CANADIAN SHIELD

A DIVISION OF SIG | SUSTAINABLE INFRASTRUCTURE GROUP

WATER · CS-310

THE SEA JAMS EVERYONE. WE PLANNED ON IT.

Persistent survey & carrier AUV — one moulded hull that surveys, carries and watches.

SURVEY · CARRY · WATCH — NO RADIO, NO GPS, BY PHYSICS

PATENT PENDING

EXPORT-CONTROLLED — INTERNATIONAL TRANSFER SUBJECT TO CANADIAN GOVERNMENT PERMITS

CARRIER, NOT A MUNITION — NON-KINETIC PAYLOAD CARTRIDGES ONLY

Ø250 MM	20 KG / 20 L	~35 H	0
PRESSURE-HULL CYLINDER × 2.0 M	WET-BAY CARTRIDGE — NON-KINETIC ONLY	ENDURANCE AT 1.5 M/S CRUISE	RADIOS ABOARD — SEAWATER KILLS RF

OVERVIEW

ONE MOULDED HULL. THE WHOLE WATER DOCTRINE INSIDE IT.

Part of the **2-system Water line** — shares its envelope and doctrine with Jellyfish.

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Orca CS-310 is the anchor of Canadian Shield's Water family: a ~100 kg-class autonomous underwater vehicle built around a buckling-governed pressure hull, a free-flooded moulded fairing and a 20 kg / 20 L wet payload bay at its center of buoyancy.

The design thesis is the family thesis: an all-plastic vehicle is cheap and quiet. No steel hull means no magnetic anomaly and only a weak sonar return — the manufacturing story and the low-signature story are the same story. Build for cost, and you build for stealth. Only the inner cylinder is a pressure vessel; everything the water touches first is moulded polymer on the fleet's own tooling.

Where the Goose is a round and the Grizzly is a mule, the Orca is a workboat: route survey, seabed awareness and coastal watchkeeping on long legs — and a carrier bus for the tools that do the close work, including its family-mate, the Jellyfish CS-320 creeper. A new payload cartridge is tooling, not redesign.

THE FAMILY SEAT

TWO WATER PLATFORMS. COUNTED EXACTLY.

The Water family is deliberately small: Orca does the tens-of-kilometres transit on its screw; Jellyfish does the last, quietest kilometre on pulse and drift. Orca trades acoustic signature for range — a screw is audible, and we accept that for the survey role. That trade is stated, not hidden.

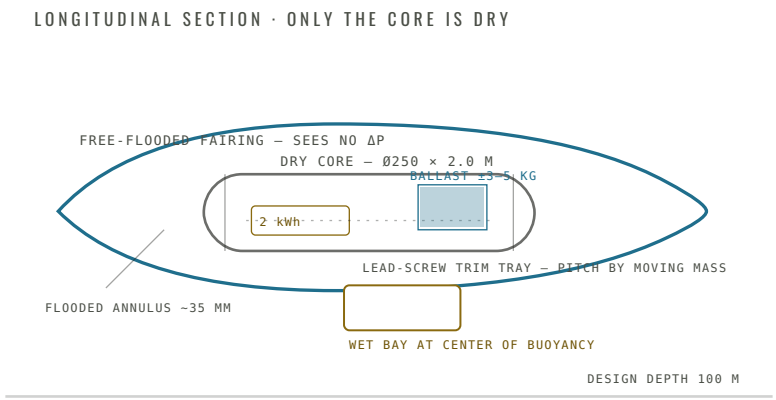
HOW IT WORKS

MECHANISM

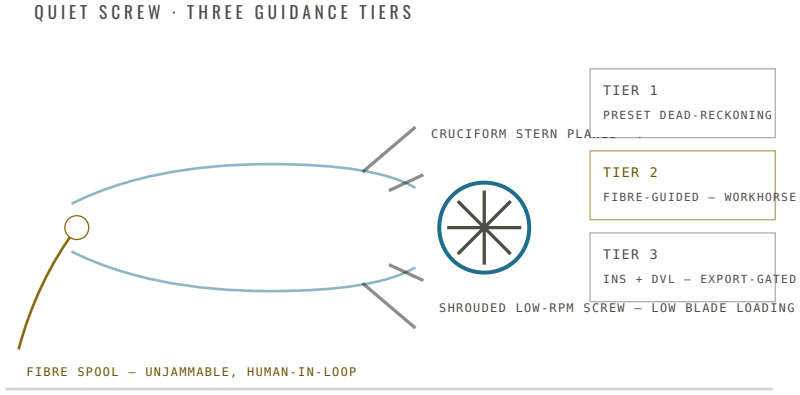
A HULL SIZED BY BUCKLING, TRIMMED BY MOVING MASS

The inner Ø250 mm cylinder is the only dry space aboard — sized against external-pressure buckling, the failure mode that actually governs a plastic hull, not hoop stress.

