TONNER DRONES

Inhibitor Drone Overview

April 2025

Tonner Drones Inhibitor

Tonner Drones has been developing the Inhibitor, a lightweight, compact, rugged and agile drone that can fly tethered or untethered at low altitudes indoors and outdoors.

It can be used for reconnaissance, offensive and defensive missions, as well as deterrence and counterterrorism.

The Inhibitor also can fire a lethal or non-lethal projectile due to Tonner Drones' patented ejection anti-recoil technology that maintains the flight stability of the drone when firing.

The system is easy to implement and operate and does not require lengthy and complicated training.

In sufficient numbers, these small and agile Inhibitor drones have the potential to provide superior surveillance and counterterrorism measures to deal with threats on the ground.

Why Is This Drone Needed?

Every day, military, police and security personnel are faced with new threats and technological developments that put their lives at risk.

PROBLEMS

- Due to advances in weapons, explosives, and related technology, it is ten times riskier to be first person through the door than it was to be in the infantry on D-Day in 1944.
- Lack of clear visuals prevents accurate mapping of, and distinction between, potential targets and innocent lives.
- Assessing the threat level of barricaded situations is complex and risky.
- Limited accuracy in hitting the desired targets, which puts military lives at greater risk..
- Too much lethality increases risk of collateral damage and puts innocent lives at risk.

NEEDS

The speed and sophistication of these new threats require personnel to be able to quickly gather accurate visual information, analyze that information, and act before the threat escalates.

Why Is This Drone Needed?

SOLUTION

The Inhibitor - an indoor flying drone that provides personnel with accurate information, threat detection and threat neutralization capabilities to protect their lives. This allows them to respond better and faster in dangerous situations, accurately target the threat, and ensure the safety of innocent bystanders.

The Inhibitor with modular weaponised payload attachment is capable of:

- Localizing hostages and enemies under limited visual situations;
- Replacing humans as the first person through the door;
- Dealing with dangerous indoor barricaded situations; and
- Using AI to manage the aiming and threat recognition functions to improve accuracy and decision making for users.

Inhibitor Development – The Fatal Funnel

When Navy Seals, special operations, and military personnel have to walk through a door not knowing what is on the other side, they call it the “Fatal Funnel”.

They enter at the base of the funnel and step into a wide range of angles – the funnel - where enemies can be positioned with their weapons trained on that door.

The first soldier into the Fatal Funnel moves from daylight outside to a darker indoor environment. He has to scan the situation from left to right, up and down, while his eyes adjust to the change in light and attempt to assess the risk.

If he spots something, within a few seconds based on limited information he must determine whether it is a threat or an innocent bystander, and if a threat, has to take aim and fire.

In contrast, an enemy positioned on the other side of that door only must be positioned with his weapon trained on the door to shoot at any sign of movement.

Soldiers agree that among the numerous dangerous jobs they do, this is one of the most dangerous. It takes immense courage to place their bodies and their lives at risk by walking into that Fatal Funnel.

Inhibitor Development – The Fatal Funnel

In hostile urban environments, soldiers will enter the Fatal Funnel repeatedly as they move from building to building and room to room.

Given the heightened casualties involved in such a situation, soldiers learned to first go through the door and if an enemy was identified, to then retreat to safety where they could then blow the entire building up. However, the risk of innocent casualties in such a situation was high.

In addition, enemies adapted to this strategy as well. One enemy would barricade himself inside with a gun trained on the door to shoot the first soldier through the door. A second enemy would be positioned near the door to drag the soldier through the door once shot.

Not knowing if their brother was dead or wounded, the team would then have to again enter and fight room to room, in what became known as “Hell Houses”.

Urban combat is war at an intimate level. And in a world of sophisticated technology, this kind of combat is still surprisingly low tech.

Tonner Drones therefore spent several years developing a tactical reconnaissance drone that can be carried with teams in the field. Teams work only a few meters behind the drone which provides them with mission critical intelligence about the positions of enemies and innocent civilians in the denied areas of buildings before the team has to cross the Fatal Funnel.

The Inhibitor is ideal in armed barricade situations and when personnel need to be the first person through the door.

The game changer: AI-powered armed drone with indoor flight capabilities and GPS.

Please click on the link below to see the drone in action:

- Indoor flight

When entering a building the Inhibitor can visualize threats and take several actions:

- See in infrared in total darkness
- Flash a strobe (to blind those within)
- Deploy a flash-bang or smoke grenade
- Fill the room with tear gas
- Injure or destroy with precise targeting

Capabilities

Unique Solution.

