



Behind the Build Webinar #1



Hold on to your tether.

We'll be starting momentarily.....



Webinar Overview

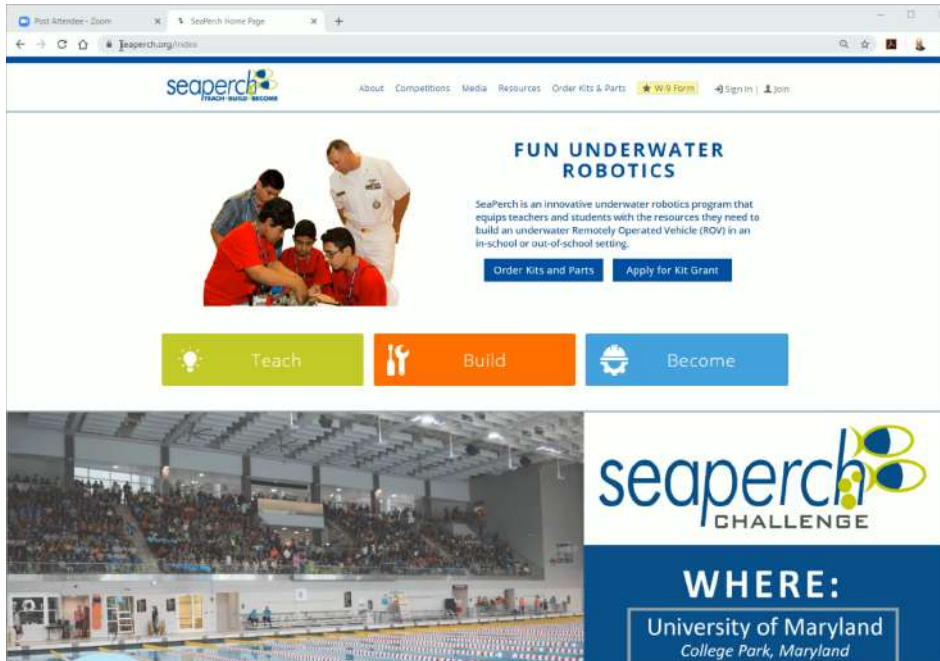
- The webinar is being recorded and will be available afterwards
- The webinar will cover:
 - The distinction between the regional competitions and the International SeaPerch Challenge.
 - Where to find information and how to ask for help.
 - All aspects of the pool events with emphasis on the course build.
 - A discussion on the new competition classes.
 - A brief overview of the Technical Design Report.
- The webinar will not cover:
 - A detailed discussion on the Technical Design Report (Nov 7 Webinar)
 - How to build an ROV
 - How to a SeaPerch program
 - We plan to host more webinars and video conferences to cover these and other topics.

Questions? Ask in the chat function throughout the Webinar. We will answer these questions at the end, as time allows.



Where to find information & how to get help

<https://www.seaperch.org/index>

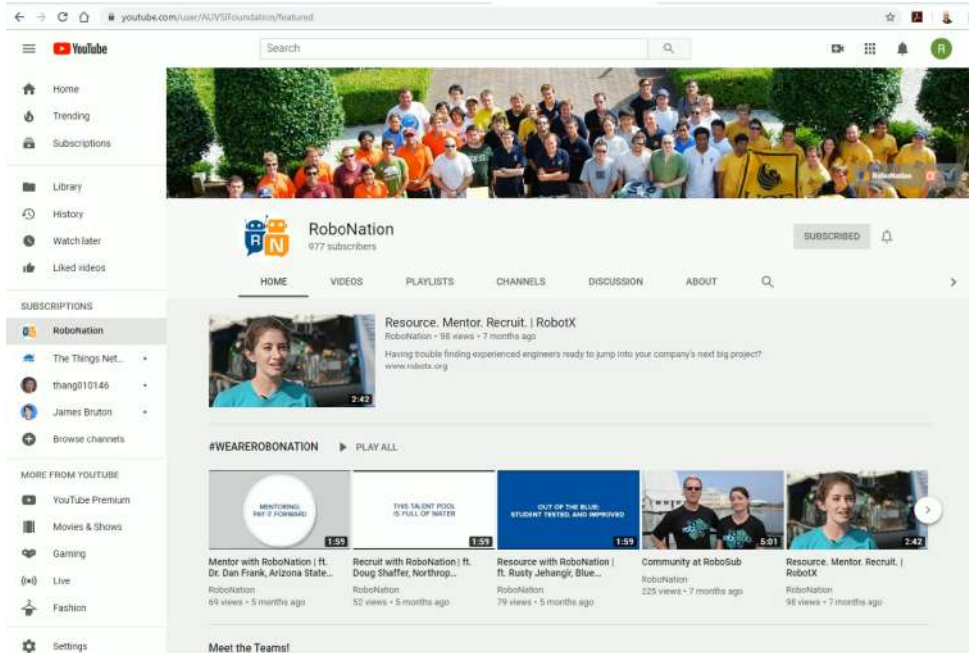


The screenshot shows the homepage of the seaperch.org website. At the top, there is a navigation bar with the seaperch logo (with the tagline 'TEACH BUILD BECOME') and links for 'About', 'Competitions', 'Media', 'Resources', 'Order Kits & Parts', 'W9 Form', 'Sign In', and 'Join'. The main content area features a large image of students and a teacher working on a project. To the right of this image, the text reads 'FUN UNDERWATER ROBOTICS' and 'SeaPerch is an innovative underwater robotics program that equips teachers and students with the resources they need to build an underwater Remotely Operated Vehicle (ROV) in an in-school or out-of-school setting.' Below this text are two buttons: 'Order Kits and Parts' and 'Apply for Kit Grant'. Underneath these are three colored buttons: 'Teach' (green), 'Build' (orange), and 'Become' (blue). The bottom section of the page is split into two parts: on the left, a wide-angle shot of a large indoor arena filled with spectators watching a competition; on the right, the 'seaperch CHALLENGE' logo and the text 'WHERE: University of Maryland College Park, Maryland'.



