Remote Drone Identification

Science and Technology

FINDING THE DIGITAL LICENSE PLATE

With the increased usage of drone technology, an emerging challenge is the ability to identify drones in use, their purpose, owner, and relevant technological makeup. The inability to do this poses a challenge in maintaining no-fly zones, ensuring public safety, and identifying drones used for nefarious purposes. All commercial drones possess unique identifiers specifying this information; a requirement established under 14 CFR Part 89 – Remote Identification of Unmanned Aircraft. However, presently, there are limited means to capture this information beyond physically examining the drone. An operator must be near the drone or Unmanned Aerial System (UAS) to garner access to the 2.4 GHz and 5.8 GHz signal. Once that signal is accessed, the ability to utilize the information in an operational context is necessary. The Department of Homeland Security (DHS) Science and Technology Directorate (S&T), through the Air Land, and Port of Entry Security (ALPOE) program's Remote Drone Identification activity, has established a joint effort with industry partners to solve this problem by developing a man-portable drone identification system.

BUILDING THE TECHNOLOGY

Drone technology is rapidly developing, and its usage has seen exponential rise. The Federal Aviation Administration (FAA) issued the Remote ID rule to enhance airspace security and safety and lay the groundwork for advanced operations. Subpart D of the Remote ID rule outlines the required minimum messaging for the built-in and aftermarket Remote ID modules. The broadcast includes key information about the identity of the UAS and its location. Accessing the drone's Remote ID information requires utilization of a receiver that has the necessary software protocols to decode the messages. Further system development is valuable to utilize the Remote ID messages for law enforcement and airspace management authorities. Further developments for the purposes of actioning the Remote ID signal include creation of a dashboard view for UAS and their operation, establishment or incorporation of designated areas of interest, access to flight authorization logs, an ability to discriminate against false signals, and the capacity to distribute this information to both local authorities as well as individuals at operational command centers. Therefore, a system that incorporates a user-friendly interface providing all pertinent information with connectivity on the backend to sensitive databases gives law enforcement, air-based assets, and operators with boots on the ground the most accurate and reliable information to enable comprehensive mission success.

Images depict AI generated scenarios of police responding and detaining unlawful UAS users through usage of this system.

EMPOWERING LAW ENFORCEMENT

Remote identification provides law enforcement officers the ability to identify drones that may pose security risks to a variety of locations and events, including but not limited to public buildings, critical infrastructure, stadiums, large public gatherings, and airports. Obtaining reliable Remote ID data will enable law enforcement to accurately track unauthorized, negligent, and criminal use of drones; identify the operator; and ensure public safety through precise and collaborative operational capabilities. Remote ID data can be queried through databases utilized by law enforcement prior to being disseminated on strategic or tactical levels, providing insight into operational or potential criminal history and the possible motives for drone use on a case-by-case basis.

INTEGRATION FOR THE LONG TERM

The technology developed during this activity is a fully integrated system that can be rapidly deployed and leveraged to discern lawful and unlawful UAS users. However, Remote ID is just one variable in a larger airspace safety management toolkit. The current system takes advantage of the Remote ID requirements and access to law enforcement databases, while remaining agile to add capabilities as policy and technological requirements shift. Future efforts may include additional sensors, automated airspace management, risk analytics, and potentially a future where integrated counter-UAS response is at the fingertips of law enforcement. As drones continue to be a valuable tool for society, DHS will continue to develop the tools to ensure they are operated appropriately.

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