

CUSTOMER SUCCESS STORY

BLUEFIN ROBOTICS IS SEEING A SEA CHANGE IN E-CAD M-CAD DESIGN INTEGRATION WITH ALTIUM DESIGNER



The Need

The ocean floor is one of the last frontiers. With depths reaching up to eleven kilometers, it's not surprising that much of it remains unmapped and unexplored. However, interest grows for the mystical deep. Government, academic and commercial organizations require detailed mapping and scientific data from these regions. From hydrate mapping to whale watching and even locating dangerous war mines in seaports, the need for a reliable and multipurpose survey tool is growing.

" Altium Designer has created an environment where the mechanical and electrical engineering teams can meet to model, visualize, and discuss the electro-mechanical designs early on in the design phase. Altium Designer is not only critical to the design process, but also to the success of the design. "

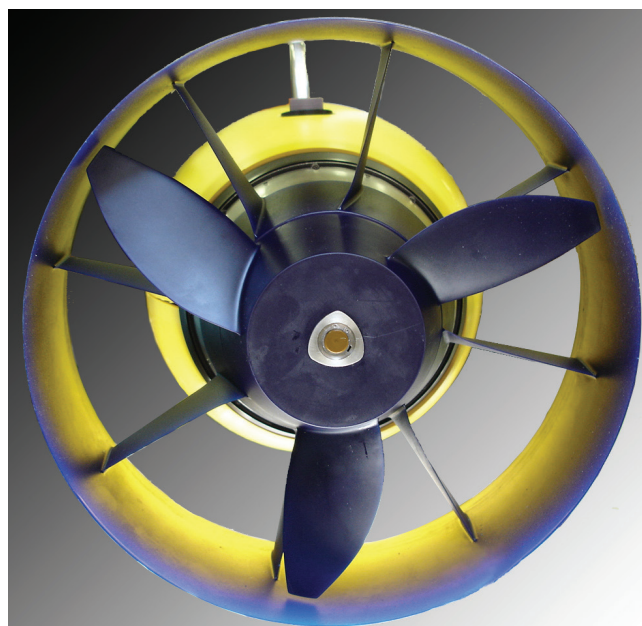
Richard Wilson, Electrical Engineer Manager, Bluefin Robotics

Meeting this demand is Bluefin Robotics. Since branching off from the Massachusetts Institute of Technology (MIT) in 1997, Bluefin has built a reputation for its Autonomous Underwater Vehicle (AUV). AUVs are completely automatic vehicles that navigate the sea-bed to collect data and images. Using advanced sonar, manometers and sensors, AUVs capture important information in areas unsuitable for human exploration.

The Challenge

The push for smaller and more complex electronics to be created in shorter time periods has created a greater need for electrical and mechanical integration. This trend was particularly relevant to Bluefin. The tight design requirements of its AUVs presented challenges when co-ordinating electrical and mechanical designs. The sequential process of electrical to mechanical design was proving to be clumsy

and fraught with design flow inefficiencies. The departments were not working collaboratively, and were constantly finding discrepancies between designs. Engineers were forced to rely on cardboard models. These were time consuming to build and rarely detailed all the mechanical specifications of the project. In effect, engineers from both sides could never fully visualize their work and requirements.



An AUV is a very tight design. The vehicles must perform in extreme conditions and often experience pressures of up to 6000lb per square inch at depths of 4000 meters. Not only do AUV engineers design their vehicle to survive these pressures, they must also make the vehicle neutrally buoyant, which reduces propulsion energy requirements and increases vehicle efficiency. In practice this means that for every cubic inch of air added to the vehicle, an equivalent amount of weight has to be added and if left un-restrained, it can lead to a large and unwieldy vehicle. When it comes to AUV design, PCB design is no exception to this volume and weight conundrum.

The Solution

Bluefin decided to upgrade to Altium Designer. By taking advantage of the IGES format and advanced STEP files import-export function, Bluefin could integrate 3D

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mechanical software data into the Altium Designer platform. This opens up a whole new level of interdependency, as accurate 3D design data flows freely between the two domains. The result is MCAD and ECAD co-design. This is an extremely efficient as mechanical engineers can now work collaboratively with their electronic peers. Engineers can now transcend the traditional sequential design process because co-design means projects can occur parallel to each other, allowing the quick generation of extremely accurate designs.



The Results

With Altium Designer, engineers could easily collaborate on the design and find the delicate balance between performance, buoyancy and reliability. The result: the Bluefin-12 AUV can travel up to 76 miles underwater and carry a sonar that maps each side to a range of 30 meters.

Product Information

Bluefin Robotics makes a series of AUVs, gliders and batteries for use in deep sea exploration and geotechnical mapping. Most AUVs are tubular in shape and are categorized based on diameter. The vehicles are completely autonomous, navigating and collecting data without operator intervention. Once in the sea, an AUV will journey to the bottom of the ocean and use a range of advanced sonar equipment and sensors to gather images and data. Originally seen as a tool

for scientists or as a novel project for budding engineers, the AUV is now gaining ground in commercial and government sectors. Recognized for being extremely reliable, AUVs are responsible for expensive ocean floor surveys for offshore oil companies as well as dangerous battle fleet experiments for the military.



About Bluefin Robotics

Bluefin started in 1989 in the MIT Autonomous Underwater Vehicle Laboratory, well recognized as one of the first to pioneer the AUV. In 1997, Bluefin branched off and has since built its own reputation for highly reliable AUVs for use in scientific, military and commercial applications.

ABOUT ALTIUM

Altium Limited (ASX:ALU) creates electronics design software. Altium's unified electronics design environment links all aspects of electronics product design in a single application that is priced as affordable as possible. This enables electronics designers to innovate, harness the latest devices and technologies, manage their projects across broad design 'ecosystems', and create connected, intelligent designs.

Founded in 1985, Altium has offices in San Diego, Sydney, Karlsruhe, Shanghai, Tokyo, Kiev, with value added resellers worldwide. For more information, visit www.altium.com. You can also follow and engage with Altium via [Facebook](#), [Twitter](#) and [YouTube](#).