Challenger

Unmanned Surface Vehicle

Smart. Brave. Empowered.

Challenger's intelligent systems will enable mariners to work smarter and delegate routing efforts to advanced self-piloting technology. Challenger comes standard with multi-modal situational awareness, including threat-based object recognition and includes tracking, anti-collision capabilities and data connectivity.

Challenger is a high endurance vessel, and it can be configurated for both Manned or Unmanned (Autonomous) missions and is compliant with NATO Standardization Agreements (STANAG) 4586, Joint Architecture for Unmanned Systems (JAUS) protocol.

ISR Packages

Multi-Mission Modularity

Systems Redundancy and Automation

SWIFTSHIPS
Autonomous Platform Solution

Application and Missions

Swiftships 46' Small Unmanned Surface Vehicle (SUVS), aka Challenger, is designed to effectively support the growing needs of the defense industry. Challenger is built on a proven platform that has served in various military and commercial engagement for over 20 years. Challenger's optimized hull structure allows for reduced drag, improved stability and proven strength, and combined with unmanned systems technology makes SUVS a multi-mission, highly endurant and modular payload capable platform allowing operations in multiple environments. It's built-in diagnostics and redundancy offers exceptional reliability and ultimate performance.

C4ISR

Challenger comes with multi-modal comms for Surface and Expedition-ary, Patrolling and Security Missions. It can be upgraded to provide threat-based object recognition, tracking, and anti-collision capabilities via data connectivity

Missile Strike/ Counterattack

A modular platform with increased payload of over 4 tons and improved hull for the stability that allow for long-range weapon system integration

Mine Countermeasure Defensive Missions

Challenger's configuration allows for cost-effective, almost entirely by a USV performed mine-hunting and neutralization operations from idetification, localization, classifi-cation, detection to neutralization

Interoperability and Network Function

Challenger can serve as part of the fleet network, communicating with flag/mothership. Per the current legislative framework (DoD Circular), weapon engagement requires human confirmation

Key Features

40+ Knots
with range of 400nm

40+ Hours
Endurance

Optimized Hull
Proven hull, reduced drag and improved stability

Shallow Waters and High Seas
Unique hull design allow operations in multiple environments

Improved Propulsion
for enhanced speed, range, stability and endurance

Multi-Mission Systems
Integrated advanced ISR package, built-in diagnostic and weapon systems

SWIFTSHIPS and ATEAN Technology Co-Development

Real Ship

Surface Vehicle Control Systems (SVCS)
Dynamic multiplier platforms - partial manned
Remote-controlled system, aka Anaconda (AN-2)

SWIFTSHIPS

Ruby — Existing Code Base

API

Ship Control System

Ship Radio / SATCOM

Signal Input Buffers

GPS (LLH position) | Accelerometer (Body frame) | Compass (Body frame) | Gyroscope (Body frame) | Barometer (MSL altitude) | Sonar (Surface altitude)

IMU

Interpolated drift calculations Error(t) | Acceleration (NEU) | Interpolated drift calculations Error(t)

Local position (NEU) | Local position prediction | Local altitude

ANTEAN TECHNOLOGY SWIFTSHIPS Co-Develop

docker

Open Source code baseline
COTS based hardware

Proportional, Integrated, Differential (PID) closed-loop motion control on a position feedback axis

Estimated (interpulated) local postion: Position(t) + Σ Error(t) — API

Wave Action Dynamics and Bathymetry

Service-Oriented Architecture microservice design

Seed Code

ANTEAN TECHNOLOGY Seed Code

Contextual Adaptation Engine — API

Tangential Surface Dynamics

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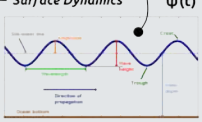


Bathymetry

Model World

Mission Operations

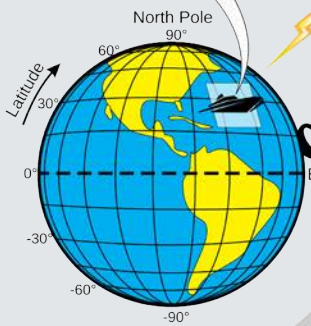
Line-of-sight
Over-the-horizon control
5G
Radio Remote

