



**BADGER
ENGINES**

POWERING DRONES TO GO FURTHER



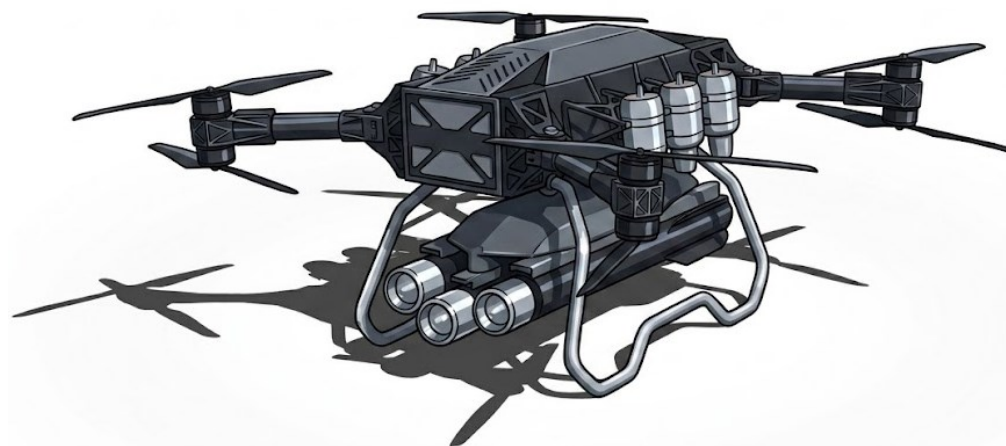
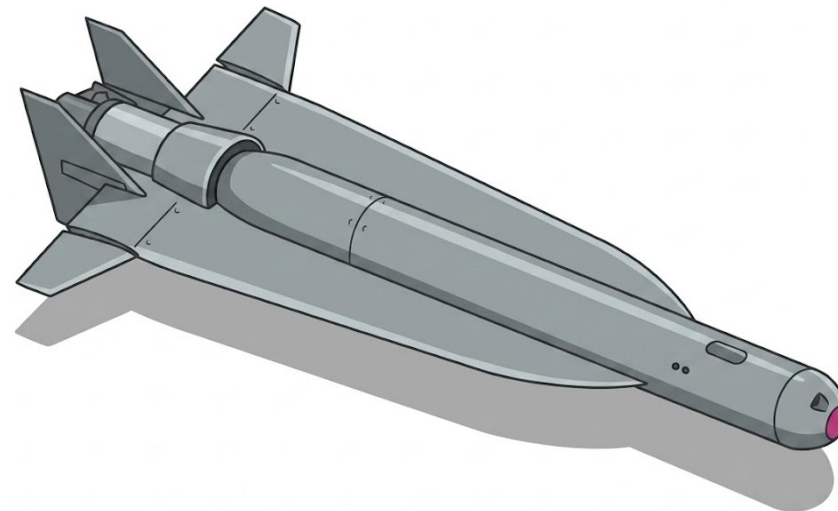
THE PROBLEM

The drone market is growing, and companies are developing them to **fly faster, further and carry heavier loads**

Drones are also becoming the **centerpiece of modern warfare**

Propulsion systems with **energy density** are necessary to drive it

Export control (ITAR) limits **components available outside the USA**





THE PROBLEM



- Jet engines provide the **highest propulsion force per weight** and are much **simpler to integrate with airframes**
- Historically **they are complex to make**, specially when scaling down
- Existing suppliers of micro jet-engines provide **insufficient quantities and quality for current demand**



BADGER
ENGINES

IS A JET ENGINE
MANUFACTURER

WHICH ALLOWS DRONE
COMPANIES

ACHIEVE LONGER MISSIONS
AND HEAVIER PAYLOADS

WITH OUR AFFORDABLE AND
PLUG-AND-PLAY ENGINES





SOLUTION

- **Micro gas turbines**
affordable, easy to integrate
and designed for mass
production
- Design-for-Manufacturing
and leveraging existing
supply chain since sketching
phase
- Advanced **virtual prototyping**
allowing **data driven fast
design iterations**
- **Goal: to be delivering 5,000
engines per month in 2 years,
10,000 in 3 years**

Badger 150N Thrust Working Prototype





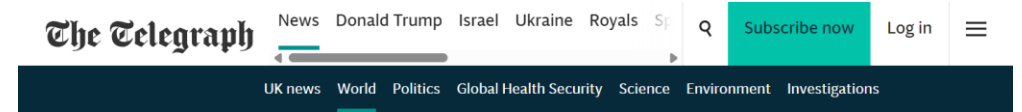
WHY NOW?

