

ENGINEERING EVALUATION - RANGER & EXPLORER		MAX SCORE = 100	
School name and # AS IT APPEARS ON THE OFFICIAL LIST:			
Judge's name:			
1 0 = Yes (1) or No (0)			
4 3 2 1 0 = 4: Outstanding, 3: Exceptional, 2: Excellent, 1: Good, 0: Poor or missing			SCORE
Teamwork/Presentation		20 pts max	
Company was prepared for the presentation		1 0	
Company presented judges with a copy of its company spec sheet as well as any updated technical documentation (e.g. revised SID)		1 0	
Presentation was well thought through, organized, and articulate		3 2 1 0	
Presentation covered the design, building, troubleshooting, and testing process		2 1 0	
Presentation highlighted design innovations/creative ideas		2 1 0	
Presentation described how the company brainstormed ideas to solve the mission and evaluated those ideas against competing alternatives		2 1 0	
Company demonstrates an understanding of the ROV systems, including the science behind them, and operations		3 2 1 0	
Each member participated and understands the basics of the vehicle plus details about at least one system		2 1 0	
Role of each member of the company is acknowledged during the presentation		1 0	
Members demonstrated they encountered challenges with determination and resolve		2 1 0	
Company demonstrates an understanding of the role that ROVs play in the mission theme		1 0	
Overall Design and Workmanship		12 pts max	
Vehicle is ready for the water		1 0	
Tested prior to the event		2 1 0	
<i>Note: Two points for entire vehicle testing prior to event; 1 point for component testing, but not integrated vehicle.</i>			
Company describes a troubleshooting technique(s) that demonstrates an understanding of the technical issues and presents a step-by-step process for addressing them		2 1 0	
Meets competition guidelines for construction (material, non-hazardous materials, etc.); followed design & build specs		1 0	
Components easy to access for maintenance & troubleshooting		2 1 0	
Is robust; constructed for durability with attention to craftsmanship and marketability to potential customers		2 1 0	
Company effectively describes how the ROV was built to accomplish mission		2 1 0	
Safety		10 pts max	
Company describes its safety philosophy and practices during design and development		2 1 0	
Presentation included specific safety features of vehicle		2 1 0	
Vehicle visually displays warning labels and safeguards		1 0	
Fuse(s) in place on the positive side		1 0	
Company describes safety precautions necessary while handling/operating the vehicle		1 0	
Company describes examples of safety incidences (from band-aids to accidents avoided)		1 0	
Company developed and shared a copy of its own safety checklist or protocol that is organized and well-thought through		1 0	
<i>Note: The checklist is NOT the safety inspection checklist provided by the competition. If the competition's is used, score as a 0.</i>			
Vehicle built according to the competition safety requirements and has passed the safety inspection (inspection sheet presented to judges)		1 0	
Systems Design and Operation			
Overall Vehicle System		4 pts max	
Company describes cost analysis that went into selecting components		2 1 0	
Company describes how functionality is increased with design or component selections		2 1 0	

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Vehicle Systems	14 pts max	
<u>Original vs. commercial design</u>		
Are the majority of the components designed & built by the company?	4 3 2 1 0	
To the extent that commercial components are used, is a valid justification and technical description provided for each commercial component?	3 2 1 0	
<u>New vs. re-used components from "last year"</u>		
Are the majority of the components new this year?	4 3 2 1 0	
To the extent that components are re-used, is a valid justification and technical description provided for each re-used component?	3 2 1 0	
Control and Electrical System	10 pts max	
Control system is thought through and designed logically	2 1 0	
Components logically and neatly incorporated	2 1 0	
Computer or Manual Controllers		
<i>Note: Score one set OR if a hybrid system, score 2 points computer, 2 points manual (The middle bullet is the same for each.)</i>		
<u>Computer</u> - software code follows logical flow	2 1 0	
- designed by students	2 1 0	
- company has a good command of s/w flow	2 1 0	
	OR	
<u>Manual</u> - switches laid out intuitively	2 1 0	
- designed by students	2 1 0	
- students are able to manipulate switches easily	2 1 0	
Propulsion	5 pts max	
Thrusters are securely attached	1 0	
Thrusters do no obstruct water flow	1 0	
Thrusters are waterproofed and protected	1 0	
Company describes rationale for number and layout of thrusters	2 1 0	
Buoyancy and Ballast	4 pts max	
Company describes how buoyancy/ballast system takes missions into account	2 1 0	
Company demonstrates application and knowledge of skills in selection and usage of particular buoyancy system	2 1 0	
Sensors	8 pts max	
Company describes rationale for number and layout of cameras	2 1 0	
Sensors are appropriate to accomplishing the mission	1 0	
Sensors are an original design or modification of an existing design (vs. commercial) and demonstrate unique features to accomplish the mission	3 2 1 0	
Company demonstrates application of knowledge and skills in design/selection of sensors	2 1 0	
Payload Tools	7 pts max	
Payload tools are appropriate for accomplishing the mission	2 1 0	
Payload tools are an original design or modification of an existing design (vs. commercial) and demonstrate unique features to accomplish the mission	3 2 1 0	
Company describes rationale for design and how those features contribute to accomplishing the mission	2 1 0	
Tether	3 pts max	
Tether is securely attached to and appropriately positioned on the ROV	1 0	
Tether is neatly bundled and protected and not a tripping hazard	1 0	
Company developed a tether management protocol	1 0	

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Budget		3 pts max
Company describes how budget was developed and adhered to (or not) during the project		1 0
Company lists purchased, re-used, and donated components		1 0
Companies acknowledges organizations and/or individuals who contributed funds, equipment, and/or technical/moral support		1 0
ENGINEERING EVALUATION SCORE:		
Discretionary Points		3 pts max
Bonus points for a job well done		3 2 1
Deductions		-15 pts max
Company mentions that work was done by commercial companies and/or instructors or mentors and not able to provide a valid justification why		0 -3 -5
Interference or coaching by mentors, parents, etc. during presentation (beyond helping with language barrier issues)		0 -1 -3
Overuse of commercial components without adequate justification		0 -3 -5
Overuse of re-used components without adequate justification		0 -3 -5
TOTAL ENGINEERING EVALUATION SCORE:		

Comments: