

RADIO-CONTROLLED BAJA CAR CONTEST RULES

6 November 2015



For illustration only. Pictures do not endorse any particular component, design, or Competition eligibility.

New in 2014:

- No changes in Vehicle requirements or basic Race Course characteristics or dimensions. Any car which was ‘legal’ by previous Rules remains legal this year.
- Competition continues to have Slalom, Acceleration, and Baja Races, on Courses of the same dimensions, shapes, clearances, and characteristics as in prior years.
- “Presentations” is now a separate Event, carrying its own Awards and Prizes, regardless of Vehicle performance in the Racing Events.
- Extensive and time-consuming “Performance-Scoring calculations” are eliminated. Slalom and Acceleration / Sprint is scored by stopwatch. Baja Competition uses a simple Finish Line tape.
- Slalom-and-Sprint Competitions shall be held on one combined track, by individual runs, with Best Elapsed Times determining Seeding for Bracket match-up’s in the Baja Event.
- The Baja Contest shall be vehicle vs. vehicle. Vehicles advance by “double-elimination” Brackets to determine one Racing Events Champion, one Finalist (“Second Place”), and one Semi-Finalist (“Third Place”).

New for 2016:

- Again, no changes in Vehicle requirements or basic Race Course characteristics or dimensions. Any car which was ‘legal’ by previous Rules remains legal this year.
- Relaxed and helpful procedures for stalled and repairable vehicles.
- Relaxed rules about going outside the race-course boundaries.

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1.0 Radio-Controlled Baja Scope

The Radio-Controlled Baja Car Contest is a competitive event where Teams of ASME Mechanical Engineering students demonstrate their design and manufacturing skills, presentation skills, and racing skills. The student Teams do the design, manufacture, describe, and race relatively inexpensive radio-controlled vehicles on a variety of challenging race-courses, at a Host Venue assisted by the local volunteers of ASME.

For the purposes of this Contest, a ‘car’ will be defined as a self-propelled radio-controlled electric land vehicle running on three or four or more wheels not in a straight line, or on tank-treads. The vehicle must comply with the regulations contained within Section 4.0 of this document.

2.0 Definitions

Host Venue

A Host Venue shall be selected and announced by the hosting Faculty and local volunteers of ASME.

Remotely Operated Auto Racers (ROAR)

ROAR is the official U.S./Canadian sanctioning body for R/C car and truck competition, a non-profit corporation organized to promote the sport of radio controlled model car racing.

Read more about ROAR at RoarRacing.com

Differential: a drive train gear assembly managing the motions of two collinear shafts or axles (as those of the rear wheels of an automobile) and permitting one shaft to revolve faster than the other.

3.0 Responsibilities

The following people / organizations have responsibilities in the RC Baja Contest as described below.

3.1 Teams

3.1.1 Eligibility

Contest Teams must be comprised entirely of undergraduate student ASME Members. There is no limit on the number of Teams that may enter the Contest nor is there a limit on the number of Teams from any given school. Team-member eligibility shall be the same as for the Old Guard Oral Presentation Competition and entering the RC Baja Car Contest does not exclude members of the Team from entering any of the Old Guard Competitions.

Each Team is responsible to produce a remote controlled vehicle in accordance with these regulations. Each Team is encouraged to bring sufficient spare parts and supporting equipment needed to complete the Events outlined herein.

Each Team wishing to compete in the RC Baja Car Contest must advise the Host Venue once the Venue and approximate dates have been announced. Local volunteers may advise and assist with Event publicity and Registration.

3.1.2 Disqualifications

Teams may be disqualified for not following the rules contained within this document, particularly relating to vehicle requirements and team conduct.

Teams may be disqualified for unruly or unsportsmanlike behavior, or by showing a deliberate pattern of avoiding or circumventing the intent of the race courses. Teams should conduct themselves in a professional manner throughout the Event, keeping in mind they are representing not only themselves but also their school and ASME Student Section.

