

GRAVADS

developed by  CURSOR INSIGHT

GRAVITY-ASSISTED AERIAL DRONE SYSTEM

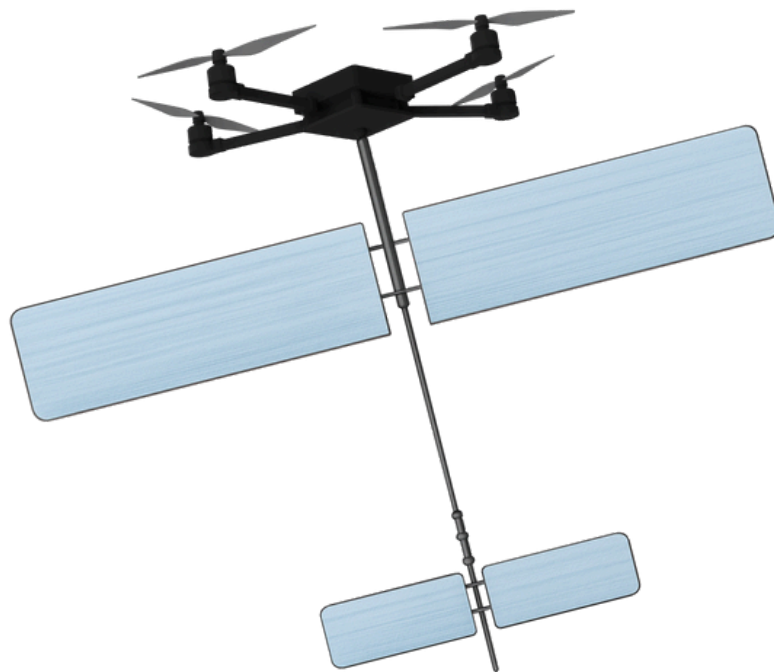
PRODUCT SHEET

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Overview

GRAVADS is a novel unmanned glider drone designed for extended-range payload delivery with minimal onboard power. GRAVADS units are carried to altitude by an external platform (e.g. aircraft, UAV, or balloon) and then released to glide autonomously to their target. By converting altitude (gravitational potential energy) into forward flight, each GRAVADS drone covers long distances without needing a conventional engine during cruise. This results in a low-cost, low-signature delivery system that can covertly deploy sensors, supplies, or other payloads over tens of kilometers.



Price

The basic glider model with camera and radio is **€499**.

Specifications

- Payload Capacity: 8 kg
- Cruising Speed: 84 km/h
- Operational Range: 60+ km
- Dimensions: 240 cm · 135 cm · 45 cm

Ultra Low Cost

Simplified design and absence of heavy engines keep the unit cost for €499, enabling single-use or swarm deployments.

Interchangeable Deployment

A standardized mounting interface allows GRAVADS gliders to attach to various carrier platforms without custom adapters, supporting rapid integration into existing defense systems.

Autonomous & Radio-Silent

Each drone's autopilot uses inertial and GPS guidance to navigate pre-programmed waypoints with no active radio transmissions after release, preserving stealth and mission security.

Defense & Dual-Use Ready

Ideal for military standoff operations, covert reconnaissance, and rapid logistics, while also adaptable to civilian tasks like remote supply drops or environmental sensing (where low cost and silence are key).

Extended Range with Minimal Power

GRAVADS leverages gravity and ambient winds to achieve exceptional range without continuous propulsion. After being lifted to a release altitude (e.g. by a carrier UAV or plane), the glider cruises at ~80–90 km/h with a descent rate ~1 m/s, translating to dozens of kilometers of travel from just a few thousand meters of altitude. This gravity-assisted flight greatly extends standoff range compared to battery-powered drones, while conserving onboard energy for essential electronics and small maneuvers. In favorable wind conditions, GRAVADS swarms can reach targets far beyond the launch point, all without the weight or noise of a running engine.

Low-Observable, Stealthy Design

Maintaining a low profile is central to GRAVADS. The drone's engine-off flight mode means nearly zero acoustic and infrared signature during cruise – crucial for evading detection by enemy forces. The airframe is built primarily from radar-attenuating dielectric materials (foam, fiberglass, plastics or wood) that minimize radar returns. Additionally, GRAVADS operates in radio silence (no RF emissions) and can fly low-altitude ingress routes when needed to avoid radar coverage. These features make it extremely hard to detect by sound, heat, or radar, allowing covert operations deep into contested areas.

Modular Launch & Deployment Options

GRAVADS excels in flexible deployment—it can reach launch altitude via multiple methods.

Aerial release

Carried by a manned aircraft or mothership UAV and dropped at altitude; multiple units can be released in sequence.

Balloon lift

Lofted by a weather balloon/aerostat, then cut loose for extended glide.

Detachable booster

Temporary multirotor/rocket module for VTOL or rapid climb, then detaches and returns or parachutes for recovery.

Ground power assist

Brief tethered boost supplies power for launch, auto-disconnecting at takeoff speed for engine-off glide.

This versatility lets defense teams use existing aircraft, UAVs, or field launchers as the mission demands.

