



NON-KINETIC UNMANNED AIRCRAFT SYSTEM (UAS) COUNTERMEASURE

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(U) DroneDefender Overview

(U) The DroneDefender is a non-kinetic solution to defend airspace against UAS, such as quadcopters, hexacopters and fixed-wing UAS, without compromising safety or risking collateral damage.

(U) KEY BENEFITS:

- ✓ Immediate response
- ✓ Low-cost technology
- ✓ Man-in-the-loop
- ✓ Point directional
- ✓ Lightweight
- ✓ Minimal training required
- ✓ Rugged

Disclaimer: This TPR is only applicable to the Evaluation Unit (B-DD-021) distribution of DroneDefender and should not be used with any Production Units.

(U) System Statistics

- (U) Cold start time: <0.1 seconds
- (U) Operating time: Up to 5 hours continuous (~300+ Engagements)
- (U) Weight: 15 lbs.- configuration dependent
- (U) Effective Area: 25° cone
- (U//FOUO) Effective against commercially available UAS operating on the most common command link and global navigation satellite system frequencies
- (U) Picatinny Rail-based system for mounting optics and lasers
- (U) Battery powered

(U) Enemy UAS Mission

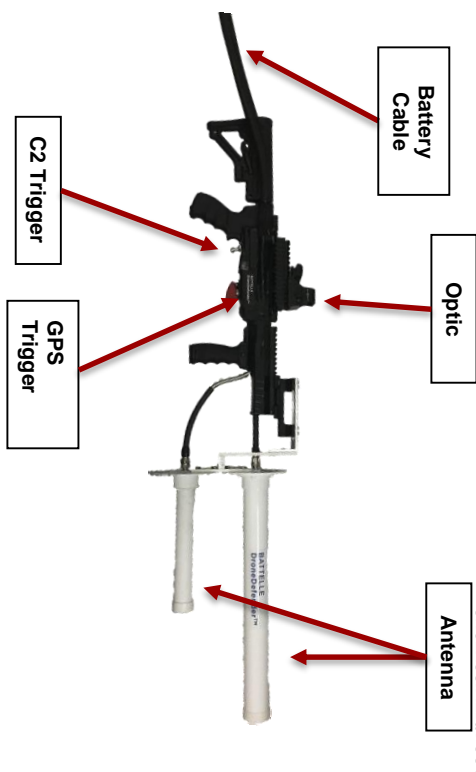
- (U) UAS can be used to conduct Kinetic Attacks, Call for Fire Support, ISR, Cyber Warfare, to elicit reactions or any other combination limited only by creativity.
- (U) Enemy forces have access to a wide variety of drones, from single-wing aircraft that can quickly create a three-dimensional map of a military base to four-propeller copters that carry high-definition cameras for ISR missions.
- (U) UAS can be guided by a radio controller or autonomously by GPS waypoints.

