



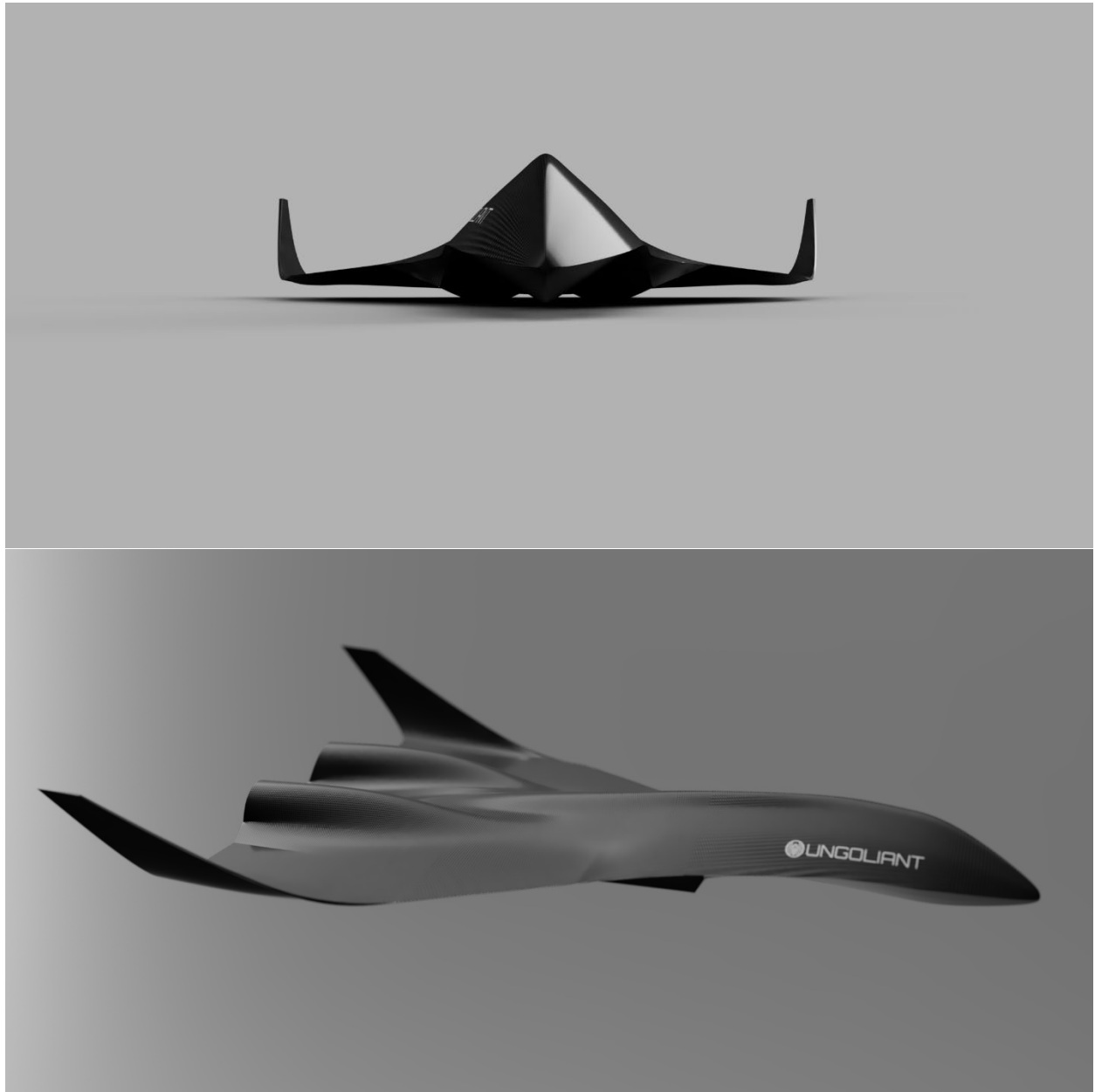
Ungoliant Systems Inc  
Engineering Department

# Barghest UAS

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**Subject:** A Rapidly Deployed Multi-role  
Group 4 UAS

