

“Enhancing capabilities for crossing the water gap
and fulfilling wider mission objectives
for littoral defence and maritime expeditionary combat forces”



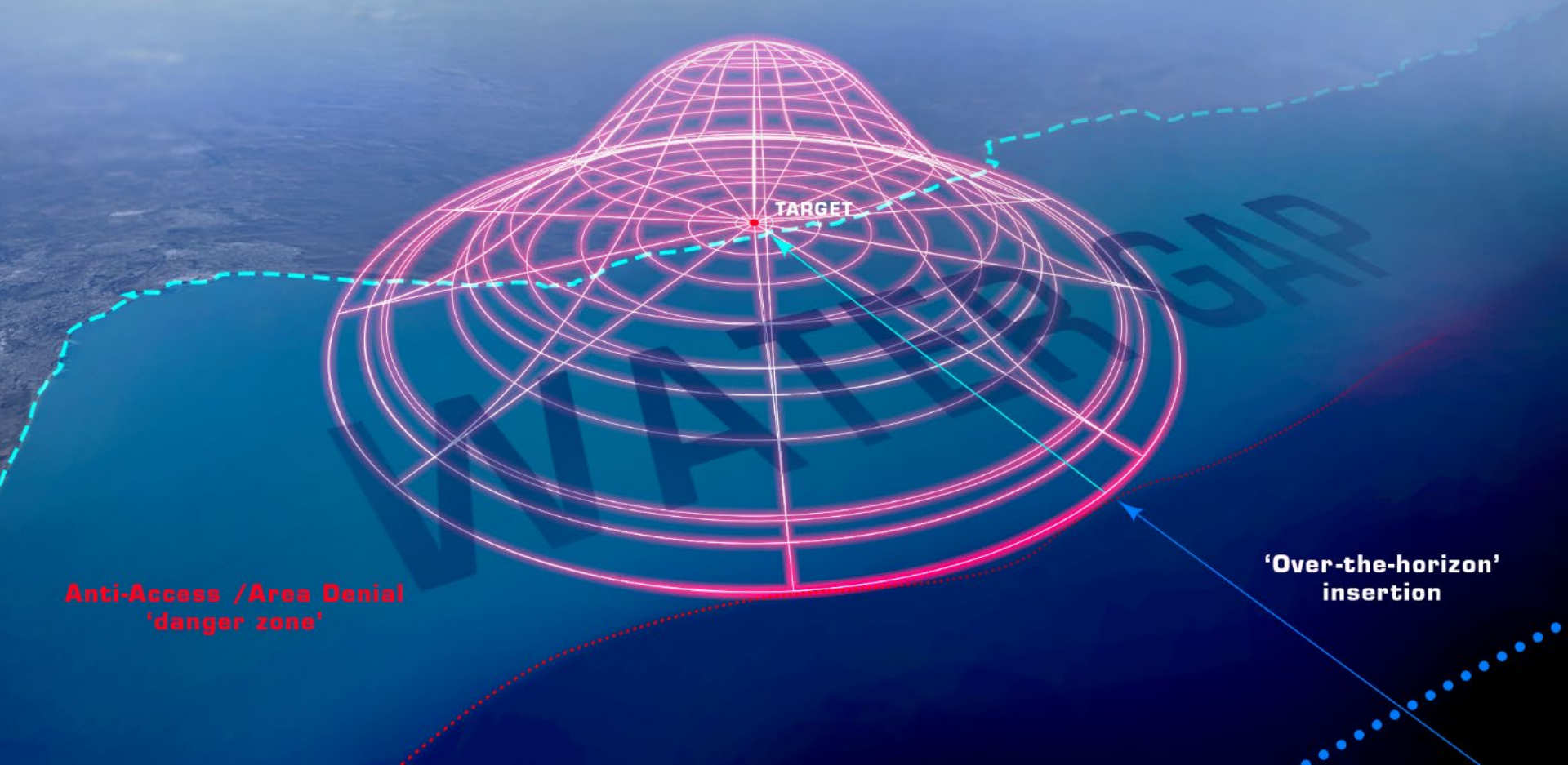
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Bridging the Water Gap

Organic Maritime Insertion



**Anti-Access / Area Denial
'danger zone'**

**'Over-the-horizon'
insertion**

Battle Space Challenges:

- Operating within the littoral is increasingly challenging with multiple threats from sea, air and land coastal defense systems able to reach extended distances offshore.
- Crossing the water gap discretely requires a minimised signature.
- Hybrid manned free-flooding submersible craft offer a unique special operations projection capability.

