

Amador Valley Robotics Team

Sponsorship Packet 2021/2022





CONTENTS:

O3 Our Mission

About Us



Competition

06 Our AUV

- Community Outreach
- Sponsorship
- Sponsorship Levels
- Contact Us

Thank You



A V B O T Z

Our Mission

To teach, develop, and apply the use of autonomous robotics, engage members in engineering challenges, and further underwater exploration technologies.

We are AVBotz

We are the Amador Valley High School Robotics Team (AVBotz), a group of students from Pleasanton, California in the outskirts of Silicon Valley. Every Saturday, we meet in our club garage to work on our AUV, Marlin, and teach our members about developing autonomous robotics systems. We strive to engage aspiring Amador Valley students in an accelerated environment that provides opportunities to approaching engineering challenges with real word applications whilst developing their teamwork and organizational skills. Self-managed by students, AVBotz members learn how to solve design problems, manage projects at scale, develop relationships within the club and with companies, and acquire skills that will help them beyond their high school education. At AVBotz, we use the highly competitive environment of RoboSub to engrave in our members our values of ambition, improvement, innovation, and teamwork as we further underwater exploration technologies.

Club Beginnings

The Amador Valley High School Robotics Club was founded in 1999 by an intrepid group of students with a passion for robotics. These students decided to enter the International Autonomous Underwater Vehicle Competition, a competition in which only colleges competed. Despite this, with their ingenuity and dedication, they placed 6th at the 2nd RoboSub competition in 2000 with their AUV Hammerhead, performing above several of the nation's most prestigious colleges.

AVBotz & Hammerhead AUV, San Diego (RoboSub 2000)





About Us

The Amador Valley Robotics Club is a team of high-school students building an autonomous submarine to compete at RoboSub, an elite underwater robotics competition.

We are a team of forty Amador Valley High School students from Pleasanton, California. Ever since our the club entered International RoboSub Competition in 2000, we have perpetuated a legacy of problem solving and independent learning. We had the highest scoring run at RoboSub 2015, and placed 7th overall, performing better runs than 28 other universities. We continue to create an environment that's as close to the real engineering world as possible, as we promote student leadership and strong collaboration between our own members & other teams.

Electrical Team

Electrical team members are responsible for designing maintaining the and electrical infrastructure of the submarine. This year, electrical will be improving the current system, which includes incorporating new sensors and boards. Electrical recruits should be interested in learning design principles of circuitry and capable of handling with complex systems integrated many components.

Business Team

Business team members are responsible for raising funds, creating a positive public image, and organizing outreach projects. This year, they will be presenting sponsorship pitches to companies around the Bay Area, writing emails and calling potential sponsors, and networking at outreach venues like fairs and meetups. Business recruits should feel comfortable meeting strangers and presenting during high-pressure situations, have good writing skills, and be eager to take initiative on their own projects.

Software Team

Software team members are responsible for writing all code for the submarine. Most of the code is algorithms for vision processing, digital signal processing, and mission control. This year, they will be writing code to integrate new hardware, accomplish the torpedoes task, modelling the competition course, and modularizing mission control architecture, as well as improving the efficacy of existing code. Software recruits should have prior programming experience.

Mechanical Team

Mechanical team members are responsible for



designing and manufacturing the physical structure of the submarine. This year, they will be improving the submarine, using 3D CAD, finite element analysis, CNC machining, 3D printing, and more. Mechanical recruits should be able to solve physical problems creatively and be willing to work with their hands as well as their computers.

Competition



AVBotz competes in the annual **International RoboSub Competition** at SSC Pacific TRANSDEC facility in San Diego, California. The competition is co-sponsored by the Association for Unmanned Vehicle Systems International (AUVSI) Foundation and the U.S. Office of Naval Research (ONR) with the goal of advancing the development of AUVs. The event serves to foster ties between young engineers and organizations developing AUV technologies.

RoboSub Competition

The competition mission elements and tasks are designed to simulate



real-world challenges such as visual recognition of objects, navigation, and acoustic pinger detection. Competition elements range from shape and color recognition to torpedo firing and manipulating and sorting objects. Each of the tasks must be completed by the vehicle(s) independent of human control or interaction.

International RoboSub Teams and Staff (RoboSub 2017)

Every August, More than 40 teams from around the world, including the U.S., India, Singapore, Russia, Japan, China, Canada, Poland, Brazil, and Thailand come together to compete in the TRANSDEC Anechoic Pool to show their mastery of engineering and design in autonomous underwater robotics.







Autonomous Underwater Vehicle (AUV)

Following the success of Marlin, the AVBotz team retired the submarine in 2020 and created Nemo, a brand new autonomous underwater vehicle (AUV) from scratch. In 2021, the team is focused on refining Nemo's stability and modularity through rigorous testing and upgrades to its electrical and software systems. This page overviews Nemo's existing specifications, and recent changes to the system.

AVBotz Nemo 2021-2022

Building off of the experience gained from Marlin, we designed and assembled Nemo as our new and improved AUV for RoboSubo despite the challenges of COVID. Nemo is an entirely new vehicle for the team that focuses on optimizing for stability and modularity. This year our electrical team is working to make maintenance easierp In addition to thiso our software team has been able to work to test code and functions without being in persono due to the simulator Gazebop These upgrades have allowed Nemo to become the most optimized AUV in the history of AVBotz.



