2018 MATE ROV COMPETITION TECHNICAL DOCUMENTATION SCORE SHEET - RANGER AND EXPLORER

JUDGE NAME:

COMPETITION CLASS:

TEAM #:

COMPANY/SCHOOL NAME: N/A

Category	Criteria	Scoring Requirements	Enter your scores here	Raw Score	Points Possible by category	Raw %	Weight	Category Score	Comments
Overall Presentation				0	60	0%	20%	0.00	
	Document specifications								
	All 4 requirements met = 4 points 3 requirements met = 3 points 2 requirements met = 2 points 1 requirement met = 1 point	Document meets the following requirements: length no more than 25 pages, font size of at least 12 points, table of contents included, all measurements are in SI units (except things traditionally specified in other units, e.g. PVC diameter)		0					
	Use same scale as above	Title page meets the following content requirements: company name, organization/school name and location (city, state), team members and their roles, and mentor name(s)		0					
		Abstract provides clear, concise summary of work in 250 words or less		0					
	Use of images and data								
		Photo of complete vehicle is included		0					
		Effective use of images, diagrams, and data to communicate the design and thought process		0					
		Photos accompanied by appropriate captions		0					
		Includes at least one effective mechanical drawing or sketch		0					
		Diagrams and drawings use sensible labeling of signals, dimensions and components		0					
	Understanding								
		Demonstrates clear understanding of the technical and scientific concepts and their relationship to vehicle design and implementation		0					
		Document clearly describes the vehicle design and building process		0					
	Document Design								
		Thorough attention to grammar and spelling		0					
		Document is thoughtfully prepared, with thorough attention paid to messaging strategy and aesthetic presentation		0					
		Document presents a professional view of the company		0					
	Acknowledgements and References								
		Document provides a properly documented list of references - books, journals, web sites, etc. used as sources; documented contributions of companies, individuals who contributed funds, equipment, and/or technical/moral support		0					
		Document provides adequate acknowledgement of contributions of companies and individuals that contributed funds, equipment, and/or other support to the team		0					

Category	Criteria	Scoring Requirements	Enter your scores here	Raw Score	Points Possible	Raw %	Weight	Category Score	Comments
Teamwork				0	20	0%	10%	0.00	
	Company Effort								
		Document clearly demonstrates that the vehicle and report were team efforts, not done by mentors or working professionals		0					
	Project Management								
		Team developed and maintained a schedule to aid in building the vehicle		0					
		Describes the organizational and planning processes and activities used		0					
		Describes how resources, procedures, and protocols were managed to meet mission objectives and solve day to day operational problems		0					
		Describes how specific team roles were assigned to design/build the vehicle		0					
Design Rationale				0	44	0%	30%	0.00	
	Content								
		Describes a logical, step-by-step planning and design process		0					
		Describes how design ideas were originated, evaluated, and selected		0					
		Data was used to compare and select from among alternative designs		0					
		The science or techniques behind the tasks is discussed		0					
		Provides clear description and sensible rationale for design choices related to cost, size, and weight		0					
	Understanding								
		Demonstrates a detailed understanding of the science/industry mission		0					
		Provides clear description and sensible rationale relating designs choices and specifications to meet mission task requirements		0					
	Build vs. buy, new vs. used:								
	Justification								
		Provided justifications for build vs. buy decisions		0					
		Provided justifications for new vs. re-used decisions		0					
	Understanding								
		Demonstrated comprehension of engineering principles of both their built and bought components		0					
		Demonstrated comprehension of engineering principles of both their new and re-used components		0					
SID				0	12	0%	5%	0.00	
	System Integration Diagrams								
	All 4 requirements met = 4 points 3 requirements met = 3 points 2 requirements met = 2 points 1 requirement met = 1 point	SID meets requirements: made using CAD, distinguishes between surface controls and the ROV, includes fuse/circuit breaker and shows its location, and uses ANSI, NEMA or IEC recognized electrical, hydraulic, and/or pneumatic symbols		0					
		SID has appropriate level of detail: is a system level/connection diagram (not a board or component-level schematic)		0					
		An appropriate block diagram of system controls is provided: i.e. a software block diagram/flow chart, or other SID detailing fluid power or mechanical controls. If mechanical controls are used, a sound rationale is provided.		0					

Category	Criteria	Scoring Requirements	Enter your scores here	Raw Score	Points Possible	Raw %	Weight	Category Score	Comments
Safety				0	16	0%	10%	0.00	
	Content								
		Document highlights safety features and philosophy		0					
		Document describes how the vehicle is designed and built to meet safety requirements		0					
	Safety procedures								
		Document describes substantive operational safety protocols		0					
		Document describes checklists for construction and operation		0					
Critical Analysis				0	32	0%	10%	0.00	
	Testing and Troubleshooting								
		Describes how (complete) vehicle was tested		0					
		Describes troubleshooting strategies and techniques used		0					
		Describes use of prototyping and testing to evaluate design options		0					
	Challenges								
		Describes at least one significant technical challenge encountered, and the process used to resolve it		0					
		Describes at least one significant interpersonal or organizational challenge encountered, and the process used to resolve it		0					
	Lessons Learned								
		Describes technical lessons learned		0					
		Describes interpersonal or management lessons learned		0					
		Describes development of skills		0					
Future Improvements				0	4	0%	5%	0.00	
	Reflection								
		Provides a thoughtful and logical discussion of at least one potential improvement to design, design process, or project management		0					
Accounting*	**See supplemental info tab for more information*			0	24	0%	10%	0.00	
	Budget								
		Thorough and accurate description of budget planning and following		0					
		Reasonable travel expense estimates are provided		0					
	Cost accounting								
		Overall accounting is thorough and accurate		0					
		A clear distinction is made between items purchased, re-used, and donated		0					
		All income sources are acknowledged and estimates of the fair market value of donations (items, services, and time) are reasonable		0					
		Accounting reflects effective use of funds		0					
				0	212		100%	0.00	Base Score
				Raw Score	Max Points (cat)		Total % (check:100)		

Category	Criteria	Scoring Requirements	Enter your scores here	Raw Score	Points Possible	Raw %	Weight	Category Score	Comments
Discretionary Points			**0-4 pts each**	0	12		1	0	Discretionary points
		Document describes exceptional design of vehicle, sensors, instruments, software, tools or other features		0					
		Team developed exceptional original software or made exceptional adaptation of software to create a unique solution		0					
		Documents describes remarkable effort to design and manufacture every component of the vehicle		0					
Deductions			**0-4 pts each**	0	12		1	0	Deduction points
		Components designed/implemented by a commercial company without adequate justification		0					
		Evidence that the work was performed by coaches, mentors, parents, or other non-team members		0					
		Significant overuse of commercial or reused components without adequate justification		0					
								0	Final Score

Other Comments

Scoring Rubric (applies to all score Items)	Outcome	Criteria	Score
	Missing	Not included, can't evaluate	**0**
	Needs work	Effort made, meets some key requirements. Understanding or treatment of key requirements needs more depth	**1**
	Partially meets requirement	Response demonstrates understanding and addresses most key requirements	**2**
	Meets requirement	Response demonstrates thorough understanding and addresses all key requirements	**3**
	Exceeds requirement	Response extends beyond key requirements, demonstrating exceptional depth and breadth of understanding	**4**

Discretionary Points Rubric	Degree	Points
Criteria: **- Novelty** **- Depth of Understanding** **- Depth of Analysis** **- Effectiveness (functions as intended)** **- Quality of Implementation**	**None**	**0**
	Minor	**1**
	Fair	**2**
	Good	**3**
	Extraordinary	**4**

Deductions Rubric	Degree	Deduction
Criteria: **- Extent to which team relied on outside help, existing work and/or purchased components and services**	**None**	**0**
	Minor	**1**
	Fair	**2**
	Medium	**3**
	Extreme	**4**

Technical Report Rubric Supplemental Information

PHOTOGRAPH OF YOUR COMPLETED ROV

In your technical documentation you must include at least one photo(s) of your completed, assembled vehicle, in addition to any photos of individual systems and/or payload.
You are permitted to make modifications that may change the look of your vehicle between the time you submit your report and the competition.
NOTE: Reports will not be re-evaluated and rescored for any changes to your vehicle from the time that you submit your documentation and the competition.