Vehicles whose equipment or construction is in violation of these Rules may, at the option of the Host Student Section and Judges, be allowed to make solo 'demonstration' runs on the Courses, but shall be not eligible to be ranked or "win."

3.1.3 Trophy

The Team winning the Racing Events will be awarded the traditional "ASME Region VIII Traveling Trophy." This winning Team will be responsible for installing a matching 'plaque plate' with the year, the Team Name, and the school, for maintaining the Trophy in a safe location of their choosing, and for returning the Trophy for the next Contest Event.

3.2 Host Venue

3.2.1 Scheduling

The Host Student Section is responsible for managing the RC Baja Contest, with the overall approach subject to the general agreement of designated local volunteers.

The Host Student Section shall schedule this Event so as not to distract or divert people from attending other key competitions and presentations at the same venue.

3.2.2 Facilities and Equipment

The Host Student Section is responsible for reserving the venues and creating the necessary facilities to effectively host the RC Baja Car Contest. These include facilities for the Presentations with desirable AV equipment and good visibility for all, indoor or outdoor race course facilities for the Performance Events in accordance with these Rules, vehicle repair area's, Safety and Emergency Response Procedures per Host venue practices, and a pleasant venue for the presentation of Awards.

The host Student Section shall provide a maintenance / repair area for vehicles that require attention throughout the Performance Events. The maintenance / repair area shall be well lit, have electrical outlets, and give protection from inclement weather.

It is traditional (but at the option of the Host Student Section) that at least four bona-fide entries are required in order for the Host Student Section to commit resources to building a track and staging the event; therefore, early Registrations are encouraged.

The Host Student Section is responsible for providing event volunteers necessary to support the RC Baja Car Competition, including personnel (e.g. Judges, MC, timekeepers, AV specialists, road crew) and their equipment (e.g. stopwatches, Brackets chart).

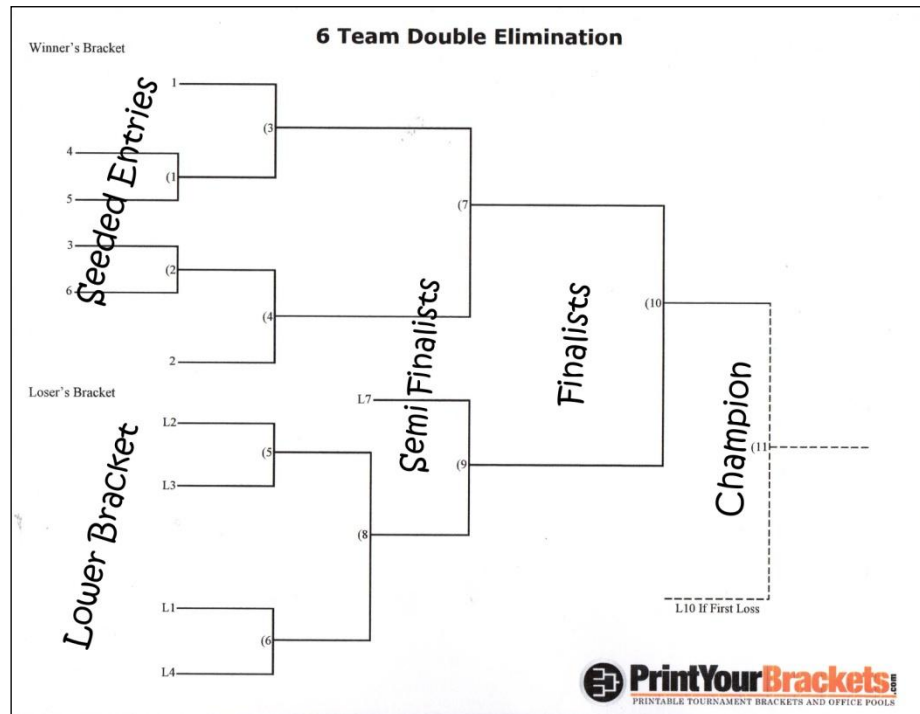
The Host Student Section is responsible for procuring and printing, displaying, and making progress-entries on the Baja Brackets Chart, and notifying the Event MC of the Performance Events results. Brackets may be printed 'large' to maximize audience visibility and enjoyment; not required if not convenient.

