DHS Science and Technology Directorate

Small Dark Aircraft: The Hunt for Drug-Smuggling Aircraft at our Borders

Protecting our skies

American airspace is highly regulated and restricted. Planes passing through—whether commercial or private—are required to identify themselves and provide proper credentials so that they may be tracked and monitored. Despite existing security measures, a number of small aircraft—including ultra-lights, small-fixed wing general aviation, and helicopters—are still able to slip through airspace undetected. Known as "small dark aircraft," these planes have become ideal drug-smuggling vehicles.

Small fixed wing aircraft

Small ultra-light aircraft

Small helicopter

Small and stealthy, these aircraft often operate over large, remote areas, making them difficult to detect. Flying below the radar, suspect aircraft are able to travel, make drops, and even land undetected. To ensure the security of our airspace, U.S. Customs and Border Protection (CBP) needs a system to remotely track and combat these aircraft.

Working across the government

In response to this need, the Department of Homeland Security Science and Technology Directorate (S&T) launched the Small Dark Aircraft project. This effort is committed to developing and transitioning capabilities to find, track, and interdict small dark aircraft. With the help of other federal agencies, S&T conducted an engineering review of current detection systems. Based on findings, S&T is developing capabilities that will improve early detection and tracking, increase the opportunity for interdiction, and enable CBP to more efficiently deploy government assets. S&T is working on these efforts with the CBP Office of Technology Innovation and Acquisition.

Developing and testing new capabilities

In October 2010, S&T reached out to the scientific community to identify innovative technologies to detect and track small aircraft. Through an invitational challenge, three capabilities were selected for further testing and development. These technologies were chosen based on the technical merit of the idea, innovation of the technique, and potential to meet CBP's mission needs. Currently, these capabilities are in the final development stages and being tested in the field. Once testing is complete, the capabilities will be fully integrated and transitioned to CBP.

In March 2011, S&T conducted a joint exercise with CBP at the U.S. Air Force Test Pilot School to evaluate current capabilities to interdict small aircraft. S&T recommended a "non-material" solution to increase detection and tracking of low flying and low observable aircraft, providing an unprecedented approach to CBP's operational doctrine.

In March 2012, S&T demonstrated acoustic and special-purpose radar technologies and their ability to detect and track small aircraft. In September 2012, these technologies were deployed to the CBP Spokane (WA) Sector for short-duration testing. Currently, S&T and CBP together are performing developmental testing at the sensor and system level, including a test of an acoustic and seismic detection system.

In October 2013, S&T conducted a 9-month long duration test of the system and the data analysis from the test was delivered to CBP in September 2014. The system will be optimized and in place through 2015.

The northern border zone is 236,000 square nautical miles in size.

Homeland Security
Science and Technology

To learn more about the Small Dark Aircraft project, contact us at: sandt.bordersmaritime@hq.dhs.gov.

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