Fast Boat (Dry Cabin) Submarine Defense & Security

Briefing Document

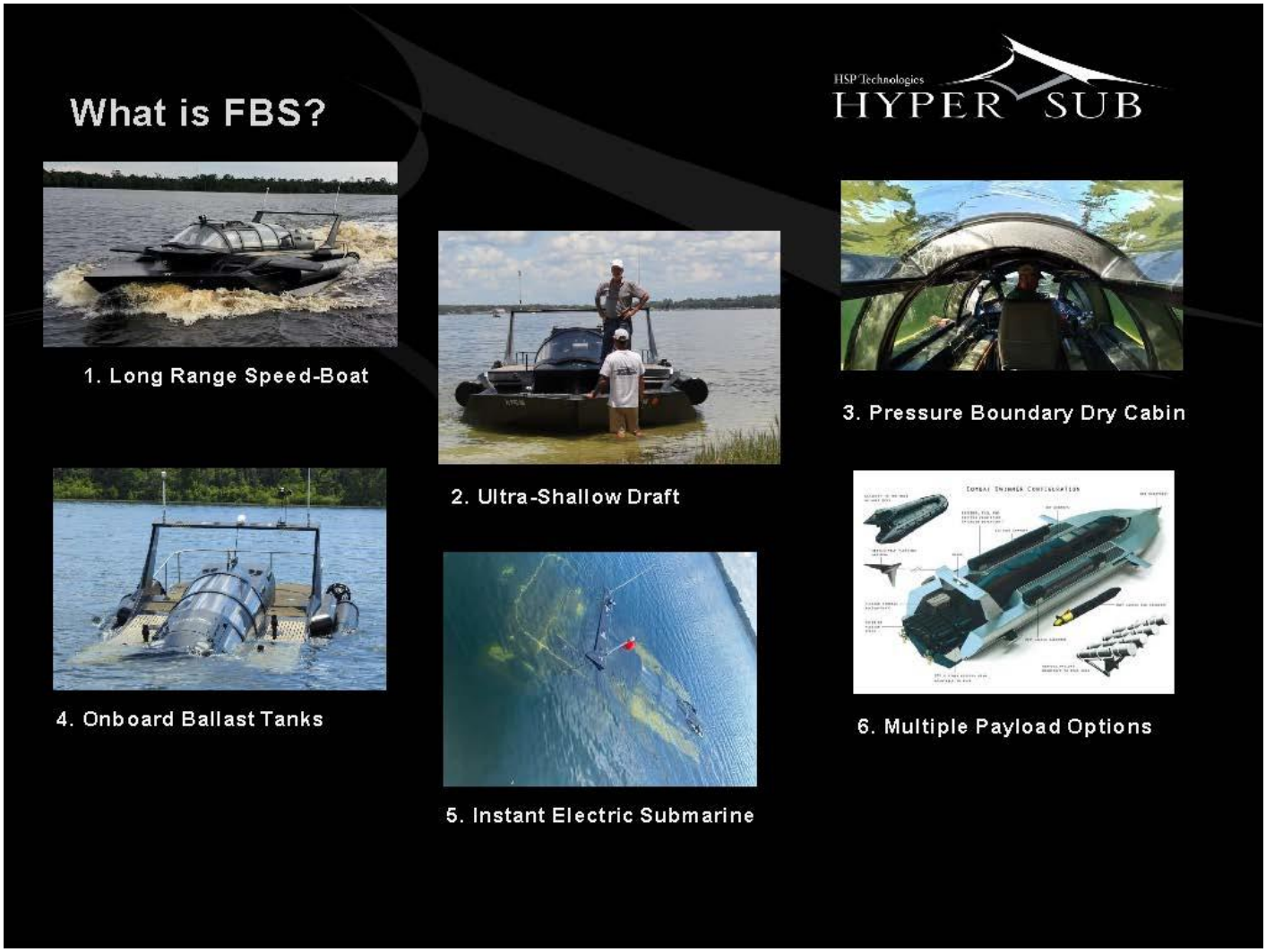
Dec 2023

Hyper-Sub Platform Technologies Inc.

www.hypersub.com

Table of Contents

The Fast Boat (Dry Cabin) Submarine
Defining a new Class of vessel



1. INTRODUCTION

Hyper-Sub Platform Technologies Inc. (HSP) was founded in Lake City, Florida, USA in 2016 by marine engineering entrepreneur and subsea visionary, Reynolds R Marion. This obsession, first sparked in his bedroom as a 12-year-old boy, was to invent a highly capable and powerful, long range, shallow draft speed boat that could quickly and seamlessly convert to a fully functioning, long duration, pressure tolerant dry-cabin, diesel-electric mini-submarine. Additionally, being capable of carrying multiple passengers in comfort and a large payload of mission equipment, used for a multitude of tasks while ranging hundreds of miles on and below the surface of the ocean.