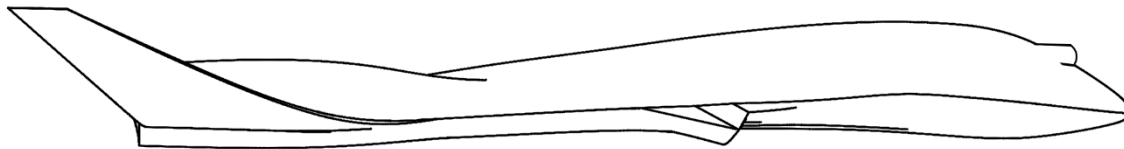
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## Executive Summary

The Barghest (Group 4) fighter is a high-agility, multi-role unmanned combat aircraft designed to counter the rapidly proliferating Group 1–4 UAS threats—especially one-way attack and reconnaissance drones. As a multi-role platform, it can also be utilized for close air support (CAS), electronic warfare (EW), decoy functions, and kinetic strike capabilities. Featuring a tailless delta-wing, twin PBS TJ200 turbojets, and a modular sensor/weapon suite, it delivers fighter-like performance at an estimated \$400k per unit, making it a scalable, low-cost asset for modern, contested environments.

Barghest is not a Collaborative Combat Aircraft (CCA) but is designed to fill the void left by existing assets. With the rapid proliferation of Group 1–4 UAS, **agile unmanned fighters are inevitable in modern conflict**—whether developed by us or by our adversaries. Barghest offers a small, fast, and cost-effective fighter capable of autonomous or semi-autonomous networked operations, delivering multi-domain support to forward forces and fulfilling roles no other asset can.



MAX SPEED: 0.8M  
RANGE (ONE WAY): 530NM  
MAX ALT: 32,000FT  
RCS: 0.5m<sup>2</sup>  
UNIT COST TARGET: \$400,000

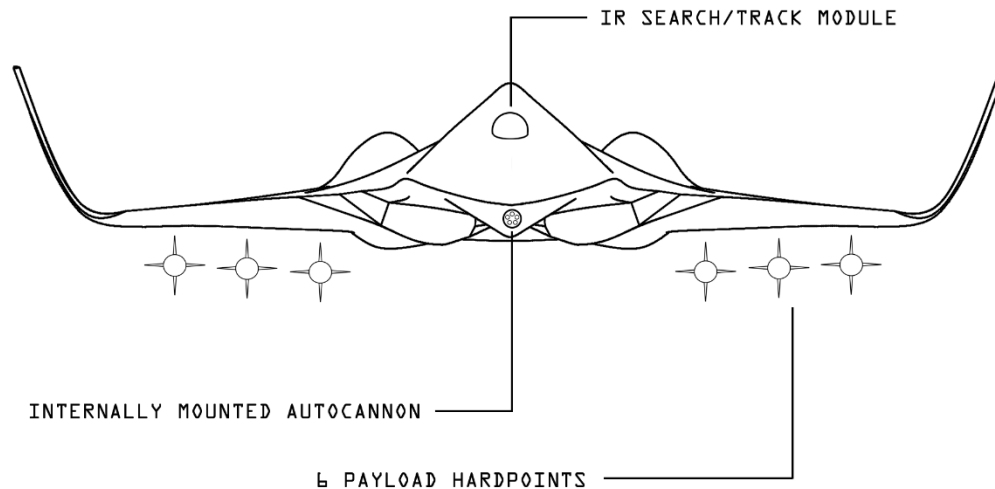
## Concept of Operations

### Mission Roles:

- **Counter-UAS (cUAS):** Intercept and neutralize one-way attack drones, ISR assets, and loitering munitions before they can designate or engage friendly forces.
- **Close Air Support (CAS) & ISR:** Deliver rapid-response for precision kinetic strike delivery and real-time battlefield intelligence, enhancing situational awareness for ground forces.
- **Decoy & Electronic Warfare (EW):** Function as a high-speed decoy to provoke enemy SAM engagement, while executing active and passive electronic warfare operations to degrade adversary sensor networks.
- **Loitering Strike / Kamikaze Optionality:** Capable of high-speed, one-way strike missions against high-value enemy assets, increasing the lethality of coordinated UAS engagements.

