

<b>TECHNICAL REPORT - RANGER &amp; EXPLORER</b>		<b>MAX SCORE = 100</b>	
<b>School name and # AS IT APPEARS ON THE OFFICIAL LIST:</b>			
<b>Judge's name:</b>			
<b>1 0 = Yes (1) or No (0)</b>			
<b>4 3 2 1 0 = 4: Outstanding, 3: Exceptional, 2: Excellent, 1: Good, 0: Poor or missing</b>			<b>SCORE</b>
<b>Overall Presentation</b>		<b>13 pts max</b>	
Report is 25 pages or less		1 0	
Measurements are in SI units (exceptions include 1/2-inch PVC, etc.)		1 0	
Report is well thought out, logically organized, and concise		3 2 1 0	
<i>Note: The report should follow a logical flow and not necessary the order presented in the specs, where budget comes before the rationale.</i>			
Report is "professional" and well written (e.g. attention to spelling, grammar, sentence structure)		2 1 0	
Includes a table of contents		1 0	
Report clearly describes how the vehicle was designed to accomplish the missions		2 1 0	
Report demonstrates an understanding of the technical and scientific concepts behind designing and building the vehicle		3 2 1 0	
<b>Title Page Contains</b>		<b>3 pts max</b>	
Includes all elements as specified in the guidelines <i>(Company name; school, club, or organization's name, city, and state; lists members of the company and their role; name of instructor/mentor)</i>		1 0	
Presents a professional view of the company		2 1 0	
<b>Abstract</b>		<b>3 pts max</b>	
Is 250 words or less		1 0	
Concise and clear summary of the company's work		2 1 0	
<b>Photos of ROV</b>		<b>5 pts max</b>	
Complete, intact photo of the vehicle is included		1 0	
Includes additional photos to help fully capture the design of the ROV		1 0	
Photo captions or descriptions accompany photos		1 0	
A mechanical drawing or sketch is included (may be of a sub-system)		2 1 0	
<i>Note: A mechanical drawing is defined as a scale graphical representation of the part or system to convey manufacturing information. The intent is to deem excellence if the drawing/sketch is particularly well done.</i>			
<b>Budget</b>		<b>7 pts max</b>	
Math accurate		1 0	
Presents a detailed accounting of funds that makes a distinction among items purchased, re-used, and donated		3 2 1 0	
<i>Note: View this as a "snapshot" as of the date it was submitted (May 29th). Companies were encouraged to note which expenses were estimates (e.g. travel to/from the competition) as well as what expenses were anticipated but had not been realized as of this date.</i>			
In addition to parts and materials, accounts for time and services either paid for or donated (e.g. local machine shop donates time on its equipment)		2 1 0	
Includes a fair market value for donations listed		1 0	
<i>Note: If no donations are listed, score as a 1</i>			
<b>System Integration Diagram (SID)</b>		<b>6 pts max</b>	
Created using CAD		1 0	
Makes a clear distinction between the surface controls and the ROV		1 0	
Discloses presence of fuse/circuit breaker		1 0	
Is a system-level, connection diagram (nota board or component-level schematic)		1 0	
If fluid power is used, includes a fluid power SID		1 0	
<i>Note: If fluid power is NOT used, score as a 1</i>			
Uses ANSI, NEMA, or IEC recognized electrical, hydraulic, and/or pneumatic symbols		1 0	

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<b>Design Rationale</b>		<b>15 pts max</b>
Presented in a clear and logical manner		3 2 1 0
Demonstrates step-by-step planning and design process		2 1 0
Describes how the company brainstormed ideas to solve the mission tasks and evaluated those ideas against competing alternatives		4 3 2 1 0
Effective (and not over-) use of images, schematics, and data to communicate their "story"		2 1 0
Demonstrates acquisition and application of technical skills		2 1 0
A flowchart describes the software flow OR rationale is provided describing why a hardware only approach was selected		2 1 0
<b>Troubleshooting Techniques</b>		<b>4 pts max</b>
Explains a troubleshooting technique(s)		2 1 0
Describes any testing done on components or the vehicle		2 1 0
<i>Note: Two points if whole vehicle was tested; one point for component testing only</i>		
<b>Vehicle Systems</b>		<b>14 pts max</b>
<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
<b>Safety</b>		<b>8 pts max</b>
Includes a safety section		1 0
Describes company safety philosophy and practices during design and development of ROV		2 1 0
Describes specific safety features of vehicle		2 1 0
Describes safety precautions necessary while handling/operating the vehicle		1 0
Includes examples of safety incidences (from band-aids to accidents avoided)		1 0
Company shares a copy (preferably as an appendix) of its own safety checklist 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>		
<b>Challenges</b>		<b>4 pts max</b>
Describe at least one challenge faced		2 1 0
<i>Note: Two points if both a technical and a non-technical challenge are described</i>		
Method(s) used to overcome the challenge(s)		2 1 0
<i>Note: Two points if both a technical and a non-technical method are described</i>		
<b>Lessons Learned</b>		<b>4 pts max</b>
Lesson learned or skill gained relating to the process – technical		2 1 0
Lesson learned or skill gained relating to the process – interpersonal		2 1 0
<b>Future Improvements</b>		<b>2 pts max</b>
Thoughtful and logical discussion of a least one improvement		2 1 0
<b>Reflections</b>		<b>2 pts max</b>
Thoughtful personal or professional accomplishments from competition participation presented as a team or as individual team members		2 1 0

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<b>Teamwork</b>		<b>7 pts max</b>
Company demonstrates that the vehicle (and the report) was a company effort		2 1 0
Company demonstrates that its members, and not mentors or working professionals, designed and built vehicle, particularly electrical and software		2 1 0
Company developed specific assignments to design/build the vehicle		1 0
Company developed a schedule to aid in building the vehicle and describes how they kept to or strayed from it		2 1 0
<b>References</b>		<b>1 pt max</b>
Lists any books, journal articles, web sites, etc. used as sources of information		1 0
<b>Acknowledgements</b>		<b>2 pts max</b>
Companies, individuals who contributed funds, equipment, and/or technical/moral support are acknowledged		1 0
Recognizes the MATE Center and/or regional contest coordinators		1 0
<b>TECHNICAL REPORT SCORE:</b>		
<b>Discretionary Points</b>		<b>3 pts max</b>
Bonus points for extraordinary work		3 2 1
<b>Deductions</b>		<b>-13 pts max</b>
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
Overuse of commercial components without adequate justification		0 -3 -5
Use of appendices		-3
<b>TOTAL TECHNICAL REPORT SCORE:</b>		

**Comments:**