

Engineering Evaluation – Judge’s Evaluation Sheet

School/Team: _____ RANGER or EXPLORER (circle one)

Judge: _____

Judges: Please note and record each bullet as 3, 2, 1, or 0 points. Record your score in the space provided (a perfect score is 100).

+3 = exceptional **+2** = good **+1** = average **0** = poor or lacking

OVERALL DESIGN & WORKMANSHIP

	+3	+2	+1	0
<ul style="list-style-type: none"> Is the vehicle complete – is it ready for the water or does it still need work? Has testing been done prior to the event? 				
<ul style="list-style-type: none"> Is the vehicle built within the imposed design and safety constraints? 				
<ul style="list-style-type: none"> Are warning labels and/or guards on potentially hazardous components? Is it made of non-corrosive materials? Is there a danger of hazardous materials being released into pool? 				
<ul style="list-style-type: none"> Is the vehicle built to accomplish the missions? 				
<ul style="list-style-type: none"> Are the vehicle and its systems well laid-out, secure, and robust? Are components easy to access for maintenance and troubleshooting? 				
<ul style="list-style-type: none"> Did the team make the best use of the resources they had available (i.e., tools, shop space, mentors, etc.)? 				

SYSTEMS DESIGN & OPERATION

Overall vehicle systems:

Maximum = 10pts

<ul style="list-style-type: none"> Did the team build their vehicle’s systems from individual components (which may have been built from scratch or obtained commercially) OR did the team use complete, commercially available, off-the-shelf, plug-and-play systems? <p>If the team used plug-and-play systems, was this use excessive or limited to one system?</p> <p>Note: This is designed to award points to teams that DID NOT use plug-and-play systems.</p>	
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Control/Electrical system:

+3 +2 +1 0

	+3	+2	+1	0
<ul style="list-style-type: none"> Is the control system scheme well thought out and designed logically and functionally? Are all components logically and neatly incorporated? 				
<ul style="list-style-type: none"> Are the electrical systems neatly run, wired, secured, and waterproofed? 				
<ul style="list-style-type: none"> Are fuse(s) in place? (Note: In the RANGER class, MATE will also place a fuse in-line between the positive battery terminal and the vehicle.) 				



	+3	+2	+1	0
<ul style="list-style-type: none"> Are the controllers computer or manual? <ul style="list-style-type: none"> Computer – is the software code well thought through? Was it designed by the students? Do the students have a good command of the software flow? Manual – are the switches laid out intuitively? Are the switches labeled? Are the students able to manipulate the switches easily? 				

Propulsion:	+3	+2	+1	0
<ul style="list-style-type: none"> Are the thrusters the appropriate size and number to allow the vehicle to accomplish the missions? 				
<ul style="list-style-type: none"> Are the thrusters securely attached, no obstructions to water flow, waterproofed, and shrouded? 				

Buoyancy/Ballast:	+3	+2	+1	0
<ul style="list-style-type: none"> Does the vehicle have a buoyancy/ballast system? Does the system take stability and the mission tasks into account? 				

Sensors:	+3	+2	+1	0
<ul style="list-style-type: none"> Is a camera present, waterproofed, and no obstructions to view? 				
<ul style="list-style-type: none"> Are other sensors present? Are these sensors commercial, off-the-shelf units or home-built? 				

Payload:	+3	+2	+1	0
<ul style="list-style-type: none"> Is the payload tool(s) appropriate for accomplishing the mission tasks? 				
<ul style="list-style-type: none"> Are there unique features incorporated into the payload tools? 				

Tether:	+3	+2	+1	0
<ul style="list-style-type: none"> Is the tether securely attached, neatly bundled, and protected? 				
<ul style="list-style-type: none"> Tether management – is the tether easy to handle? Has the team developed a tether management protocol? 				

<u>ORIGINALITY</u>	+3	+2	+1	0
<ul style="list-style-type: none"> Are there unique and/or original concepts in the vehicle's design and systems? 				
<ul style="list-style-type: none"> Are there innovations that increase safety? 				



	+3	+2	+1	0
• Are there innovations or modifications that result in higher functionality and lower costs?				
• Is it apparent that the student team members (and NOT the instructors or mentors) completed the actual construction of the vehicle, particularly in the complex electrical and software areas?				

TEAMWORK/PRESENTATION

	+3	+2	+1	0
• Overall, was the presentation professional and the team well prepared?				
• Was the presentation well thought out, organized, and articulate?				
• Did the team as a whole demonstrate superior understanding of the ROV systems and operation?				
• Did each team member demonstrate an understanding of the vehicle and its systems and operation?				
• Did the students exemplify teamwork and the ideals behind working well together?				
• Did the students demonstrate that, while they encountered challenges, they faced them as a team with determination and resolve as well as a sense of humor?				

DISCRETIONARY POINTS

	+3	+2	+1	0
• Opportunity to award the team “bonus” points for a job well done.				

ENGINEERING EVALUATION SCORE (100 points max): _____