Acoustic Pingers Help Contestants in Robosub Competition

The Robosub competition was started 18 years ago to advance the development of autonomous underwater vehicles (AUV). Co-sponsors are the Association of Unmanned Vehicle Systems International (AUVSI) and the U.S. Office of Naval Research (ONR). The goal is to challenge a new generation of engineers to accomplish realistic missions in an underwater environment and get young people excited about careers in science, technology, engineering and maths.

Teams from high schools, colleges, and universities from around the world compete in this annual event. Participants learn how to work together to create an autonomous system that will accomplish a variety of challenging tasks. The underwater vehicles they construct must navigate a complex course which involves visual and acoustic sensing elements, small and large object manipulation, dropping markers into specific bins, and launching torpedoes at particular targets; all without human control or intervention. Points are awarded for the number and difficulty of the tasks successfully completed.

One returning competitor is North Carolina State University Underwater Robotics Club, a student-run organisation that designs and builds autonomous submersibles. Their vehicle *Seawolf* was designed to be capable of manoeuvring through an underwater obstacle course, retrieving and dropping payloads, and navigating to locations marked by an acoustic pinger. To test their vehicle's ability to manoeuvre to an acoustic beacon, the team needed a pinger for trials. They choose JW Fishers SFP-1 single frequency pinger for its low cost, and because its specifications met the Robosub requirements. The SFP-1 transmits a preset frequency between 22 and 37.5kHz which can be detected at a distance of several thousand feet.

Newcomer From China

A newcomer to [Robosub](#) is the SASAUV team from Shanghai American School, an international high school based in China. Their group is divided into three parts, each responsible for different tasks; navigation and software, hardware, and multimedia. At a time when many modern AUVs are exploring new and sometimes radical exterior designs, their design philosophy is the underwater vehicle should have the shape of a conventional submarine. To accelerate the development of the AUV's acoustic sensing capability, the team used parts of JW Fishers PR-1 pinger receiver, a device that finds acoustic pingers and guides the operator to the pinger's location. Team captain Kylin Daniel reported that even when they were unable to accomplish all of the required tasks, the team still managed to score more points than many notable college teams. This project has given the high schoolers an incredible experience, and it is hoped they will compete again in the future.

Other teams using Fishers acoustic devices to help design their AUVs for Robosub are from Kasetsart University in Thailand, University of Colorado Boulder, National University of Singapore, and India's Underwater Robotics Society. Other educational institutions using Fishers pingers in their projects are the University of Delaware, University of Texas Austin, University of South Florida, Texas A&M, Lester B. Pearson College, Inha University in China, Coastal Carolina University. Louisiana State University, and Pukyong National University in Korea.

Image: Members of NCSU Underwater Robotics Club with Seawolf*. Inset: Shanghai American School students with their AUV* Nerwin Jr.