SWIFTSHIPS

Fleet Management

ANTEAN TECHNOLOGY SWIFTSHIPS Co-Develop

Instant capture and transfer of live information
- Near-sentient computer system
- Highly accurate steering
- High-speed maneuvering



Ground Station

ANTEAN TECHNOLOGY SWIFTSHIPS Co-Develop

Seed Code

Seed Code Structure
- Autonomy Manager
- Vessel Device Manager
- Data Compression Services
- Link Manager System
- Autopilot controller
- Advanced Mission Plan Engine

Automony Processor

Seed Code

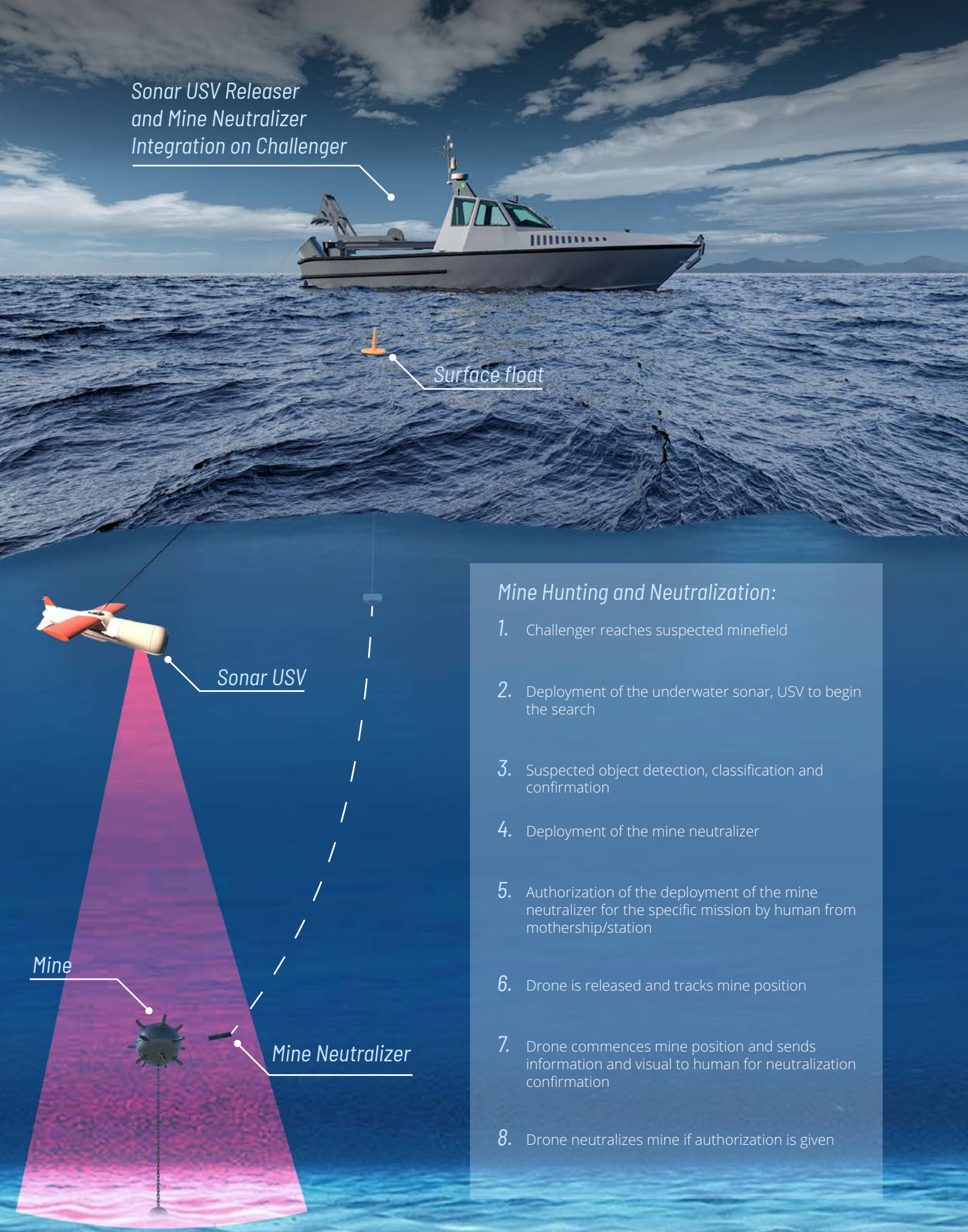
Note:
The onboard Autonomy Processor filters and processes mission data at the tactical edge, adapting to any situation and environment using artificial intelligence and machine learning, including automated system manipulations to ensure safe operations and collision avoidance via radar and sonar sensors.