Where to find information & how to get help

<https://www.youtube.com/user/AUVSIFoundation>

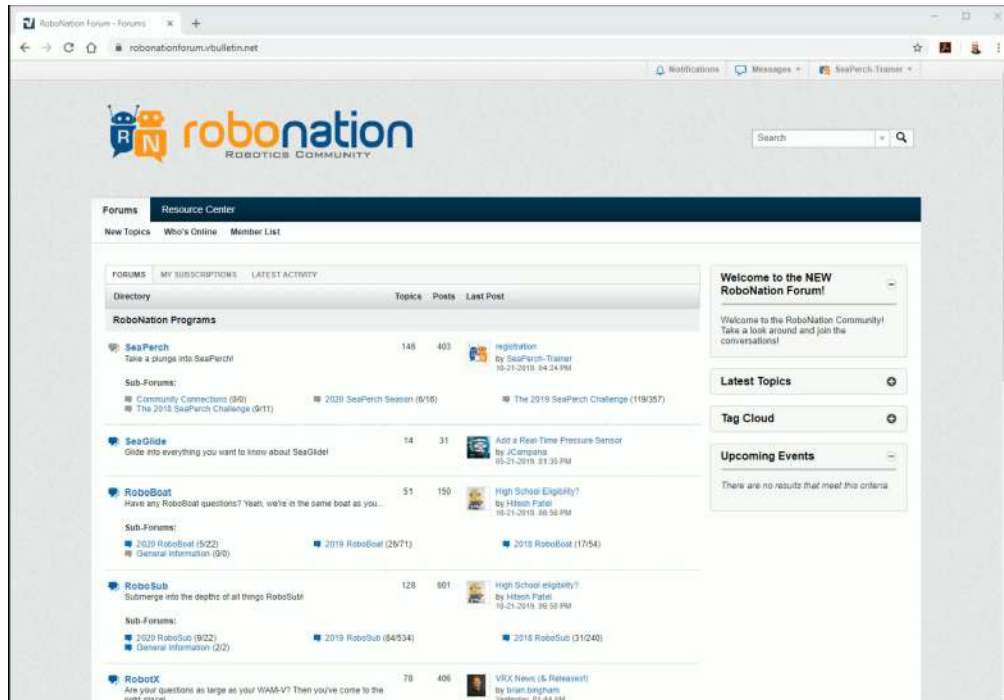


The screenshot shows the YouTube channel page for RoboNation. The channel has 977 subscribers and is currently subscribed to. The main video featured is titled "Resource, Mentor, Recruit | RobotX" with 98 views and is 2:42 long. Below this, there is a section for "#WEAREROBONATION" with a "PLAY ALL" button. A row of five video thumbnails is displayed, each with a duration of 1:59, except for the last one which is 5:01. The thumbnails are: "Mentor with RoboNation | ft. Dr. Dan Frank, Arizona State..." (64 views, 5 months ago), "Recruit with RoboNation | ft. Doug Shaffer, Northrop..." (52 views, 5 months ago), "Resource with RoboNation | ft. Rusty Jehangir, Blue..." (79 views, 5 months ago), "Community at RoboSub" (225 views, 7 months ago), and "Resource, Mentor, Recruit, | RobotX" (58 views, 7 months ago). The left sidebar shows navigation options like Home, Trending, Subscriptions, Library, History, Watch later, Liked videos, and a list of subscriptions including RoboNation, The Things Net., thang010146, James Bruton, and Browse channels. The bottom left corner of the slide features the RoboNation logo, and the bottom right corner features a stylized green and blue logo.



Where to find information & how to get help

<https://robonationforum.vbulletin.net/>



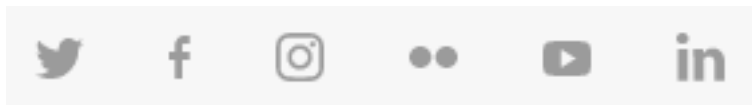
The screenshot shows the RoboNation Forum website. The header features the RoboNation Robotics Community logo and a search bar. Below the header, there are navigation tabs for 'Forums' and 'Resource Center'. The main content area is a directory of forums, organized into sections for RoboNation Programs, SeaPerch, SeaGlide, RoboBoat, RoboSub, and RobotX. Each section lists the forum name, a brief description, the number of topics and posts, and the most recent post. The right sidebar contains a welcome message, latest topics, tag cloud, and upcoming events.