Challenges:

“How do we move our SF Operators and Marines without being detected”?

How does a SF team/ Raider party use submersed vehicles in defeating coastal defences allowing other forces access”?

Solution:
Tactical Diving Vehicles
(TDVs)



LONG RANGE INSERTION In Denied Environment



Single Mode Surface Craft

- Rapid over the horizon capability
- Transportation of an effective team size



- Large signature (no discretion capability)
- Little to no environmental protection
- Little to no ballistic protection

Multi Mode Surface Craft

- Rapid over the horizon capability
- Transportation of an effective team size



- Signature reduction (semi-submerged & awash)
- Increased environmental protection
- Ballistic protection potential

Comms
Link

12hr Mission Profile

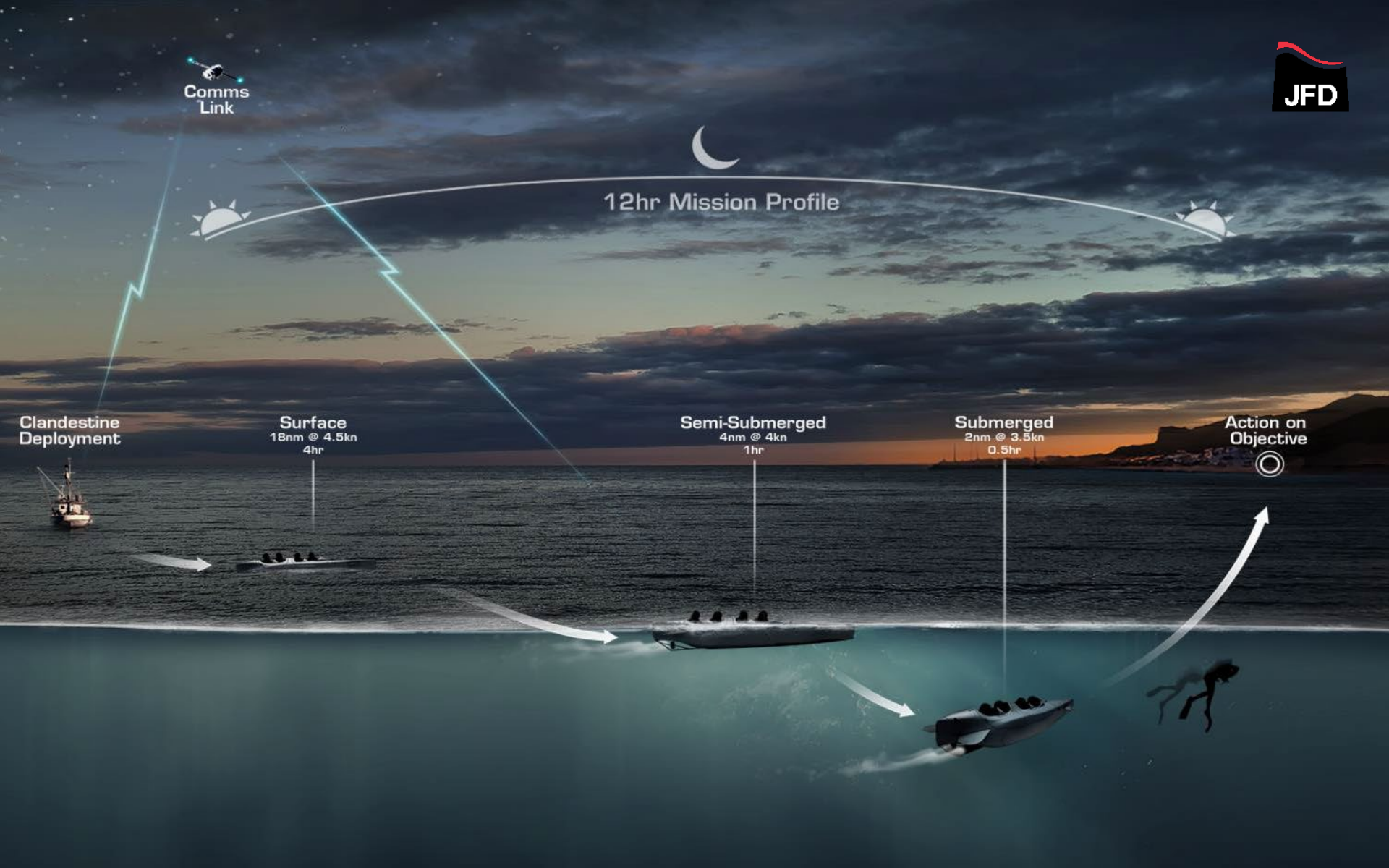
Clandestine
Deployment

Surface
18nm @ 4.5kn
4hr

Semi-Submerged
4nm @ 4kn
1hr

Submerged
2nm @ 3.5kn
0.5hr

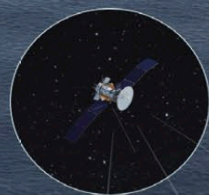
Action on
Objective



TDV Manoeuvre....closing the Littoral Gap

Insertion Options

- Air drop
- Helicopter
- Submarine
- Vessel



- Direct Action
- Intelligence, Surveillance
- Target Acquisition
- Reconnaissance
- Hostage Rescue
- Maritime Counter Terrorism
- Counter Narcotics



Surface
18nm @ 4.5kn
4hr



Semi submerged
4nm @ 4kn
1hr



Submerged
2nm @ 3.5kn
0.5hr



Tactical Diving Life Support Systems



JFD provides specialist underwater life support systems for naval and special operations forces globally.

Our experience and close partnership with clients allows JFD to deliver world leading capability.