Tonner Drones has solved the aerodynamic complexities of indoor flight and the stability complexities of aerial shooting in a similar scenario.

Modular component can be customized and adjusted based on client's needs, including both lethal (bullets, grenades, rockets) and non-lethal (tasers) capabilities that can even include planting seeds for reforestation purposes.

Control and AI capabilities

- Inhibitor is semi-automated, operated manually and stabilized automatically.
- AI supports human detection, face recognition and shooting accuracy.
- Inhibitor can fly through doorways, down narrow corridors, up and down stairs, recognize faces, aim on target, and has lethal and non-lethal capabilities to neutralize threats.

Inhibitor Firing Capabilities

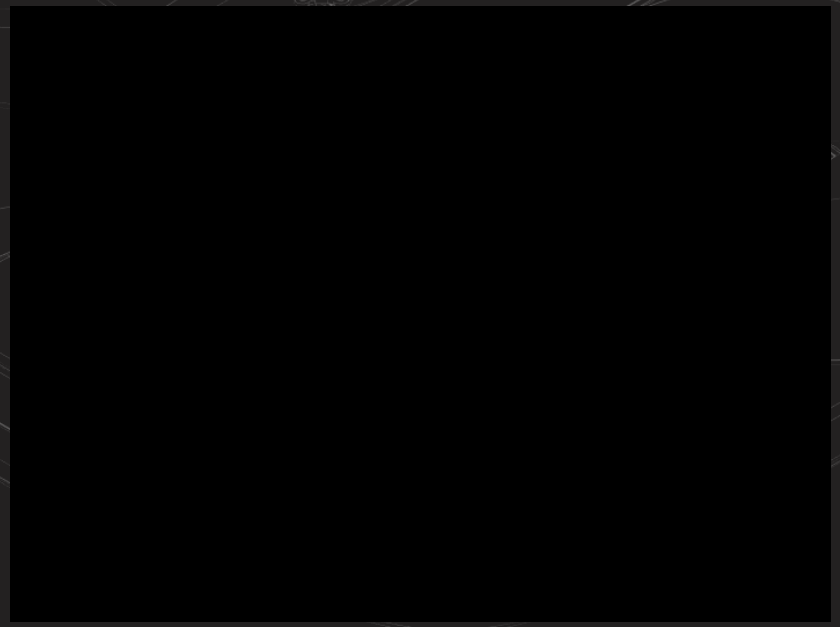
While other companies have developed small surveillance drones to be used by military personnel in the field, Tonner Drones went a step further and researched and developed the technology required for these smaller drones to fire lethal and non-lethal projectiles.

One of the key challenges to firing a projectile from a smaller drone is that the recoil from the shot destabilizes the drone causing it to swerve off course and crash.

As such, Tonner Drones spent several years developing the ejection anti-recoil technology required to ensure that once a projectile was fired from the Inhibitor, the drone would remain stable in the air.

This ingenious patented system allows the drone to compensate for recoil and quickly regain zero to aim at another target with precision.

The result is a low-altitude, agile drone that operate indoors and outdoors in urban environments and fire a projectile to an accuracy of 30 cm from 12 meters away.



Inhibitor Patent

- Tonner Drones spent more than 7 years successfully pursuing an application for a patent covering a critical technology component for its drone – the Recoil Ejection System.
- The German Patent and Trade Mark Office granted the patent on 16 December 2021.
- Details on the patent can be found at this link: DE patent office register
- Corresponding patent applications have also been filed as follows:
- World Intellectual Property Organization (WIPO) International Patent Application has also been filed pursuant to the Patent Cooperation Treaty (PCT), which has 157 contracting member states.

- Australia: link to the AU Patent office register
- Canada: link to CA Patent office register
- Europe: link to EPO register
- New Zealand: link to NZ patent office register
- USA: link to US patent office register
- UK: link to UK Intellectual Property Office

German Patent and Trade Mark Office

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WIPO

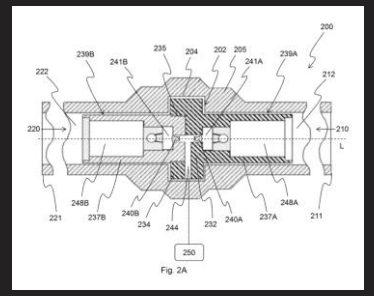
Australian Government
IP Australia

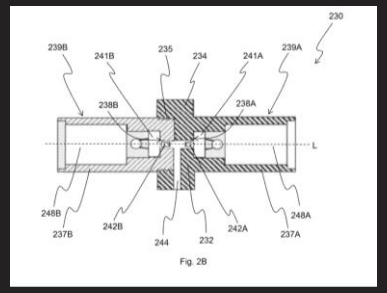
UNITED STATES PATENT AND TRADEMARK OFFICE
uspto