Around it, the moulded nose, mid and tail fairings flood freely and feel no pressure differential at all — which is why they can be light, cheap and quietly shaped. Inside, the 2 kWh battery rides a lead-screw trim tray: pitch trim by moving mass, not by thrashing control surfaces. A pumped variable-ballast system worth ±3–5 kg handles the fresh-to-salt swing and fine depth-keeping, and at the 100 m design depth the wall works out to ~15 mm — set by buckling, not hoop stress.



ORCA CS-310 · HULL SECTION — ONLY THE INNER CYLINDER FIGHTS THE SEA



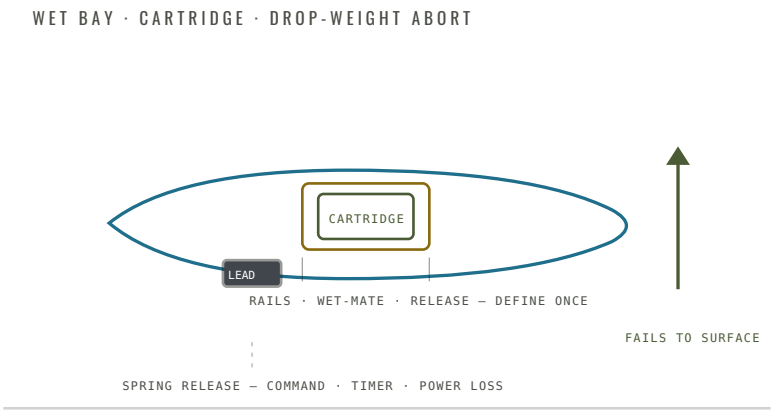
ORCA CS-310 · DRIVE & GUIDANCE — QUIET-SCREW IS A POSTURE, STATED PLAINLY

HOW IT WORKS · WET BAY & ABORT

A CARRIER'S BAY, AND THE DUMBEST POSSIBLE WAY HOME

The flooded wet bay sits at the center of buoyancy and swallows one ~20 kg / ~20 L cartridge — sensor node, relay, sampler, inspection package, or a carried vehicle. Non-kinetic cartridges only. That rule is binding.

A define-once interface contract — mount rails, wet-mate connector, retention and release, buoyancy bookkeeping — means a new cartridge is tooling, not redesign. And when anything goes wrong, the one must-work device aboard is also the simplest: a cast-lead drop weight on a preloaded spring. On command, on timer lapse, or on power loss, the weight goes and the vehicle rises. A fault surfaces the Orca — it does not strand a battery on a lakebed.



ORCA CS-310 · WET BAY & ABORT — THE MUST-WORK DEVICE IS THE SIMPLEST ONE

SPECIFICATIONS

CAPABILITIES & SPECIFICATIONS

ORCA CS-310

DIMENSIONS & MASS

Overall length	~2.4 m — free-flooded moulded fairing, max dia ~Ø320 mm
Pressure hull	Ø250 mm × 2.0 m — buckling-governed cylinder, domed ends
Displacement class	~100 kg — a two-person carry
Flooded annulus	~35 mm between hull and fairing

PERFORMANCE & ENVELOPE

Endurance	~35 h / ~190 km at 1.5 m/s cruise; ~5 h at 3 m/s — cube-law trade
Design depth	100 m — wall ~15 mm, sized against external-pressure buckling
Variable ballast	±3–5 kg pumped tank — fresh-to-salt swing ~2.4 kg absorbed

DRIVE & TRIM

Propulsion	Shrouded low-RPM ducted screw, low blade loading; cruciform stern planes ×4
Energy	2 kWh Li-ion pack
Pitch trim	Battery pack on a lead-screw tray — pitch by moving mass
Abort	Cast-lead drop weight, spring-released on command, timer or power loss — fails to surface

GUIDANCE & COMMUNICATIONS

Guidance tiers	Tier 1 preset dead-reckoning · Tier 2 fibre-guided (workhorse) · Tier 3 INS + DVL
Fibre guidance	Payout spool with a human on the far end — nothing in the water to jam
Communications	No radio, no GPS — acoustic modem as sparse check-in only, never a control channel

PAYLOAD & WET BAY

Wet bay	~20 kg / ~20 L flooded bay at the center of buoyancy
Cartridge rule	Non-kinetic cartridges only — binding, in every variant
Interface	Define-once contract — mount rails, wet-mate connector, retention and release, buoyancy bookkeeping
Cartridge classes	Sensor node · relay · sampler · inspection package · carried Jellyfish CS-320 creeper

MATERIALS & SIGNATURE

Construction	Polymer-first — GF-nylon hull; free-flooded fairings moulded on fleet tooling, rPET-eligible
Magnetic signature	No steel hull — no magnetic anomaly, weak sonar return
Acoustic posture	Screw audibility accepted for the survey role — the trade is stated, not hidden
Tooling	Moulded on the fleet's own 5-axis die shop

COMPLIANCE

Patent status	Patent pending
Export control	Export-controlled — international transfer subject to Canadian government permits; export posture is counsel-first
Tier 3 navigation	INS + DVL hardware export-gated in its own right
Munitions classification	Carrier, not a munition — no warhead, no fuze, no energetic material, in any variant
Close-work scope	The last, quietest kilometre belongs to Jellyfish CS-320 — carried here as a cartridge

ENDURANCE IS STATED AT THE CRUISE SPEEDS SHOWN — THE CUBE-LAW TRADE BETWEEN SPEED AND RANGE APPLIES. NO LOW-SIGNATURE FIGURE IS CLAIMED ON THIS PAGE; THE SCREW IS AUDIBLE AND THAT TRADE IS ACCEPTED FOR THE SURVEY ROLE. CLOSE-IN CREEP WORK BELONGS TO JELLYFISH CS-320, CARRIED IN THIS WET BAY.

