

MILITARY APPLICATIONS

SIXDOF:

Enabling Autonomy and Accuracy in Challenging Environments

THE CHALLENGE

As the battlefield environment evolves and U.S. adversaries acquire the ability to contest or disrupt legacy platforms, the need for a new generation of autonomous solutions has never been greater. In order to remain relevant, autonomous systems must deliver higher speed, greater accuracy, and more durability at a lower SWaP-C than legacy systems.

Sixdof's high-speed optical tracking platform provides unparalleled capabilities to ensure battlefield superiority into the future. The many applications of Sixdof technology which are of interest to tier-1 militaries and defense primes include: UAS landing under exceptionally challenging conditions, air-to-air refueling, and pilot goggle systems.



ADDRESSING INDUSTRY PAIN POINTS

Over the course of seven years, Sixdof Space has developed a beacon/sensor high-speed optical tracking platform which is designed to address specific pain points in the defense sector. The fourth-generation Sixdof platform includes the following:

APNT: Not reliant on GPS for PNT so it is ideal for contested environments

6DOF: Provides full position and orientation information of the sensor relative to the beacon at a speed of 400 times per second

OpSec/InfoSec: The sensor is not a camera and so it is ideal for sensitive or restricted environments

Modular: Architecture is designed specifically for flexible integration

UAS LANDING

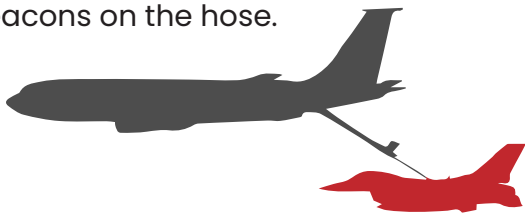
The capability to land an unmanned aerial system (UAS) precisely and autonomously is crucial in high-intensity situations. Military forces aboard a ship need to land a UAS back on the ship for repeat flights. Achieving this in real-world conditions, with unpredictable weather and varying times of day, is challenging.

Traditional solutions, such as QR codes, GPS, and standard beacons, struggle with precise autonomous UAS landings at night, in windy conditions, in blinding sunlight, and in contested environments. U.S. troops must operate under all conditions and cannot rely on ideal conditions.

Sixdof offers customizable technology that integrates seamlessly into various UAS platforms, enabling autonomous precision landings based on high-resolution, drift-free optical tracking. It ensures centimeter-level accuracy at any time of day, in nearly any weather, and up to 100 meters away. In addition, the platform can also be used to orchestrate “swarms” of autonomous platforms in a “follow me” pattern for UASs or UGVs.

AIR-TO-AIR REFUELING

In another application, Sixdof technology can be employed in building a more accurate and effective air-to-air refueling mechanism (A2RM). As a platform-agnostic system, our technology can be incorporated into relevant structures to ensure the accuracy and efficacy of both boom/receptacle and probe/drogue refueling. For this scenario, the system can be implemented with full redundancy, where the primary arrangement is a sensor on the tanker’s refueling hose and the beacons mounted on the jet, but it is backed up by an opposite configuration with a sensor on the jet tracking the beacons on the hose.



PILOT GOGGLES

Pilots use headsets that employ a collection of VR/AR tools. In training simulators, this serves to create unparalleled realism and while in the air it can provide additional layers of data. Cybersickness in VR/AR goggles primarily results from latency issues and the disconnect between motion and visual input.



When there’s a delay between a user’s physical movements and the corresponding changes in the display, the brain receives conflicting signals from the eyes and the vestibular system, leading to symptoms such as dizziness, nausea, and disorientation. Mitigating the risk of cybersickness and enabling a fully immersive experience is critical for pilots in training and in operational situations. Sixdof’s ultra-low latency ensures smooth synchronization between motion and visual feedback, crucial for mitigating the risks of cybersickness when using VR/AR.

ABOUT US

Sixdof Space (www.sixdofspace.com) was founded in 2017 and is headquartered in Jerusalem, Israel, where it has an R&D office. In addition, Sixdof has a wholly-owned U.S. subsidiary that has been approved to conduct business with the U.S. government. Sixdof capabilities are available for direct contracting based on award of AFWERX Commercial Solutions Opening (CSO) from the Super Goggle Digital Design Challenge and the Air-to-Air Refueling Mechanism Digital Design Challenge.

Having sold cutting-edge precision tracking solutions to organizations spanning Israel Aerospace Industries to surgical robotics companies, Sixdof Space is experienced in providing accurate solutions designed for mission-critical, high-pressure situations. For additional information on Sixdof and our offerings, please reach out to CEO Mark Goldfarb at Mark@sixdofspace.com