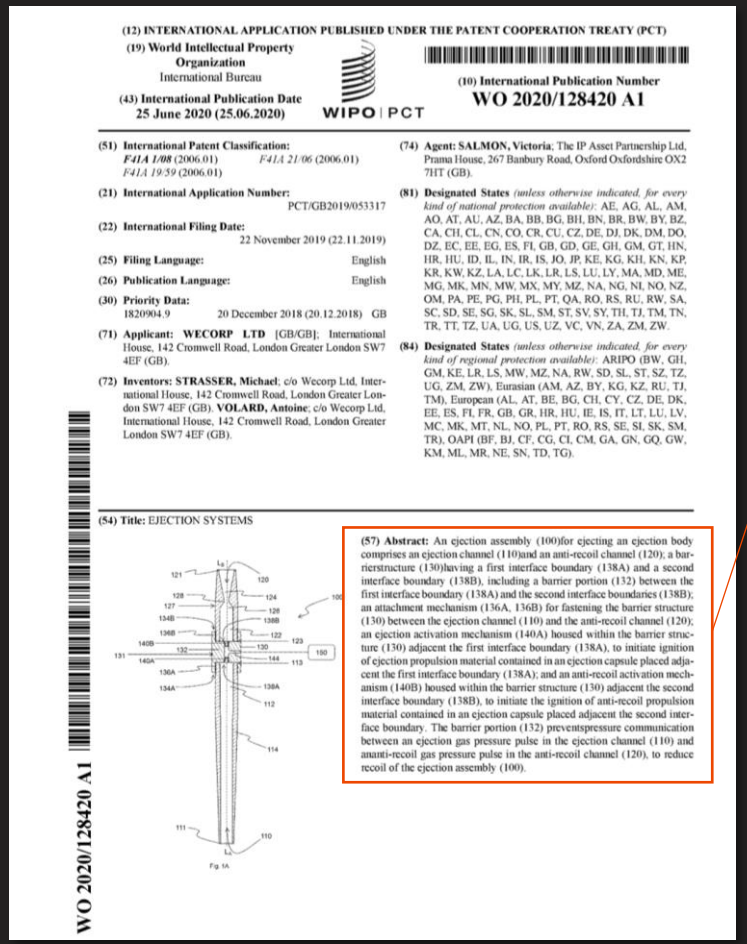
Europaisches Patentamt
European Patent Office
Office européen des brevets

Overview of Inhibitor Patent

- The Recoil Ejection System technology ensures the stable operation and flight of the drone when a projectile is fired from the modular component.
- The ejection assembly contains an ejection channel and an anti-recoil channel.
- There is an anti-recoil activation mechanism housed within the structure.
- The design has a barrier that prevents pressure communication between the ejection gas pressure pulse in the ejection channel and the anti-recoil gas pressure pulse in the anti-recoil channel to reduce the recoil of the ejection assembly upon firing.
- The result is that when a projectile is fired from the drone, it can maintain a stable flight and continued operation.







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(71) Applicant: **WECORP LTD** [GB/GB]; International House, 142 Cromwell Road, London Greater London SW7 4EF (GB).

(72) Inventors: **STRASSER, Michael**; c/o Wecorp Ltd, International House, 142 Cromwell Road, London Greater London SW7 4EF (GB). **VOLARD, Antoine**; c/o Wecorp Ltd, International House, 142 Cromwell Road, London Greater London SW7 4EF (GB).

(74) Agent: **SALMON, Victoria**; The IP Asset Partnership Ltd, Prama House, 267 Banbury Road, Oxford Oxfordshire OX2 7HT (GB).

