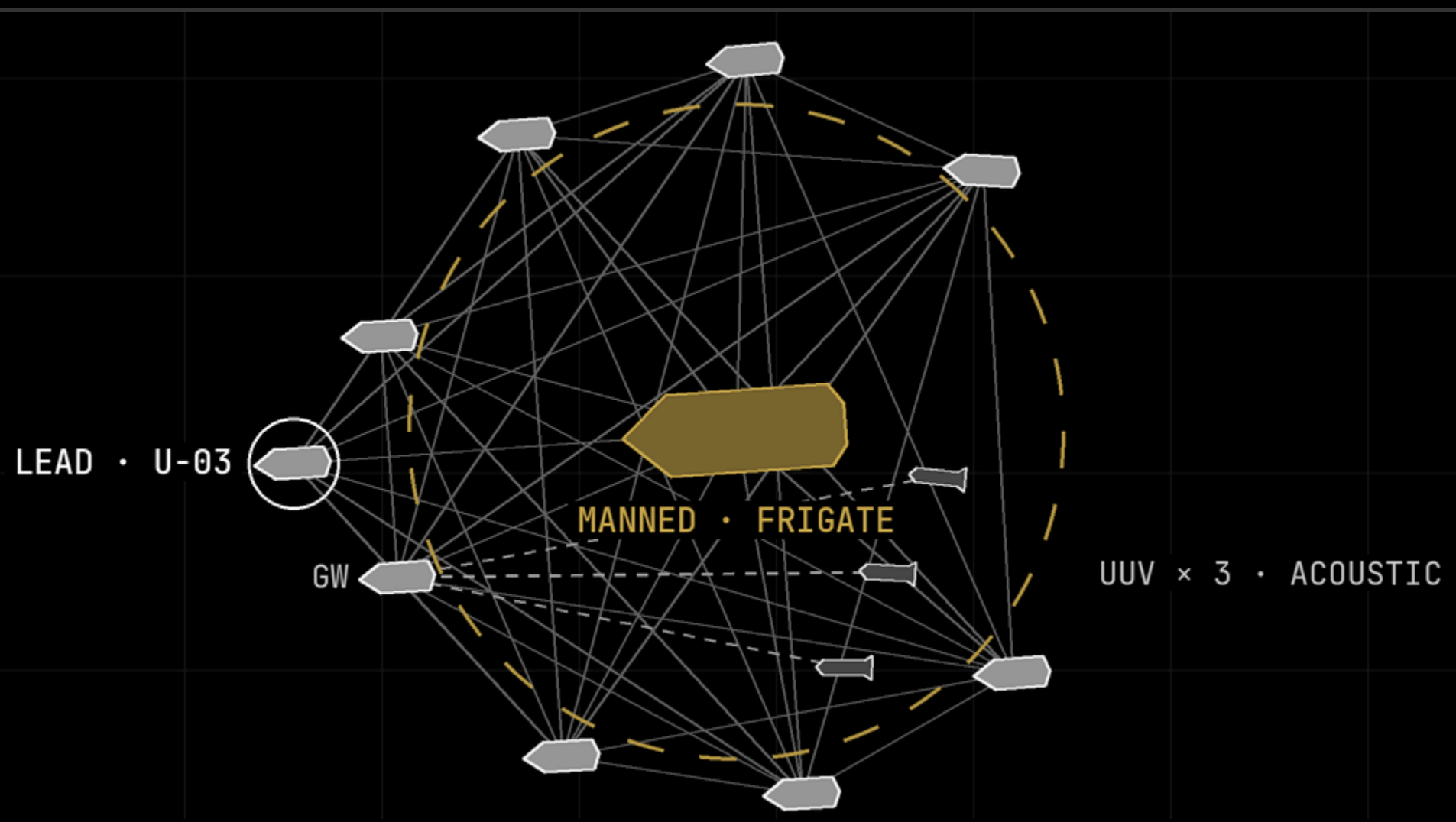
NAVAL SWARMS IN 2026: WHERE THEY REALLY ARE.

What is proven at sea, what is still on paper, and the five problems in between.



WHAT IS PROVEN

PACKS, NOT SWARMS (YET).

COMBAT

UKRAINE, BLACK SEA

Sea drones have sunk or damaged roughly a dozen Russian warships since 2022. Mostly remote-piloted over satellite links; autonomy for transit, under jamming and in the final approach.

EXERCISE

NATO REPMUS 2026

300+ uncrewed systems, 36 navies. A frigate screened by 20–30 uncrewed escorts against a mass attack by dozens of drones. Humans approved every move.

ANNOUNCED

US NAVY · CHINA

“Thousands” of small USVs planned for the Indo-Pacific by 2030. China showed an L30 USV group encircling an intruder (state TV, March 2026).

No public evidence yet of more than two or three vessels cooperating autonomously under jamming.

THE FIVE HARD PROBLEMS.

01 **CONTESTED COMMS**

GNSS jamming and spoofing are routine in the Black Sea and the Red Sea. Links will drop.

02 **DECISIONS WITHOUT A CENTRE**

Lose the leader or the link, keep the mission. That takes election and consensus, not a joystick.

03 **THE OCEAN EATS RADIO**

Under water: acoustic links in bits to kilobits per second, seconds of latency, no GPS.

04 **HUMANS ON THE LOOP**

Classic studies cap one operator at a handful of vehicles. Manned ships, COLREGs and the law still apply.

05 **TRUST & TESTING**

Emergent behaviour is hard to certify, and multi-vendor software integration set back Replicator in 2025.

THE DEEPDOCK VIEW

A SWARM IS A SYSTEM, NOT A FORMATION.

→ **DEGRADE GRACEFULLY**

Every unit must know what to do when the network, the leader or GPS is gone.

→ **COMMAND INTENT, NOT BOATS**

One operator sets the mission; the swarm handles the geometry.

→ **SIMULATION TO SEA**

Deterministic simulation first, then real hulls: Shark and Sardine.

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