**SHADOW
ENFORCER**



**SHADOW
(BACK MOUNT
CAPABLE)**



**SHADOW
EXCURSION**



**STEALTH
SC**



**STEALTH
CDLSE**



MMUBA

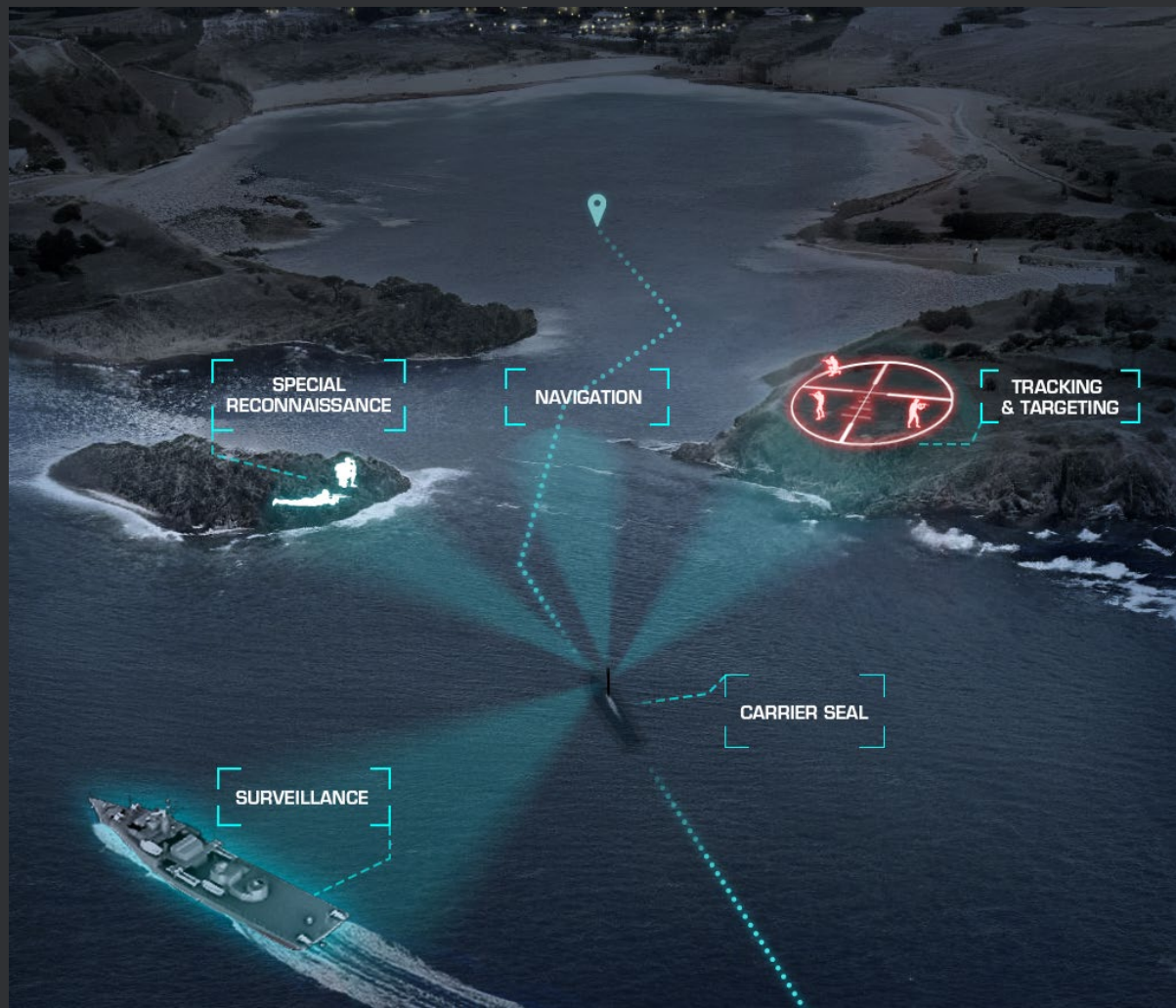
Concepts of Employment

CONCEPT OF EMPLOYMENT



ISTAR Operations

- Tactical electro optical mast
- Semi-submerged mode





UAV Launch for ISTAR
situational awareness





ISTAR - UAV Launch



Restricted Area Access
Discrete infiltration



CONCEPT OF EMPLOYMENT Maritime Interdiction



Critical Infrastructure Response:

- Counter Terrorism
 - Counter Narcotics
 - Counter Weapon Smuggling
-
- Delivery direct to the target
 - No need for long swim approaches
 - Operator performance is enhanced





Rapid Stealth Exfiltration





Enhancing Effect for Mission Success

Sensors and Effectors

CONCEPT OF EMPLOYMENT



Hydrographic Survey:

- Discrete deployment of beach reconnaissance swimmers
- Pre Amphibious landing seabed side scan reconnaissance

CARRIER SEAL



Launch from Support Ship
Autonomous 'Wing Man'