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(54) Title: EJECTION SYSTEMS

(57) **Abstract:** An ejection assembly (100)for ejecting an ejection body comprises an ejection channel (110)and an anti-recoil channel (120); a barrierstructure (130)having a first interface boundary (138A) and a second interface boundary (138B), including a barrier portion (132) between the first interface boundary (138A) and the second interface boundaries (138B); an attachment mechanism (136A, 136B) for fastening the barrier structure (130) between the ejection channel (110) and the anti-recoil channel (120); an ejection activation mechanism (140A) housed within the barrier structure (130) adjacent the first interface boundary (138A), to initiate ignition of ejection propulsion material contained in an ejection capsule placed adjacent the first interface boundary (138A); and an anti-recoil activation mechanism (140B) housed within the barrier structure (130) adjacent the second interface boundary (138B), to initiate the ignition of anti-recoil propulsion material contained in an ejection capsule placed adjacent the second interface boundary. The barrier portion (132) preventspressure communication between an ejection gas pressure pulse in the ejection channel (110) and ananti-recoil gas pressure pulse in the anti-recoil channel (120), to reduce recoil of the ejection assembly (100).

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Inhibitor Counterterrorism Solutions

A strategic number of Inhibitors can be maintained at key points in threatened areas under the control of local police and security personnel and can be rapidly deployed into the air when a threat is detected.

The Inhibitor can either remain tethered to a power source so that it can stay in the air for extended periods of time or fly anywhere a trained pilot directs it.

Using the Inhibitors' surveillance cameras, Intelligence can quickly be gathered from the air regarding the positioning of attacking personnel, and the Inhibitors can then be positioned to geolocate and fire upon targets.

Using artificial intelligence, a system can also be developed where these drones are connected in "swarms".

These "swarms" of drones can then communicate with one another and further enhance the surveillance, geolocating, and neutralization capabilities of local police and security personnel.

Tonner Inhibitor

TARGET

Ability to aim manually or assisted by AI.

FLIGHT

Fly autonomously with stability and transition between indoor and outdoor

CONTROL

Pilot able to control the drone, without extensive training, and retains final say in shooting decision.

SHOOT

Ability to shoot multiple rounds with semi-automatic reloading functionality.

Accuracy: 30 cm / 12 m

Ammunition: Lethal and non-lethal

Tonner Inhibitor

Unmanned Aerial Vehicle (UAV)

SPECIFICATIONS

Dimensions | 90 x 70 cm

Weight | ~10Kg

Flight time | 15mins

Wind resistance | 10 m\s

Battery |
- Battery swap <2 min (land – swap – take off), no tools needed
- Modular battery pack (air transportable cell <100Wh
- Fitted for smart battery functionalities

