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Underwater Drone 101 - All you need to know

Rachel Doornekamp | March 3rd, 2020

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Since the 1950s, [underwater drones](#) have been developed and used.

The United States Navy paved the way for the development of underwater drones. It was in the 1960s that the Navy started using underwater cameras and drones to retrieve lost equipment and explore wrecks.

It was even an underwater drone that discovered the wreck of the Titanic in 1985. As with all things drone, the 2000s have seen a lot of improvement and increase in capability and reach. Modern drones are far more advanced than anything that came before them and innovation continues still.

The History of Underwater Drones

Underwater drones were first invented in the 1950s. Their design enabled them to carry out missions for the Navy and research colleges.

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The money came from the defense budget. Like many technologies to emerge from the Cold War, drones fell under the Navy's control.

In the 1960s, technology continued to advance. This allowed an underwater drone to even retrieve a lost nuclear bomb. The retrieval occurred off the coast of Spain and remained secret for many years.

Through the 1970s, commercial industries began to use them in earnest. Underwater drones even saved the crew of a wrecked submarine during the 1970s. Drones grew in demand for their effectiveness and ability to do things no human could.

The most famous decade that heralded the arrival of underwater drones was the 1980s.

The finding of the Titanic by Robert Ballard required a new type of ROV. They developed this machine with help from the Navy. The latest version enabled the discovery of the famous wrecks of the Titanic and Bismarck.

In the 1990s, drones began to do more extensive work.

Newer drone models could now disable mines and do other duties that once relied on human divers. Methods of deployment and battery life were also improved. These improvements led to an even more extensive array of industries that used the drones.

The 2000s saw a massive boost to underwater drones. The reason behind this was the improvement of the lithium-ion battery technology.

As this method of energy storage improved, so too did the construction of drones. In decades past, a drone would require a tremendous tether and a full research ship to deploy. In the 2000s, it became possible to deploy them off much smaller vessels.

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How Does an Underwater Drone Work?

Modern underwater drones are like miniature submarines without crew. These submarine drones are challenging to send radio signals to. They can be autonomous, using their onboard sensors to function. Another method is a long tether that allows for a direct connection between ship and drone.

An underwater drone works by controlling its buoyancy so that it doesn't sink. Like all underwater vehicles, they have crush depths and can be designed for different operating conditions. The motors they use push water and allow the drone to move about either by command or on their own.

Most underwater drones use a line that connects them to the control room where they're operated. Inside this control room, operators can manage the tilt, elevation, and orientation of the vehicle in real-time. Cameras act like eyes, allowing the operators to guide the drone to its target.

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Underwater Drone Technical Specifications



ROV General Specs

- Width: 325 mm (12.8")
- Height: 258 mm (10.2")
- Length: 279 mm (11.0")
- Weight (in air): 8.5 kg (18.7 lb)
- Body Material: Die Cast Aluminum
- Window Material: Acrylic
- Depth Rating: 200 m (656 ft)
- Operating Temp: -10°C to 50°C (14°F – 122°F)
- Case (option): Custom Pelican Air 1637 Handle and Wheels
- Warranty: 1 Year – Parts and Labor (optional 2-3)

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Video: UHD 4K - 3840x2160, 720p - 1280x720, 30FPS 0.001 Lux, 270° Total Range of View

Picture: JPG 8mp

Lights: High Efficiency LED, Fully Dimmable, 1000 Lumens Tracking with Camera, Optional 1000-4400 Lumens
Add-ons

Underwater Drone Camera

One of the most important functions of an underwater drone is the camera. A Underwater drone camera allows users to get eyes underwater to perform a wide variety of tasks including inspection, retrieval and observation, among countless other applications.

DTG3 Underwater Camera

Feedback With advanced capabilities and intelligence, the DTG3 Underwater Camera is the best in its class. The mini commercial-grade underwater drone is built to provide operators with the ability to quickly deploy and visually inspect within underwater environments.

Designed to work well in low light, the 4k internal camera provides a 270 degree rotating field of vision. With live, zero latency viewing, operators get a clear and accurate visual of the underwater environments they are operating in. Pilots can record high quality videos or switch to photo mode to snap photos in up to 8 megapixels.

The straightforward handheld controller is easy to use. The 7-inch screen is sunlight-readable and weatherproof, meaning users get a clear view no matter what conditions they are facing.