The design and development execution of this dual use, dual modality concept has resulted in the revolutionary and game changing, Fast Boat Submarine (FBS), a multi-purpose, long range, surface & subsea utility vessel, fully engineered and provisioned for a range of littoral, green or brown water sea to shore connector operations. Not only can it successfully navigate in extremely shallow waters, with its 2'7" (0.8m.) draft option but it can also operate fully submerged and undetected in less than 15ft (4.5m.); and unlike its competitors, FBS does not require that any crew and passengers wear dive gear for flooded cabin operations during the dive phase, hence the fully dry, 1 atm. pressure barrier cabin which unlike any competitors offerings, allows for extended submergence capability in dry comfort. Only the Lockheed Martin Dry Combat Submersible (DCS) has this capability. However, DCS is unable to deliver itself at speed over long distance on the surface to reach its Area of Operations.

All FBS models are based on a series or 'family' of scalable and modular Commercial off the shelf (COTS) vessels, leveraging a common, platform 'Truck' design; much like the vast array of land based armored vehicles optimized for multiple purposes, built around a common chassis; often with quick change-out modules for specific task reconfiguration. (Think – US Army Stryker, current Marine Advanced Reconnaissance Vehicle (ARV) or Land Rover Defender etc.). For FBS, this will also include an advanced, un-crewed variant. Additionally, FBS is designed, constructed and tested in accordance with full International Association of Classification Societies (IACS) procedures and certification to ensure it will meet the most demanding procurement terms and conditions.

Note: This document discusses multiple ways the FBS can be configured and used. However, any formal request for the sale, manufacture and delivery of FBS will be reviewed and governed in accordance with the current rules, regulations, and guidelines as provided by the US Bureau of Industry and Security, U.S. Dept of Commerce, U.S. Munitions List (USML), and International Traffic in Arms Regulations (ITAR). FBS in its basic format, has been classified under US Commercial Export Control Classification Number (ECCN) 8A001a which allows for export from USA under certain control regulations for defined and approved end user applications.

2. BACKGROUND TO FBS Concepts of Operations

Since the end of the Cold War and subsequent 3 decades, there has been a well-documented increase in localized political tensions and armed conflict around the world, including the coastal regions of the Black Sea, Eastern Mediterranean, Southwest Asia and South China Sea; heralding an increased occurrence of littoral zone incidents. This has unfortunately, been all too evident in the 2022 war between Ukraine and Russia, presenting new control challenges for military leaders and strategists. Additionally, this has not been lost on the US DoD & its Allies:

In 2017 Robert B Neller, Commandant US Marine Corps and Admiral John M Richardson, Chief of Naval Operations, in their publication ***'Littoral Operations in a Contested Environment'***, noted the following needs:

- 'To reduce the risk of inshore operations in complex archipelagoes or confined, shallow waters through the establishment of screening/scouting surface forces in proximity to key operating areas using "hard to find, hard to hit" platforms, operating from mobile expeditionary locations or afloat forward staging base would further complicate adversary targeting helping provide friendly forces a favorable missile ratio.
- Ability to conduct sea-based inshore maritime raids and amphibious advanced force operations.

Neller's successor at USMC, General David H Berger added the following requirements for "sweeping changes" in his ***'Force Design 2030'*** document of March 2020:

- Forces that can continue to operate inside an adversary's long-range precision fire weapons engagement zone (WEZ) are more operationally relevant than forces which must rapidly maneuver to positions outside the WEZ in order to remain survivable.
- Mobility inside the WEZ is a competitive advantage and an operational imperative.
- And in partnership with the Navy, our units should possess littoral maneuver capabilities to include high-speed, long-range, low-signature craft capable of maneuvering Marines for a variety of missions.

Furthermore, an article in the United States Naval Institute News of May 20 2022, quoted Vice Adm. Keith Blount RN, Commander of NATO's Allied Maritime Command (MARCOM):

- Required focus on command and control (C2) and networks in the littoral environment.
- Whereby navies can project power from the sea to the shore seamlessly.
- All the above models being most useful in considering future littoral warfare in places like the Mediterranean Sea, the Black Sea, the Baltic Sea or even the High North.

