Unmanned Underwater Vehicles in the Wild

Supplier 360

CMMC Assistance

Procurement Technical Assistance Centers

Open TechScouts

GENERAL DYNAMICS
Mission Systems
Scotty Miller II
VP, Supply Chain Management

Our focus this month is on our business out of Quincy, Massachusetts, and our Bluefin products family. Like all of our business areas, we need to ensure we understand and follow what our markets are doing. This business is not immune to the same market conditions that have affected many of our businesses.

Our job is to ensure we meet our commitments at General Dynamics Mission Systems, but more importantly we must ensure our supply base is strong and on level ground. We continue to be affected by the pandemic as well as shortages in raw materials for electronics and petroleum-based products. I am looking for all of us to maintain our focus and deliver on our business commitments and to engage our suppliers in continuous and strategic discussions. You have all done fantastic work the last 18 months, as have our suppliers and partners. And for that, I thank you.

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About this publication This is General Dynamics Mission Systems’ Innovation Sourcing Network, open supplier innovation ecosystem monthly newsletter. © 2021 General Dynamics
Keep Your Supplier 360 Profile Updated

The government Federal Acquisition Regulations (FAR) rules associated with small business (FAR 19.301-1, FAR 52.219-9 and 13 CFR 125.3) requires all purchase orders to have the proper North American Industry Classification System code (NAICS code) and Small Business Administration’s (SBA) size standard in order to be counted as small business. We are requesting that all our suppliers, large or small, ensure this information is properly updated in the General Dynamics Mission System Supplier 360 portal.

All suppliers are requested to update their profile in Supplier 360, which is our primary system for sourcing of suppliers for procurement opportunities. To learn more about Supplier 360, or request activation if General Dynamics Mission Systems has issued your company a purchase order in the last thirteen months or you’re one of our sub-contractors, please visit us at https://gdmissionsystems.com/about-us/suppliers/s360.

Regards,
General Dynamics Mission Systems Supplier Chain Management Team

See the latest information and quick start guides here: https://gdmissionsystems.com/about-us/suppliers/s360

Thank you for your cooperation. We look forward to building the future together. If you have any questions or concerns, do not hesitate to contact S360@gd-ms.com.
## Commodity Categories

### Operational Services
- Active Attenuators
- Adhesives
- Air Circulators & Blower Eq.
- Antennas
- AssetTools
- Audio Equipment
- Batteries & Chargers
- Bells & Buzzers
- Chemicals, Lubricants & Greases
- Chillers
- Circuit Breakers
- Compressors & Vacuum Pumps
- Controls
- Display Optics
- Earphones
- Electronic Tubes
- Explosive Devices
- Fan & Fan Assemblies
- Furniture - Lab Generating Parts
- Generators
- Handsets
- Headsets
- Indicating Parts
- Inspection Gages
- Inverters
- Shop Floor
- Suits & Cons. Supplies
- Speakers
- Standard Pkg. Supplies
- Surge Suppressors
- Switches
- Tape
- Texts
- Test Equipment & Calibration Trainers
- Transformers
- Vehicles
- UPS

### Mechanical Products
- Actuating Levers
- Antenna Masts
- Arms
- Bearings
- Bellows
- Bolts
- Brackets
- Calibrated parts
- Casings
- Casters
- Chassis
- and Bases Container Hardware
- Custom Fabric Parts
- Custom Packaging Decals
- Drives
- Drive Belts
- Drums
- Endorsement parts
- Eyepieces
- Fan Blades & Rollers
- Fasteners
- Fastening Parts
- Firing Pins
- Flat Mechanical Parts
- Gaskets
- Gears
- Glass parts
- Geometries
- Heat Sinks
- Holding Parts
- Insulating parts
- Joy Sticks (Custom)
- Keypads
- Membrane Labels
- Lanyards
- Lenses
- Links
- Machining Mechanical Clutches
- Mechanical Hardware Parts
- Metals
- Nipples
- Nuts
- Operating Control Parts

### Component and Assembly Products
- Bandpass filters
- Capacitors
- Circuit board
- Assemblies
- Circuit boards
- Coil Formas
- Contact Materials
- Manufacturing (Keypad Assemblies, Box Build, CCA)
- Converters (RF - Up and Down Delay Lines
- Flex circuits & Flex Assemblies
- FPGA Boards
- Fuses
- Inductive Devices
- Isolators - RF Limiter - RF Microcircuits
- Oscillators (Crystal)
- PCB-Mounted: Amplifiers, Passive Attenuators, Passive filters, Transformers
- Populated Boards
- Power Amplifiers
- RF (Not Component Level)
- Resistors
- RF Assemblies
- RF Circulators
- RF Filters
- RF Mixers
- RF Switches
- Semiconductors
- Sensors
- Substrate
- TOXXXX
- Tuners
- Tuning Cores
- TWTA
- VCOs
- Waveguides