Learn more about [DTG3 Underwater Drone packages](#) to see which DTG3 is right for you!

REVOLUTION Underwater Camera

The Deep Trekker REVOLUTION is a completely re-imagined drone. Mission-ready with greater payload capabilities, deeper depths and advanced stabilization, the REVOLUTION is tough and portable. The patent pending revolving head allows operators to rotate the camera, manipulators, and sonar all while station holding in moving water.

With a 260 degree field of view, the 4k underwater camera allows for excellent situational awareness. Pilots can record high quality video or switch the camera to photo mode to take pictures in up to 8 megapixels. Specifically designed to work in harsh, low light environments the camera reliably provides excellent footage for operators.

The integrated screen controller provides live, zero latency viewing on a super bright, sunlight-readable and weatherproof screen.

Learn more about [Deep Trekker REVOLUTION](#)

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Underwater Drone 4K Footage of Avro Arrow Search



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AUXILIARY Underwater Camera

Add additional angles to video capabilities with a custom mountable underwater auxiliary camera. This option mounts directly onto the ROV. With the option to toggle between the main and auxiliary camera, users can view and record on the selected camera. An auxiliary camera provides pilots with the ability to gain further perspective on the grabber from above or have a rear-facing camera to assist in guiding the tether in hazardous situations.

DUAL AUXILIARY UNDERWATER CAMERA

Add even more angles to the ROV with underwater side facing cameras. Like the single auxiliary camera this option mounts directly onto the ROV. The toggle option allows operators to move between the main camera and two side cameras for viewing and recording. Side cameras provide valuable additional perspectives for a wide variety of inspections including bridge, seawall and fishnet inspections.

Underwater drones are also perfect for inspecting a ship's outer hull. The oil and gas industry uses drones often to check underwater drill sights.

This was brought to the public consciousness after the BP oil spill, which saw daily drone footage displayed on network news. Before that, they had gained fame from finding wrecks like the Titanic and Bismarck, thanks to how good they are at scouring the ocean floor.

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Unlike manned submersibles, underwater drones don't need to cater to crew safety. This allows them to be much smaller and carry more sensors and tools than a similarly sized submersible of the past. This is very

useful to researchers who use them for an array of operations.

Detecting potential ecological disasters and finding new sea life are all areas revolutionized by the use of underwater drones. They can take samples of the seafloor and water at various depths. These samples can help scientists determine pollution and potential dangers to people living near the coast.

Drones can operate in conditions that humans would find impossible. Such conditions include extended submersion in icy waters of the arctic or algae blooms that are harmful to life. This enables researchers and commercial interests to deploy sensors and tools that were impossible even a few years ago.

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**Learn more about which underwater ROV is best
for your application.**

CONTACT INDUSTRY SPECIALIST

WHAT UNIQUE FEATURES DO WE OFFER?

Lightweight, Low Drag Tether: The power source of the Deep Trekker is onboard the vehicle itself, allowing it to take advantage of a low-drag, minimal diameter tether. With its neutrally buoyant tether (5mm-6mm depending on options), the power is completely used by the unit, and NOT in dragging the heavy tether through water. High strength fibers are integrated into the polyurethane tether so that the robots can be managed without the need for additional leads.

Patented Pitching System: Using our unique internal pitching system, Deep Trekker underwater drones are able to move in every direction using only horizontally-mounted thrusters. The pitching system allows the pilot to orient the outer body of the robot through the vertical arc so that the thrusters are driving the unit in the desired direction.

Fully Integrated Viewing & Control: Heavy control boxes, arduous software and extra power requirements can

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sensors can also be added.

360 Degree Viewing: With the 360 window paired with the 270 degree camera sweep and the 180 degree pitch angle, Deep Trekker underwater drones can see in front, behind, above, below and all points in between using

only one HD, low-light camera. All systems come complete with an LED lighting system that tracks with the camera.

Modular Add-Ons: At Deep Trekker versatility is critical to innovation and growth. Our family of ROVs can be integrated with a broad range of add-ons to suit many different needs. Multibeam imaging sonar is perhaps one of the most important tools to add to ROVs, greatly improving their capabilities in many applications, such as dangerous and arduous search and recovery missions, and inspections in difficult to reach and confined spaces. Sonar can provide visibility in murky or zero-visibility environments, which can make these challenging missions easier and safer to conduct. In some cases they would not even be possible without the use of sonar.