This approach to force projection in a contested littoral environment or Weapons Engagement Zone has led Hyper-Sub Platform Technologies Inc. to develop the family of long-range, Fast Boat (Dry Cabin) Submarine connector vessels. The scalable and highly modular payload design approach allows a full range of packaged mission sets including offensive or defensive capability for blue, green and brown water, amphibious or special operations tasking. Certainly, FBS goes a long way to supporting and enhancing the above scenarios and numerous others. Whether deployed from a Forward Operating Base, home port, slipway, estuary or delivered in theatre by large transportation aircraft, Landing Craft Dock, Offshore Patrol Vessel or other amphibious sea to shore connector solution, once in theatre, FBS can ingress the WEZ and roam hundreds of miles above and below the water line, covert and alone or as part of a multi-system, multi-domain, zone security, force multiplier for disparate surface, subsurface, offensive & defensive or humanitarian missions.

FBS can be configured for shoreline, submerged, littoral patrol, dry landing of small reconnaissance / combat raid parties or as a search and rescue vessel. It can also be fitted with a swimmer delivery lock-in / lock-out chamber for Special Forces / SEAL teams. Alternatively, FBS could be armored and armed with a payload of offensive, defensive

and EW / Command & Control (C2) systems & sensors for surface to air, surface to surface or anti-submarine mission sets. Furthermore, its robust design and impressive lift capability can serve as a combat engineer and salvage asset or even as an in-theatre re-supply platform. Alternatively, FBS can be delivered as a fully autonomous unmanned variant for multiple missions including remote operations weapon platform or an Unmanned Underwater Vehicle (UUV) & Unmanned Aerial Vehicle (UAV) mothership, allowing submerged recharging of and data harvesting from tactical or strategic UUV assets to infinitely extend their submerged mission capability - **Define YOUR mission, Design YOUR FBS**.

3. ABOUT THE FBS

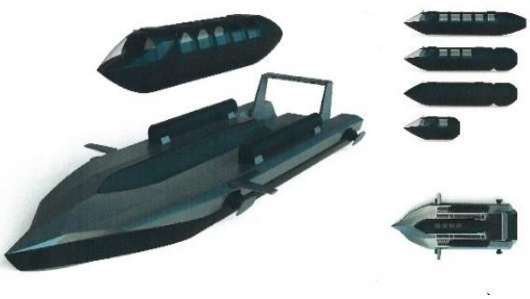
HSP has carefully considered every single aspect of the FBS design and development including operations capability, safety and robust design aesthetics. Key to the success of FBS is five-fold:

a. **Sea Frame.** Ingeniously but practically designed, this is the functional base of the entire vessel providing a low center of gravity while rigidly and robustly securing the engines, ballast tanks, battery modules and cabin. The vessel has a low-profile design helping stabilize the vessel in turbulent sea conditions and minimizing detection (should that be required). It also allows for a payload of approx. 3,000lb (1,360Kg) for any additional mission equipment.

b. **Dry Chamber.** The pressure inside the acrylic cabin doesn't change regardless of the operating depth (remaining at 1 atmosphere), keeping the crew and passengers warm and dry, enabling prolonged dive and deployment times which increases mission capabilities and flexibility. Built for depths to 500 feet (150 meters), single and multi-cabin options are available, and customizable, for different missions or uses. This includes multiple, modular configurations for crew/passenger seating, equipment, electronics or mission specific workstations. Alternatively, floodable lock-in /out chamber for dive teams can be provided.

c. Ballast Tanks. An innovative 8 chamber, air compensated, hyper-ballast tank design revolutionizes FBS safety with over 30,000 lbs. (15 tons) of reserve lift available for rapid ascent. Additionally, the Controlled Dead Systems Submerged Recoverability means the boat can surface with all primary air, electrical and hydraulic systems shut down in a controlled fashion. The vessel can still recover even if the cabin is flooded, there being sufficient reserve air to blow the main ballast tanks twice @ 500' (152m.) depth using standard air loads.

d. Modularity. To continue the 'Truck' metaphor and as previously mentioned, the FBS can be supplied with a combination of cabin and cargo space to fit the required use case of each client. Additionally, the client can buy FBS with multiple modules for fast change out prior to, or between different mission sets. It even comes as standard with 68 Ft^2 / 6.5m^2 flatbed storage available above the engine deck or further space available on the flat, gunwale surfaces.



e. Certified Components. As with any emerging technological solution**,** proven track-record can be a challenge for any product life cycle. What FBS cleverly does, is to leverage already established COTS components that individually, have already been approved for marine and subsea operations elsewhere. E.g., the acrylic cabin, engines, hull, battery packs, subsea thrusters etc. are all proven and certified options for other commercial and defense marine products.