### Operational Services
- Sourcing Support
- Meeting/ Events
- Car Services, etc.
- (Airport Parking, Ground Services)
- Car Rental
- Hotels & Lodging
- Meeting/ Events
- Sourcing Support

### Composites
- Back Shells
- Cable Assemblies
- Cables
- Computer Cables
- Connectors
- Cordsets
- Headers
- Holders
- Sleeving
- Sockets
- Terminals
- Wire

### IT Hardware and Software
- Cameras
- Cloud Platform
- Cloud Infrastructure
- Cloud Solutions
- Computer Hardware
- Hardware Services
- IT Hardware & Software Maintenance
- Networking
- Networking Switches
- Optical Transceiver
- Routers
- Servers
- Software
- Storage
- Telecom
- Video

### Software Maintenance
- Computer Hardware
- Cloud Solutions
- Computer Cables
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### Interconnect
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- Metals
- Nipples
- Nuts
- Operating Control Parts
- Ornamental Parts
- Pistons
- Plastic Fabricated Items
- Plastics
- Pullies
- Quick Release Plungers & Slides
- Raw Material
- Retaining parts
- Rivets
- Screened Ventilating Parts
- Screws
- Sealing Parts
- Sectors and Spools
- Shells
- Sheet Metal
- Shielding parts
- Springs
- Tags and Instruction Cards
- Washers
- Wheels

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UUVS UNDER THE ICE

ICEX 2020: U.S. Navy Deploys Autonomous UUVs Under The Ice

Article published 4/26/2021 by General Dynamics Mission Systems

Under the ice and on top of the world. During the U.S. Navy’s ICEX 2020 Exercise, one of our Bluefin-21 autonomous Unmanned Underwater Vehicles (UUVs) was put to the test in the harsh conditions of the Arctic Circle. (Image Credit: Dan McDonald, General Dynamics Mission Systems)

As the Arctic ice is diminishing, interest in the region for defense, commerce, fishing and tourism is increasing. Understanding the ever-changing ocean, ice and atmospheric environment—especially in the Arctic—is essential in order to best equip the U.S. Navy with the most effective technology. During the U.S. Navy’s recent biennial Ice Exercise (ICEX 2020), General Dynamics partnered with MIT to put the Bluefin-21 Macrura Unmanned Underwater Vehicle (UUV) to the test under the ice in the Arctic Circle.

In the following excerpt from an article in the Naval Engineers Journal, Capt. Edward Lundquist, U.S. Navy (Ret.) describes the challenges of testing technology in these hostile, icy conditions and what researchers learned during the exercise.

There are many challenges involved with deploying UUVs in and around ice in polar regions. One of the limitations in the high north is the lack of land-based communications or satellite coverage. For systems that update their location using frequent GPS fixes, the lack of coverage becomes problematic. To demonstrate new technologies that can help unmanned underwater vehicles (UUVs), know where they are, the team used MIT’s Macrura UUV based on the General Dynamics Mission Systems Bluefin Robotics 21-inch (diameter) vehicle.

To overcome the limitations of persistent ice cover, which prevents surfacing to take a GPS fix, the team demonstrated an integrated communication and navigation-aiding framework known as the ICEX tracking range—or icex-tracker—to provide accurate positioning using a network of surface buoys linked by radio communications to Camp Seadragon, equipped with small acoustic modems and transducers suspended beneath the ice.

“For ICEX 2020, our science team experimented with the MIT Macrura to navigate precisely while conducting a submerged mission,” said Lt. Cmdr. Dan Goodwin, a naval officer and master’s candidate in a graduate program jointly run by MIT and WHOI. “We can drill a hole in the ice and drop in an ice-tethered profiler that’s anchored in the surface ice and has a suspended sensor below at predetermined depths that measures temperature and salinity versus depth. We can also attach modems to the tether that can communicate with a UUV.

We used four buoys about 2,000 meters apart, the same buoys that the submarines used, with micro modems at both 30- and 100-meters depths to compensate for the temperature and salinity differences in the water that affect acoustic propagation. This allowed the UUV to adaptively switch between modems depending on the depth of and range to the vehicle to ensure the most coherent acoustic communication. The travel time of those signals provided acoustic aided navigation for the UUV. The system was also able to compensate for currents, which can vary in in direction and intensity at different depths.”