FORUMS	MY SUBSCRIPTIONS	LATEST ACTIVITY
Directory		Topics Posts Last Post
RoboNation Programs		
SeaPerch Take a plunge into SeaPerch!	145	403 registration By SeaPerch-Trainer 10-21-2019, 04:24 PM
Sub-Forums:		
Community Connections (34)	2020 SeaPerch Season (0/16)	The 2019 SeaPerch Challenge (119/287)
The 2018 SeaPerch Challenge (0/11)		
SeaGlide Glide into everything you want to know about SeaGlide!	14	31 Add a Real Time Pressure Sensor By JCampino 09-21-2019, 01:35 PM
RoboBoat Have any RoboBoat questions? Yeah, we're in the same boat as you...	51	150 High School Eligibility? By Hitch Patel 10-21-2019, 08:50 PM
Sub-Forums:		
2020 RoboBoat (5/22)	2019 RoboBoat (26/71)	2018 RoboBoat (17/54)
General Information (90)		
RoboSub Submerge into the depths of all things RoboSub!	128	601 High School eligibility? By Hitch Patel 10-21-2019, 08:50 PM
Sub-Forums:		
2020 RoboSub (9/22)	2019 RoboSub (34/334)	2018 RoboSub (112/40)
General Information (22)		
RobotX Are your questions as large as your WAA-V? Then you've come to the right place!	78	406 VRX News (& Release!) By Brian Langham 10/16/19, 01:44 AM



Where to find information & how to get help

Social Media



#seaperch #seaperchwaterwaycleanup #wearerobonation



Regional Competitions vs. the International Challenge



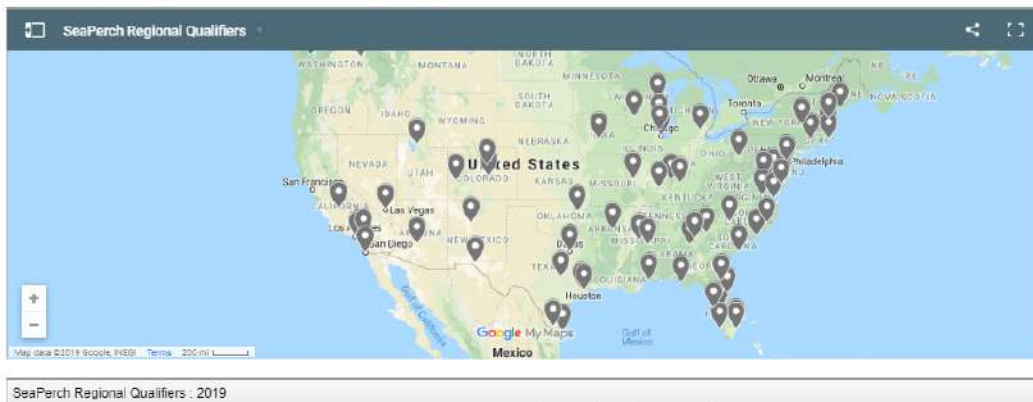
Regional Competitions

Page update for 2020 coming in early November.

SeaPerch competitions are hosted annually by local coordinators around the world. The map and list below include the regional competitions that have been allocated qualifying spaces for an International SeaPerch Challenge.

To sign-up to host a Regional Qualifier for the 2020 SeaPerch Season, please register [here](#). All regional competitions must be registered by (UPDATED) **October 31, 2019** in order to be considered for qualifying spaces.

If you live in an area that has not had or does not show a local qualifying competition for the current season and would be interested in learning more about hosting an event, please contact us at info@seaperch.org.



Classes and Divisions for the 2020 SeaPerch Challenge

2020 SeaPerch Challenge Competition Classes and Design Rules

Rules	Middle School Stock Class		High School Stock Class		Open Class
	PVC Division	Other Materials Division	PVC Division	Other Materials Division	n/a
BUDGET*					
The total cost of modifications to the final ROV must be \$25 or less	X	X	X	X	
The cost of modifications may exceed \$25					X
MATERIALS					
Frame built using only PVC, CPVC, PEX pipe and fittings.	X		X		X
Attachments and non-frame parts made from various materials but may not include 3D printed or additive manufactured parts.	X		X		
Frame and other parts may include 3D printed or additive manufactured parts as well as other materials.		X		X	X
Parts may be made using CNC machinery.					X
POWER SUPPLY					
Must design for and utilize a 12-volt power source	X	X	X	X	X
May utilize a second power source (no more than 12-volts) to power auxiliary equipment					X
MOTORS					
Must include waterproofed motors	X	X	X	X	X
Must use ONLY stock SeaPerch motors (Jameco Electronics 232022) for propulsion**	X	X	X	X	X
Additional non-stock motors may be used for non-propulsion uses	X	X	X	X	X
May include more than 3 thrusters (i.e. Motor and propeller assembly)					X

CONTROLLERS					
May only use simple on/off switches for thruster controls	X	X	X	X	
May use power conditioning or pulse-width modulation (PWM) controls for thruster controls					X
May use microcontrollers such as Arduino or Raspberry Pi for thruster controls					X
May use PWM, microcontrollers, or other devices for non-thruster controls	X	X	X	X	X
May use a fixed or variable resistor to reduce voltage	X	X	X	X	X
STRUCTURE/SIZE					
Must fit through 18" diameter hoop	X	X	X	X	X
COMPETITION CRITERIA					
ROV must not be modified after compliance check (with the exception of buoyancy)	X	X	X	X	X
The same ROV must be used for both pool events	X	X	X	X	X
Team includes a student in 9 th grade or above			X	X	X

