Fly safely with FlightHorizon. Detect and avoid aircraft when flying beyond visual line-of-sight.

Do your commercial unmanned aircraft operations require beyond visual line-of-sight flight, FAA Part 107.205 Line-of-Sight waiver, 333 Exemption Certificate of Authorization to fly beyond line-of-sight or other authorizations? Do you need autonomous self-separation assurance? Do you need to fly above 400', fly near airports, at night or over water? FlightHorizon, designed by NASA, provides a complete autonomous collision avoidance solution for both piloted and fully autonomous unmanned aircraft to deliver situational awareness, self-separation commands, and collision avoidance for both piloted and autonomous unmanned aircraft.

PRODUCT BACKGROUND

Vigilant Aerospace Systems, Inc. provides the FlightHorizon family of products which use data from standard aviation transponders and radar, when available, to allow unmanned aircraft to autonomously self-separate from other aircraft and avoid mid-air collisions. This function is critical to allowing unmanned aircraft to fly beyond visual line-of-sight.

The system is based on an exclusively licensed NASA patent ([#9,405,005](#)) and prototype which has been extensively tested and which provides a unique autonomous "detect-and-avoid" function.

In addition, the software provides unmanned aircraft pilots with a 2D map-based view and 3D synthetic cockpit view of the airspace and full sensor fusion across aviation transponders, and when available, radars and online data feeds. The system is designed to help operators maintain flight safety, achieve beyond visual line-of-sight flight authorizations and comply with [FAA Part 107.205 waiver requirements](#) and upcoming [RTCA SC-228 Phase II MOPS](#).

The company also provides integration and development consulting in addition to testing, training and compliance services for unmanned aircraft flight operation departments and fleet managers.

PRODUCTS

- FlightHorizon GCS™ – Uses an aviation transponder and, when available, ground-based radar attached to a laptop or workstation at the ground control station to provide collision avoidance commands and situational awareness to the ground-based unmanned aircraft pilot.

- FlightHorizon COMMANDER™ – Airspace management system designed for airspace managers, fleet operators and anyone who needs to maintain a big-picture view of their airspace, maintain well-clear for unmanned aircraft and keep detailed flight logs.

- FlightHorizon PILOT™ – (COMING SOON) Uses onboard FlightHorizon computer, transponder data and, when available, radar data, to send self-separation commands directly to the onboard autopilot.

AWARDS AND AFFILIATIONS

- R&D 100 Award Finalist for 2017

- Winner of the FLC's National Excellence in Technology Transfer Award 2017

- Winner of the FLC's Far West Region Outstanding Commercialization Success Award 2016

- Member of the NASA Unmanned Traffic Management (UTM) Collaborative and the UTM SAA / DAA Working Group

- Invited Test Partner in the FAA's ASSURE UAS Center of Excellence Research Program

ADDITIONAL TECHNICAL RESOURCES

- Technical journal publications, white papers, and presentations about FlightHorizon are available online at [www.VigilantAerospace.com/resources](#)

- Product videos are available online at [www.VigilantAerospace.com/video](#)

OVERVIEW

Vigilant Aerospace provides consulting services to ensure the smooth integration of FlightHorizon into your flight operations. Services include installation, configuration, system integration, software customization, user interface customization, testing, training and compliance consulting for companies using FlightHorizon products.

SERVICES

<u>Systems Integration</u> – Equipage and purchasing advice, equipment installation and configuration, software configuration and other services related to the use of FlightHorizon for detect-and-avoid

<u>Software Development</u> – Development of specialized hardware integration modules, new user interfaces and new software functions for equipment and mission-specific client needs

<u>Testing</u> – Testing of installed FlightHorizon systems, including especially transponder and radar installation testing, systems integration testing and software testing

<u>Training</u> – Training of personnel to use FlightHorizon for flight safety, situational awareness, self-separation and collision avoidance in routine flight operations

<u>Compliance Consulting</u> – Advice on how to meet equipage and performance-based regulatory requirements using FlightHorizon and related hardware, systems and processes