“As the conflicts in Iran and Ukraine show, drones are rapidly reshaping warfare, with cheap systems destroying high value targets and innovation cycles measured in weeks, not years.

Ukraine uses roughly 200,000 drones a month and there were 700 drones launched per day at the height of conflict in Iran”

[UK MoD Press Release](#) (Published 12 June 2026)

This market is urgent, requires high volumes, and it is matter of national security for all NATO countries



Russia's new jet-powered drones outpace Ukrainian interceptors

Moscow launches weapons capable of reaching 500kmph to exploit gaps in Kyiv's air defence

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Antonia Langford

in Kyiv

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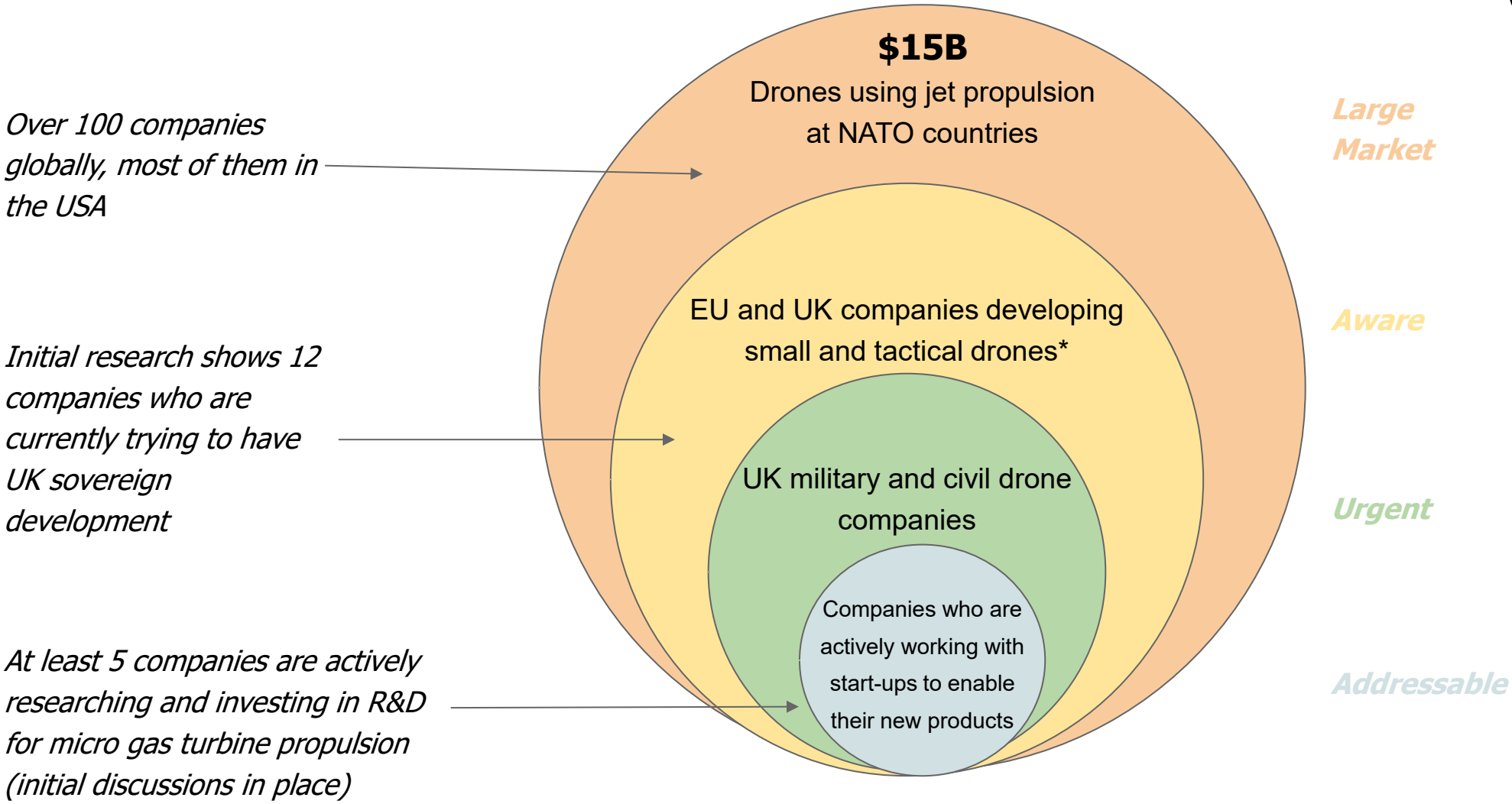
Published 02 July 2026 4:00pm BST

Now, residents of the Ukrainian capital are being terrorised by a different soundtrack: the high-pitched whistle of jet-powered drones, tearing through the sky so fast they could be mistaken for missiles.

