Drooid: palm-size swarms for modern battlefields

Daniel Kalu & Fitz Doud · July 2025

Slide 1: Problem

Modern battlefields demand scalable, intelligent, and expendable systems but current robotics are:

- Too large and expensive to deploy at scale
- Reliant on GPS and centralized control
- Vulnerable to jamming, destruction, or environmental limits
- Require too much operator input and training

> Result: Mission teams lack agile, intelligent assets for ISR, breaching, and multi-domain coordination in denied environments.

"75% of military casualties occur during reconnaissance and patrol missions" - DoD Combat Studies

Slide 2: Solution

Drooid builds insect-like teams of autonomous drones & crawlers that:

- Think and coordinate like swarms no single point of failure
- Operate in GPS- and comms-denied zones
- Are palm-sized, quiet, and rapidly manufacturable
- Perform recon, mesh networking, breaching, and perimeter defense

> **Think: "100 brains over one body" for modern tactical advantage.

Slide 3 · Why Now?

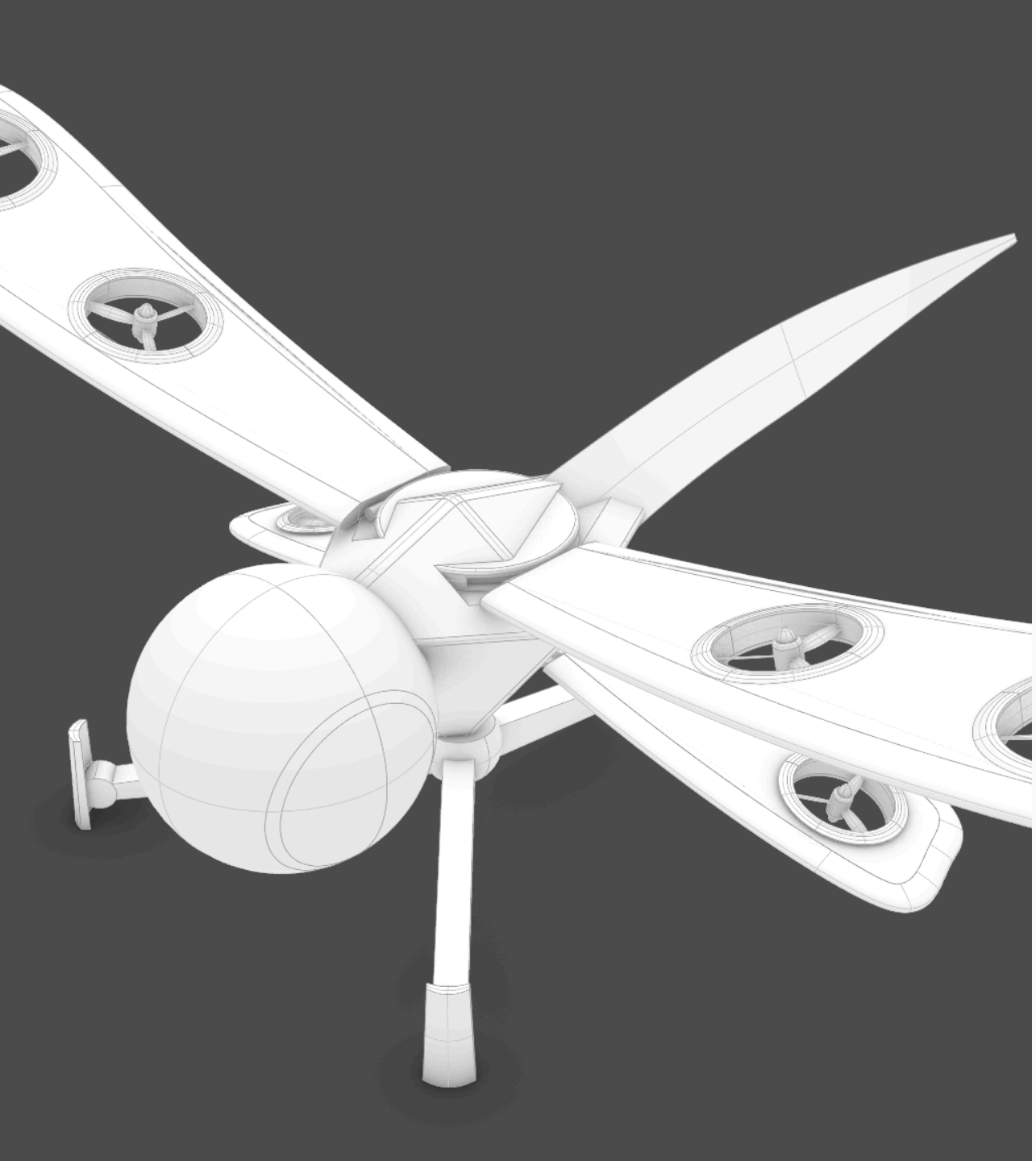
- **DoD is buying swarms now**
  Replicator, DIU sUAS, and AFWERX TACFI all fund low-cost, attritable autonomy.
- **Edge-AI + batteries finally fit in a palm**
  Jetson Orin Nano / RK3588 boards < **$100** + 350 Wh/kg cells ⇒ 15 min endurance with on-board inference.
- **GPS-denied wars expose the gap**
  Ukraine, Gaza, and looming Indo-Pac flashpoints show the cost of losing ISR and comms.
- **Prototype loop is instant**
  Newlab Detroit's printers, drone cage, and motion-lab let us go **prompt → flight test in < 72 h** with zero cap-ex.