Rapid insertion over water
From ship 75km range

Restricted Area Access
Discrete infiltration

UAV situational awareness
and Target designation



Operatives disembark TDV's
to execute their mission

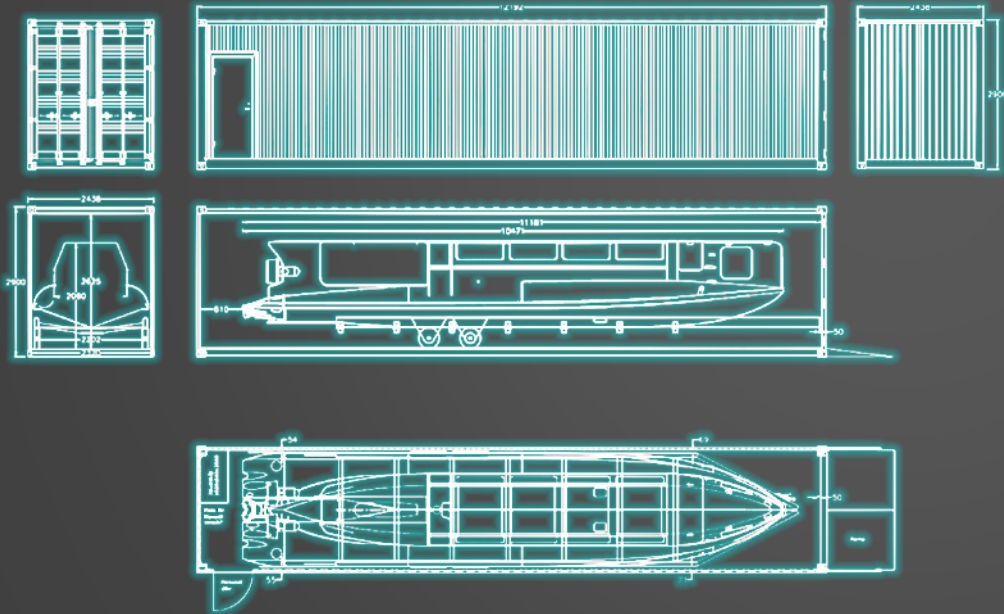
Overwatch Carrier Seal



CARRIER SEAL – CONTAINERISED SHIPMENT



- Containerised 'fly away' capability



CONCEPT OF EMPLOYMENT

Fire Support

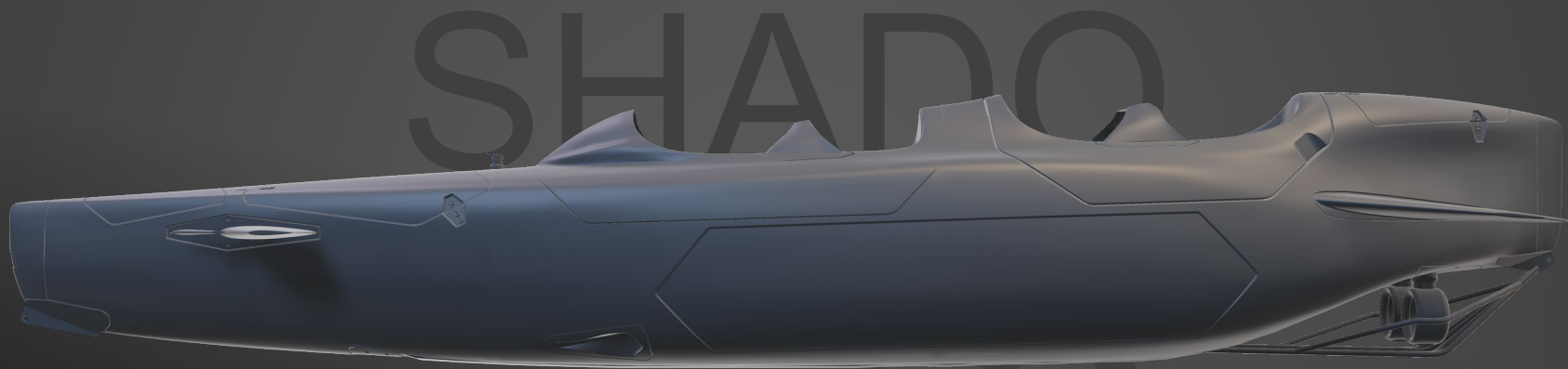
- Pre-assault surveillance
- Fire Support
- Stand-Off Attack
- Distraction





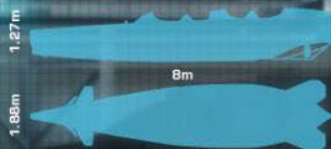


Questions?



SHADOW SEAL

SPECIFICATIONS



OPERATIONAL STRETCH POTENTIAL

- + Air Drop
- + Extendable Mast
- + Electro optical system
- + Autonomy
- + Remote Control
- + Bespoke Launch And Recovery System
- + Bespoke Trailer
- + Stand-off weapon integration

BUOYANCY SYSTEM

To quickly achieve positive buoyancy for routine or emergency use, Shadow Seal incorporates a buoyancy system supplied by high pressure compressed air.