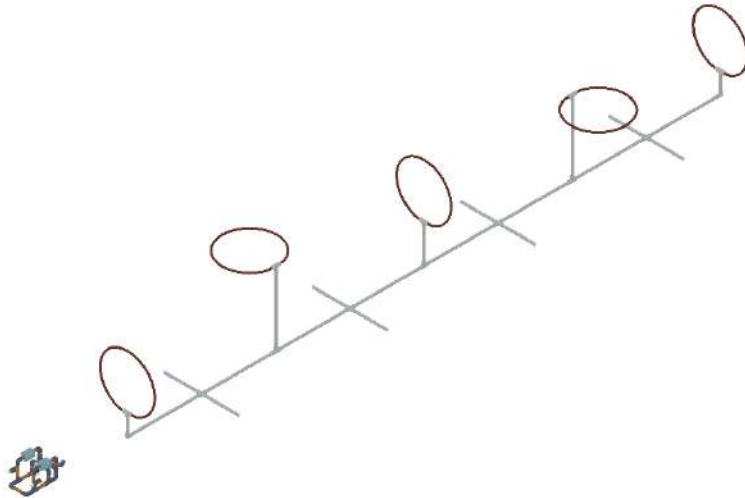
*Budget Guidelines include:

- Donated material will be assessed at what the cost would be to procure the material.
- Spare parts and tools are not included in this budget.
- Materials used on earlier prototypes are not included in this budget. Only materials and supplies used on the competition ROV and controllers that are not part of the standard SeaPerch ROV kit should be included.
- Proof of budget compliance should be made available to the judges upon request.
- 3D printed parts will be costed out at \$0.05 per gram.

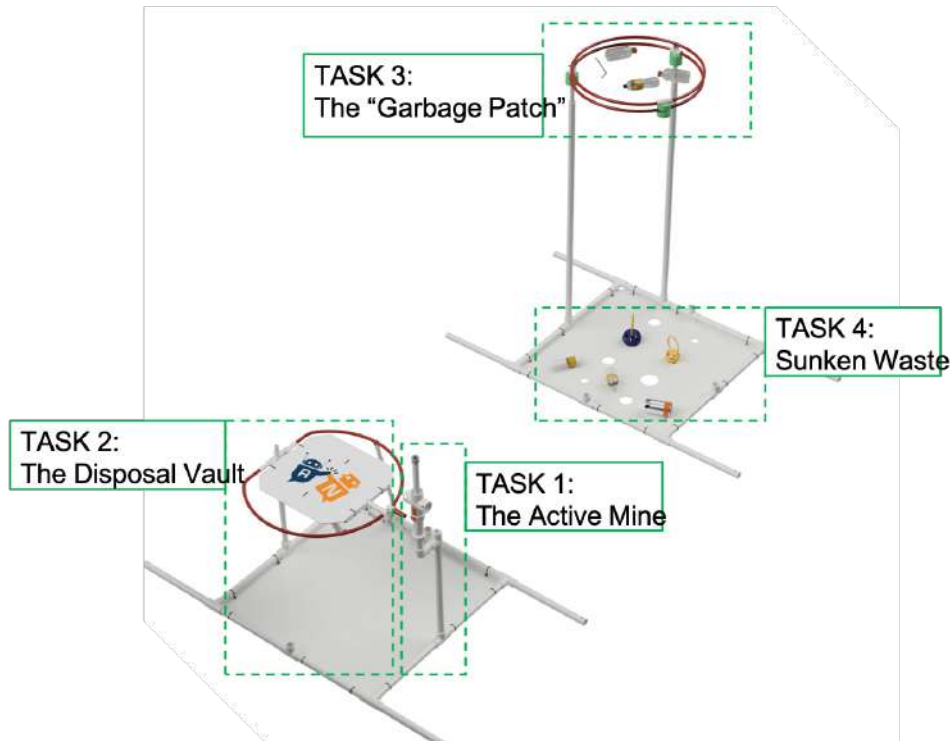
**Thrusters used for propulsion are thrusters that directly exert force against the water causing the ROV to move in any direction