Mission Planner

Seed Code

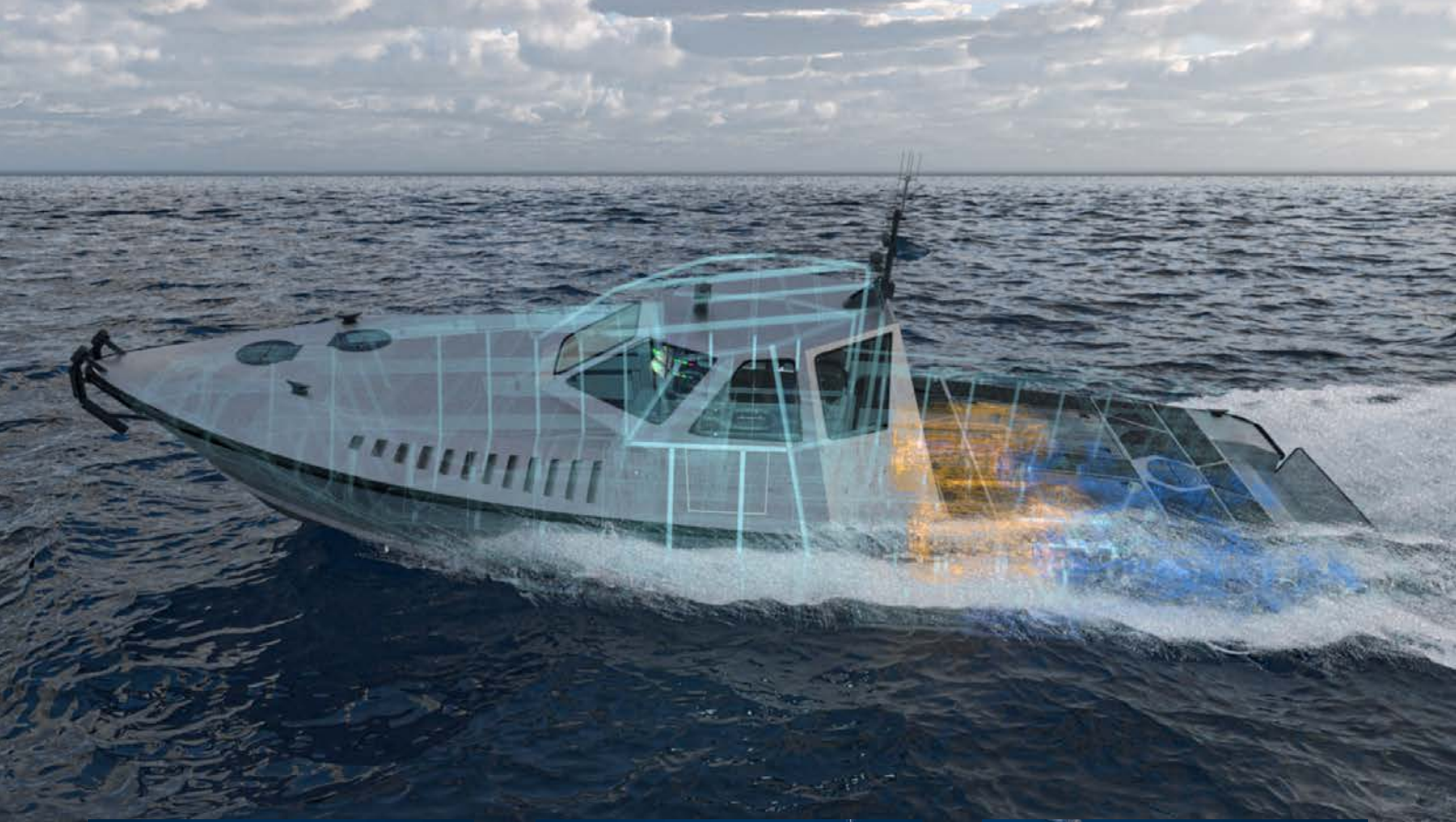
Contingency planning
- Automonous decision making
- Port security
- Mine countermeasure
- Surveillance