VIGILANT AEROSPACE SYSTEMS
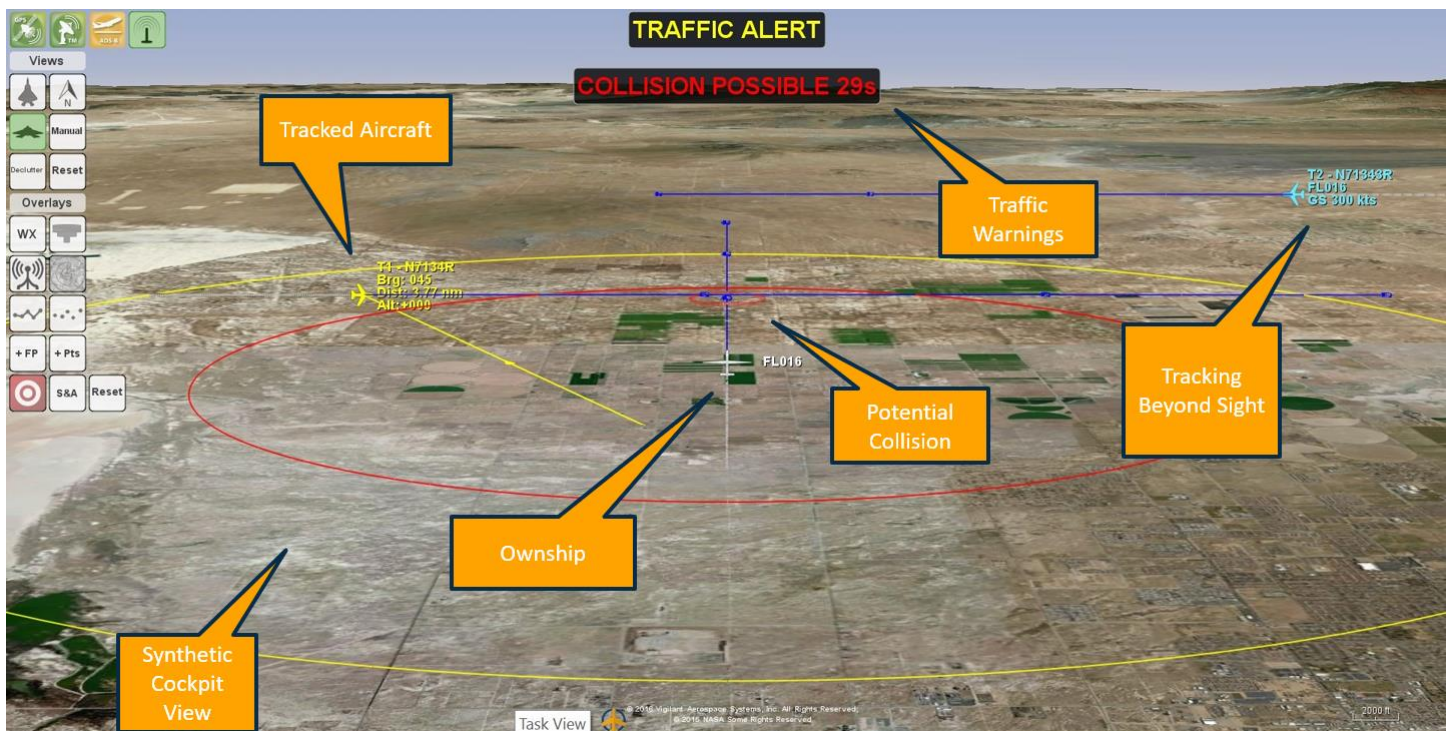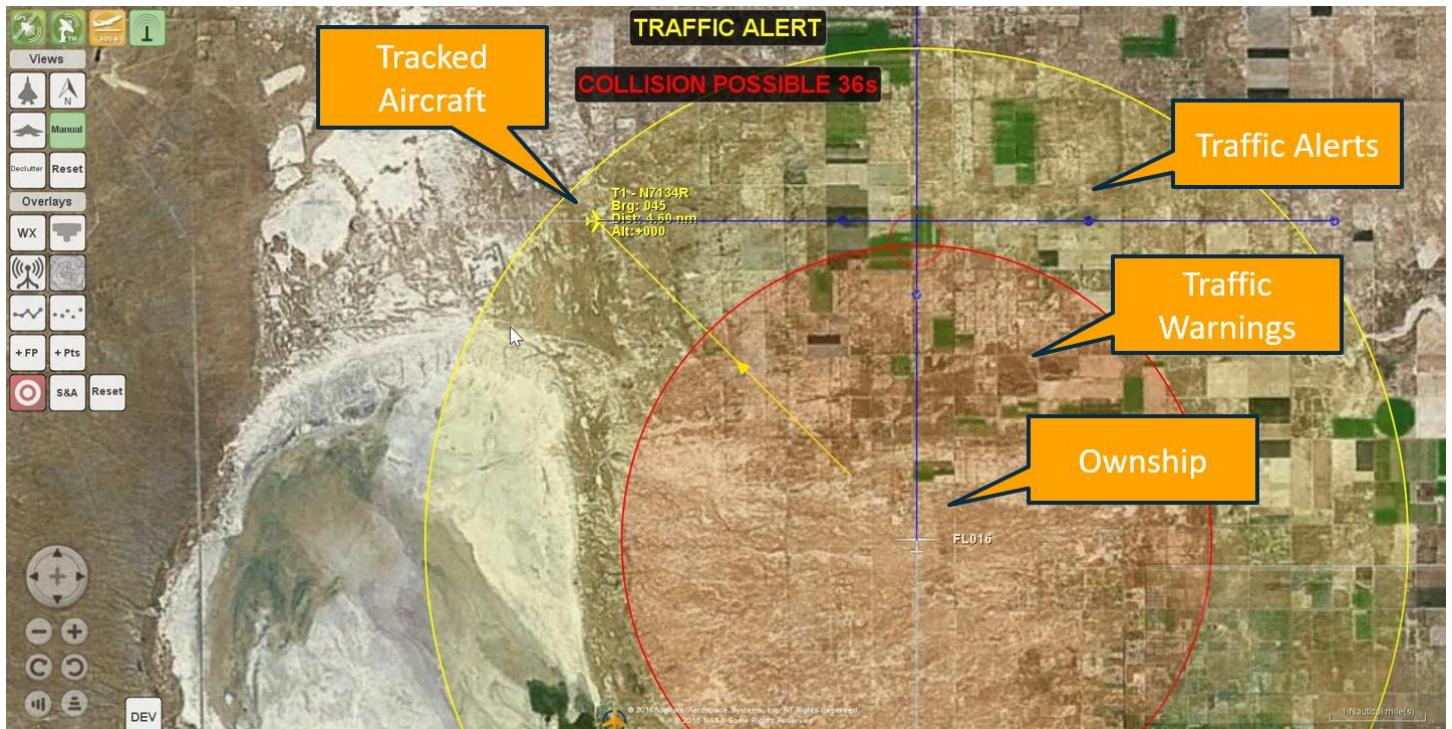
This buying guide will help you select the correct product based on your operational needs.