These upgraded systems can reach speeds of up to 500kmph – almost three times faster than their Iranian-designed propeller-driven predecessors – and carry warheads weighing between 50kg and 90kg.



THE MARKET



*UAV Classes between I(d) and II, in accordance with the NATO classification scheme



THE MARKET – SEGMENTATION AND GROWTH

North America, Europe, Middle East and Far East Combat Drones Market, By Engine Thrust Output, 2022-2035 (USD Million)											
By Engine Thrust Output	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	CAGR %
Micro-Thrust Drones (Up to 200N)	1,967	2,640	3,269	3,777	4,169	4,415	4,576	4,694	4,803	4,891	14.9%
Low-Thrust Drones (200N to 600N)	1,478	1,997	2,489	2,894	3,215	3,427	3,575	3,691	3,801	3,896	16.4%
Medium-Thrust Drones (600N to 1,500N)	2,465	3,309	4,099	4,737	5,234	5,549	5,758	5,915	6,061	6,184	15.1%
High-Thrust Drones (1,500N to 3,000N)	2,787	3,695	4,521	5,160	5,629	5,891	6,035	6,119	6,189	6,231	12.4%
Total	8,696	11,641	14,377	16,567	18,246	19,282	19,944	20,419	20,853	21,202	13.7%



COMPETITION

Production Volume



**BADGER
ENGINES**



Airframe Integration





BUSINESS MODEL

Offer a **family of propulsion systems** system to be easily integrated in mini to tactical drones*:

- **BEC150** – 150N thrust
- **BEC350** – 350N thrust
- **BEC550** – 550N thrust
- **BEC750** – 750N thrust

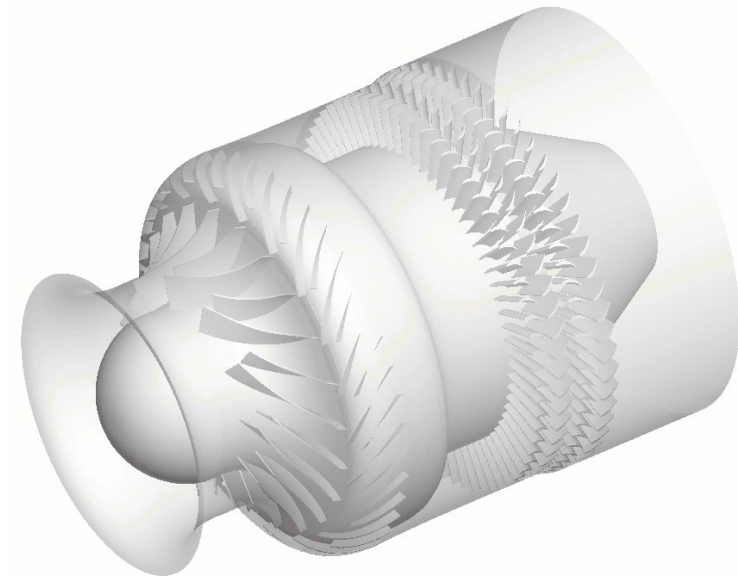
- **BEC300H** – Hybrid System offering 300N thrust and electrical power up to 1.5 kW

*UAV Classes between I(c) and II, in accordance with the NATO classification scheme

Focus on attritable **UAV (Unmanned Aerial Vehicles) market** while still delivering quality

It enables multiple drone applications: one-way effectors, heavy-lift carrier, surveillance, defensive swarm