4. FBS DEFENSE & SECURITY MISSION SETS

- **Amphibious Operations, Insertion & Recovery – sea to shore connector**
- **C4 Intelligence, Surveillance and Reconnaissance (ISR) Operations**
- **Scouting & Screening**
- **Counter Insurgency (COIN)**
- **Beach Landing Reconnaissance & Seabed Survey**
- **Riverine & Estuarine Operations**
- **Unmanned or Manned UUV Mothership**
- **Special Forces Operations & Swimmer Delivery**
- **Electronic Warfare & Intelligence - Jamming & Spoofing**
- **Mine Countermeasures and Explosive Ordinance Disposal**
- **Submerged Target Detection, Tracking, and Awareness**
- **Anti-Submarine Warfare (ASW) /Anti-Surface Warfare (ASuW)**
- **Low Level, Anti-Aircraft / Drone Defense / Drone Deployment**
- **Over the Horizon Operations & Forward Air Control**
- **Equipment / personnel logistical re-supply**
- **Littoral / Coastal Patrol Duties**
- **Port & Maritime Asset Defense**
- **Combat Engineers, Salvage & Heavy Lift**
- **Personnel Rescue & Recovery / Medical Evacuation**
- **Oil Field Security**
- **Anti-terrorism / Counter-Piracy,**
- **Border Security and Drug Enforcement Agency Operations**

FBS integrated into a Multi-purpose, Special Operations Offshore Patrol Vessel
Graphics courtesy of Antipodean Projects International

5. FBS CONFIGURATION

a. Dimensions. The standard FBS measures approximately 45' (14m.) x 16' (5m.) and a height (including the horizontal stabilizer) of 9' 6" (3m.) complete with a choice of 2' 7" (0.8m) or 3'10" (1.2m.) draft depending on mission profile. All allowing for launch from a beach, estuary, slipway or dock. The design dimensions provide the lowest in-water profile possible. However a 100ft variant is also available.

b. Engines. FBS standard fit includes 2 x 480HP, turbodiesel, inboard marine engines, allowing 30+ Kts (depending on payload & configuration). Standard fuel capacity is 525 US gallons (200 L.) – an extender tank payload option is available.

c. Compressors. Operating at up to 4,500 PSI**,** allow for refill of 4,000 Ft^3 air storage used for operation of ballast tanks, passenger breathing air circulation and if required, can be accessed for recharge of SCUBA dive cylinders and operation of any diver lock in / lock out chamber, if incorporated into the design.

d. Battery Packs. FBS is currently offered with 22.8 kWh AGM battery packs as standard which can propel the vessel submerged at speeds of up to 6 Kts. These packs can be re-charged multiple times during a mission via the engines and a snorkel option also allows for recharging routines whilst submerged. Multiple other battery upgrade options including Nickel Hydride and Lithium Polymer are also available. However, battery technology and capability are developing at such a pace, that all battery options can be discussed at time of purchase, to ensure the latest and best capabilities are being offered for any given scenario. See below table of options & capability:

Battery Load	**22.8kWh AGM only**	**68kWh**	**136kWh**	**272kWh**	**544kWh**
Weight (Payload Used)	1,000lbs AGM only	750lbs (Nick) 495lbs (Lith.)	1,500lbs (Nick) 990lbs (Lith.)	3,000lbs (Nick) 1,980lbs (Lith.)	6,000lbs (Nick) 3,960lbs (Lith.)
Performance @ 1.4 knots	28nm 20 hrs.	83.4nm 59.6 hrs.	166.8nm 119.2 hrs.	333.6nm 238.4 hrs	667nm 476hrs
Performance @ 2.0 knots	15.24nm 8 hrs.	45.5nm 24 hrs.	91nm 48 hrs.	182nm 96 hrs.	364nm 192 hrs.
Performance @ 3.0 knots	6nm 2hrs.	18nm 6 hrs.	36nm 12 hrs.	72nm 24 hrs.	144nm 48 hrs.
Performance @ 3.7 knots	3.7nm 1 hrs.	11.1nm 3 hrs.	22.2nm 6 hrs.	44.4nm 12 hrs.	88nm 24 hrs.
Performance @ 4.4 knots	2.2nm 30 min.	6.5nm 1.5 hrs.	13nm 3 hrs.	26nm 6 hrs.	52nm 12 hrs.
Performance @ 4.9 knots	1.67nm 20 min.	4.9nm 1 hrs.	9.8nm 2 hrs.	19.6nm 4 hrs.	39.2nm 8 hrs.
Performance @ 5.7 knots	.9nm 10 min.	2.8nm 30 min.	5.7nm 1 hrs.	11.4nm 2 hrs.	22.8nm 4 hrs.

e. Thrusters. While operating subsea, the system is propelled horizontally & vertically by electric over hydraulic thrusters. These also provide hover and station keeping capability.

f. Navigation & Communications. FBS comes with a standard marine radome type navigation radar, GPS, echosounder and chart plotter plus VHF radio. However, there are multiple alternative options for advanced navigation equipment, SATCOM, Iridium systems or Smart Radio Cloud Relay.

