon Environmental, awarded a contract to Accipiter for the deployment of our state-of-the-art radar surveillance systems through Accipiter's unique Radar-as-a-Service (RaaS) program.

The Solution

Accipiter is the only company whose avian radar systems have been tested and validated by the US Federal Aviation Authority (FAA) and the US Department of Defense. The testing of Accipiter's 3D avian radar systems was instrumental in development of the FAA's Advisory Circular 150/5220-25 "Airport Avian Radar Systems" and the only company whose systems currently operate at North American commercial airports. Further, Accipiter developed a unique concept of Radar-as-a-Service (RaaS), enabling airport operators to benefit from the significant technological advantages of avian radar through a multi-year subscription service.

YYZ has deployed two of Accipiter avian radar systems at strategic locations. The Accipiter® TS1-24D is our 3D avian surveillance radar system. Utilizing proprietary digital radar processing the system can track over 500 birds simultaneously, delivering 3D target trajectories for each bird (lat, lon, alt, speed, heading, and size), tracking small targets (Starling sized birds) at 2km and larger targets (Canada Goose sized bird) at 7km. The Accipiter® TS1-8A is our 2D surveillance radar system, which delivers similar performance without the altitude indication but with a greater instantaneous elevation coverage of 20°, compared to an agile 4° beam of the 3D system. The combination of both radar systems enables significant ariel coverage across the airport facility, enabling tracking of birds and drone activity. The radars are complimented by the addition of Accipiter's ADS-B sub-system, which provides tracking and identification



Project Start: 03/2020; **Project Finish:** 12/2021

Support Commencement: 08/2020

Support Services: Ongoing



Market: Aviation Safety & Security



Type of Contract: Supply, Commission and Support; Radar-as-a-Service (RaaS) contract



Client Contact:

Available upon request



Accipiter® TS1-24D 3D Radar Surveillance System



Accipiter® TS1-8A 2D Radar Surveillance System

of cooperative aircraft, enabling monitoring of birds / drone aircraft interaction. While the Accipiter® surveillance radar systems cannot identify a drone specifically, they provide early warning to potential drone threats, enabling slewing of cameras as well as purpose-built 3D drone radars which operate at shorter ranges. (Drone radar and camera will be added in fall 2021). The radar data is synchronized with the Accipiter's patented M³ Target Information System, located at our Niagara Data Centre, allowing the customer to view live, historical and analytical displays through Accipiter's Surveillance-to-Intelligence® (S2I) tools using standard browsers both in an operations center and mobile in the field.

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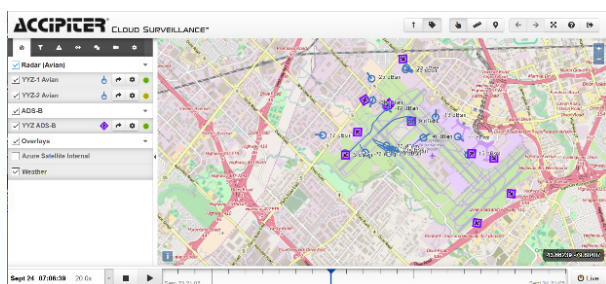
Accipiter's Radar Intelligence Network™ Platform Technology

Accipiter offers several carefully engineered systems to address your particular aviation safety and security problems, and they are all built on our patented and game-changing Radar Intelligence Network™ (RIN) platform technology. The RIN architecture ensures your system can easily adapt and grow with your changing threats and needs. Our novel approach to wide-area, real-time detection, tracking, post processing, AI and display, coupled with on-the-fly and interactive analytics applied to historical target data, sets us apart from any other radar systems provider by giving you unprecedented situational understanding and decision support. Our RIN allows any number of sensors to seamlessly connect, plug and play, over any TCP/IP network to our patented M³ Target Information System (TIS) which forms the heart of all our delivered systems. And because the RIN was engineered to be radar agnostic and COP-agnostic, the right radar sensor(s) can be selected for your problem, and surveillance data can be provided with our S2I tools as well as integrated into your C2 systems or business intelligence platforms.