Direct B2B sales to drone OEMs and co-development with customer





DEVELOPMENT ROADMAP

Design the right thing

Today



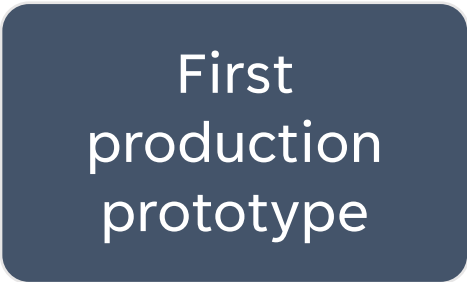
TRL 4

Technology proven with virtual prototype and initial physical tests

Gather requirements for first product demonstrator

Prove it works

+ 6 months



TRL 5

Physical prototype Technology Demonstrator for **BEC150** and **BEC350**

Gather initial LOIs, MOUs and co-development offers

Prove it survives

+ 6 months



TRL 6

MVP, confirm application & pain points

Third party testing

First orders of small batches

Prove it scales

+ 6 months



TRL 7

PMF understood and quantified

Production CAPEX and OPEX estimation for unit cost and scale up proposal

We want to **disrupt the drone market** by providing powerful and affordable propulsion systems

We want to be the enabler of new markets:

Military sovereignty

Last-mile supply chain

Maintenance in heights

Emergency relief

Rescue operations



Source image: [How emergency responders are using drones to save lives](#)



MEET OUR TEAM



We worked together at the R&D department at Dyson,
designing high-speed motors for production of millions per year



Thiago Ebel

Director of Technology at world-leader
turbomachinery consultancy

10 years experience in industries such as aerospace,
automotive, energy and white goods

Experience from low TRL research to production
products

Gas turbine global network



George Watson

10 years experience with product
design and prototyping

Experience design for mass
manufacturing for small high speed
rotating machinery

Rapid prototyping, 3D printing

Global supply chain network

Investment goal: Pre Seed \$4.0M

Covering

- High level engineering software licenses and computing to run it
- Small machine shop and lab for in-house testing and prototyping (quick iterations)
- 3 technical milestones delivery up to TRL7 to support market validation
- Hire top talent, full time (most already identified and excited to join)
- Third party testing (external validation and certification)

What would this unlock

- The right tools and the right people
- Speed of delivery
- Market validation
- IP protection
- Initial R&D in further IP:
 - Fuel flexibility
 - Acoustics (stealth mode)
 - Durable version (non-attributable)
 - Micro generator mode (hybrid propulsion and small power plant applications)



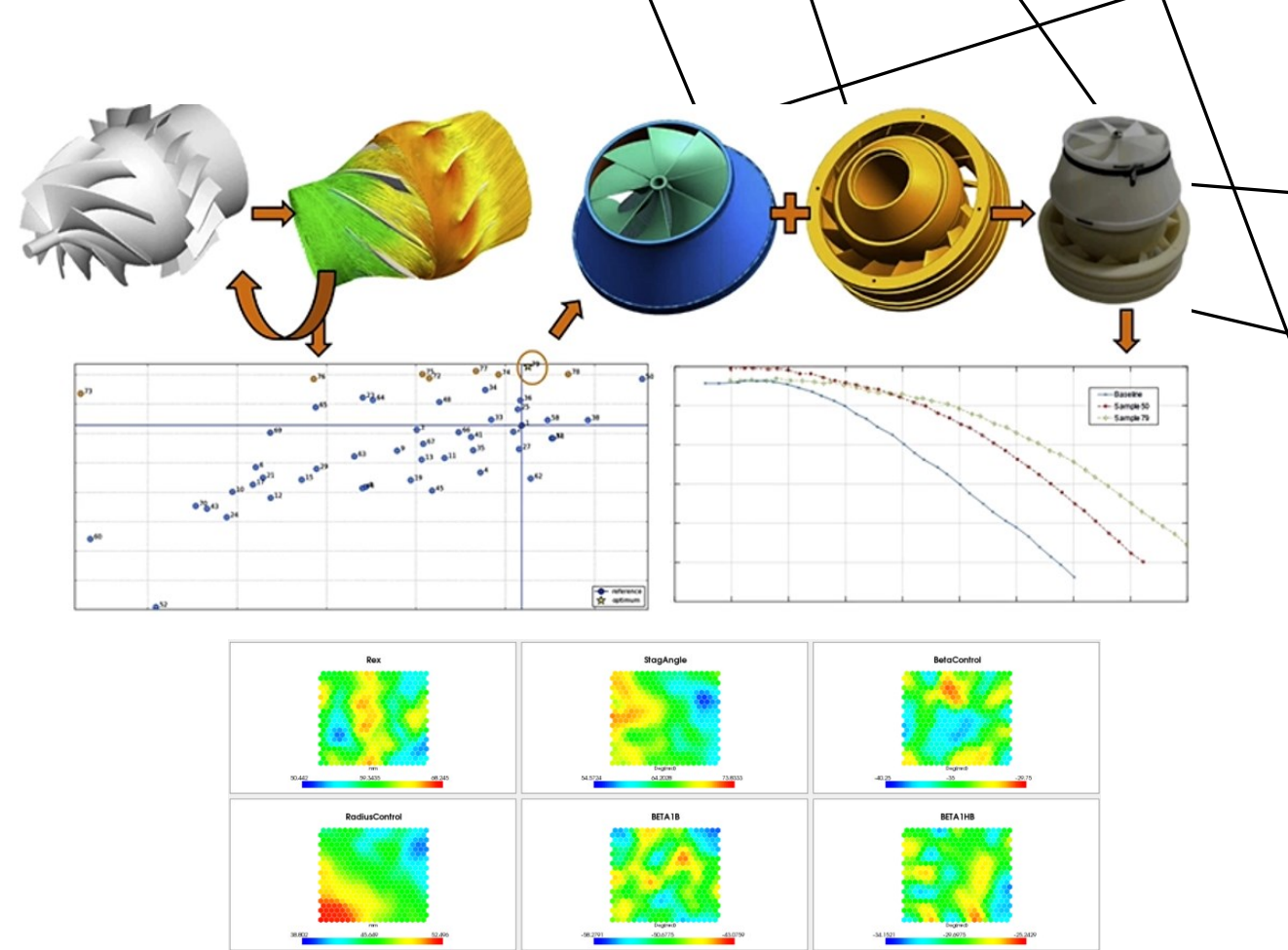
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THE TECHNOLOGY