Slide 4 · Biomimetic Swarm Designs

Field-ready forms inspired by nature.
Each unit built from COTS parts and rapid printing.

- **Dragonfly** flyer – indoor or outdoor recon
- **Fish** swimmer – flooded tunnel and drain mapping
- **Orb** comm ball – drops in rubble to relay voice and data

All designs are backpack-deployable and task-specific.




DDYSSEY

Slide 5 : Product Overview - Drooid Tactical Swarm Kit

Module	Role in a DoD mission
Micro Flyers	Palm-scale ISR drones for room-clearing, rooftop sweeps, and perimeter alarms
Ground Crawlers	Low-profile scouts that breach door gaps, map tunnels, and drag comm beacons forward
Swappable Payloads	Snap-in HD / IR cams, CBRN & gas sensors, EW sniffers, breaching spikes
HiveBox Field Hub	One ruck-size charger + mesh gateway that boots and re-arms 20 bots anywhere

Starter Load-Out: 10 flyers + 10 crawlers + HiveBox, stowed in a single Pelican-spec case — deployable by one operator in < 5 min.

Slide 6 · Core Tech Stack (Prototype v0)

Pillar	Ships in the first 6 months	Why it matters
Nano-Bots	10 flyers + 10 crawlers, printed frames, COTS sensors	Cheap, expendable, backpack-deployable
SwarmOS Lite	Decentralized nav, mesh comms, hard kill-switch	Keeps running when GPS or radio is jammed
HiveBox	Laptop-size field base: compute, charger, data logger	One plug-in hub powers & coordinates the swarm
AI-to-Print	Prompt → CAD → 3-D print in **48 h**	Hardware iterations move at software speed

> **Focus:** prove this minimal full stack first—then add swimmers, advanced payloads, and the Constructor engine after Series A.

Slide 7 · DoD Applications

Special Operations – silent advance recon, perimeter sensors

FOB Security – twenty-four seven autonomous fence patrol

Urban Warfare – room-by-room intel and IED spotting

Border & Area Denial – persistent watch with minimal logistics

Drooid scales from platoon kits to base-wide mesh nets.

Slide 8 · Operational Advantages

Advantage	Impact
Redundant swarm	Mission survives individual losses
Low unit cost	Affordable mass and attrition use
Adaptive AI	Replans locally when jammed
Tiny footprint	Hard to detect and target

Slide 9 · Market Size and Spend

Total addressable defense spend **47 B USD**

- Unmanned systems 23 B
- ISR 18 B
- Force protection 6 B

> Growing DoD budgets in autonomous systems, ISR, and expeditionary robotics

Near-term budgets

SOCOM 2.1 B • Army ISR 8.3 B • CBP 1.8 B • Classified 0.5 B+

Slide 10 · Go-to-Market Roadmap

Phase 1 (0-6 mo)

SBIR Phase I wins, exercise demos, DIU pitch

Phase 2 (6-18 mo)

SOF pilot kits, SBIR II, border agency trials

Phase 3 (18-36 mo)

Program-of-Record bids, scale manufacturing, FMS sales

Slide 11: Tech Differentiators

- **Decentralized swarm AI** vs traditional single-drone autonomy
- **Ornithopter + crawler dual-domain coordination**
- **Real-time mesh comms + modular payloads**
- **Fully attritable, fast-manufacturable systems**

> No other DoD vendor combines these at palm-scale in both ground and aerial domains

Slide 12: Business Model

- 💼 **Direct to DoD (SBIR / DIU / OTA programs)**
- 🤝 Partner with primes as swarm layer for legacy platforms
- 📦 Pack-based unit sales or swarm-as-a-service for specific mission types

Slide 13 · Build Plan · first six months

Month	Deliverable
1	Parts in, Li-Po safety SOP and smart-charger station
2	Frames printed, UWB anchors live, bench tests pass
3	Indoor hover, crawler roll, kill-switch demo
4	GPS-denied nav flight in AAIR corridor
5	Multi-bot sensor sweep, auto-dock recharge
6	Ten-bot mixed mission video and data pack

Slide 14 · Non-Dilutive Leverage

- NSF SBIR Phase I – 275 k submitted
- AFWERX TACFI – 75 k LOI in draft
- Michigan SPARK proto-grant – 100 k match

Grants stretch investor capital nine months.

Slide 15: Funding Ask

> Raising $250k SAFE @ $3M post-money valuation

- 🚀 Use of funds: Fabricate Gen-1 prototypes, field test ISR swarms, file SBIRs
- 📍 Goal: Demonstrate swarm ISR capability in a denied environment in <6 months

Team & Newlab Advantage

Fitz Doud – Robotics platform engineer, ex-open-source maintainer

Daniel Kalu – CS grad from Minerva, AI/ML & swarm control

Newlab @ Michigan Central – SLA/SLS printers, drone cage, motion-capture lab

Thank You

Contact:

fitzdoud@gmail.com

dankalu.work@gmail.com

Join us in building the future of swarm defense robotics.