### Operational Integration:

- **Swarm Autonomy & AI Coordination:** Equipped with advanced autonomy for AI-driven cooperative engagement, allowing swarm formations to dynamically identify, classify, and neutralize threats with human-in-the-loop oversight.
- **Deployment Flexibility:**
  - **Austere and Forward-Deployed Operations:** Capable of catapult launch, runway operation, and arrestor cable recovery, enabling distributed airpower concepts in low-infrastructure environments.
  - **Maritime Adaptability:** Potential for carrier-capable and expeditionary variants supporting naval and littoral operations.



## Key Technical Capabilities

### Airframe & Stealth:

- **Design:** Tailless delta-wing configuration constructed from carbon fiber composites for low weight, modularity, and reduced radar signature.
- **Size:** Group 4 class (MTOW ~680–900 kg); compact dimensions (~6–7 m length, ~4 m wingspan).

### Propulsion & Performance:

- **Engines:** Twin PBS TJ200 turbojets providing >Mach 0.8 speed and 8–9G maneuverability.
- **Endurance/Range:** ~2-hour endurance with an 800 km one-way operational radius for rapid repositioning.

### Sensor & Avionics Package:

- **Primary Sensor:** An EO/IR sensor operating as anIRST for all-aspect thermal detection of low-signature enemy UAS.
- **Optional Sensor:** X-band radar to augment targeting.
- **Communications:** Secure, mesh-enabled datalink with LPI/LPD and frequency hopping to ensure anti-jam connectivity.

### Weapons & Payload Capacity:

- **Armament Options:**
  - *Soft-Kill:* High-power microwave (HPM) pod (e.g., similar to the Epirus Leonidas Pod) for disabling drone swarms.
  - *Kinetic Weapons:* Up to 8 small, guided missiles (e.g., NAVAIR Spike) for precise engagement.
  - *Additional Systems:* Optional internal gun and micro precision guided bombs for close-range or CAS missions.
- **Payload Modularity:** Adaptable internal/external hardpoints to tailor weapons loads per mission.

### Autonomy & AI Integration:

- **Operational Autonomy:** Advanced AI/ML supports autonomous threat detection, target classification, and mission execution with human-on-the-loop oversight.
- **Decision-Making:** Reinforcement learning-based mission execution enables rapid, autonomous responses in dynamic environments.
- **Secure Data Sharing:** Communications utilize encryption and secure protocols for seamless integration into the broader tactical network.

### Command & Control (C2) Interface:

- **Control Modes:** Supports both direct human control and AI-assisted autonomy.
- **Integration:** Compatible with 5th/6th generation fighters, ground stations, satellite relays, and tactical networks (e.g., AWACS, CCAs).

### Survivability & Countermeasures:

- **Defensive Systems:** Incorporates EW/SIGINT capabilities, RCS reduction techniques, and redundant systems.
- **Attritable Design:** Designed as a low-cost, expendable asset that accepts losses as part of modern attrition warfare.