- The breakthrough is the use of **digital prototyping for data driven improvements** [1], [2] which allows **fast iterations** analyzing **techno-economical trade-offs** [3].
- And then combined with **mass-production techniques** (typically found in the white goods industry instead of aerospace) [4] allows for using the scale to drive unit cost down.



[1] Ebel, T., and Thoburn, W., 2025, "AERODYNAMICS NUMERICAL OPTIMIZATION AND EXPERIMENTAL VERIFICATION OF A LOW REYNOLDS NUMBER MIXED FLOW BLOWER FOR MULTIPLE OPERATIONAL POINTS," Proceedings of ASME Turbo Expo 2025 Turbomachinery Technical Conference and Exposition, Memphis, Tennessee.

[2] Ebel, T., Anderson, M., Pandya, P., Perchanok, M., Tiney, N., and Gravante, S. P., 2021, "Use of an Integrated Approach for Analysis and Design of Turbocharged Internal Combustion Engine," Volume 6: Ceramics and Ceramic Composites; Coal, Biomass, Hydrogen, and Alternative Fuels; Microturbines, Turbochargers, and Small Turbomachines

[3] Ebel, T., Gresham, T., Idrissi, M. Y., and Rizk, A., 2026, "TECHNO ECONOMIC ANALYSIS FOR CENTRIFUGAL COMPRESSORS USING OIL-FREE TECHNOLOGIES FOR MODERN REFRIGERANT FLUIDS IN 300 KW REFRIGERATION SYSTEMS," Proceedings of ASME Turbo Expo 2026 Turbomachinery Technical Conference and Exposition, Milan, Italy.

[4] Celebrating 100 million Dyson motors made in Singapore - [Link](#)



INITIAL INVESTORS

- Selected by Wilbe through their Build Week at pre-incorporation (valuation at \$3,500,000)
- Allowed us to start working at Badger Engines full time





THE TARGET MARKET

- Thrust: force generated by the engine
- NATO classification scheme (right) for drones (UAV/UAS)
- To power Drone Classes between **I(c)** and **III** it is necessary engines which can provide thrust of 100N and above.
- Families of engines (with different thrust) are necessary for different drone classes

NATO UAS Class	Maximum Take off Weight	Common Taxonomy
I(a)	<200g	Nano
I(b)	200g to 2kg	Micro
I(c)	2kg to 20kg	Mini
I(d)	20kg to 150kg	Small
II	150kg to 600kg	Tactical
III	>600kg	M/H ALE



COMPETITION

NATO SUPPLIERS



START-UPS FOR MICRO JET ENGINES (NATO)

- Volund Manufacturing (USA)
- AeroDesignWorks (Germany)
- Destinus (Netherlands)
- Argive, a division of Alloyed (UK)
- Aurora (Australia)
- Modini (UK)
- Mach Industries (USA)
- Beehive Technologies (USA)



NON-NATO SUPPLIERS



I.e.: Belorussian drones (Berkut-BM) powered by Chinese micro jet engines (Swiwin turbines)

