

# JAMMER DIRECTIONAL TACTICAL SYSTEM

Full denial of any of the satellite navigation systems operating around the world: GPS, Glonass, Beido, Compass, Galileo on all frequencies and modes used. This results in 100% loss of the drone's relevant data input on position, velocity and time control.

As those sat-nav constellations operate on different frequencies for both civil and military use, the system can easily be switched by the operator between those frequencies, either the civil or the military frequencies selected or in full duplex on both civil and military, with a power setting of approx. 0,1W up to 1,5 kW ERP in a narrow "pencil" beam directed to the "to be jammed target".

# OPERATIONAL TESTS

A precursor of the Achilles System has already been installed on several naval vessels and land based facilities (both fixed and mobile) in full operational use. Confirmed range effectiveness up to 80 NM against manned fighter aircraft has been proven during two live exercises.

Results of those tests successfully demonstrated that the jet pilot did no longer have any accurate current geographic air position, only inaccurate visual height indication, no control over his radar picture due to distortion, no timing source capable of controlling its internal processes for fire control and navigation, no ability to use secure communications such as frequency hopping communications or satellite based communication. Both of these confidential tests where successfully carried out with a Sukhoi SU27/40 MK1 and an F 16, for comparison between both types.

# JAMMING OF THE GUIDANCE SYSTEM

Because of the rapidly increasing use of drone/UAV/UCAS by the military as well as civilians, but also terrorists, the real threat of unwanted breach of restricted airspace also increases. A recon/ espionage flight or even an attack on a military compound, a civil installation, a nuclear power station, an airport, a sports event or a government building or all part of modern defense scenarios.

All currently identified guidance systems operate within known frequency ranges. Achilles covers all such frequencies in the band range of 70MHz up to 6.5GHz, but is not limited to this range.

Especially where potential adversaries can use an anonymous and relatively cheap commercially available drone, which is basically for sale around the corner, the jamming of the guidance system leads to very effective airspace access denial.

Such non-military drones can be equipped with high quality cameras, which can invade people's privacy, but can also be used to smuggle drugs, crash into buildings, drop bombs or even shoot a gun, on top of the ability to gather SIGINT data.

# ACHILLES' DRONE-STOPPER SPECIFICATIONS

- Size depending upon requirements; can be reduced to approx. 1 m3
- Standard version in NATO tri-colour matt camouflage, but available in any RAL colour.
- Standard electrical feed 17-37 Volt DC and/or 95-265 Volt AC 48-65 Hz conform STANAG 1008 ed. 9, and regular MIL-SPEC GPU's.
- Jamming system effective range exceeds 120 km/ 65 NM on air targets (with respect to trajectory attenuation and on 80% power).
- Jamming system exceeds over 55 km/ 30 NM on sea targets (with respect to radar horizon, over-water reflection and attenuation on 80% of power).
- Demo unit weight approx. 700kg, compact commercial unit 280-450kg
- Fully stand alone,remotely controlled and autonomous.
- Simplified HMI (Human Machine Interface).
- Adaptable to vehicle, fixed stand or ship born configurations.
- Performs fully integrated with existing systems like radar or optronics for early warning.
- Installed base of 16 units of Achilles' predecessor (mostly marine)
- For non-target-focused area protection, the Achilles System can be used as an omnidirectional system (for example asset protection up to a 10 km circular perimeter, or even beyond, depending upon the power rating. And for border control a 180 degrees unit is under feasibility study).

# TESTING SAFETY

Due to safety regulations and precautions, all emitters of the prototype are temporarily limited in power, in order not to disturb airspace beyond acceptable distances, and can be set by the operator during tests and demonstrations with limitations to circa 1- 2 km effective range.

# CONTACT

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# DRONE STOPPING SYSTEM





# EXECUTIVE SUMMARY

Drones are already capable of delivering chemicals and explosives over medium-long ranges, solo or in swarms. There are currently no regulations or sufficient countermeasures in place to stop someone from flying a heavily armed drone into a busy city or airspace. Even with unarmed drones significant damage can be inflicted by targeting commercial aircraft during take-off and landing.

Experts such as the Teal Group, an aerospace and defence consultancy company, predict global spending on the production of drones for both military and commercial use could reach Euro 80 billion in the next ten years.

Typical available current systems to defend potential targets from drone attacks are based upon short range perimeter fencing, with only limited singular countermeasures. Until now, major threats by hostile nations, terrorists or rogue parties couldn't be stopped with sufficient reassurance, with the exception of just a few nations and for only a very small number of high value assets. But with the new Achilles systems, a Xegasus development, all this is now changing. With its long range, multiple target, multiple countermeasure, mil spec based and high energy drone-stopping capability a solution is at hand.



# INTRODUCTION

The FAA estimates that by 2020, there could be approx. 30,000 drones operating in US domestic airspace alone. Sites dedicated to US national security and defense have estimated that every country in the world will have military drone technology within the next 10 years.

The rise of drones is not an isolated or temporary event; the cyber battlefield is quickly becoming one of the most active in international conflicts. "Information warfare," a term generally including both drones and cyber warfare, is giving rise to the unnerving creation of new threats.

# PROTOTYPE

The basic version of the Achilles System consists of two essential modules. Several others can be added later on as per customer specific requirements. Compatible interfacing with most currently available radar detection systems is readily available.



Two standard modules/functionalities:

- 1. Selective multi frequency jamming of the drone's satellite navigation system (a Jammer Directional Tactical system, "JDT").
- 2. Selective multi frequency jamming of the drone's electronic guidance and control systems. Typically in 360° "omni" mode

Planned upgrade modules:

- 3. Laser-based interference with a drone's optical sensors and any optical guidance system (including overload- and elimination capability). Almost completed.
- 4. Advanced anti-swarm capabilities, when more than a few hostile drones have been detected, either simultaneously or in waves, not just in omni mode, but also selectively targeted.
- 5. Integration with a fire control system with LPI radar and weaponry (under investigation).

The modules are interlinked in a secure standard container, with prefab upgrade compatibility, based upon mil spec components and fully non-ITAR designed. Its software and hardware configuration are proprietary and are adequately protected against reverse engineering.

Although primarily designed as a drone-stopper, Xegasus developed its Achilles System with the possibility for use against selected manned 'bogeys' as well. Notwithstanding that Achilles is initially land-based, it is fully capable of being deployed in a marine theater through mounting on a navy surface vessel, as this was the origin of its conception (including ruggedisation for salt water environment).



DRONE  
STOPPING  
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