THE TRADES, STATED

UNDERWATER, THE NO-RADIO DOCTRINE COSTS NOTHING. THE SEA ENFORCES IT.

Every Canadian Shield platform is built no-radio, no-GPS — jam-proof because there is nothing to jam. In the water, that doctrine isn't even a choice: seawater conductivity kills RF outright, a few metres down.

The Orca is what happens when a fleet doctrine finds its most natural home. Fibre is the workhorse guidance tier — a physical thread with a human on the end, immune to jamming by construction. Bounded autonomy covers the long legs. There is no ballistic tier at sea, and no radio anywhere in the loop, because the ocean already made that decision for everyone. Adversary jammers spend power on a vehicle that was never listening.

And it is a carrier, not a munition. The wet bay takes sensor, relay, sampler and inspection cartridges — never a warhead, never a fuze, never an energetic material. That boundary is binding across the fleet, in every variant, for every customer.

THE HOUSE THESIS

BUILD FOR COST, AND YOU BUILD FOR STEALTH.

A moulded polymer vehicle from the fleet's own die shop is inexpensive enough to buy in numbers — and non-magnetic, acoustically dull and sovereign-made by the same act. Salvo depth at sea is hulls in the water; the manufacturing floor is what puts them there.

DEPLOYMENT

ONE SURVEY LEG, START TO FINISH.

A harbour-approach survey, walked end to end — illustrative of how the vehicle is used, not a mission record.

01 · ARRIVE

TWO PEOPLE, ONE VEHICLE

The ~100 kg-class hull is a two-person carry from truck bed or small boat — no crane, no davit; handling points are sized for a shore crew. The cartridge clicks into the wet bay on the define-once interface, ballast trim is set for local water — the fresh-to-salt swing absorbed by the pumped tank — and the mission plan and abort criteria load at the shore station, pre-dive.

02 · WORK

THE LONG QUIET LEG

On fibre for the close work and bounded autonomy for the transit, the Orca runs its survey lines at cruise — hours of seabed awareness on one charge, with silent-running segments where the mission calls for them. Route survey and watchkeeping are the anchor mission set; cartridge work — emplacing a sensor node, carrying a sampler, delivering a creeper to its start point — rides along on the same hull.

03 · RECOVER

IT COMES BACK UP. ALWAYS.

Nominal recovery is a planned rendezvous at the surface. Off-nominal recovery is the drop weight: command, timer lapse or power loss releases the lead and the vehicle rises — the abort is mechanical, spring-driven and dumb by intent. Either way the hull, the battery and the data come home; then recharge, re-cartridge, relaunch.

THE FAMILY

RELATED SYSTEMS

CS-320 · THE CREEPER

JELLYFISH

The mothership-carried creeper — rides the Orca's wet bay as a cartridge, then does the last, quietest kilometre on pulse and drift.

Orca CS-310 · patent pending · export-controlled — international transfer requires Canadian government permits; export posture is counsel-first. Carrier, not a munition: the flooded wet bay accepts non-kinetic payload cartridges only — no warhead, no fuze, no energetic material, in any variant. No radio, no GPS aboard — the acoustic modem is a sparse check-in link, never a control channel; Tier 3 navigation hardware is export-gated in its own right. The last, quietest kilometre belongs to Jellyfish CS-320, carried in this wet bay.

THE SEA JAMS EVERYONE.
WE PLANNED ON IT.

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Build for cost, and you build for stealth.

01

REQUEST A TECHNICAL EXCHANGE

A working session with engineering, not sales — bring your engagement problem, we bring the mechanism.

02

REQUEST THE WATER FAMILY DATA PACK

Drawings, tolerances and test basis for Orca and its siblings, gated behind export screening.

03

DISCUSS A TRIAL QUANTITY

Tell us end-user, jurisdiction, quantity band and timeline — we respond against your program, not a price list.

SALES
sales@cdnshield.ca

GENERAL
info@cdnshield.ca

WEB
cdnshield.ca

Direct lines, named points of contact and facility details are shared with qualified programs following screening — not withheld, sequenced.

Canadian Shield is a defence and industrial drone company, backed by SIG: four-domain uncrewed systems built for jammed, GPS-denied environments — no-radio by design, manufactured for cost and salvo depth.

Orca CS-310
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