## Manufacturing & Scalability

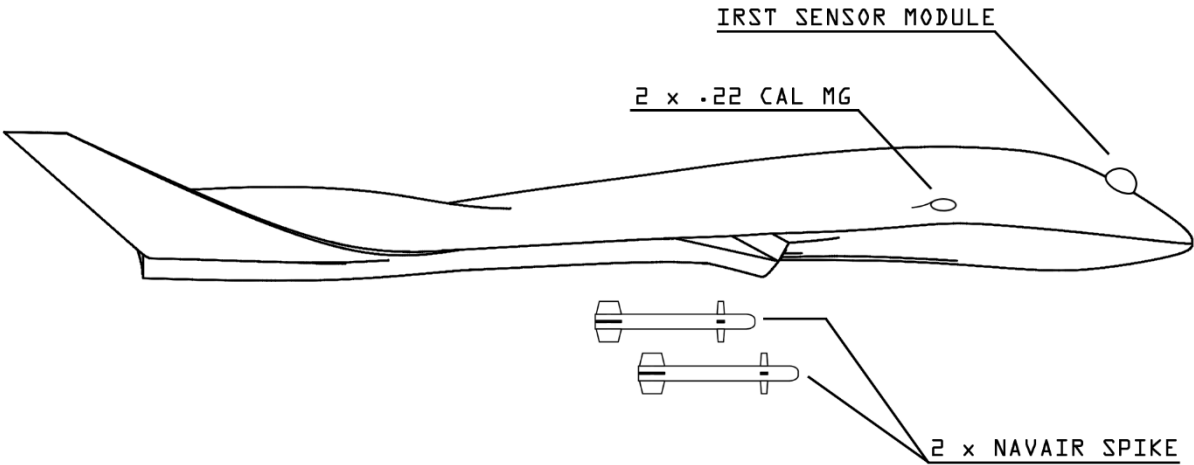
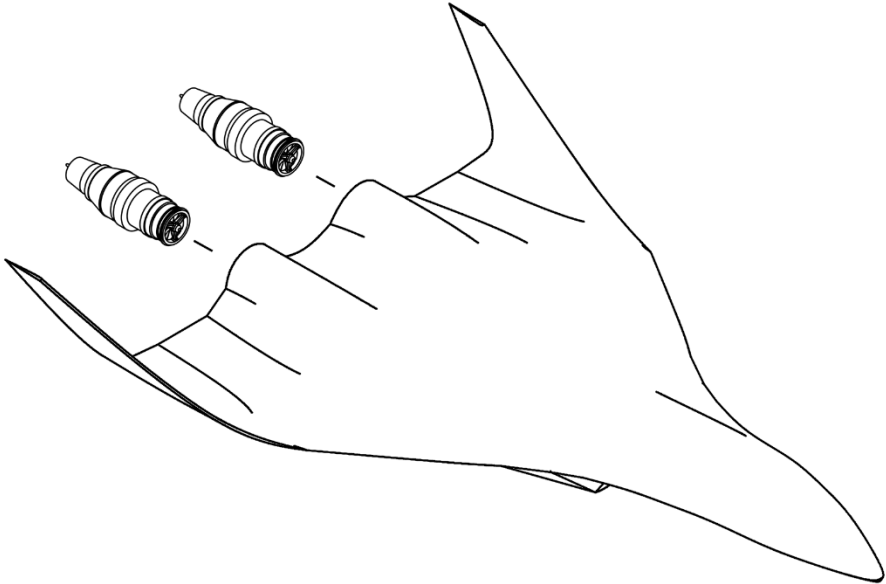
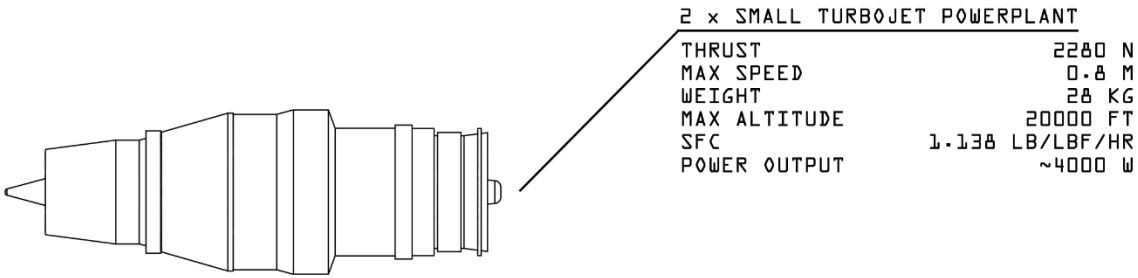
### Production Feasibility:

- **Modular Design:** Composite airframe and emphasis on COTS components enable rapid, scalable manufacturing.
- **Cost Efficiency:** Target unit cost of ~\$400k, with simplified avionics and standardized parts reducing O&M costs.
- **Supply Chain:** Leverages commercial suppliers for engines (PBS TJ200), sensors, and communications gear; minimizes reliance on bespoke systems.
- **Integration:** Designed to be incorporated into existing military logistics and command structures, with ease of storage, transport, and rapid turnaround.