Mission Planning



Mine Hunting and Neutralization:

1. Challenger reaches suspected minefield
2. Deployment of the underwater sonar, USV to begin the search
3. Suspected object detection, classification and confirmation
4. Deployment of the mine neutralizer
5. Authorization of the deployment of the mine neutralizer for the specific mission by human from mothership/station
6. Drone is released and tracks mine position
7. Drone commences mine position and sends information and visual to human for neutralization confirmation
8. Drone neutralizes mine if authorization is given

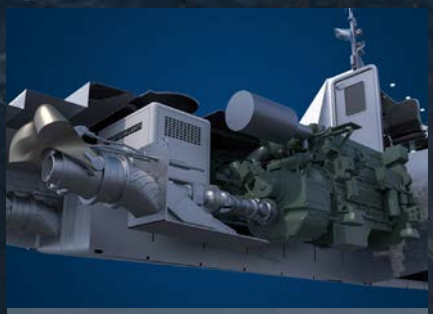


Optimized Hull

V-shaped hull built on ABS HSNC requirements and has been tested on the missions for over 20 years

Seaframe

Additional review of the hull structure to include an FE to determine high stress areas, to accommodate the higher design pressures that will be accommodated in an unmanned vessel

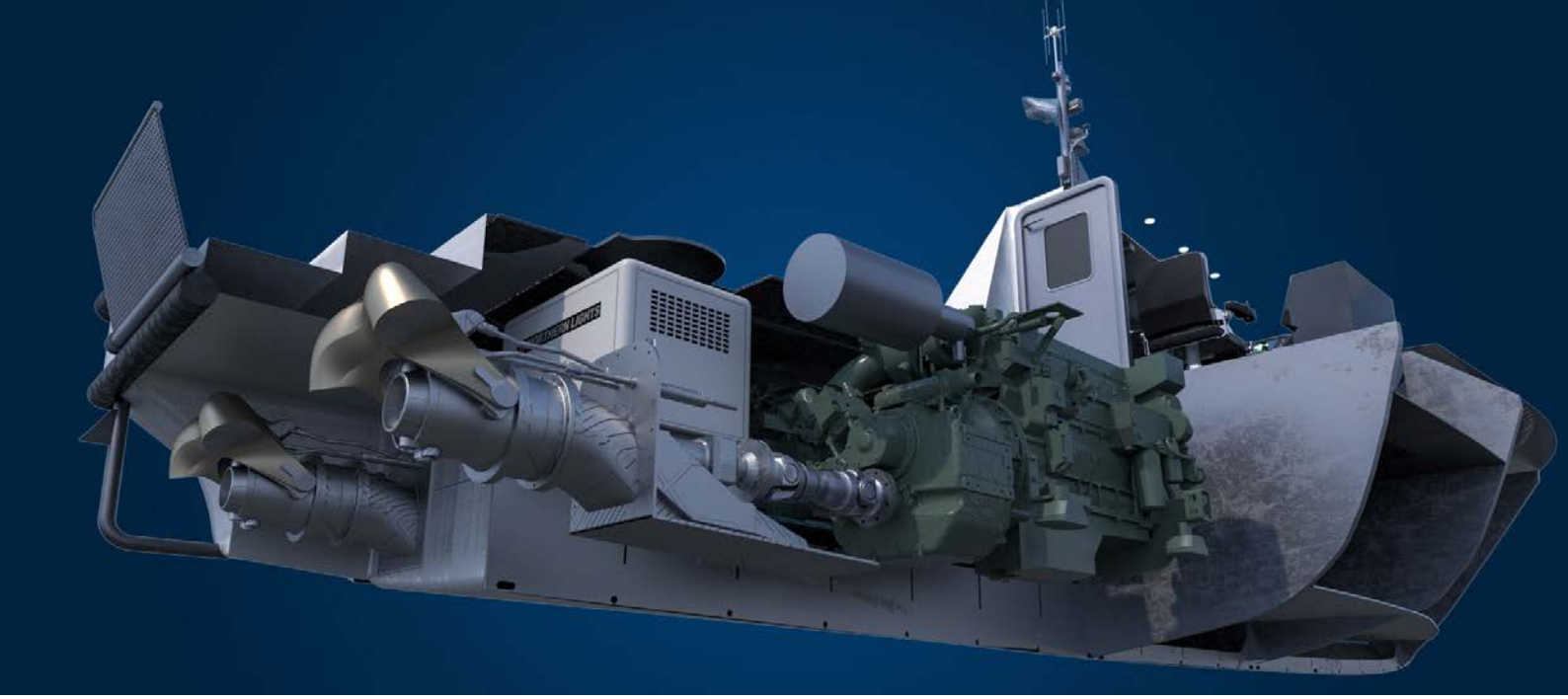


Machinery Systems

- Fully automated Fire Suppression system in machinery spaces including automatic shutdowns of powered ventilation fans and dampers
- Independent/redundant bilge pumps with level sensors to provide a simple/robust system
- Fuel System with dual fuel tanks to ensure redundancy in fuel supply, extended life fuel filtration with pressure monitoring
- Dual/Redundant AC electrical generators with automatic/programmable controllers within the Switchboard to allow for load sharing and redundant power supply for the ship›s operating and autonomy systems

Machinery Control Systems

- PLC based system to monitor, report and control the ship›s systems and provide an interface between the autonomy system, ship›s propulsion controls (MECS), and machinery