Additionally, latest subsea, remote and supervised autonomy solutions are integrated to include waypoint following, navigation by sonar target and other such advanced hands-free solutions.

g. **Cabin.** As previously discussed, there are multiple cabin options available accommodating up to a total of eight (8) personnel. The acrylic used in the FBS is the same as that used in other commercially available manned submersible systems and can be configured internally to the client's own specification and requirements where at all feasible. Alternatively, this space can be utilized for an uncrewed autonomy package and additional weapon or sensor packages.

FBS can be supplied with full digital control and navigation suite or digital/analog mix

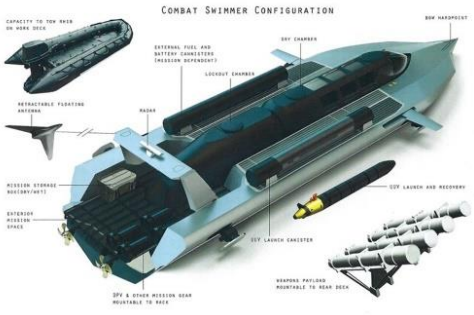
h. **Safety.** Above all else, safety of operation and for all personnel on board is paramount. This has been apparent throughout the entire design process and of course is underscored by the IACS certification. A 'Dead Sub' recovery via ballast tanks or ballast drop tray has already been covered. Additionally, FBS can provide breathing air to the cabin for 48 hours in emergency situations. A full suite of H2, O2 & CO2 monitoring, scrubbing and fire extinguishing equipment is also standard fit.

6. FBS DEFENSE VARIANTS

The modularity and scalability of FBS design means there are numerous options and multiple combinations of payload, cabin size and layout. However, in basic design configuration, HSP offers 3 distinct models of FBS for defense & security applications.

a. **SeaGhost** Allows you to get in really close and ultra-shallow. That's the FBS specialty. For nearshore applications, whether ISR, coastal security, riverine / estuarine or covert, dry insertion of Marines and other amphibious assets. This FBS variant is outfitted with a shallow V/W hull blend that enables surface navigation in waters as shallow as 2' 7" (0.8m.) and incorporates a single cabin that allows for multiple workstations or for a team of eight, surfacing/beaching at night to deploy troops dry. Ideal for Riverine and Estuarine operations also. All systems can be supplied with the latest AutoNavigation, station keeping, waypoint following and over the horizon control capability. This "Ingressor" platform can provide multiple mission formats in a practical and versatile way.

b. SeaBlade Divers stay dry and warm until mission execution. Deploy the FBS subsea from over the horizon, covertly ingress an area, and loiter until the time is right to deploy your team and assets.



The FBS has been designed to address many additional payload requirements including rapid UUV deployment This FBS variant features a deeper v-hull design and incorporates a forward cabin (for a pilot and copilot) plus rearward lock-in / lock-out cabin for swimmer delivery. The dry cabin(s) produce greater mission flexibility and outcome probabilities by keeping personnel comfortable until required for action, which is a significant advantage over all current "go-fast" wet sub designs.

This platform is ideal for governments whose area of interest and influence is the nearshore. It can be strategically forward deployed from Blue Water in place of larger assets such as diesel or nuclear submarines. Additionally, by eliminating the need for these larger assets, multiple low profile FBS units with varied payloads can be deployed as required, to increase tactical mission capabilities and therefore increased success, with a reduced likelihood of detection.

c. SeaNomad we are currently witnesses to game-changing developments in remotely supervised, fully autonomous uncrewed technologies, enhanced by Artificial Intelligence and Machine Learning algorithms for automated target recognition, tracking and precision navigation. This has enabled engagement in remote, maritime warfare through the deployment of Uncrewed Surface and Underwater Vehicles (USV/UUV), particularly in complex and high risk, contested, littoral, 'green' or 'brown' waters. However, one limitation of UUV/UAV design is the reliance on battery propulsion, often severely limiting range and duration, requiring recovery for re-charge and data extraction. What is missing is resilience and persistence, measured in days not hours. Despite many capable UUV technologies being available, no other crewed or uncrewed, heavy payload, dual surface and subsea weapons platform exists that can act as a highly mobile, mothership or refuel and comms relay station for extended duration UUV/UAV operations. FBS has a submerged lifting capability of 15,000 lbs. (6,800 kg.) and cargo capacity of over 6,000 lbs. (2,700 kg.). For comparison, Mk 46 torpedoes weigh 512 lbs. (232 kg). This offers advantages crucial in the Black Sea, Arabian Gulf or South China Seas. It can transit to an area of interest on the surface at speeds of 30 + Kts and a range of 400 nm (740 km) prior to extended, submerged operations. Scalability means larger FBS variants could serve as covert, resupply trucks for amphibious beach landing, support & logistical resupply, incorporating additional C4ISR sensors and defense/offense systems. Alternatively, multiple platforms on the seafloor, off an adversary's coastline, activated when required, leveraging dual modality, for surface and subsea missions. HSP is in communication with several of the leading USA providers of full autonomy OEM packages for both surface and subsea vehicles to ensure a suitable Full Autonomy Module will be provided for uncrewed operations.

