RC MARINE TRANSPORTATION POWERBOATS – LEVEL II

OVERVIEW

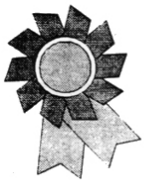
Radio controlled powerboat event provides an opportunity for TSA members to demonstrate their ability to use radio control to solve a marine transportation related problem through good design, artisanship, teamwork, and the function of the marine vehicle. Function, construction, design and teamwork are the primary elements evaluated.

PURPOSE

The RC Powerboat racing competition is designed to promote teamwork and problem solving among students as they acquire the skills to build, modify, operate and maintain a radio-controlled marine craft. Each team will be given points for their entry from the following categories:

A. Engineering and Aesthetics
B. Technical Report
C. Racing

ELIGIBILITY



A. Entrance is limited to two (2) teams per chapter.
B. A team will consist of two (2) to six (6) members from the same chapter.
C. Only registered team members may set up operate the entry during competition.

TIME LIMITS

A. Entry must be completed during the current school year.
B. Each chapter must enter its boat at the time of registration.
C. Each chapter is responsible for having its entry and team at the orientation session and course at the scheduled times as specified in the conference program.
D. Each team has 15 minutes to practice and prepare its boat for competition.

PROCEDURE

A. Registration

The participants register the boat, technical report, and radio during the event check-in at registration with the event coordinator. Be certain to mark the entry numbers on the boat, technical report, and radio. At the registration desk, transmitters of all participants will be impounded. They will be returned to the assigned racer just before each race or practice session and collected again at the end of the session or race. They will also be returned to all participants at an announced time following all races. Each transmitter should be clearly marked with an identification number and frequency. Since

there is the possibility of accidental or purposeful radio interference during practice or race session, no transmitters will be permitted outside of the race area at any time. Members in violation of this rule will subject themselves and/or their entire chapter to disqualification from this and/or other events.

B. Site and Event Conditions

Entries will compete on an indoor pool (unless an acceptable outdoor pond or small lake is available). The course will be configured by the race committee and will consist of a minimum of two (2) markers placed in an open area of the pool. It is the discretion of the coordinator as to the direction and route of the course. All team members must be present at the orientation prior to the start of the first qualifying heat. The race director may make revisions in certain procedures as he/she may deem necessary for certain conditions. Any revisions will be announced at the pilots briefing and/or posted at a specified place as the conference site.

C. Preparation

Participants are to use the preparation time to familiarize themselves with the course. It is the discretion of the coordinator as to the number of vehicles on the course at any given time during practice. If the coordinator, due to the number of entries, chooses to limit the number of vehicles practicing at a time, they may do so.

D. Competition

Each qualifying heat will consist of three (3) races of three (3) laps around the course. The fastest boats qualify for the semi-finals. The six (6) boats with the fastest times will qualify for the semi-finals. Each team may designate one pilot to continue through the semi-finals and final races. The semi-finals and finals will consist of three (3) races of three (3) complete laps. The rules of competition boating and proper etiquette will be enforced. Student teams will be responsible for proper care and maintenance of boats between heats. All entries must be submitted for general inspection and judging at the designated time. Technical inspections will be held prior to and immediately after the race. Entries may not be removed from the race area until this inspection is over. A pilot who fails to submit to entry inspection will be disqualified.

E. Race Rules

There will be a maximum of 3 boats racing during each heat. The start of the race will have a 1-minute countdown, and the start. The competitor may handle the boats until the 1-minute countdown, at which they must position it on the course for the start of the race. The competitors may not touch the boat from the 1-minute

countdown until the conclusion of the race. If they do so, they forfeit that race. If a boat crosses the starting line before the start of the race, it must cross completely back over the starting line to begin the race. The boat with the starboard tack has the right of way unless it is overtaking another boat. When a boat is overtaking another boat, it gives up its right of way. If a boat touches the course markers during the race, it must navigate around that marker again without touching it to continue on the course. If a boat runs into another boat deliberately or by accident, the boat that did not have the right of way will have 5 points deducted from their total points for the races and that race will be restarted. If this happens five (5) times, the boat at fault will not be allowed back on the course and will automatically receive last place. If the boats have been damaged by this collision, they will have fifteen (15) minutes to make all necessary repairs and continue racing. It is suggested that all competitors race a fair and courteous race and avoid all collisions.

F. Sportsmanship

Unruly or unsportsmanlike conduct will not be tolerated. People judged to be in violation will be asked to leave the area. Any team member in violation may disqualify the entire team. Unsportsmanlike sailing such as hitting other boats and short coursing will not be permitted. Any team doing so may be disqualified upon the judgment of the race director.