According to Goodwin, the system is completely scalable. “We could use more buoys to provide wider coverage, and provide positioning to all types of UUVs.”

REMARKABLE RECOVERY

Goodwin said launch and recovery of UUVs is tricky. In thick ice, it is especially challenging. The team had to cut a “hydro hole” 3 feet wide and 15 feet long in the 6-foot-thick ice, removing 8 tons of ice in order to make a hole large enough to place Macrura in the water.

“We were able to demonstrate under-ice navigation to near-GPS quality. The Macrura vehicle knew where it was, and we knew where it was.”

In fact, at one point during the operation the vehicle stopped under the ice, and efforts to recover the vehicle were put on hold for a major ice storm. “Days later, we were able to go directly to where it was, cut a hole in the ice, and extract the vehicle,” said Goodwin.

“The recovery wouldn’t have been possible without the incredible accuracy of the navigation system which was improved further using the in-situ environmental model,” added Schmidt.

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BEHIND THE SCENES PHOTOS FROM ICEX 2020

At ICEX 2020, MIT partnered with General Dynamics to demonstrate new navigation technologies by deploying the Bluefin-21 Macrura UUV under a six-foot-thick sheet of ice. (Image Credit: Dan McDonald, General Dynamics Mission Systems)

At ICEX 2020, the Bluefin-21 Macrura (right) was deployed under the ice and ran for several hours while operating completely autonomously, demonstrating the newly combined communication/navigation tracking system. (Image Credit: Chief petty officer Troy Barnhart, U.S. Navy)
The MIT and General Dynamics team were able to successfully locate and recover the Bluefin-21 Macrura UUV through a "hydro hole" using the new navigation system. (Image Credit: Daniel Goodwin, MIT)

The Northern Lights illuminate Camp Seadragon, the temporary ice camp built for the U.S. Navy’s biennial Ice Exercise. (Image Credit: Mass Communication Specialist 1st Class Michael Zingaro, U.S. Navy)

More Articles about General Dynamics UUVs

Paul Dalton, VP of Undersea Systems, Discusses How General Dynamics’ UUV Capabilities Contribute to U.S. Maritime Superiority
Read Article Here
Article Published May 12, 2021, by General Dynamics Mission Systems

Knifefish And The Future Of UUVs: A Discussion With General Dynamics Program Manager Mike Enright
Read Article Here
Article Published March 25, 2021, by General Dynamics Mission Systems

General Dynamics Mission Systems Delivers First Knifefish Surface Mine Countermeasure Unmanned Undersea Vehicle System
Read Article Here
Article Published March 18, 2021, by General Dynamics Mission Systems

Alexis Petro
Supplier Diversity Program Manager

Do you know your PTAC?
As the Small Business team, we are often asked questions by small businesses that we do not have the expertise or resources to answer. A small business may need help with their SAM.gov registration, or may not fully understand the difference between the types of socioeconomic classifications and when they are able to self-certify or need a third-party verification. These are important distinctions that need to be addressed, and fortunately as a small business, you qualify to utilize a Procurement Technical Assistance Center, or PTAC.

There are 94 PTAC Centers nationwide and 300 local offices. They serve to assist small businesses to compete successfully in the government marketplace. PTACs are part of the Procurement Technical Assistance Program (PTAP), which was authorized by Congress in 1985 and is administered by the Department of Defense, Defense Logistics Agency (DLA).

So which PTAC should you call? When you visit the PTAC website you can enter your business’ address and it will direct you to your local office. Once in contact, you can receive assistance on not only SAM registration, but also a host of other topics regarding government contracting. Many PTACs will also host workshops and matchmaking events and provide one-on-one counseling. This is all provided at no cost to the small business.

A PTAC is an excellent resource for small businesses to develop their skills, establish their presence and grow their footprint in the federal marketplace. Get to know your PTAC and explore the benefit of these extra resources!
General Dynamics Mission Systems is seeking a partner to fabricate various machined plastic components using Royalite R85/21 ABS-Blue PMS 280. Must have thermoforming and machine capability.

For More Information, visit gdmissionsystems.com/isn

The Supplier News and Information Center is now available on the General Dynamics Mission Systems website www.gdmissionsystems.com


General Dynamics Mission Systems has established the Supplier News and Information Center on the Supplier page of our website to keep our supply chain partners informed with critical information relating to our operating status and the adjustments we are making in response to the COVID-19 outbreak.

Search under About and Suppliers to click on the COVID-19 Information for Suppliers button.