7. ADVANCED TECHNOLOGIES INTEGRATION

Latest surface and subsea autonomy and remote navigation capabilities are embedded into the FBS vessel. Defence & Security systems are supplied with latest as standard:

a. **Software** A flexible and scalable SWaP-C based framework for cooperative robotic mission planning / execution with open architecture and encryption enabled security protection, as used by US Navy Expeditionary EOD UUV teams, SF diver propulsion vehicles and hand-held navigation devices. This software also provides precise independent underwater navigation capability and referencing, using pre-set waypoints, to target location and navigation by target or object of interest, station keeping etc. using camera or imaging sonar data.

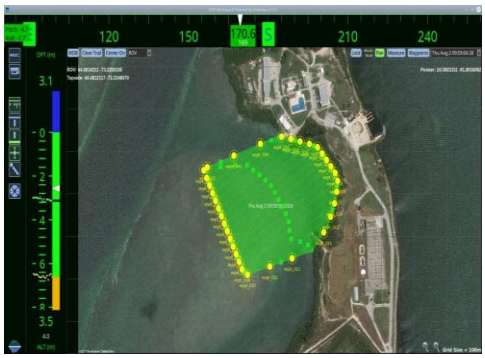


Image Courtesy of Greensea Inc.

b. **Hardware** FBS also exploits the very latest in subsea navigation capability via the integration of Inertial Navigation System (INS) fed from Attitude and Heading Reference System (AHRS), Inertial Measurement Unit (IMU) and Doppler Velocity Log, (DVL) seabed tracking device which may then be aided and refreshed by deployable surface GPS or Ultra Short Baseline (USBL) input. This package also allows for expansion to include Over the Horizon Supervised Autonomy or pilot free, remote command & control with mission re-tasking on the fly, capability.

c. **Training & Task Modelling** A full software and hardware FBS simulator can also be provided to aid initial introduction and on–the–job training or to aid development, modelling and practice of tactics and new mission profiles.

8. FBS DEVELOPMENT ROADMAP

At Team Hyper-Sub we refuse to rest on our laurels. Therefore, an ongoing program and product roadmap for continuous evolution of improvement and upgrade is in place. This includes continuous review of vessel architecture and build materials, both internally and in partnership with clients. Additionally, we work closely with relevant authorities and institutions to monitor and improve thermal, acoustic, EMI / EMC footprint and other detection avoidance capability. Propulsion methods will also remain in review, including the latest, emerging, alternative battery power technology sources and green, alternative energy like methanol, biofuel and Hydrogen fuel cells etc. Developments will include an increasing use of latest available Artificial Intelligence algorithms enabling 'hands-off' or full remote global control and unmanned or supervised autonomy routines with built in machine learning capabilities for continued evolution of the product lifecycle.

9. FBS STANDARD FEATURES (other options available)

a. Specification & Dimensions

- **Length Overall (LOA):** 45’ 2” (14m.)
- **Beam:** (With side tank modules installed): 16’ 6” (5 meters)
- **Height (horizontal stabilizer fitted):** 9’ 6” (3m.)
- **Draft:** 2’ 7” (0.8m.) or 3’ 10” (1.2m) – V or V/W hull choice
- **Transportation Width: 14’ 6” (4m.)**
- **Transportation Height (arch stowed):** 7’ 10” (2m.)
- **Dry Weight:** 30,000 lbs. (13,608 kg)
- **Displacement:** Variable but Max All-Up Weight (MAUW) 39,676lb / (18 tonnes)
- **Pilot Cabin:** crew of two (2)
  Acrylic, 1 atmosphere, 500' (152m) depth rated
  Lock In/Out Chamber: up to six (6) Combat Swimmers (with minimum vital equipment)
  Aluminum, 500' (152m) depth rated. Top side hatch egress/ingress
- **Variable Cargo Capacity**: 3,000 – 6,000 lbs. (1,360 - 2,720kg)
- **Deck Space:** Rear and side deck space for ad-hoc equipment like dry transport containers, combat swimmer mission apparatus, diver propulsion vehicles, tool storage and other payloads.
- **Payload Mounting:** Multiple plates and fixing points for securing ‘after-market’ ultra-lightweight torpedoes (assuming within acceptable payload weight and dimensions), Unmanned Underwater Vehicle (UUV), gun mount, fuel drop tanks etc. To be designed and located in discussion with client’s after-market requirements.
- **Transportation**: Land transport semi-trailer plus lifting hook points around vessel for craneage.