SID

See the Design and Building Specifications section of the competition manual for guidance on creating your system interconnetion diagram (SID).

ACCOUNTING

Budget

At the beginning of the project, companies should establish a budget.
A budget is different than a project costing sheet (see the next bullet) in that it is a projection of the cost of the project.
Companies should create categories and realistically estimate what they think that they will spend in each.
If well-thought through, the project costing will align with the budget (i.e., the amount budgeted for a certain category will be the actual amount spent!).
The budget can be included as an appendix.
Budgets typically don't provide estimates for every part, either just the overall categories or the categories and larger purchases.
How the budget is split up will be different for each company, though it is suggested that the company goes further than just a budget of parts and travel (for example, break it up into the overall components, chassis, electrical, travel, etc.)
Including items being re-used in the budget can be helpful to figure out how much the team estimates it will need to raise funds for.

Example Budget:

Budget

			Reporting period	
School Name:		Zande High School	From:	12/1/2014
Instructor/Sponsor:		Jill Zande	To:	5/28/2014

Income

Income at start of project (if any)

Source				Amount
Zande High School Grant				$ 1,000.00

Expenses

Category	Type*	Description/Examples	Projected Cost	Budgeted Value
Hardware	Purchased	PVC pipe, tees	$ 2,000.00	$ 2,000.00
Electronics	Purchased	Control boards, wire	$ 500.00	$ 500.00
	Re-used	Logitech Extreme 3D Pro	$ 35.00	$ -
	Donation	2 SeaBotix Thrusters	$ 2,600.00	$ -
Sensors	Purchased	Lights Camera Action SS-AquaCam	$ 1,000.00	$ 1,000.00
Travel	Purchased	1 round-trip airfare to St. John's	$ 1,500.00	$ 1,500.00
General	Purchased	Marketing material, transportation packaging	$ 150.00	$ 150.00
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -

***Items must fall into one of the following:**

Purchase - defined as items that will be purchased new or services paid for.

Re-use - defined as items that were purchased in previous years. Amount MUST be listed as the current market value.

Donation - defined as equipment, materials, and time that were contributed to your company.

Total Income:	$ 1,000.00
Total Expenses:	$ 7,785.00
Total Expenses-Re-use/Donations:	$ 5,150.00
Total Fundraising Needed:	$ (4,150.00)

Project costing

Project costing is an accounting of your income, donations, and expenditures.

Items must be listed as one of the following: purchased, re-used, parts donated, or cash donated.

For re-used or donated items, report the item's current market value and note the source or organization that made the donation.

Example Project Costing:

PROJECT COSTING

						Reporting period	
School Name:				Zande High School		From: 12/1/2014	
Instructor/Sponsor:				Jill Zande		To: 5/28/2014	
Funds							
Date	**Type***	**Category**	**Expense**	**Description**	**Sources/Notes**	**Amount**	**Running Balance**
12/1/2014	Purchased	Hardware	PVC	PVC pipe, tees	Used for vehicle frame	$ (200.00)	$ (200.00)
12/5/2014	Re-used	Electronics	Joystick	Logitech Extreme 3D Pro	Used for control system	$ (35.00)	$ (235.00)
1/10/2015	Parts donated	Sensors	Camera	Lights Camera Action SS-AquaCam	Won at a previous competition	$ (600.00)	$ (835.00)
1/31/2015	Purchased	Travel	Airfare	1 round-trip airfare to St. John's	Chaperone's ticket	$ (900.00)	$ (1,735.00)
2/2/2015	Cash donated	General		Funds donated by local Rotary Club	Used for general vehicle construction	$ 500.00	$ (1,235.00)
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
							$ -
	***Items must fall into one of the following:**						
	Purchased - defined as items that are purchased new or services paid for.					Total Raised	$ 500.00
	Re-used - defined as items that were purchased in previous years. Amount MUST be listed as the current market value.					Total Spent	$ (1,735.00)
	Parts donated - defined as equipment, materials, and time that were contributed to your company. Do NOT include items given to your school for general use.					Final Balance	$ (1,235.00)
	Cash donated - defined as funds contributed to your company. Do NOT include funds given to your school for general use.						