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Underwater Drone - Deep Trekker DTG3 ROV



QUALITY? IT MATTERS!

All of Deep Trekker underwater drones are built to last. Each model is constructed of sturdy cast aluminum, anodized and epoxy coated for corrosion resistance. Its unique spherical design has inherent strength, and offers no maintenance thrusters, making the durability of our robots unmatched. If your project or application evolve past the capabilities of your underwater drone, we offer various attachments to enhance its functionality and extend its lifespan.

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commercial industry has continued this tradition, and an underwater drone is useful for a large variety of commercial interests.

Gas and oil companies often use them to explore areas that are being considered for drilling and to check those already being drilled at. Oceanic research foundations and organizations use underwater drones for searching and analyzing the seafloor.

Those with infrastructure underwater also use them. Drones are used to monitor pipes that lay underwater and help provide oil and other essential services to society. These drones are durable enough for multiple deployments.

The aquaculture industry is using underwater drones for a more efficient performance of net inspections, lighting, feeding, trouble shooting and stock monitoring. The use of underwater drones has proven to be a cost effective way to ensure healthy fish crop, efficient harvest and environmental protection.

Feedback In commercial diving and inspections, divers' safety is top priority and underwater drones allow them to perform inspections in enclosed spaces, including tanks, pipes and intake structures without the risks associated to the job.

As technology continues to progress, underwater drones are continuing to evolve. Accessibility to them has caused their use to rise. They are expanding into all manners of ocean-based industries.

In Deep Trekker we have identified two main type of personas the Hobbyist and the Professional



THE HOBBYIST

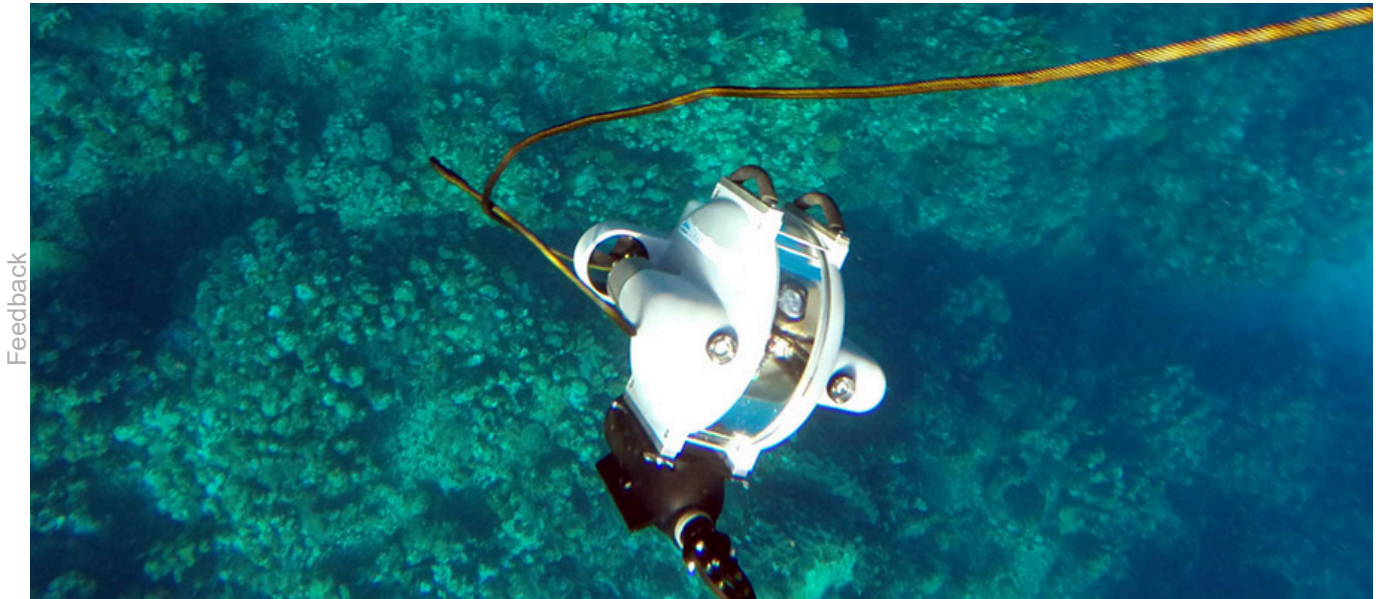
With an increased interest in the ocean by many people, and the increased availability of once expensive and non-commercially available equipment, underwater drones have become a popular hobby amongst many.