REGULATIONS

A. Vehicle Specifications and Material Limitations.

1. Any material may be used for the hull.
2. Kits or kit parts may not be used for the hull body.
3. Servos and RC equipment may be purchased.
4. Each team must be capable of racing a minimum of three different frequencies and may be required to do so upon notice.
5. In the event of radio frequency conflict in the semifinals or the finals, the lower qualifying racer must change their frequency.
6. A battery pack no larger than a 7.2 Volt RC Car battery pack may be used.
7. The Receiver may be powered by its own separate power source.
8. The controller must be through a surface channel radio controller. (Don't use a controller or frequency designed for aircraft.)
9. It is recommended that the boats be able to steer and control their propulsion by remote control.

10. Any form of propulsion may be used. Inboard, outboard, water-jet, paddle-wheel, or a fan (swamp boat).
11. You can use any motor(s) as long as it is (they are) electric.
12. The hull can be made out of plastic, fiberglass, cardboard, wood, duct tape, anything as long as it is not a kit.

B. Specific Tolerances
   1. The hull may be any shape or size within 230 mm width x 450 mm length and may be constructed from more than one piece or part.
   2. Multiple hull designs such as catamarans are permitted but the total width and length must mot exceed the 230 mm x 450 mm specifications.
   3. The height of the boat may not exceed 200mm. This includes the hull and propeller.
   4. There is no weight restriction.
   5. Placement of parts (motor(s), rudders, RC equipment, etc.) is solely at the discretion of the designer.
   6. The boat must be powered solely by the propeller(s).

   These tolerances include any portion of the boat such as the rudder(s), keel, mast, or hull at the maximum point of operation. If the boat exceeds these specific tolerances, it will be the obligation of the judges to deduct a maximum of 20 points from the entry.

   The antenna is the only component that may protrude from the maximum dimensions. This is for control purposes only.

C. The technical report should include five (5) or less double-spaced, typewritten or electronically composed pages to be submitted in a standard one-inch 3-ring binder. Only one report is to be submitted and it must be by a conference attending team member. The technical report will be retained by the competitive events until judging is complete. The report should contain the following:
   1. Cover sheet with event title, event site, event date, and student event numbers.
   2. Table of Contents.
   3. Parts list.
   4. Information about the design process, assembly, painting, and detail work.
   5. Problems or difficulties that were encountered in the building and/or solved.
   6. A standard multi-view drawing of the entry.
   7. Bibliography

EVALUATION

OFFICIAL RATING CRITERIA

Design and Construction	60 points maximum
Appearance	20 points maximum
Quality of work	20 points maximum
Innovation of design	20 points maximum
Technical Report	20 points maximum
Content (technically correct)	5 points maximum
Clarity (clear and well written)	5 points maximum
Technical drawing (technically correct)	5 points maximum
Completeness (all parts including bibliography)	5 points maximum
Rules violation (specifications or tolerances)	-20 points maximum
Race	20 points maximum

1st Place	20 points
2nd Place	15 points
3rd Place	10 points
4th thru 12th Place	5 points
All other finishers	0 points

Total Possible Points **100 points**

RC MARINE TRANSPORTATION – LEVEL II
EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

A. Event coordinator (1)
B. Three (3) event evaluators for the following
   1. Preparation area and radio check out/in
   2. Check-in
   3. Competition judges.
   4. Report and craftsmanship evaluation
C. Race Coordinator (may be the coordinator)
D. Two (2) individuals for checking and totaling evaluation sheets

MATERIALS

A. Coordinators box containing:
   1. Official rating forms
   2. Event guidelines
   3. Event entry list
B. Equipment for competition
   1. A minimum of two (2) markers for course
   2. Caution tape to minimize traffic around course and pool area
   3. Dry-erase board, colored markers, and eraser.
   4. Whistle (to start races)
C. Table and chairs as needed for
   1. Check-in
   2. Radio and vehicle storage
   3. Evaluators

PROCEDURE

A. Event coordinator reviews contents of the coordinator's box
B. Event coordinator follows the directions given in the Procedure section.
C. Event coordinator records and initials
   1. Deductions
   2. Failures to appear
   3. Disqualifications
   4. Protests
   5. Race results

RC MARINE TRANSPORTATION
POWERBOATS – LEVEL II

OFFICIAL RATING FORM HIGH SCHOOL

ENTRANT'S ID #s / EVALUATIVE CRITERIA									
A. Design and Construction									
1. Appearance	20 pts								
2. Quality of work	20 pts								
3. Innovation of design	20 pts								
Sub-total	**60 pts**								
B. Technical Report									
1. Content	5 pts								
2. Clarity	5 pts								
3. Technical Drawing	5 pts								
4. Completeness	5 pts								
Sub-total	**20 pts**								
C. Rules Violation (if any)	**-20pts Max.**								
Race (see rules form)	**20 pts Max.**								
TOTAL	**100 pts.**								

Evaluator's comments/notes:

I certify these results to be true and accurate to the best of my knowledge.

Evaluator's signature _____