Key Features and Benefits

Simplified Glider Design

Each GRAVADS unit is a rugged fixed-wing glider optimized for stability and long glide times. The main wing is a lightweight foam/composite structure with no complex ailerons or flaps – control is achieved via two or more all-moving tail surfaces (e.g. a V-tail or tri-fin) in the rear. By concentrating moving parts in a compact tail module, the design reduces points of failure and simplifies assembly. This configuration yields a high glide ratio (10:1 or better) and low stall speed, allowing gentle descent and loitering ability over targets. An optional folding propeller or small ducted fan can be included for last-moment maneuvers or altitude adjustments, but remains off during the majority of the flight to preserve stealth.

Multiple Configurations Available

Beyond the standard fixed-wing glider, the GRAVADS concept supports alternate drone configurations for special use cases:

Autogyro Rotorcraft

A rotary-wing version uses a free-spinning autorotation rotor for lift, enabling very low vertical sink rates and controlled vertical descents. This is ideal for missions requiring a hovering drop or soft landing, trading some horizontal range for vertical control.

Parafoil System

A compact, parafoil (ram-air parachute) variant can be deployed for payloads that need an especially gentle descent or for ultra-portable storage. The parachute canopy and steering lines are packed with the payload and deploy upon release, steering via small servo motors. While its glide ratio is lower, the parafoil drone is extremely simple and lightweight – perfect for low-cost resupply drops or sensor dispersal where pinpoint landing is more important than range.

These configurations share common avionics and interfaces, meaning a variety of GRAVADS drones (glider, rotor, or parafoil) can be mixed in one operation to meet different mission profiles. All are compatible with the same launch platforms and guidance systems.

Standardized Mount & Interface

GRAVADS is built around a universal mechanical and electrical interface (the GRAVADS Interface Standard) that ensures interoperability across carriers and payloads:

Mechanical Docking

A robust pin-and-lug mounting system lets any GRAVADS drone securely attach to any compliant carrier (UAV, aircraft, etc.) with a quick tool-less latch. This standardized hardpoint handles the weight and launch forces, and uses alignment guides to ensure reliable coupling even under field conditions.

Electrical & Data Link

An integrated connector provides low-voltage power and a simple data bus between carrier and drone for status checks and safe arming. Before release, the carrier can verify the glider is attached and ready; a two-step arm signal then prepares the drone for drop. On release command, the interface cleanly disconnects both mechanically and electrically. (If desired for security, the drone can ignore any data link and fly completely autonomously once dropped.)

Fail-Safe Safety Logic

The interface enforces safe states – for example, the drone won't power its control surfaces until fully attached, and will automatically default to SAFE mode if any anomaly or premature disconnect is detected. Arm and release commands require proper handshakes to prevent accidental drops.

Modular Payload Swap

The same standardization philosophy extends to the payload bay. Payload modules (sensor packages, comms relays, etc.) can be designed with plug-and-play connectors for power/data and simple latching mechanisms. This makes it easy to swap payloads in the field or integrate third-party modules, with assurances that each payload meets the size/weight/interface specs of GRAVADS.

For defense contractors, this standard interface means easier integration of GRAVADS into new and legacy systems, and an ecosystem where multiple vendors can develop compatible launchers, drones, or add-ons. For military users, it translates to quicker deployment cycles, mix-and-match flexibility in the field, and reduced risk in multi-unit operations.

Autonomous, Secure Navigation

Once released, GRAVADS drones operate fully autonomously to accomplish their mission with high precision and security:

Pre-Programmed Waypoints

Before launch, mission waypoints or target coordinates are loaded into the drone's autopilot. GRAVADS then navigates via a blend of GPS and inertial measurement. It can execute complex flight paths, fly around no-go zones, and arrive on target without any pilot intervention.

Radio Silence by Default

To avoid giving away its presence, the drone does not rely on live radio control or telemetry. All guidance is on-board and jam-resistant. In high-threat scenarios, GRAVADS can even operate with GPS denied by using inertial navigation updates or celestial/solar position sensors as alternatives for course correction. No emitting signals means it's extremely difficult to detect or interfere with electronically.

Protected Avionics

Critical electronics (flight computer, sensors, battery) are housed in a Faraday-shielded avionics bay. This not only masks electromagnetic emissions but also protects against EMP or jamming attempts. The flight software is securely developed and can be locked down – no changes or uplinks in mission, and any updates require cryptographic signatures, ensuring the system cannot be maliciously altered.

Smart Terminal Guidance

As it nears the destination, GRAVADS can perform programmed terminal maneuvers. Depending on the mission, it might execute a steep dive or flare to precisely drop a payload, or a shallow approach for a soft landing (touchdown under 2 m/s if recovery is planned). If carrying a kinetic payload, it can impact the target directly at speed. The guidance algorithms also optimize glide efficiency, continuously estimating wind and energy state to adjust course for maximum range and accuracy.

Swarm Coordination

When multiple GRAVADS units are deployed together (for example, a swarm release of dozens of gliders), they can be programmed with simple collision avoidance and spacing logic. This ensures drones don't interfere with each other – e.g., assigning each glider a different altitude band or staggered release timing. Swarms can be coordinated to approach a target from multiple directions or to automatically take over each other's tasks if one fails. This force-multiplier effect enables saturation attacks or wide-area sensor coverage, all managed through decentralized on-board rules without requiring inter-drone communication.