Double-Elimination Brackets Charts are available for any number of Entries from the Web by these Links:

3 Teams	4 Teams	5 Teams	6 Teams	7 Teams	8 Teams
9 Teams	10 Teams	11 Teams	12 Teams	13 Teams	14 Teams
15 Teams	16 Teams	17 Teams	18 Teams	19 Teams	20 Teams

Additional Bracket Forms are available at "[Double Elimination Seeded Tournament Brackets](#)" at <http://www.printyourbrackets.com/>

Here is an example of a Standard Bracket. Standardized Brackets are available for any number of Entrants.



3.2.3 Master-of-Ceremonies

The Host Student Section is responsible to provide a Master-of-Ceremonies to support the RC Baja Car Competition. The MC should be in attendance throughout the Event, familiar with the campus, Contest rules, competition courses and venues, and event staff and volunteers.

3.3 Judges

At least three Judges are required for the Competitions: three for the Presentations Competition, and three (may be the same people, or different but equally skilled) for the Performance Events. The Host Student Section and designated local volunteers should work jointly to select and recruit the Contest Judges. Frequently, nearby ASME Senior Section members are recruited for event judging.

It is recommended that at least two Judges be current ASME members or supporters and at least one Judge be an RC hobbyist or enthusiast. Depending upon budgets and circumstances, Judges may be reimbursed for lodging and travel expenses.

Judges are responsible to know and fully understand these Rules. Judges are responsible to resolve issues that may arise during the event. Mid-year questions shall be directed to designated local volunteers.

3.3.1 Judge Responsibilities

There will be a 'Lead Judge' for the Presentations and a 'Lead Judge' for the Racing events.

The Lead Judge for the Presentations is responsible for leading Judges' determinations that each vehicle is in compliance with the Contest Rules ("eligible"), collecting the Judges' Forms, leading the deliberations of the Presentations Judges, and providing "Presentations Winners" selections promptly to the Event MC.

The Lead Judge for the Performance Events is responsible for leading the Judges' determinations that the Race Courses and the Seeding, Brackets, and timing procedures are in compliance with the Competition Rules, and determinations of 'at fault' (if any) in the event of a 'traffic accident' or collision.

3.3.2 Presentations Judging

Scoring criteria are shown on the [Presentations Judging Form](#), given at the end of this document.

3.4 Volunteer Support

Designated local volunteers are responsible for administering and publishing the RC Baja Car Contest Rules.

Questions arising mid-year and between Contests shall be directed to designated local volunteers.

During the Competitions, questions shall be directed to the Judges. Judges may choose to consult with the on-site designated volunteers.

3.4.1 Distribution of Prizes and Funds

The Host Venue is responsible for establishing and awarding prizes, and may solicit funds from interested groups and persons. Award Presentations may be made by the Judges or by the RC Baja Car Contest Master-of-Ceremonies as seems most appropriate. Awards in the Presentations Competition and the Racing Competition shall be comparable or equal.

3.4.2 Continuous Improvement

Interim and post-Event suggestions for improvements to these Rules may be directed to the designated local volunteers. Team participants should be consulted for feedback promptly after the Event.

4.0 Vehicle Requirements

4.1 Vehicle Restrictions:

The purpose of these restrictions is to ensure an event competition of student-produced vehicles, all of which use common, easily available drive trains; rather than allowing expensive, off-the-shelf "professional-sports" entries.

The vehicle must be conceived, designed, and fabricated by students without any direct involvement from professional engineers, automotive engineers, or related professionals. The student competition Team may use any literature or knowledge applicable to vehicle design. The students may use information from professionals or from professors as long as the information is received in a discussion of alternatives with their pro's and con's. Professionals may not make decisions of design or drawings, nor fabricate parts for the Team except as needed by shop rules and safety considerations.

4.2 Mandatory Components:

Radio-controlled car parts which you must use, as specified here, without alterations. You must use the motor and the battery pack as specified below; these are the only sources of power that can be used for propulsion:

- a) **Propulsion Motor:** One per vehicle. Propulsion motor may perform additional functions, and additional motors may be carried on the vehicle for other purposes, but only one motor may propel the vehicle. Any motor which conforms to current-vintage **ROAR** brushed or brushless specifications and manufacture is legal.
http://www.roarracing.com/approved_brushless_motors.php
"ROAR" motors from previous-years' vintages are also legal. If ROAR identification doesn't show on the motor, bring the box or literature.

- b) **Propulsion Battery Pack:** One per vehicle. The propulsion battery-pack may perform additional functions, and additional batteries of other types may be carried on the vehicle for other purposes, but only one battery-pack may propel the vehicle. Propulsion battery-pack is defined as: any 7.2-Volt 6-cell RC battery, or, any 7.4-Volt 2-cell or 2S LiPo RC battery when used with proper "balancing" charger and allied equipment [*prohibition of lithium-polymer batteries removed August 2012*]. Batteries may be un-wrapped and wired separately but not altered internally; bring the original case or wrapper to show type and classification. Teams may bring and swap-out more than one battery-pack to minimize "re-charging" downtime. Battery must be securely mounted to vehicle.

4.3 Purchased or Custom Made Components, Make or Buy, It's your choice:

Commercially-manufactured vehicle parts which you may select and purchase, subject to these limitations; you may also make any of these items:

- a) Transmitter, receiver, servo's: Your choice, make or buy, with proper Channel.
- b) Speed control: Any available RC style – e.g. mechanical, resistor, or electronic – is okay. Home-made controls can be of any common RC style. Separate dedicated batteries just for your controls are acceptable, but they may not help propel the vehicle.
- c) Wheels, shocks, tank-treads, springs, hubs and spindles. Tires and traction devices that would leave marks on the venue's floors will not be allowed.
- d) Multiple servo's are okay.
- e) Store-bought universal joints are okay.
- f) Nuts, bolts, shafting, ordinary hardware and machine components; transistor and chip components.
- g) Differentials made by the Team from pre-existing separate components, or "toy-kit" (e.g: Erector Set™; iThink™, Lego™) differentials, ARE acceptable. Differentials sold or intended for radio-controlled vehicles are NOT acceptable. You must describe the origin of your differential unit.
- h) Non-functional ornaments. Body, if used, shall not interfere with inspection of vehicle components.

"YOU MAKE IT" = the rest of the vehicle.

4.4 On-Site Vehicle Modifications and Vehicle "Morphing"

It is intended that the vehicles, as designed and presented, shall be capable of competing in all Events. "By hand" or tool-assisted alterations for specific Events (e.g. swapping slick tires for knobbies) are prohibited, but, changes in vehicle configuration or articulation made entirely and solely by RC remote-control are allowable [*adopted April 2012*]. Necessary damage-repairs, to restore the vehicle, will be allowed if the Judges are notified of the simple necessity and general nature of the repairs.

4.5 Repeat Entries

If a vehicle, or an important portion of it, has been entered in a previous year's Competition, the following rules shall apply:

- a) During the main Presentation, the presenters shall identify the "pre-existing" and the "new" elements of the entry, fully and accurately. Full Presentation points can be earned for this type of presentation. "Presentation" points depend upon the speakers, *not* the vehicle, so, full-score points can be earned in this event.
- b) For scoring for "Design-and-Creativity" and for "Manufacturing Skills," points will be earned thus: Up-to-full points can be earned for new elements of the entry; proportionally fewer points are earned for improvements to pre-existing elements; no points are earned for fully pre-existing elements. In short, "full points" can only be earned once, and not again in future competitions.
- c) Repeat-entries may compete in the "Performance" Events without penalty. A pre-existing "hot" design has the right to compete against anything new, which was created to try to beat it.