Pool Events: Obstacle Course



Pool Events: Mission Course



Pool Events: Mission Course

Task 2:
The Disposal Vault



Task 1:
Active Mine

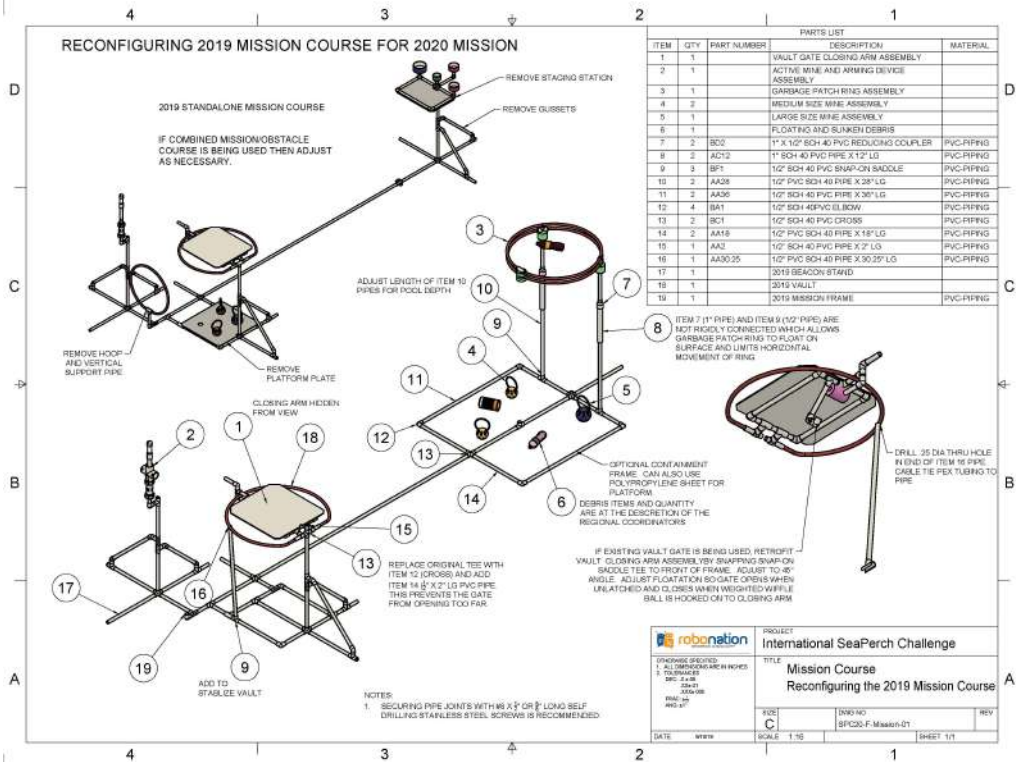


Task 3:
The "Garbage Patch"

Task 4:
Sunken Waste



RECONFIGURING 2019 MISSION COURSE FOR 2020 MISSION



PARTS LIST				
ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
1	1		VAULT GATE CLOSING ARM ASSEMBLY	
2	1		ACTIVE MINE AND ARMING DEVICE ASSEMBLY	
3	1		GARBAGE PATCH RINGS ASSEMBLY	
4	2		MEDIUM SIZE MINE ASSEMBLY	
5	1		LARGE SIZE MINE ASSEMBLY	
6	1		FLOATING AND SINKING DEBRIS	
7	2	BC2	1" X 1/2" SCH 40 PVC REDUCING COUPLER	PVC-PIPING
8	2	AC12	1" SCH 40 PVC PIPE X 12" LG	PVC-PIPING
9	3	BP1	1/2" SCH 40 PVC SNAP-ON SADDLE	PVC-PIPING
10	2	AA28	1/2" PVC SCH 40 PIPE X 38" LG	PVC-PIPING
11	2	AA36	1/2" SCH 40 PVC PIPE X 38" LG	PVC-PIPING
12	4	BA1	1/2" SCH 40 PVC GLEW	PVC-PIPING
13	2	BC1	1/2" SCH 40 PVC CROSS	PVC-PIPING
14	2	AA18	1/2" PVC SCH 40 PIPE X 18" LG	PVC-PIPING
15	1	AA2	1/2" SCH 40 PVC PIPE X 2" LG	PVC-PIPING
16	1	AA30-25	1/2" PVC SCH 40 PIPE X 30.25" LG	PVC-PIPING
17	1		2019 BEACON STAND	
18	1		2019 VAULT	
19	1		2019 MISSION FRAME	PVC-PIPING

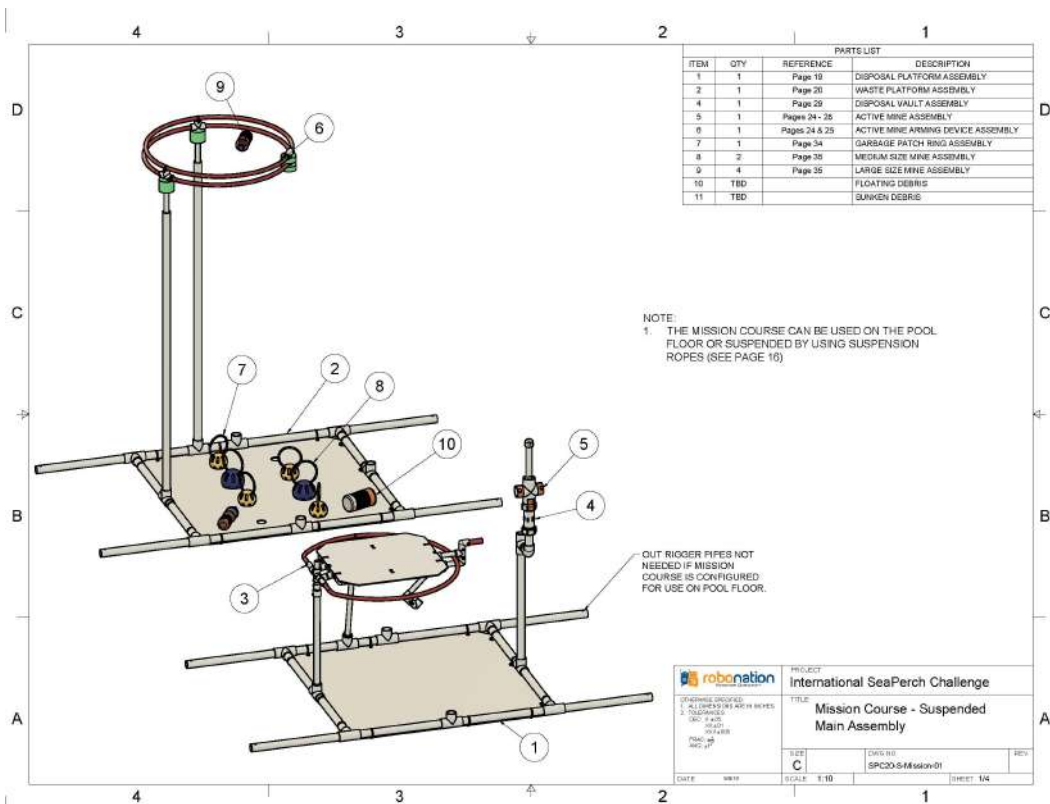
ITEM 7 (1" PIPE) AND ITEM 9 (1/2" PIPE) ARE NOT TIGHTLY CONNECTED WHICH ALLOWS GARBAGE PATCH RING TO FLOAT ON SURFACE AND LIMITS HORIZONTAL MOVEMENT OF RING

