

2017 MATE ROV COMPETITION TECHNICAL DOCUMENTATION SCORE SHEET - RANGER AND EXPLORER

JUDGE NAME:

COMPETITION CLASS:

TEAM #:

COMPANY/SCHOOL NAME:

| Category | Criteria | Scoring Requirements | Raw Score | Points Possible | Raw % | Weight | Category Score | Comments |
|-----------------------------|--|--|-------------|-----------------|-------|--------|----------------|----------|
| | | | by category | | | | | |
| Overall Presentation | | | | 60 | | 20% | | |
| | 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 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) | | | | | | |
| | Use same scale as above | Title page meets content requirements: company name, organization/school name and location (city, state), team members and their roles, and mentor name(s) Abstract provides clear, concise summary of work in 250 words or less | | | | | | |
| | Use of images and data | | | | | | | |
| | | Photo of complete vehicle is included Effective use of images, diagrams, and data to communicate the design and thought process Photos accompanied by appropriate captions Includes at least one effective mechanical drawing or sketch Diagrams and drawings use sensible labeling of signals, dimensions and components | | | | | | |
| | Understanding | | | | | | | |
| | | Demonstrates clear understanding of the technical and scientific concepts and their relationship to vehicle design and implementation Document clearly describes the vehicle design and building process | | | | | | |
| | Document Design | | | | | | | |
| | | Thorough attention to grammar and spelling Document is thoughtfully prepared, with thorough attention paid to messaging strategy and aesthetic presentation Document presents a professional view of the company | | | | | | |
| | 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 support to the team Document provides adequate acknowledgement of contributions of companies and individuals that contributed funds, equipment, and/or other support to the team | | | | | | |
| Teamwork | | | | 20 | | 10% | | |
| | Company Effort | | | | | | | |
| | | Document clearly demonstrates that the vehicle and report were team efforts, not done by mentors or working professionals | | | | | | |
| | Project Management | | | | | | | |
| | | Team developed and maintained a schedule to aid in building the vehicle Describes the organizational and planning processes and activities used Describes how resources, procedures, and protocols were managed to meet mission objectives and solve day to day operational problems Describes how specific team roles were assigned to design/build the vehicle | | | | | | |

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|--|--|--|-----------|-----------------|-------|--------|----------------|----------|
| Design Rationale | | | | 44 | | 30% | | |
| | Content | Describes a logical, step-by-step planning and design process Describes how design ideas were originated, evaluated, and selected Data was used to compare and select from among alternative designs The science or techniques behind the tasks is discussed Provides clear description and sensible rationale for design choices related to cost, size, and weight | | | | | | |
| | Understanding | Demonstrated a detailed understanding of the science/industry mission Provides clear description and sensible rationale relating designs choices and specifications to meet mission task requirements | | | | | | |
| | Build vs. buy, new vs. used | Decision process for use of new vs. re-used components is clearly articulated and sensibly rationalized Decision process for use of home-built vs. commercial components is clearly articulated and sensibly rationalized Demonstrated a thorough understanding of the new or re-used components principle of operation Demonstrated a thorough understanding of the home-built or commercial components principle of operation | | | | | | |
| SID | | | | 12 | | 5% | | |
| | 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 SID has appropriate level of detail: is a system level/connection diagram (not a board or component-level schematic) 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. | | | | | | |
| Safety | | | | 16 | | 10% | | |
| | Content | Document highlights safety features and philosophy Document describes how the vehicle is designed and built to meet safety requirements | | | | | | |
| | Safety procedures | Document provides substantive operational safety protocols and Document describes checklists for construction and operation | | | | | | |
| Critical Analysis* | | | | 32 | | 10% | | |
| *aka designs tested, pitfalls encountered, lessons learned | Testing and Troubleshooting | Describes how (complete) vehicle was tested Describes troubleshooting strategies and techniques used Describes use of prototyping and testing to evaluate design options | | | | | | |
| | Challenges | Describes at least one significant technical challenge encountered, and the process used to resolve it Describes at least one significant interpersonal or organizational challenge encountered, and the process used to resolve it | | | | | | |
| | Lessons Learned | Describes technical lessons learned Describes interpersonal or management lessons learned Describes development of skills | | | | | | |

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|-----------------------------|------------------------|--|-----------|------------------|-------|---------------------|----------------|-----------------------------|
| Future Improvements | | | | 4 | | 5% | | |
| | Reflection | Provides a thoughtful and logical discussion of at least one potential improvement to design, design process, or project management | | | | | | |
| Accounting | | | | 24 | | 10% | | |
| | Budget | Thorough and accurate description of budget planning and following Reasonable travel expense estimates are provided | | | | | | |
| | Cost accounting | Overall accounting is thorough and accurate A clear distinction is made between items purchased, re-used, and donated All income sources are acknowledged and estimates of the fair market value of donations (items, services, and time) are reasonable Accounting reflects effective use of funds | | | | | | |
| | | | | 212 | | 100% | | Base Score |
| | | | Raw Score | Max Points (cat) | | Total % (check:100) | | |
| | | | | | | Weight | | |
| Discretionary Points | | | | 12 | | 1 | | Discretionary points |
| | | Document describes exceptional design of vehicle, sensors, instruments, software, tools or other features Team developed exceptional original software or made exceptional adaptation of software to create a unique solution Documents describes remarkable effort to design and manufacture every component of the vehicle | | | | | | |
| Deductions | | | | 12 | | 1 | | Deduction points |
| | | Components designed/implemented by a commercial company without adequate justification Evidence that the work was performed by coaches, mentors, parents, or other non-team members Significant overuse of commercial or reused components without adequate justification | | | | | | |
| | | | | | | | | Final Score |

| 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 | 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 |

SCORE_SCALE
RUBRIC_SCALE

100
4