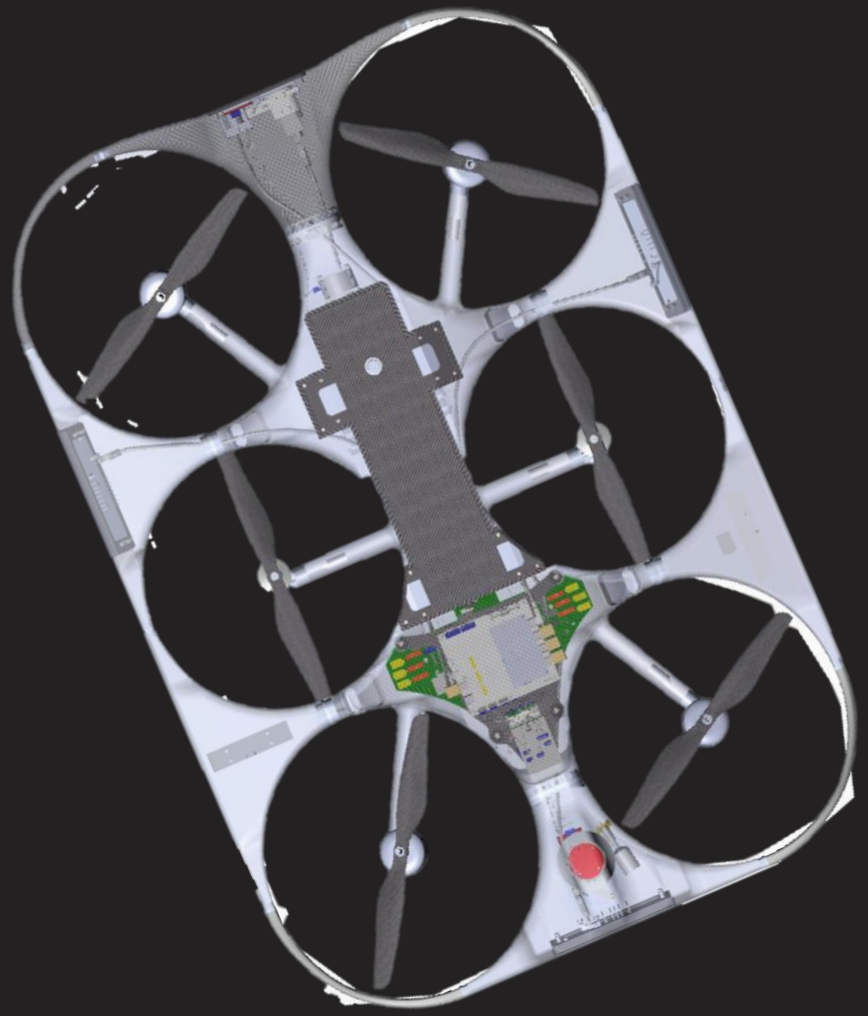
Payload capacity | 1.4kg

Modular payload capability |
- Payload swap: <1min, no tools needed
- Magazine swap: <1min, no tools needed

Current payload |
- 5 rounds 5.7x28mm with automatic reloading
- Penetration of level 3A body armour

Indoor/outdoor transition |
- Indoor/GPS denied environment flight (triple redundant visual stabilization)
- GPS waypoints flight

Tonner Inhibitor



SPECIFICATIONS

Tracking |
- Human detection
- Target tracking: indoor 12m; outdoor >12m
- Accuracy: non-confined indoor environment 30cm @ 12m

Impact resistant structure (for indoor navigation) |
Replaceable propeller guards

Controller (Herelink) |
- Digital encrypted control signal (AES 128)
- Analog FPV video (for graceful loss of signal)
- Range: 500m in open air. From tactical bound or breach point for indoor

Touch screen |
- Target confirmation
- Low criticality commands (take-off, land, waypoints, lights, etc)