OPTIONAL CONTAINMENT FRAME. CAN ALSO USE POLYPROPYLENE SHEET FOR PLATFORM
DEBRIS ITEMS AND QUANTITY ARE AT THE DISCRETION OF THE REGIONAL COORDINATORS

IF EXISTING VAULT GATE IS BEING USED, RETROFIT VAULT CLOSING ARM ASSEMBLY BY SNAPPING SNAP-ON SADDLE TIE TO FRONT OF FRAME. ADJUST TO 90° ANGLE. ADJUST FLOATATION SO GATE OPENS WHEN UNLATCHED AND CLOSERS WHEN WEIGHTED WAFLE BALL IS HOOKED ON TO CLOSING ARM

- NOTES:
1. SECURING PIPE JOINTS WITH W8 X 7 OR 1/2" LONG SELF DRILLING STAINLESS STEEL SCREWS IS RECOMMENDED.

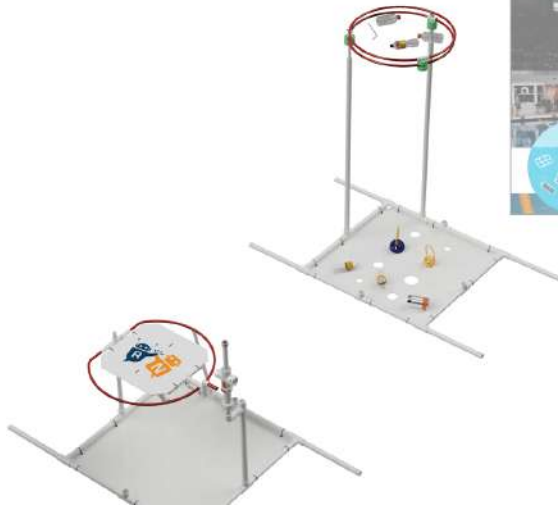
	PROJECT	International SeaPerch Challenge	
	TITLE	Mission Course Reconfiguring the 2019 Mission Course	
COORDINATOR: SHELBY 1. DAVIDSON 2. JAMES 3. JAMES 4. JAMES 5. JAMES 6. JAMES 7. JAMES 8. JAMES 9. JAMES 10. JAMES 11. JAMES 12. JAMES 13. JAMES 14. JAMES 15. JAMES 16. JAMES 17. JAMES 18. JAMES 19. JAMES 20. JAMES 21. JAMES 22. JAMES 23. JAMES 24. JAMES 25. JAMES 26. JAMES 27. JAMES 28. JAMES 29. JAMES 30. JAMES 31. JAMES 32. JAMES 33. JAMES 34. JAMES 35. JAMES 36. JAMES 37. JAMES 38. JAMES 39. JAMES 40. JAMES 41. JAMES 42. JAMES 43. JAMES 44. JAMES 45. JAMES 46. JAMES 47. JAMES 48. JAMES 49. JAMES 50. JAMES 51. JAMES 52. JAMES 53. JAMES 54. JAMES 55. JAMES 56. JAMES 57. JAMES 58. JAMES 59. JAMES 60. JAMES 61. JAMES 62. JAMES 63. JAMES 64. JAMES 65. JAMES 66. JAMES 67. JAMES 68. JAMES 69. JAMES 70. JAMES 71. JAMES 72. JAMES 73. JAMES 74. JAMES 75. JAMES 76. JAMES 77. JAMES 78. JAMES 79. JAMES 80. JAMES 81. JAMES 82. JAMES 83. JAMES 84. JAMES 85. JAMES 86. JAMES 87. JAMES 88. JAMES 89. JAMES 90. JAMES 91. JAMES 92. JAMES 93. JAMES 94. JAMES 95. JAMES 96. JAMES 97. JAMES 98. JAMES 99. 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Possible Practice Prop
Gate Latch & Closing Arm



