

# Bluefin-21



## BLUEFIN ROBOTICS

**Applications:**

Offshore Survey

Search & Salvage

Archaeology & Exploration

Oceanography

Mine Countermeasures (MCM)

Unexploded Ordnance (UXO)

The Bluefin-21 is a highly modular autonomous underwater vehicle able to carry multiple sensors and payloads at once. It boasts a high energy capacity that enables extended operations even at the greatest depths. The Bluefin-21 has immense capability but is also flexible enough to operate from various ships of opportunity worldwide.

**FREE-FLOODED MODULARITY** – The vehicle design includes swappable payload sections and battery modules for in-field mission reconfiguration. Subsystems can be quickly accessed for rapid turnaround between missions and also allow for in-field maintenance, accelerating operational tempo.

**EFFICIENT WORKHORSE** – The Bluefin-21 is an efficient, deep-rated AUV able to execute surveys with demanding requirements typically addressed by larger, more cumbersome platforms. Its small size and ability to be launched and recovered from a simple A-frame or docking head allow it to take advantage of ships of opportunity.

**ACCURATE NAVIGATION** – The Bluefin-21 uses an INS to provide the best possible navigation accuracy. Dead reckoning drift is typically less than 0.1% of distance traveled, yielding higher quality data. USBL aiding further improves navigation accuracy.

**AIR-SHIPPIABLE** – The vehicle, batteries and support equipment can be broken down and packaged into easily transportable sections, making the system ideal for time-critical and remote operations.

## Technical Specifications

- **Diameter:** 21 in (53 cm)
- **Length:** 16.2 ft (493 cm)
- **Weight (Dry):** 1,650 lb (750 kg)
- **Buoyancy:** ~ 16 lb (7.3 kg) net positive
- **Lift Points:** 1 (located mid-vehicle)
- **Depth Rating:** 14,763 ft (4,500 m)
- **Endurance:** 25 hours @ 3 knots with standard payload
- **Speed:** Up to 4.5 knots
- **Energy:**
  - 13.5 kWh of total energy
  - Nine 1.5 kWh battery packs
  - Lithium-polymer, pressure-tolerant
- **Propulsion:**
  - Gimballed, ducted thruster for propulsion and control
- **Navigation:**
  - Real-time accuracy  $\leq 0.1\%$  of D.T. CEP 50
  - INS, DVL, SVS and GPS
  - USBL tracking with vehicle position updates
- **Antenna:** Integrated — GPS, RF, Iridium and strobe
- **Communications:**
  - RF, Iridium and acoustic
  - Ethernet via shore power cable
- **Safety Systems:**
  - Fault and leak detection, dropweight,
  - acoustic tracking transponder,
  - strobe, RDF and Iridium
  - (all independently powered)
- **Software:** GUI-based Operator Tool Suite
- **Data Management:**
  - 4 GB flash drive for vehicle data
  - Plus additional payload storage
- **Standard Payloads (others available):**
  - EdgeTech 2200-M 120/410 kHz side scan sonar (option: EdgeTech 230/850 kHz dynamically focused)
  - EdgeTech DW-216 sub-bottom profiler
  - Reson 7125 400 kHz multibeam echosounder



**System Package** — The Bluefin-21 comes as a part of a comprehensive system package primarily consisting of the vehicle, support equipment, spares, software, training and 1-year warranty.



**Operator Tool Suite** — Each system includes an intuitive software package that provides the interface between the AUV and operator for all phases of a mission, including planning, monitoring and execution, data management, and post-mission analysis.

## GENERAL DYNAMICS

Mission Systems

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