(U) DroneDefender Employment

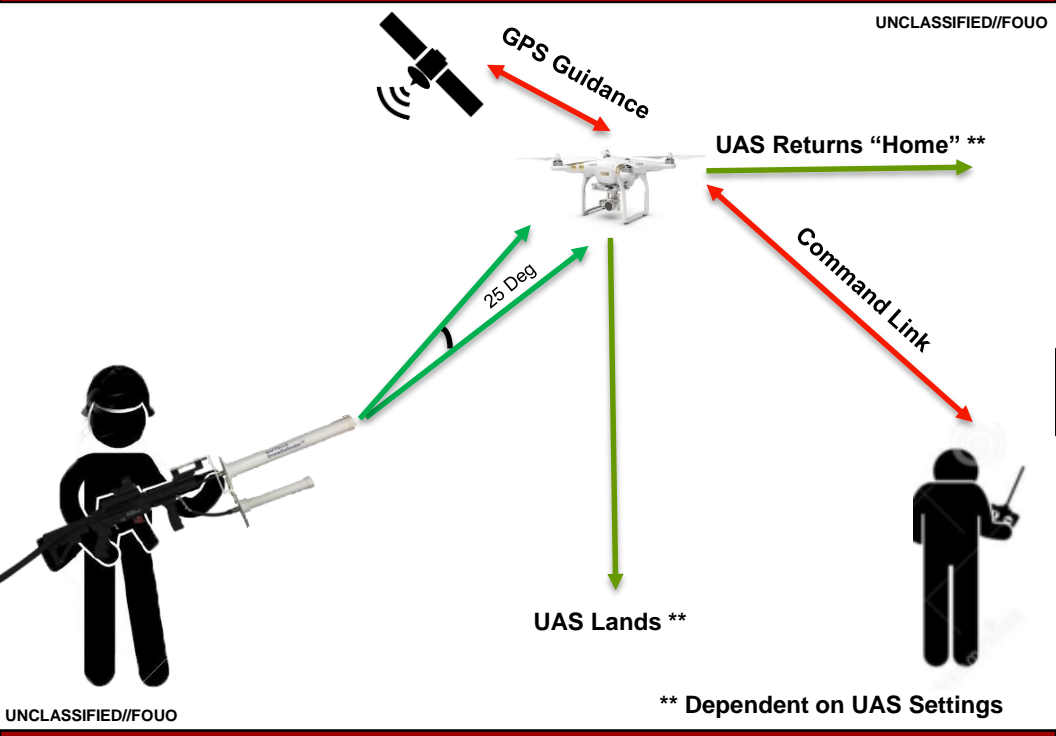
- (U) Proper planning by leaders will ensure that units employ adequate force protection measures when employing the DroneDefender system.
- (U) Notify higher and adjacent units (Clear airspace and pass early warning).
- (U) Get distance and bearing to the threat.
- (U) Center the UAS in the optic.
- (U) Activate the DroneDefender while keeping the UAS in the center of the reticle as it either returns to the initial launch point or lands on the ground.
- (U) Determine if a recovery team or EOD is required for retrieval or exploitation.

(U) UAS Basics

- (U) The majority of commercial UAS operate their command link on similar radio frequencies.
- (U) Drones receive guidance and position information in real time by GPS sensors.
- (U) Operators can set up waypoints to have the UAS follow a flight path using GPS coordinates.
- (U) Drones have automatic failsafe commands, which will tell the system what to do if it loses a signal. Pilots have the option of setting the drone's failsafe to hover, land at its current location, or return to home if the command and control link is disrupted.
- (U) If the GPS and the command link are disrupted, the system will either hover until the battery is depleted or land in place.



(U//FOUO) General Employment of DroneDefender



(U//FOUO) Dismounted Operations



(U//FOUO) Base Defense



(U) Operational Considerations

- (U//FOUO) DroneDefender is designed to be a man-portable, dismounted system. It is best emplaced in perimeter guard towers for base defense.
- (U) Once spotted, UAS are vulnerable to Radio Frequency (RF) and/or GPS disruption by the DroneDefender.
- (U//FOUO) Operators should conduct system checks, including battery and system functionality, during pre-mission checks or shift changes. The battery can be left on during an operation or a shift without degradation of operational capability.
- (U//FOUO) The audible signature of the UAS will most likely be noticed before any visual indicators are present.
- (U//FOUO) Scan air sectors vertically 10 degrees at a time in order to maximize peripheral vision. Tilting the operators head while wearing polarized sunglasses 90 degrees will help visually draw out a suspected UAS in the sky.
- (U//FOUO) DroneDefender works within line of sight and even when the UAS is right above the patrol or guard tower.
- (U//FOUO) Obtain compass bearings of UAS's route of ingress and egress (if it returns to the initial launch point).

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(U) Recovery of Enemy UAS

- (U//FOUO) Depending on the type of UAS engaged, the drone will either return to the initial launch location or land when disrupted.
- (U//FOUO) If the enemy UAS lands, keep the DroneDefender centered in the reticle while recovery forces or EOD responds to the downed UAS. If there is a suspected payload on it, use standoff optics and sensors to determine the UAS payload.
- (U//FOUO) Do not attempt to pick up the defeated UAS if the propellers on the UAS are still spinning or if there is reason to believe the system is carrying a dangerous payload. Throw a towel or a blanket on the system to prevent injury from remote propeller activation.
- (U//FOUO) Take photos of the downed UAS. If there is a camera on it and no reason to suspect a dangerous payload, retrieve the memory card from the UAS's camera.
- (U//FOUO) When recovering the downed UAS, ensure the drone is off and tape up the camera lens to prevent enemy exploitation.
- (U//FOUO) If the battery on the drone appears structurally compromised, use surgical gloves to recover the UAS to ensure no hazardous material gets in contact with human skin.