Operational needs…	Requirements…	Product…
• Unmanned flights within 20 miles of the ground control station • Simplest and most economical solution	• Requires unmanned aircraft pilot • Requires onboard transponder • No onboard systems integration required • Ground-based radar unit option, when available • Networked traffic management option	**FLIGHTHORIZON GCS™**
• Airspace management, tracking of multiple aircraft in real time, self-separation and well-clear maintenance	• Optional online data feeds require internet connection • Optional radar module	**FLIGHTHORIZON COMMANDER™**
• Fully autonomous detect-and-avoid solution • Unlimited range from the ground control station	• Requires onboard transponder • Requires installation of FlightHorizon flight computer and integration to autopilot • Onboard radar unit option, when available • Networked traffic management option	**FLIGHTHORIZON PILOT™**
• Systems integration and testing • Software and hardware integration to onboard control radio and autopilot • Custom software and user interface design and development	**NONE**	**FLIGHTHORIZON CONSULTING**

Detect-and-Avoid UAS System Successfully Trialed Beyond Line of Sight   1 Feb 2017

"The flights tested the system's DAA algorithms, hardware integration and user interface performance. Eighteen different scenarios were flown multiple times using two DJI Phantom 4 drones; one aircraft acted as the primary ownship, and the other acted as an intruder aircraft.

Vigilant Aerospace says its system successfully detected and tracked the intruder aircraft and provided warnings on 100% of air traffic during the encounters. The scenarios triggered the system's traffic alerts, threat alerts and collision warnings – in turn, allowing the drone pilots to avoid collisions.'" – Betsy Lillian

DJI Phantom 4s used in sense-and-avoid testing   1 Feb 2017

"But, significantly, the scenarios were beyond the visual line of sight. Those flights, … simulated real-world scenarios in which visual detection of approaching aircraft by ground-based unmanned pilots might not be possible due to distance, weather, altitude and speed. […] These weren't just simple tests. The FAA's senior UAV regulator was on hand to observe, as was an FCC observer whose task was to monitor radio transmissions." – Scott Simmie

Vigilant Aerospace Completes BLOS Test at NASA Armstrong   30 Jan 2017

"To demonstrate the system's BLOS capabilities, a variety of flights were conducted, including ones where ground based unmanned pilots were possibly unable to see approaching aircraft due to a variety of factors such as distance, weather, altitude and speed.

In total, almost 100 scripted encounters between UAS under different realistic flight conditions were flown to test several of the system's primary functionalities, including its DAA algorithms, user interface performance and hardware integration." - Staff

Who Benefits from Airmap and its Digital Certificates for Drones?   10 March 2017

"There are other solutions for aircraft identification that don't involve certificates or a digitally enabled UTM system. For example, Vigilant Aerospace completed beyond line-of-sight flight testing of its new FlightHorizon collision avoidance system for drones at NASA Armstrong Flight Research Center in the Mojave Desert without a complex system." – Colin Snow, The Drone Analyst

Vigilant Aerospace Partners with NASA on UAS Traffic Management System   5 Aug 2016

"The partnership allows the company to integrate UTM flight plans and traffic data into its FlightHorizon avionics software and provides NASA with access to the company's flight test data and system development advice and feedback. FlightHorizon provides UAV operators with air traffic visualization and detect-and-avoid commands for integration into the national airspace and beyond line-of-sight flying. The software is based on technologies the company exclusively licensed from NASA's Armstrong Flight Research Center earlier this year." - Staff