Ingress protection | Inspired to IP43

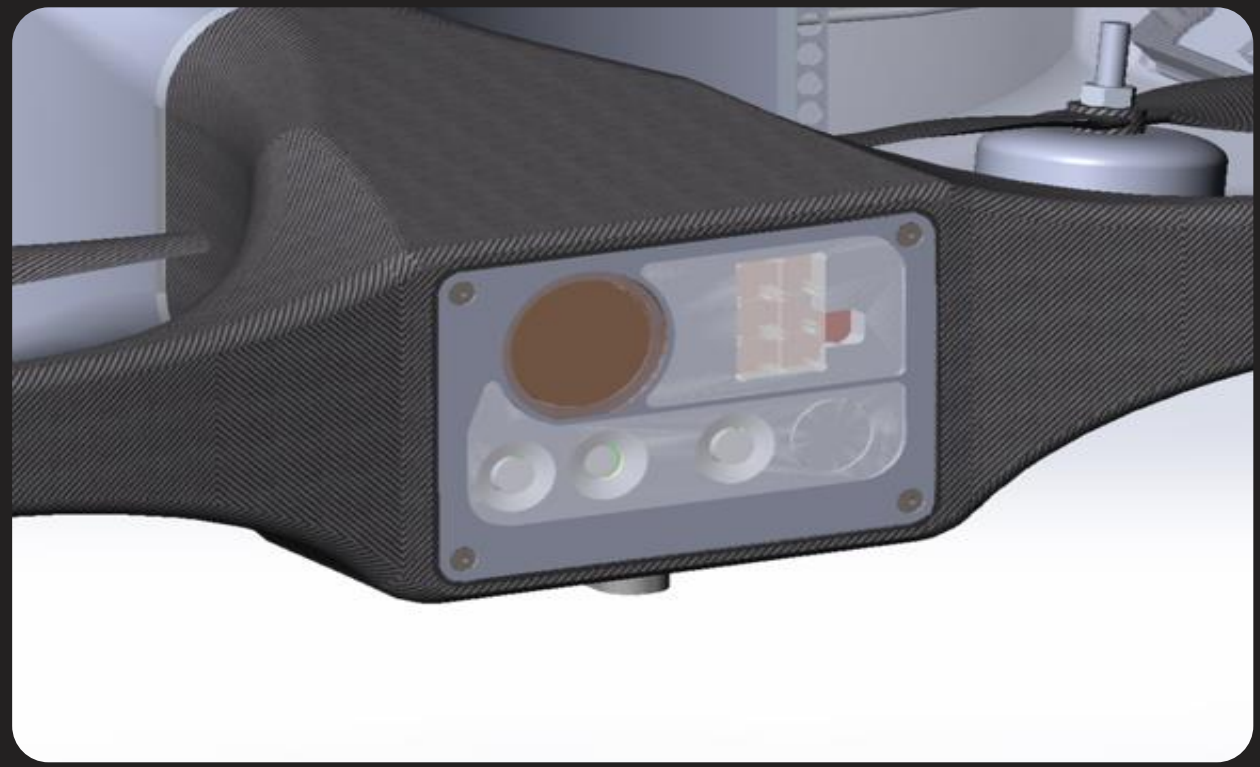
Active cooling | Extracting fan

Tonner Inhibitor

Perception

SENSORS

- 3 x Inertial Measurement Unit (IMU)
- Magnetometer
- Barometer
- 1D Lidar
- 3 x VIO cameras (Visual Inertial Odometry)
- GPS
- Thermal Camera
- MIPI Camera (FPV)
- Depth Camera (future spec’ing)



Tonner Inhibitor

UAV | Structure & Electronics Control & Planning

Carbon-Kevlar monocoque structure

Fully-integrated electronics, antennas and sensors.

Outer structure Level 1 repair

Interchangeable camera module shell.

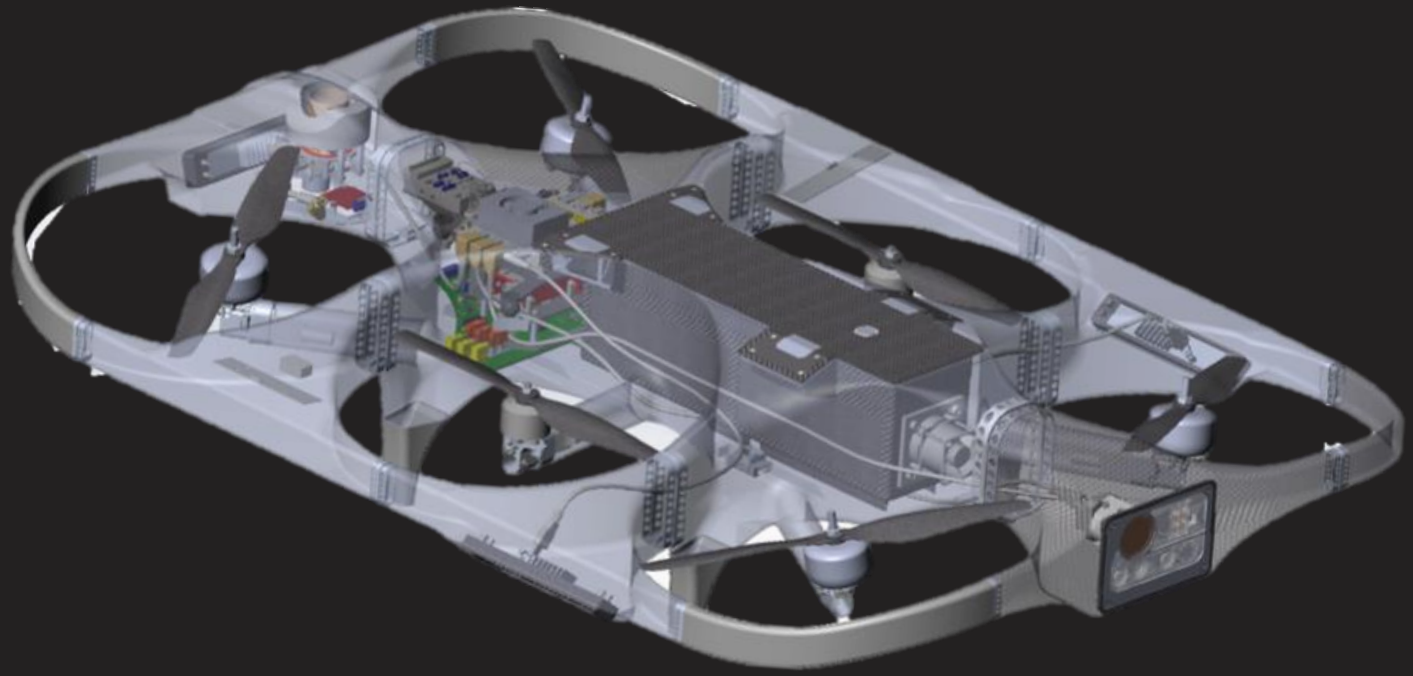
Smart Battery

Cell modularity for compliance with air travel requirements.

4x Sensor bays

Quick-release 1.4kg payload bay

Standardized modular interface for mechanical connection, power and data.



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