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participate in recreational scuba diving, the DTG3 ROV series offers 4k video and camera capabilities directly to your handheld controller, depth rated to 150 meters.

A hobbyist can use ROVs for a variety of applications, such as:

- Underwater Exploration (including marine life, coral reefs, and underwater formations)
- Underwater Photography and Videography
- Wreck Diving and Exploration
- Data Recording (such as for inspections or environmental monitoring)



THE PROFESSIONAL

The best suited underwater drone for "the professional" is the DTG3 Navigator ROV and its bigger brother, the REVOLUTION ROV - used for ocean floor exploration or inspections at depths that divers are often unable to reach. A working class underwater drone, for example, acts as a safe alternative for divers, often used for offshore inspection projects, military and search & rescue missions, and deep archaeological investigations. For example, a vessel's structural integrity, potential transferring of invasive species, or contraband smuggling, demands periodic inspections of a vessel's hull during transit and when entering port. Deep Trekker underwater drones help mitigate the risk to said work.

There is a broad range of uses for ROVs in professional spaces. Some applications a professional might use ROVs for can include:

- Offshore Oil and Gas Industry (used for inspections, maintenance, and repair tasks on underwater infrastructure, such as pipelines, wellheads, and subsea equipment.)
- Hydroelectric and Dam Inspections (can assist in identifying potential issues, such as cracks, sediment buildup, or structural damage)
- Military and Defence (used by the US Navy for mine countermeasures such as explosive ordnance disposal, intelligence, surveillance, and reconnaissance missions, salvage and recovery, etc.)

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- Aquaculture (can help with fish monitoring, net inspections, feed monitoring, water quality sampling, etc.)
- Infrastructure (such as inspections of sewer and wastewater pipelines, hydroelectric dams, underwater cables, etc.)

- Scientific Exploration and Archaeology (used to explore underwater archaeological sites, investigate underwater geology, conduct geological surveys, gather valuable data, capture images, collect samples, conduct biological surveys, map underwater ecosystems, observe marine life behavior in their natural habitats, and recover artifacts from submerged locations.)

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What Advantages Do Underwater Drones Have?

Compared to deploying divers, underwater drones are quite safe. Those who operate the drone can sit in the safety and comfort of a control room. Using drones can also increase the safety of divers who are accompanying them, by keeping a steady eye out for any potential danger.

The best underwater drone is one that can achieve all of these missions on a consistent basis. [Deep Trekker](#) produces commercial grade [underwater drones](#). Their drones can fulfill a variety of missions without risking lives to do it.

Another key advantage of using underwater drones is the time they can stay underwater. Scuba tanks last for one hour in water that's not deep or choppy. While some tanks arrangements can prolong this, the more activity the diver has to do, the more oxygen they use up.

Drones don't need oxygen and operate off of battery power. This allows them to stay functioning for hours on end without the need to recharge. This can provide a worksite with constant monitoring, and a drone can check

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operated vehicle) isn't required, you don't have to spend the money to get one. The [DT 100](#) acts as an underwater drone camera with no need for any other frills and [add-ons](#).

This means that drones can address the concerns of a mission without risking lives. You can scale your purchase to the task at hand instead of needing to have a diver certified in a wide array of underwater profiles.

Deploying drones doesn't require expensive insurance and contracting costs. Some drones can be deployed by a single individual off of any boat. You don't need to have a crew or an expansive team to operate them, thus reducing operating costs considerably.

Underwater Drones Are Here to Stay

In the modern era, underwater drones have been everything from rescuers to repair technicians. They have been at the center of diplomatic incidents and undersea disasters. The humble underwater drone, which began nearly 70 years ago, continues to make itself useful in all areas of ocean work.

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Like all areas of drone technology, the underwater drone is here to stay. They continue to advance the understanding of the ocean. Without underwater drones, the oceans of the world would be far less explored and far less accessible than they are to us today.

Underwater drones might even [find life on other planets](#). They remain one of the most exciting and energetic technological creations that humanity has ever deployed. From the depths of the ocean to outer space, the world is using drones more than ever.

Getting the right underwater drone is important for any endeavor. If you're going to use an underwater drone, [contact us](#) at Deep Trekker. Don't risk money and lives unnecessarily, trust in the technology that is changing the world.

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