## Comparative Analysis

Platform	Speed & Agility	Range/Endurance	Payload (Sensors/Weapons)	Unit Cost	Roles & Limitations
MQ-9 Reaper	~230 mph cruise; low agility	~1,850 km range; ~27 hr endurance	3,000+ lb payload; advanced sensor turret, Hellfire missiles	~\$32 M per unit	ISR/strike; too slow for rapid cUAS, vulnerable in contested airspace
XQ-58A Valkyrie	~Mach 0.72 cruise, >Mach 0.85 dash; moderate agility	~4,800 km ferry range; limited endurance	~600 lb internal bay; modular payload options	~\$5.5 M current (target <\$3 M future)	Attritable loyal wingman; high cost and limited for decentralized, close-in cUAS
BQM-167A Target Drone	230–600 knots; up to 9G turns	~1 hr endurance; limited operational radius	No lethal payload; augmentation devices available	~\$570k each	High-performance target; not an operational combat system
Barghest (Proposed)	>Mach 0.8 dash; 8–9G agility	~800 km one-way; ~2 hr endurance	~100–150 kg modular payload (IRST, HPM pod, Spike missiles, optional gun, micro bombs)	~\$0.4 M (target)	Multi-role fighter: rapid cUAS interceptor, quick-reaction CAS, decoy/EW, with kamikaze option; limited endurance compared to ISR-only drones

**Unique Value Proposition:** Barghest offers a dramatically lower unit cost with fighter-like agility and multi-role capability, filling a critical niche in modern aerial combat. It provides rapid cUAS response, fast CAS delivery, and flexible decoy/EW operations, all integrated within a scalable, networked system.



## Path to Deployment & Next Steps

### Development Roadmap:

- Develop a small, cUAS focused low-cost, fixed-wing interceptor to test flight controls and terminal guidance/acquisition of targets
- TRL Progression: Advance from concept design through prototyping (TRL 4-6), followed by flight tests and iterative refinements.
- Timeline: Initial prototypes and preliminary flight tests within 6–9 months; transition to limited low-rate production in 1–2 years.

### Funding & Partnerships:

- Initial raise via SAFE with angel backers
- Potential Funding: Seek R&D investment from defense agencies (e.g., DARPA, AFRL) and partner with established aerospace contractors.
- Collaborations: Explore co-development opportunities with industry leaders (e.g., Anduril, L3Harris) to integrate proven COTS systems.

### Testbeds & Demonstrations:

- Flight Test Programs: Leverage existing test platforms (e.g., X-plane programs) to validate design and operational concepts.
- Joint Exercises: Integrate with USAF/USN pilot training exercises and JADC2 networks to ensure seamless multi-domain integration.

### Requirements from Defense Contractors:

- R&D Funding: Support for prototyping, flight testing, and integration of advanced AI and secure communications.
- Co-Development: Partnerships for sensor integration, autopilot systems, and armament testing.
- Production Support: Assistance in scaling manufacturing processes and supply chain logistics for rapid deployment.

## Conclusion

Given the proliferation of UAS threats across Groups 1–4, aircraft like the Barghest are inevitable. Modern conflicts will feature agile, unmanned fighters that provide airborne, on-call active defense—filling a critical gap that no existing asset can match. The Barghest (Group 4) fighter is a transformative unmanned combat solution designed to directly address deficiencies in counter-UAS and close air support missions. Combining fighter-level speed and agility with modular sensor and weapon systems, it offers rapid, ground controlled or autonomous responses against emerging threats. The Barghest provides a versatile, re-taskable system capable of intercepting hostile drones, delivering precision close air support, and performing decoy/EW roles at an extremely low cost. This decisive edge not only enhances protection for forward troops but also complicates enemy strategies. In a future destined to include more Group 1-4 threats, not less, we believe Barghest will pave the way for a new era of agile, networked unmanned combat air power that will be indispensable in future conflicts.