2020 SeaPerch Challenge Practice Animation



seaperch
CHALLENGE

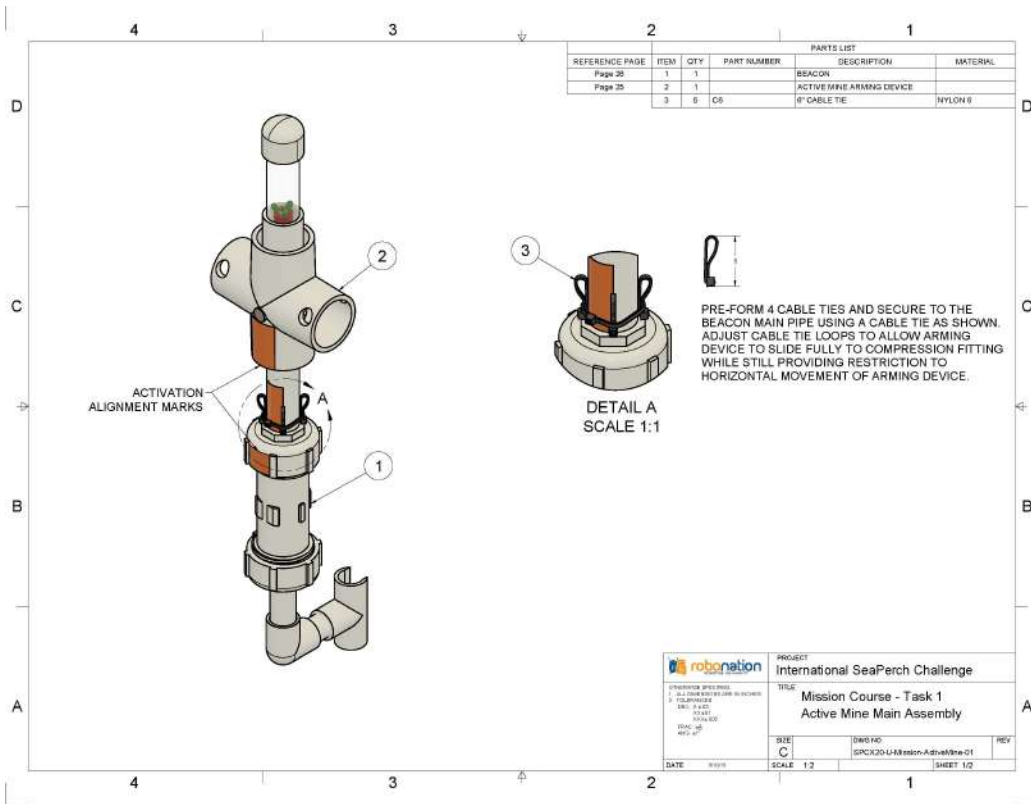
WHERE:

University of Maryland
College Park, Maryland

WHEN:

May 30-31, 2020



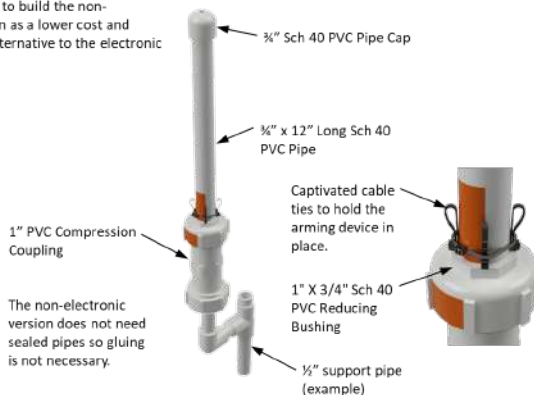
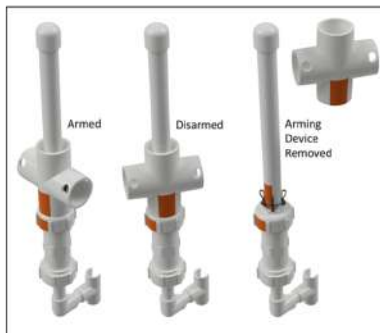


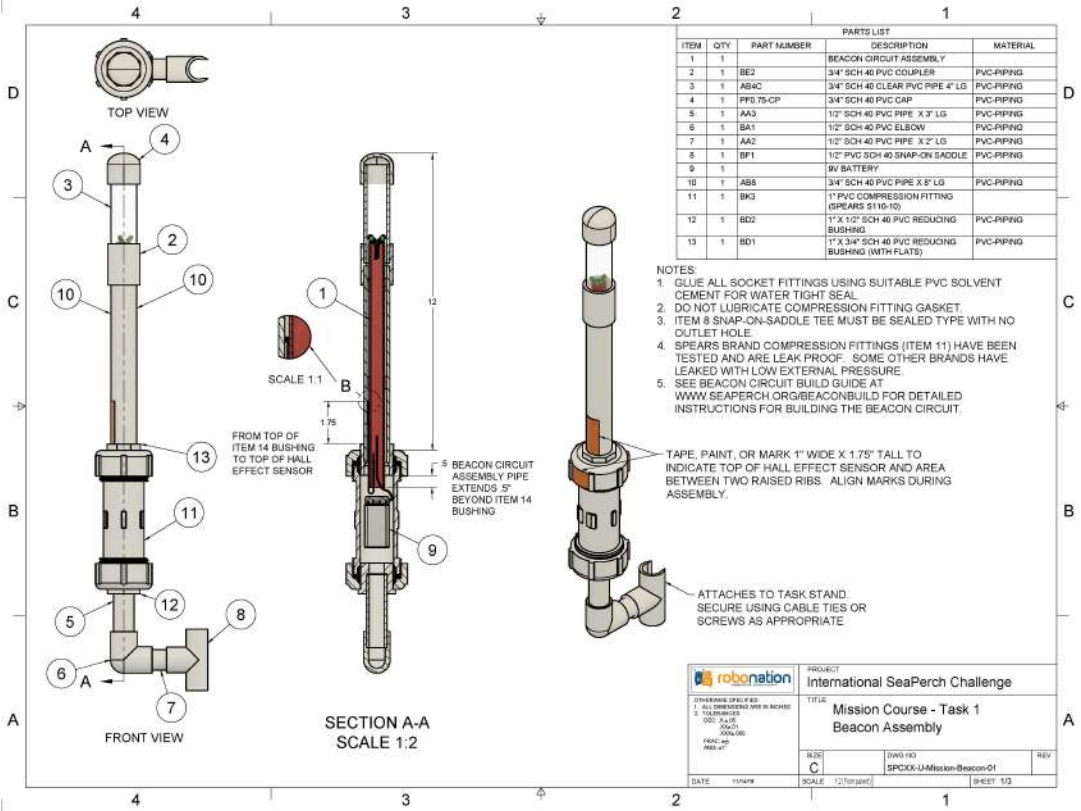
Active Mine – Non-Electronic Version

The 2020 International SeaPerch Challenge Mission course will reuse the 2019 SeaPerch Challenge Beacon as a simulated underwater mine (no real explosives) utilizing LEDs to indicate that the active mine is armed. Teams must rotate or remove an arming device which will disarm the mine and turn off the LEDs.