4.6 Transmitter / Controller Requirements

For non-interference during the Competition, transmitter frequencies must be unique and at least two Channel numbers apart. Request approval of your desired Channel with the Host School via e-mail or equivalent, and request that confirmation be returned. Channels will be allotted on a first-requested first-accepted basis by time of correspondence, so do this early.

Drivers and Teams required to use their assigned-frequency.

Before set-up and competition, the Host Student Section will examine the transmitter frequencies to verify that they are as pre-registered or at least unique and properly spaced from others; if not, transmitters will have to be changed or isolated so as not to interfere with other competitors.

5.0 Presentations

5.1 Presentations Competition

This Competition is a separate Event, and carries its own Awards and Prizes, totally independent of performance in the Racing Events.

Presentations shall be judged on Presentation Skills, Design and Creativity, and Manufacturing Skills, per the [Presentations Judging Form](#), provided near the end of this document.

One or more Team members will give the Presentation to the Judging Team and audience. The Presentation must include the following information.

- Team members' names
- Origin of the vehicle differential(s)
- Disclosure of parts already used in previous competitions

The presentation cannot last more than five minutes and should not be interrupted by questions. After the presentation, there will be approximately 5 minutes for questions and answers. During the question period, Team's members other than the main presenter are encouraged to answer questions. Judges or a helper shall signal unobtrusively when end of allotted time is approaching. Judges may extend the Q&A time as they might desire or need, and take ample time to examine the vehicle.

For the Presentations, the vehicle must be present to be viewed and examined by the Judges in the condition specified by the Team.

5.2 Judging for "Presentation Skills"

The Judges will consider the content, organization, and delivery of the Presentation and Answers, and will only evaluate the Team's ability to give a technical presentation. High scores are possible, regardless of the design or capabilities of the vehicle.

5.3 Judging for "Design and Creativity"

The purpose of "Design-and-Creativity" scoring is to evaluate the engineering effort and comprehension that went into the design of the vehicle and how the engineering met the intent of this Competition by use of standard plus new and creative concepts and practices.

After the Team's Presentation, the Judges are encouraged to ask penetrating questions relative to the Team's understanding and level of analysis of the vehicle.

The Judges will use the presentation and answers as a basis for evaluating the engineering effort, along with an examination of the vehicle, to form their own opinions of the design concepts being adequate and appropriate for the application; and certify the vehicle's compliance and eligibility (or not) to compete in the Races via a check-list entry on the [Presentations Judging Form](#).

SEE ALSO: "Rules regarding Repeat Entries, Section 4.5.

5.4 Judging for "Manufacturing Skills"

The purpose of "Manufacturing Skills" scoring is to evaluate the Team's manufacturing and fabrication decisions and methods, keeping in mind that the vehicle was made specifically as an entry in a low-cost design-and-performance competition for student engineers, facing only loosely-defined racing conditions, limited preparation time and resources, and restrictions tending away from the use of expensive or pre-manufactured radio-control parts. Economical cost, strength, and reliability will be considered

Of interest will be the percentage of parts discussed, the demonstration of knowledge of the alternatives for manufacturing and the wisdom in the selection of the techniques used to produce the vehicle.

SEE ALSO: "Rules Regarding Repeat Entries," Section 4.5.

6.0 Performance Events

There will be **TWO PERFORMANCE ("RACING") EVENTS**, which test the abilities of the vehicle in maneuverability, acceleration, and performance on demanding 'terrain:'

- **Slalom-and-Sprint**, individual performances, two per Team, with Teams' best-times (by stopwatch or equivalent) determining 'Seeding' for competition Brackets in the Baja Race.
- **Baja**, vehicle vs. vehicle in matching lanes on rough terrain, per standardized double-elimination competition Brackets.

The Slalom-and-Sprint Event shall be held first, to determine Seeding for vehicle vs. vehicle competition Brackets in the Baja Races.

In accordance with Section 4.6 shown above: Before set-up and competition, the Host Student Section shall examine the transmitter frequencies to verify that they are as pre-registered or at least unique and properly spaced from others; if not, transmitters will have to be changed or isolated so as not to interfere with other competitors.