Surveillance-to-Intelligence™ (S2I) Tools

Accipiter provides a suite of easy-to-use S2I tools, giving users with different roles or missions the situational understanding they need to be more effective at performing their duties. The Accipiter® Radar Common Operating Picture (COP) and ThreatViewer™ give watch standers and dispatchers a real-time map-view of target tracks from all sensors with built-in, 24-hour rapid replay along with alerts in response to detected threats of interest. Our tablet-based Mobile Response COP gives responders in vehicles a user-centric display, allowing them to more easily put their own eyes on live targets of interest so they can take action.

Our strategic S2I tools interactively or on-the-fly mine the TIS's historical target data to give analysts understanding of target activity patterns or managers specialized reporting with metrics and key performance indicators (KPIs) used to better manage and allocate resources to mitigate risk. The Accipiter® Track Histories Viewer delivers spatial patterns of tracks around your aerodrome every hour, while the Accipiter® Target Analyzer Software (TAS) allows the analyst to generate a variety of temporal and spatial target activity distributions.



Accipiter® Common Operating Picture (COP) at YYZ

About Accipiter

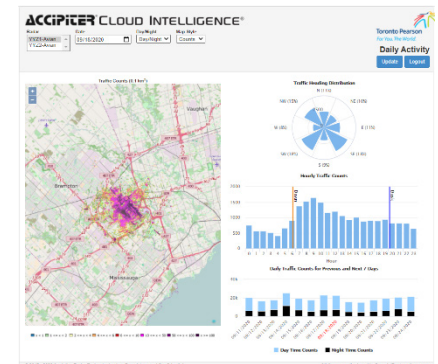
Accipiter Radar is a North American company that develops, sells, and operates high-performance Radar Intelligence Networks™ that monitor the behavior of uncooperative targets such as small vessels, low flying aircraft, drones / UAS, people, vehicles and birds, as well as distributed phenomenon such as weather, waves and ice. Accipiter is a world leader in extracting actionable intelligence from multiple surveillance sources. Its suite of Surveillance-to-Intelligence™ (S2I) analytical user apps provides both tactical (real-time) and strategic (historical) situational awareness for 21st century safety and security applications.

Accipiter provide protection and security for governments, military, security agencies and commercial operators around the world including airports, military airbases, ports, waterways, critical infrastructure, remote mining facilities, LNG plants. Accipiter is a leader in radar surveillance for Beyond Visual Line of Sight (BVLOS) for commercial drone operations.

Products Designed and Built to Exceed Expectations

Accipiter's family of products are designed for persistent detection and tracking of cooperative and uncooperative targets on the water, in the air and on the ground. 2D and 3D radar systems for fixed installation locations or for rapid mission deployment, connect with Accipiter's M³ Target Information System and Surveillance-to-Intelligence™ tools to enable live tactical situational awareness and strategic analytical decision making through 24/7/365 all domain awareness.

Whether you are protecting your homeland through border enforcement, providing coastal surveillance or using surveillance to protect your critical infrastructure perimeter; increasing aviation safety through bird and drone activity monitoring or safety management; or protecting wildlife through wildlife hazard management studies, habitat management and active bird deterrent systems, Accipiter has a proven system for you.



Accipiter® Daily Activity Dashboard at YYZ

CANADA

Accipiter Radar Technologies Inc.
576 HWY 20 W
Fenwick, ON L0S 1C0
Phone: 905-228-6888
Fax: 905-892-2249
Mail Only: P.O. Box 939, Fonthill, ON L0S 1E0

Email: sales@accipiterradar.com

USA

Accipiter Radar Corporation
40 Centre Drive, Suite 300
Orchard Park, NY 14127
Phone: 716-508-4432
Fax: 888-393-6421

Website: www.accipiterradar.com

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