Low-Cost, Easy Manufacture

GRAVADS drones are intentionally designed for low cost and rapid production – a stark contrast to many complex military UAVs. Key aspects of its manufacturability and cost-effectiveness include:

Commodity Materials

The airframe is made largely from low-cost, readily available materials like extruded polystyrene (XPS) or expanded polypropylene foams, basic fiberglass or carbon-fiber spars, and simple plastic or wooden components. These materials not only lower cost, but also inherently reduce radar visibility compared to metal.

Simplified Construction

No exotic processes are needed – components can be produced with CNC hot-wire cutting, low-temperature molds, or off-the-shelf parts. The design emphasizes a minimal parts count, and assemblies use tool-less connectors, snap-fit joints, or tape/adhesive seams. For example, the wing might attach to the fuselage using a pin-and-sleeve joint secured with a single clip, allowing quick field assembly or replacement.

Modular Tail/Avionics Unit

All the “complex” parts (servomotors, flight computer, sensors, battery, etc.) are consolidated in a removable tail module. This unit can be pre-assembled and tested independently, then simply plugged into the airframe before flight. It eliminates the need to wire servos through the wing or fuss with multiple subassemblies – greatly reducing assembly time and chances for error. It also means a damaged airframe can be swapped out in minutes by moving the tail module to a new shell.

Distributed Production & Scalability

Because of the low-tech build requirements, GRAVADS drones can be manufactured in a distributed fashion – small workshops, local suppliers, or even hobbyist builders could produce components that meet spec. This opens the door for rapid scaling of production (thousands of units if needed) without a single vulnerable factory. It also helps defense contractors involve local industry or allies in production. The required workforce needs only basic skills, thanks to jigs and pre-fabricated parts, making it feasible to produce or assemble units in-theater or on short notice.

Affordable Deployment

The lack of an engine or complex systems means maintenance is minimal and units can be considered expendable if mission needs dictate. Even with advanced features, the target bill-of-materials cost remains around €250 per unit, making large swarm deployments economically viable. This cost-effectiveness gives military planners flexibility to use GRAVADS for high-risk or one-way missions that would be prohibitively expensive for other UAVs.

Applications & Use Cases

GRAVADS is a multi-mission platform poised to enhance both military operations and defense industry capabilities:

Covert Long-Range Delivery

Deliver supplies, equipment or humanitarian aid to remote or denied areas without alerting adversaries. For special forces or resupply missions, a silent glider dropping a payload is far less noticeable than a helicopter or powered drone.

Decoys and Electronic Warfare

Use GRAVADS gliders as decoys to saturate enemy air defenses or as jamming/relay platforms. Equipped with lightweight EW payloads or reflectors, a swarm of gliders can mimic a formation of inbound threats or disrupt communications, causing confusion disproportionate to their cost.

Swarm Attacks

Overwhelm targets with sheer numbers. Dozens of GRAVADS units can be released from a single mothership aircraft, each carrying a small kinetic charge or sub-munitions. They can approach from different angles simultaneously, confusing defensive systems. Even if many are intercepted, others will get through – a warhead on a \$250 glider can neutralize far more expensive assets on the ground.

Emergency and Tactical Logistics

Rapidly send critical items (medical supplies, ammo, comms gear) to units in the field. Because GRAVADS can land gently, the delivered payload (or the drone itself) can be recovered by friendly forces. This is useful in situations where ground routes are dangerous or other aircraft would be too risky or detectable.

Collaborative Operations

GRAVADS drones can work in conjunction with traditional UAVs – e.g., a larger reconnaissance drone identifies targets, then deploys a GRAVADS swarm to investigate or engage. Defense contractors can integrate GRAVADS as a force multiplier in existing drone systems, offering clients a scalable solution that pairs high-end drones with low-cost gliders for expanded coverage.

In essence, GRAVADS fills a gap between short-range small drones and large expensive UAVs or missiles – providing a low-cost, stealthy, and flexible option for a variety of missions that require reaching out further while staying under the radar.

About Cursor Insight

We began as specialists in motion analysis — decoding the subtle language of human movement. To address the complexities of this field, we developed a dedicated programming language to describe motion and a powerful toolchain to classify it. Our system can extract and interpret data from a wide range of sensing devices.

Thanks to our creativity and technical depth, we've successfully applied motion analysis in diverse domains. Based in the UK and Hungary, we build biometric applications for law enforcement, banking, gaming, cybersecurity, and healthcare.



Over time, our curiosity pushed us beyond biometrics and into building entirely new technologies. Most recently, we developed a novel military platform — GRAVADS — which is currently under patent review. We're now increasingly focused on defense-related solutions: reconnaissance drones, a modular UAV Command and Electronic Warfare Platform, and an AI-powered Visual Intelligence Upgrade Kit for existing drone fleets.

Contact Us

Interested in Our Technology?

If you would like to learn more about our solutions or explore how they could support your goals, feel free to contact our CEO, Tamas.

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 [Book a meeting](#)