ANTI-DRONE DEVICES FOR ARTSAKH'S DEFENSE

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The drones are a terrorist weapon.
They not only kill targets but also
terrorize other people.
Noam Chomsky

Anti- or counter-drone technology (aka counter-UAS or C-UAS), refers to the recent invention of systems that are deployed to detect and/or intercept unmanned aircrafts while in flight. This new technology is rapidly evolving as the mass adoption of drones takes place as Azerbaijan acquired many attack drones from Israel and Turkey.

The rapid growth of counter-drone technology is predicated on the profitability of this kind of venture and on the deep concern about the threat that drones pose in military and civilian environments. Many unarmed civilians have been victimized because of drone attacks during unconventional warfare such as done by Azerbaijan/Turkey forces during the Second Artsakh War in 2020.

To avoid confusion due to so many different anti-drone devices and to better understand this emerging and evolving technology of drone detection and neutralization, anti-drone or counter-drone measures can be categorized into two main types of methods: *Drone Detection* and *Drone Mitigation or Interception*. The first is for mainly defensive measures, and the second is for counter offensive missions.

(I) Drone Detection technology detect the enemy's UAS (unmanned aerial or aircraft systems), namely drones in the airspace. Drone detection methods include Radar, RF sensors, and PTZ cameras. When a foreign drone flies within the protected perimeter, drone detection will detect the intruding drone in the airspace. For instance, the *911 Security AirGuard* system is a drone detection platform not only detects the intruding drone but also identifies the pilot location, flight path, and other useful telemetry data (i.e., data collected at remote or inaccessible points and transmitted to receiving equipment for monitoring, display, and recording).

Briefly, let us introduce drone detection technology of Radar, RF sensors, and PTZ cameras in simple terms:

The Radar system has a transmitter that emits radio waves called radar signals, which are either reflected back or scattered by objects (e.g., approaching drones) they encounter. The distorted waves bounce back to the radar receiver, then by means of algorithms* they are converted into visual on-screen format that gives an idea of the approaching object in terms of its size and density. Radar can provide effective detection of drone presence over a long-range to enable the side being attacked to prepare for the approaching enemy's drones. *(An algorithm is a set of instructions for solving a problem or accomplishing a task).
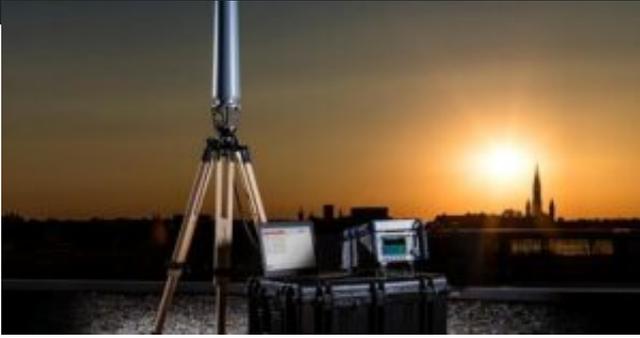
This is a Radio Frequency (RF) analyzer. RF analyzers consist of one or more antennas to receive radio waves and a processor to analyze the RF spectrum. They are used to try to detect radio communication between a drone and its distant pilot (namely its controller). Based on the information gathered, steps will be taken to deter or even destroy the approaching enemy attack drones. A device like this was deeply needed during the first four days of Arstakh's Second War in 2020.

The RF (Radio Frequency) sensors system consists basically of RF scanners that are used to scan a known range of frequencies commonly used by drones to operate. The sensors can stay up to date with the latest drones by virtue of an updated database with all the drones. The RF system is passive, which means it does not transmit anything, but RF-based UAV detection and identification is a useful technology in conjunction with the Radar system technology.

As for PTZ (Pan, Tilt, and Zoom functions) cameras that enable the monitoring of a large area in the airspace with a single device. Optical detection of drones with powerful PTZ cameras can detect even small drones at a great distance. Often, a PTZ camera's high-resolution imaging allows security personnel to capture visual evidence of a drone's payload, providing them with the chance to prepare for any additional threats posed by the enemy drone.