b. Surface Performance Characteristics

- **Fuel Capacity:** 525 gallons (1,987 liters) Diesel
- **Hull Construction:** aluminum V-hull or V/W hull options
- **Upper Decks:** aluminum
- **Standard Engines:** 2 x 480-hp Yanmar diesel with V-drives
- **Transmissions / Ratio:** ZF/2.5:1
- **Propellers:** 24x31 4-blade, no-cup Michigan Wheel
- **Cruising Speed:** 30 mph /48 kph / 26 kts @ 3,000 RPM (min payload & sea conditions)
- **Fuel Consumption:** 34 gal per hr. 127 liters per hr. (min. payload & sea conditions)
- **Planing speed:** achieved in 8 seconds. (min. payload & sea conditions)
- **Wide Open Throttle (WOT):** 35 mph/ 57 kph / 31 kts (min. payload & sea conditions)

c. Submerged Performance Characteristics

- **Propulsion:** 2 x 60 hp 12" thrusters - electric over hydraulic
- **Station Keeping / Hover Capability:** 2 or more 10 hp vertical
- **Normal Life-Support Duration:** twelve (12) hours
- **Emergency Life-Support Duration:** forty-eight (48) hours
- **Maximum Dive Depth (Acrylic Cabin):** 500 feet (152m.)
- **Max possible submerged range: ***140nm / 260 Km @ 1.4Kts
- **Max Submerged Speed: ****5.5 kts / 10 Kph
  (Range greatly reduced at this speed)

Note: Based on standard 22.8 kWh battery pack
****Note: Achieved through 5 recharge cycles on surface or using engine snorkels***

d. Standard Submerged Systems & Options

- **Batteries:** 22.8 kWh AGM
- **Standard Dive Air Storage:** 4,000 std. cu. ft. @ 4500 psi (SCBA air rated)
- **Electrical system:** 96 VDC and 12 VDC (other break-out voltages available for additional sensor & tooling payload integration)
- **Accessories:** SCBA air umbilical for prolonged diver support
  SCUBA tank recharge station & A/C Power Inverter

e. Navigation, Communication & Instrumentation (Suggested Examples only)

- 1 x surface navigation Radar radome
- 1 x Echosounder with chart plotter
- 4 x Surface navigation lights
- 1 x Mini hybrid acoustic navigation solution with Doppler Velocity Log, AHRS motion reference unit, north seeking gyro and depth sensor allowing for mid-water station keeping at altitudes from 30cm (12") to 200m (656ft) plus pre-programmed waypoint following routines. For subsea.
- 1 x Full global coverage Iridium Satellite link. (TBD)
- 1 x Supervised autonomy, precision waypoint following software and mission planning suite
- 1 x HD ZOOM IP, Hi Definition camera (or equivalent) Additional cameras as required
- 4 x Fully dimmable High Lux LED lighting arrays
- 1x imaging sonar for real time diver tracking, obstacle avoidance and measurement of objects in zero-visibility conditions.
- 1 x Fittings and power supply for Smart Radio Cloud Relay System
- 1 x High specification computer with back-up drive and touch screen LCD display monitors for navigation, sensor and onboard systems monitoring.

Note Exact specification / model of computer and ancillary equipment to be determined by HSP and client at time of manufacture to ensure sufficient capacity with reserve and redundancy built in.