Weight (in air)	27kg
Hull	12"x 24" x 12"
Dimensions	Length: 24", Width: 34", Height: 16"
Propulsion	8x VideoRay M5 Brushless Thrusters
Power	2x 22.2V 16,000 mAh LiPo Batteries (in series)
Underwater Connections	SubConn Power, Circular, Micro Circular, Ethernet, and Coax series
Cameras	1x 1.3 MP Point Grey Blackfly machine vision cameras w/ Theia Technologies SY125M lens 1x 20MP Point Grey Blackfly machine vision camera w/ Computar V0828-MPY lens
Navigation Sensors	Pressure Sensor (Ashcroft Model K1) AHRS (PNI TRAX AHRS Module) Hydrophones (4x Teledyne Reson TC4013)
Main Computer	Intel i7-4790T on Jetway NG9J-Q87 Mini ITX 16GB DDR3 RAM 1TB mSATA SSD
Embedded Computer (Control)	ATmega 2560
Data Acquisition and Signal Processing	Custom fbga with quad DAC at 1MegaSample acquaring signal Custom Conditioning Boards

Community Outreach

To spark interest in science, technology, engineering, and mathematics around our community, we proudly participate in many outreach events, events, and workshops. We are happy to give back to our community and enjoy sharing our passion with our supportive community.



Building Our Local Connections

This year our club participated in several outreach events, either as workshop leaders or as volunteers to help promote robotics and engineering often by showcasing our submarine. We held local events at three Pleasanton middle schools: Harvest Park, Hart and Pleasanton Middle Schools. To promote coding for younger students, we lead weekly after school lessons at Harvest Park and Pleasanton Middle School. Many of the team members, especially from the software division, taught a 20 week course on Java and Python to 100 middle school students during the school year. Our members led workshops at a local hackathon and ACE Code Day, providing a plethora of workshops on robotics and computer science ranging from a crash course in machine learning to an introduction in hardware components. Events like these allow us to share our knowledge with 200–300 future engineers and potential club members, thus promoting our club

and furthering its mission. Ever since we started working with the local Lego Mindstorms Robotics Club at Harvest Park, we've always arrived to find 50 middle school students ready to learn, fix problems, and ask questions to expand their knowledge; we have the privilege to work with such aspiring students in a club that some of our own members used to participate in. At HART Middle School's annual STEAM night, our sub entered the MP room, and students were amazed by the size and intricacy of our submarine. We also transported our sub to the Livermore Innovation Fair, where we explained its inner workings and capabilities to hundreds of families and children of all ages. Most recently, we were invited to Pleasanton's "Ignite 2.0" STEAM event, where we had the chance to speak to the community about the importance of engineering for all ages and the applications of autonomous systems. Through all of our efforts, we hope to continue to inspire students to explore the fields of robotics and engineering.

Become a Sponsor

We are able to operate because of the generous contributions from our **Sponsor Group**. Your sponsorship to AVBotz is a win-win partnership. Support from our sponsors gives us the opportunity to explore engineering with immediate applications, provide members with crucial financing skills, make connections with the engineering community, and you the chance to appeal to engineers of the future while benefiting the efforts of robotics and technology in society.

Ways to Sponsor The Team





Hardware Donations



Software/Service Donations

Being the one of the few continuously competing high school teams is hard, especially when we're on a tight budget; as a high school, one of our main challenges is maximizing the potential of the funding we receive. Support from our sponsors allows us to broaden our ability to solve the engineering challenges with more freedom. We depend on our sponsors because we receive all of our funding from them — none of our funds come from our school. Any support through monetary donations, hardware donations, and software or service donations greatly help the team make strides in sustaining our club.

Expanding Your Reach

AVBotz is the most ambitious student led engineering projects on campus. Through participation in community outreach events and international competitions, such as RoboSub, there is an abundance of opportunities for the team to promote your company on local and international scales. We will do this through by placing your company logo onto our team shirts, competition paper, sponsor banner, website, presentations, and other merchandise we distribute. We will ensure to display our appreciation of your support whenever we attend these types of events.



AVBotz Team & Marlin 2018

Sponsorship Levels

In addition to supporting our club, Sponsorship Levels give our biggest supporters perks to promote their company. All donations in either parts, service, or money will reserve your sponsorship level for 2 years. Thank you for your support!

- Company logo displayed on competition vehicle's inner LCD screen
- Company logo, description, and website link under Platinum on website
- Company name on 2019 competition paper and sponsorship packet
- Logo in slideshow during community events
- Description posted in Github
- Sponsorship Spotlight on Twitter, Facebook, Instagram

- Company logo, description, and website link under Gold on website
- Company name on 2019 competition paper and sponsorship packet
- Logo in slideshow during community events
- Description posted in Github
- Sponsorship Spotlight on Twitter, Facebook, Instagram

- Company logo, description, and website link under Silver on website
- Company name on 2019 sponsorship packet
- Description posted in Github
- Sponsorship Spotlight on Twitter, Facebook, Instagram

- Company logo, description, and website link under Bronze on website
- Company name on 2019 sponsorship packet
- Sponsorship Spotlight on Twitter, Facebook, Instagram

Contact Us

Mailing Address

Write check to: Amador Valley High School Memo Line: AVBotz (Robotics Club) Address envelope to: Janell Ward Mail to: Amador Valley HS

(1155 Santa Rita Rd, Pleasanton, CA 94566-6176)

Email

hello@avbotz.com

http://www.avbotz.com

Social

GitHub @AVBotz Facebook @AVBotz Twitter @AVBotz Instagram @AVBotz

Information

We are a 501[©] tax-exempt nonprofit organization

(Tax ID #94-3062524)

Thank You to Our Sponsors

AHEAD OF WHAT'S POSSIBLE™