6.1 Slalom-and-Sprint Event



indoors example



outdoors example

The concept of the Slalom-and-Sprint Event is to demonstrate the vehicle's combined ability to maneuver in an area of restricted clearances and to accelerate / sprint on a clear high-speed lane. Two runs per Team, and each Team's best-time in this Event is used for Seeding in the Baja event.

6.1.1 Slalom-and-Sprint Race Course

This Race Course shall consist of two racing portions: a Slalom course with central pylons to maneuver around, then, a straight and unobstructed Sprint lane for acceleration and speed, followed by a zone for the vehicles to decelerate and stop. Starting Line shall be at the start of the Slalom portion and the Finish Line shall be at the end of the acceleration / sprint portion.

Side lines shall be indicated by harmless chalk or tape. A 'turn zone' may be inserted between the two portions, if room space or audience visibility does not allow for one long and straight layout.

The Slalom portion of the Course will have the general shape of a bowling alley lane, 9 feet wide. There will be ten pylons of generally rectangular or blocky shape (can't roll away if tipped over) in a straight or offset central line, laid out between two side lines. The pylons shall be placed to provide clearances of four feet from each other and at least four feet from any side line. The near edge of the first pylon shall be four feet from the Starting Line.

The Sprint portion of the Course shall also have the general shape of a bowling alley lane and follow the Slalom portion, either directly straight or via a simple turn zone if required by room size or audience visibility. Sprint lane shall be a straight and level track, 9 or more feet wide with a length of 60 feet or more. (It is encouraged, to extend the track length beyond 60 feet.) The Finish line shall be at the end of the Sprint portion of the Course.

An obstacle-free, spectator-free zone shall be provided at the end of the Sprint track, allowing ample space for the vehicle to decelerate and stop.

6.1.2 Conduct of the Slalom-and-Sprint Event.

This event calls for two Drivers from each Team. Each Driver will be given one individual run. The total elapsed time to complete each run, from 'Start!' signal to Finish line, will be recorded by stopwatch or equivalent.

Special agents that increase traction may not be added to the tires or track surface. Tires that would leave marks on the venue's nice racing surfaces will not be allowed, and shall be disqualified if not corrected.

The Driver may stand anywhere or move about, during the run. The Driver (only) may rescue, by hand, a stranded or marooned vehicle, but the clock will continue to run during the rescue. The rescue may not improve the track location or velocity of the vehicle.

The vehicle shall begin by crossing the Start, pass to either side of the nearest pylon, wend its way between each of the successive pylons in order (passing each on alternating sides), pass on the proper side of the final pylon, then sprint to the Finish Line.

"Elapsed time" begins with the 'Start!' signal, and ends when the vehicle crosses the Finish-line. No time penalty will be assessed for hitting or displacing a pylon or barrier, but the clock will continue to run, and displaced items will remain in that displaced position and still count as pylons or barriers for maneuvering purposes for the duration of that run. No time penalty will be assessed for going outside a track boundary, but the clock will continue to run.

The 'elapsed time' (by stopwatch or equivalent) will be recorded for each of the Team's two runs, and each Team's 'best' (lower duration) run time shall be used to determine that Team's Seeding in the Baja Bracket competitions; Team with lowest best time becoming "first Seed" and so on down.

6.2 Baja Event

The concept of the Baja Event is to demonstrate the vehicle's maneuverability and handling qualities on rough terrain. This course will combine the performance features of acceleration, braking, and cornering, in one event.

To best challenge the vehicle's design, the track will simulate an actual off-road Baja track, with bumps and jumps, in a manner such as can be constructed inside a building or in a college courtyard.

Baja Event will be vehicle vs. vehicle via standard Brackets. Brackets will be "double elimination," giving each Team at least two opportunities to race in this Event.

6.2.1 Baja Race Course

Race-course lay-out and features are created by ingenuity of the Host Student Section. Creativity and challenging features are encouraged. Parts of the racing-surface may be "slick" or may be "rough," to simulate different kinds of "Baja" terrain and traction.