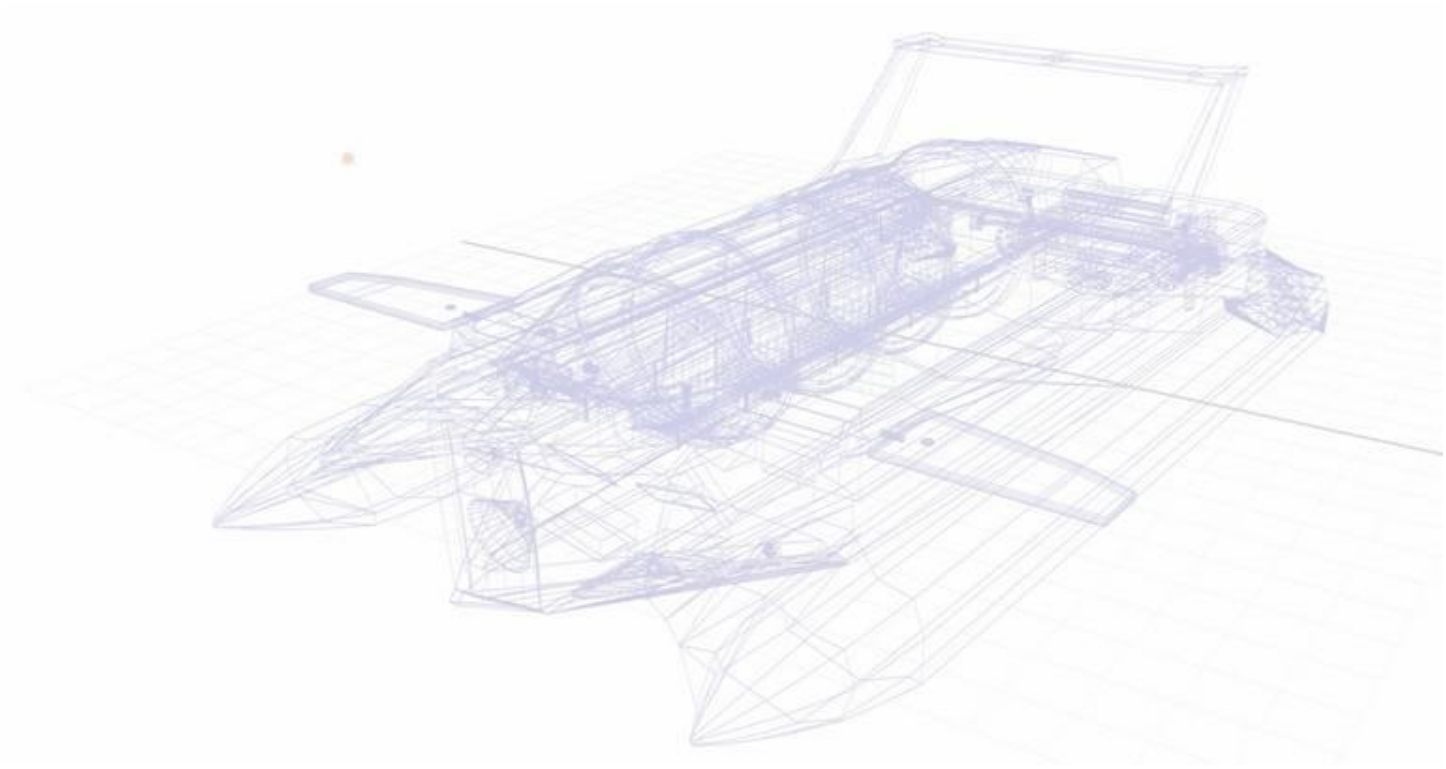
f. Safety Features & Equipment

- Three independent methods of surfacing: Normal operating system surfacing, Emergency drop tray surfacing (3,000 lbs./1361 kg) and Controlled Dead Systems Submerged Recoverability (boat can surface with all primary air, electrical and hydraulic systems shut down in a controlled fashion)
- Passive safety characteristics such as Hyper-ballast compartmentalization (eight (8) separate compartments) retaining over 15,000 lbs. (6,805 kg) of total reserve submerged lift for rapid ascents in the event of the most severe emergencies including complete recovery in the extremely unlikely event that the cabin was to flood.
- Sufficient reserve air to blow ballast tanks **twice** @ 500' (152 m) depth using standard air loads
- Submerged EPIRB and VHF antennae deployment location and communications capability
- Atmospheric monitoring system Various (H2, O2 & CO2), Life support (CO2) Maintained at less than 0.5 %, Life support (O2) Maintained between 19-22 %
- Emergency life-support: forty-eight (48) hours per crew /passenger
- CO2 scrubber equipment
- 4 x Emergency Strobe lights
- Dual frequency underwater telephone
- Fire extinguishing systems: Engine compartment / Halon auto dump

Note 1: All systems and designs will be certified to approved IACS Rules for Classification and Construction of Manned Submersibles.

Note2: Client proposed changes to the design of above specification may be reviewed internally and considered as a chargeable Non-Recurring Engineering solution.

Defining a new Class of vessel.



For Further information:

Hyper-Sub Platform Technologies Inc.
PO Box 471
Lake City, FL, 32056
USA

+1 386 227 6573
amurrie@hypersub.com
www.hypersub.com
Company Page LinkedIn
Fast Boat Submarine Video