- User Interface (UI) to allow local and remote monitoring. The MCS will also serve as the Vessel Alarm and Monitoring System, as defined by Class Rules



Technical Specification

Swiftships 14m high speed, multi-mission “Challenger” is a mono-hull, diesel-powered, all-welded aluminum craft with twin water jets. The hull consist of four (4) watertight bulkheads forming five (5) watertight compartments, which allow the Challenger to operate optimally in shallow water while its’ deep V allow operations in high seas.

LOA	46 Feet (14 Meters)
BEAM	14.5 Feet (4.4 Meters)
DRAFT	2 Feet (0.6 Meters)
PAYLOAD	7.7 Tons [Modular/multi-payload flexibility]
FUEL CAPACITY	800 Gallons (3,028.3 L)
POTABLE WATER	80 Gallons (302.8 Liters)
ENDURANCE	40+ Hours
SPEED	40+ Knots with Range of 400 NM
MACHINERY	• Engines: Two (2) Volvo D13-700: 700 BHP@2300 RPM) • Generators: One (1) Northern Lights 9 KW Generator • DC/Battery Electrical: 24 Volt DC System
ELECTRONICS	• One (1) Satellite Internet Service and Phone • One (1) VHF Radio • One (1) Integrated Radar • One (1) Fathometer System • One (1) Magnetic & Flux Gate Compass • One (1) Autopilot • Two (2) GPS • One (1) Wind Speed Indicator • Satellite/Data Link
PRECISION EQUIPMENT	• One (1) Simrad HALO 6ft Pulse Radar • One (1) Raven Vista F42 Radar • One (1) PTZ Antenna
WEAPON SYSTEM	• One (1) 50 cal. Remote Weapon System • Two (2) 50 cal. or 7.62mm Dillon Weapon Systems
ACCOMODATION	• One (1) Galley Sink • Two (2) Electrical Cook-Top • One (1) 5.0 cu. ft. Refrigerator • One (1) Collapsible Table • Two (2) Fixed Settees
APPLICATION AND MISSIONS	• C4ISR • Missile Strike/Counterattack • Mine Counter Measure/Defensive Missions • Interoperability and Network Function

SWIFTSHIPS
Autonomous Platform Solutions

Main Shipyard

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