CLOSED CIRCUIT BALLAST & TRIM SYSTEM

To optimise performance and control, Shadow Seal incorporates a Closed Circuit Ballast & Trim System enabling neutral buoyancy to be readily achieved in a range of operational environments.



4 OPERATOR CAPACITY



DIMENSIONS & WEIGHT

OVERALL LENGTH: 8.0m / 26ft.3in.
WIDTH: 1.88m / 5ft.11in.
HEIGHT WITH MAST: 2.18m to 4.12m (fully extended mast) / 7ft.2in. to 13ft.6in.
WEIGHT: 2,500kg
TOTAL WEIGHT: 2,500kg + 750kg (Personnel and Equipment)

REMOTE CONTROL

The vehicle has the capability to be remotely controlled expanding its operational employment potential.

BUILT-IN-BREATHING SYSTEM

When submerged, operators use personal life support systems such as oxygen rebreathers, however, Shadow Seal incorporates a Built-In-Breathing System for extended diving profiles and emergency use.

POWER SYSTEM

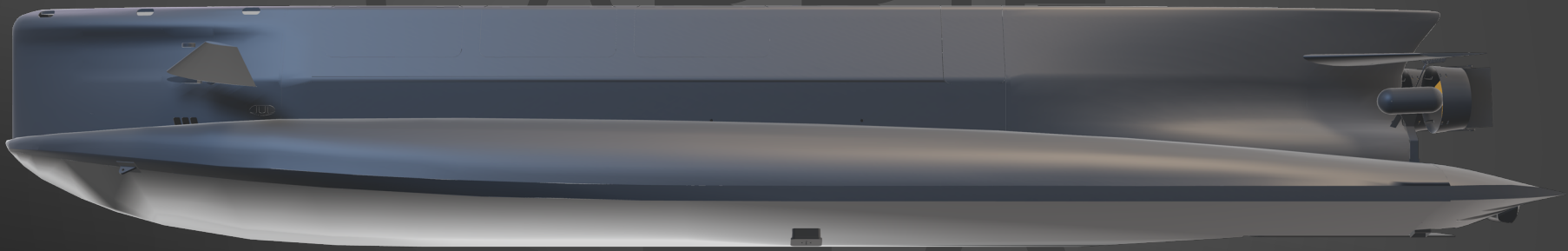
Shadow Seal is powered by 8 x 10kwh batteries that drive the propulsion system.

BATTERY PACK: 8 x 10 kWh
PROPULSION THRUSTERS: 2 x 9 kW
RANGE SUBMERGED: 25 nautical miles or 7hrs at 3.5 knots
RANGE SURFACE: 80 nautical miles or 20hrs at 4.5 knots





CADDIE



CELA



CARRIER SEAL

OVERVIEW

Crewed by a driver and vehicle commander, the Carrier Seal is specifically designed for rapid over the horizon surface transportation of a Tactical Diving team of up to eight operators. Where the threat level requires discretion, Carrier Seal may run awash with minimum signature and when required, a fully submerged covert infiltration / extraction may be conducted

Besides the transportation of Tactical Divers, the Carrier Seal can be configured for boarding, reconnaissance, surveillance, deployment of AUV and UAVs, fire support, and stand off attack. The craft is fitted with several multipurpose quick mounts for light to medium machine guns for defense or to provide support to Operators ashore

MATURITY

Carrier Seal is in service with key Special Forces Groups

2 + 6 OPERATOR
CAPACITY



DIMENSIONS & WEIGHT

OVERALL LENGTH:	10.45m / 34ft.3in.
BEAM:	2.23m / 7ft.4in.
HEIGHT:	1.65m / 5ft.5in.
WEIGHT:	4,000kg
PAYLOAD:	1,000kg neutral buoyant (inc .divers)

OPERATIONAL

MAX DEPTH:	40m
TYPICAL TRANSIT DEPTH:	4m
SURFACE MAX SPEED:	30 knots
RANGE SURFACE:	150 nautical miles (75nm fuel bag addition)
SUBMERGED MAX SPEED:	>5 knots
RANGE SUBMERGED:	15 nautical miles (+15nm with additional batteries)