(II) Drone Mitigation or Interception is the new technology that works by electronically or physically disrupting the enemy drone flight and even taking it down by counter offensive measures. According to Merriam-Webster, *Mitigation* can be defined as "to cause to become less harsh or hostile" or "to make less severe or painful". Militarily, to mitigate the threat that unauthorized drones pose in a given environment, which involves either a defensive mitigation actions, offensive mitigation actions, or a combination of the two. As for drone *interception*, it means in the military case as the engaging of an enemy drone in an attempt to hinder or prevent it from carrying out its mission.

Incidentally, if the Artsakh Defense forces had these types of anti-drone devices we would have saved the lives of many of our brave soldiers and most likely would have won the war, but their reckless generals were lost in their egocentric pursuits.

Back to the subject of Drone mitigation technologies, which include Drone Jammers, Spoofers, Nets, and Security Drones.

Let us introduce Drone Jammers, Spoofers, Nets, and Security Drones as types of drone mitigation or interception in plain English:

A Drone Jammer is a machine designed to send electromagnetic noise at radio frequencies with the purpose of overriding the same radio and GPS signals your drone uses to operate. Basically, it works by blasting electromagnetic noise at the radio frequencies that drones use to operate and emit information. They are designed to drown out the conversation between a drone and its operator, which means the drone cannot receive instructions from its distant pilot. Thus, confusion sets in and the drone is orphaned in mid-air.

A Drone Spoofer, unlike a jammer that works by blocking RF frequencies, a spoofer sends fake GPS signals that mimic legitimate ones. In other words, a spoofer hijacks a drone's communication link by emitting a counterfeit signal that the device reads as valid because it is a copy of the real signal. The drone spoofer, therefore, specializes in hoax and tricks to mislead the enemy distant drone pilot.

A Drone Net can be used to protect pilots, civilians, and spectators from potential harm if a drone flies off course. When a drone breaches a jamming signal, larger drones carrying nets can be deployed to physically snare a rogue UAV and bring it out of the sky. In this scenario, a drone falling from the sky is more likely, and the pilot will probably not get the drone back in one piece.

Security Drones offer services for event surveillance and intruder response. UAVs allow security personnel to reduce and deter threats, survey larger areas in less time, and respond more effectively to intruders. This type of aerial drone service is an ideal tool for upgrading one's security force.

The drone industry is currently experiencing an exponential growth with no signs of abatement in any time soon. Due to their high price, however, many countries find attack drones out of their military budget. However, a peaceful country like the Republic of Armenia is surrounded by belligerent enemies, it just cannot afford not to buy attack drones and anti-drone equipment to detect, deter, and even destroy enemy drones.

The good news is that anti-drones are not as expensive as attack drones. Because of fierce competition, prices of anti-drone devices are plummeting. Anti-drone devices are selling for a fraction of attack drones (For example, a basic attack drone from China would sell for $1 million, while an anti-drone radar would sell for $250K, excluding the armed carrying vehicle).

In addition to affordable prices, the emerging technologies of anti-drones possess many attractive features. For example, while attack drones require trained distant pilots, anti-drone measures can be operated by ordinary citizens such as a Tavush village teacher in Armenia can use it effectively to take his or her students to a safe shelter before the enemy drones attack his flock.

Anti-drone devices will save many a precious life of the people of Artsakh. Let us build a "drone castle" for defense around Artsakh with the affordable emerging anti-drone technology.

With more drones in the sky, especially in the hands of imperialistic rogue nations such as Turkey and Azerbaijan, anti-drone technology can keep the bad ones at bay.

To find its confidence again, Artsakh must become an "anti-drone castle" to defend its population against ruthless, genocidal adversaries, who wage illegal and immoral "total war" against enemy soldiers and innocent civilians.

The invention of anti-drone technology will, hopefully, bring an end to the illegal and immoral use of attack drones against soldiers and unarmed civilians as Azerbaijan and Turkey did during the Artsakh 2020 War. Equipped with attack drones and anti-drone devices, the Republic of Artsakh will prevail again and reestablish Shushi as its quintessential historical center of its people's ages-long culture and heritage.

There are no comments yet.

Keghart
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