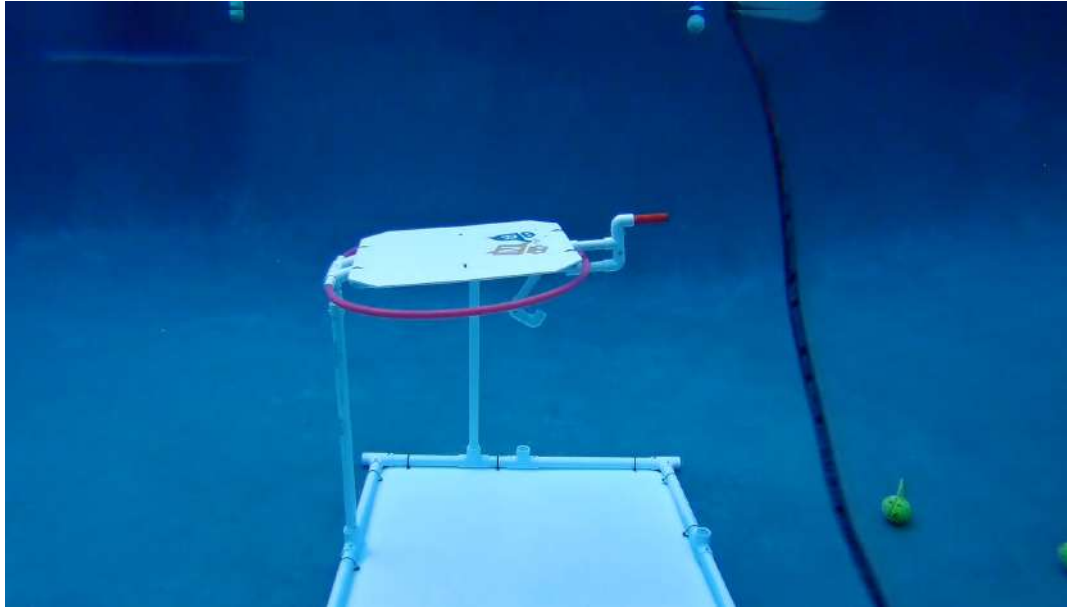
However, a non-electronic version of the active mine can be substituted for use in SeaPerch Regional Competitions that did not build the Beacon in 2019 and by SeaPerch teams for practicing the Active Mine task. Both the electronic and non-electronic versions have indicator markings on the active mine and arming device. For the non-electronic version, the markings serve as the sole indicator that the mine has been disarmed.

SeaPerch Regional Competitions and teams may want to build the non-electronic version as a lower cost and easier to build alternative to the electronic version.





The Disposal Vault Demo



The Garbage Patch Containment Ring



2020 SeaPerch Challenge Marine Debris Objects

The details provided here are for marine debris (floating and sunken trash) used in the 2020 SeaPerch Challenge. Recycled items will be used for this Challenge. Items have been selected based on wide availability and it is recommended that SeaPerch Regional Competition Coordinators use similar items.

Debris used for competitions will vary across regional competitions, please check with your SeaPerch Regional Competition Coordinator for information regarding the regional competition you plan to attend.

Teams will have to create innovative designs that are capable of grabbing or capturing a wide variety of objects of different sizes and shapes in order to complete the Mission Challenge.

Floating Trash – There will be five objects will be floating in the Garbage Patch.

6-Pack Ring with $\frac{1}{4}$ " x 6" long Polypropylene Rope threaded through the 6-pack ring.

Drinking Straw

Large Drink Bottle – 16.9 oz water bottle – half filled with water and capped.

Small Drink Bottle (2) – 12 oz. sports drink bottles – half filled with water and capped.

Sunken Trash – There will be three items of sunken waste and two mines on the Waste Platform. Waste objects will have bright colored tape to increase visibility.

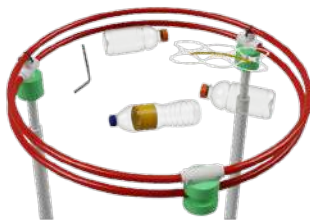
Mines – one large size (i.e. softball size) weighted Wiffle ball, and one medium size (i.e. baseball size) weighted Wiffle ball. Weight = 65 grams water (max).

Food Can – One 16 oz metal food can with lid removed. Weight = 40 grams weight in water.

Small Drink Bottle – 12 oz. sports drink bottle. Weight = 45 grams weight in water.

Large Drink Bottle – 16.9 oz water bottle. Weight = 42 grams in water.

Note: Each drink bottle will be weighted with four $\frac{1}{4}$ " Stainless Steel Washers, 0.055" thick, 1.5" outside diameter (the same washers used in the weighted Wiffle Balls, see <https://www.seaperch.org/2020course> Bill of Materials).



Task 3: The Garbage Patch
(Floating Debris)



Task 4: Sunken Waste



Tips for Coaches Competition Success



The Technical Design Report

Citizen Science Projects (non-scored)



Q&A