Course will enable two Vehicles to race each other at the same time, without interfering with each other. Course will have a Center-line Stripe or Indicators, separating two lanes, one for each Vehicle.

Course may be of either of two general styles:



Single-Lap Course: Common Starting Line. Serpentine. Identical matching features in each lane. Equal numbers of turns to the left and to the right, with turns in pairs of matched-size radii (small to the left, small to the right; big to the left, big to the right; any order so long as matched in pairs). Centerline lengths of lanes to be equal. One Lap, one Finish Line tape at the end.



Two-Lap cross-over Course. Common Starting Line. Similar (but not necessarily identical) features in each lane. A 'cross-over viaduct' near the end of the first lap, enabling vehicles to 'swap' lanes for the second Lap, one vehicle going overhead and the other going at ground level. Both vehicles encounter all the same features, just in a different sequence. Vehicles 'do' the viaduct at the end of each Lap. Total distance traveled is automatically equal for each vehicle. Two Laps, one Finish Line tape at the end of the second Lap.

The Baja Race Course may have any combination of the following features:

- Jumps
- Drop offs
- Bumps (single or multiple)
- Large ramp or platform
- Slalom or tight maneuvering section
- Off-tilted and changing-radius or sharp-radius turns
- Sand, gravel, pebbles, marbles, miscellaneous plastic bits.

Varying types of course surfaces should also be expected. The following course features have been used in prior races

- Grass and Astro-Turf™
- Asphalt
- Concrete, smooth and rough finish
- Carpeting / rugs
- Plastic (e.g. PVC surfaces and barriers)
- Wood including plywood and varnished wood gym floor
- Rubber mats
- Ice
- Duct-tape
- Plastic tarps
- Chicken-wire

- Plaster of Paris
- Sand, gravel, and dusty surfaces

The Baja Race Course features must meet the following criteria.

- Course will have a Start and Finish line. Approximate length of the course will be 200 to 400 feet.
- Course shall have two side-by side-lanes, either for single-lap use or for cross-over style.
- Each lane of the track shall be laid out with clearances such that a 36-inch-diameter circular template would be able to transit the entire course at the level used by the vehicles. (This template could look like a garbage-can lid of that diameter and would check all minimum passages and clearances.)
- Ramps and all parts of the track shall provide at least 36" width of road-and-driving surface.
- Rising launch-ramps and level drop-offs shall be no higher than twelve inches. Steep or vertical obstacles (e.g. barriers, hurdles, stair steps, walls), which would require the vehicle to jump or climb over them, are prohibited.
- Any racing-surface going "up" shall be blended or 'radiused' at its start with carpet, cardboard, duct tape, or the like. The transition angle onto rising features or surfaces shall be no steeper than 45°
- The minimum overhead clearance at any location of the course is 24 inches.
- Tunnels, barriers, and chutes which obscure visibility or control for more than a mere moment are prohibited.
- Portions of the course which expose the vehicle to an uncontrolled drop of larger than 24" shall have side walls or cushions or other features to protect the vehicle.
- The course shall include at least one long straight portion with at least one launch-ramp (or dirt-track equivalent).
- Edges of features, barriers or rugs that could snag or ensnare people or the vehicles must be eliminated or blended with duct-tape or the like.
- Any exposed screws, nails, and wire structures shall be protected so as to not snag or ensnare vehicles or people.
- Mechanized, moving, or intermittent track features (e.g. turn-tables, conveyors, drawbridges) are prohibited. To be fair to all competitors, the track shall be of a constant and static configuration.
- Standing water or water hazards are prohibited, however the course might be unavoidably damp.

It is expected that Teams from the "Host Student Section" shall be honorable, by NOT taking any advantage from advance practice on a track, facility, or racing arrangement prepared by their own school for this event (Note: there have NEVER been any complaints in this regard).

6.2.2 Baja Race Match-up's per "Seeding" and "Brackets"

"Seeding" and "Brackets" are event-scheduling systems, used to arrange Team vs. Team match-up's in Competitions with multiple teams.

Seeding: a List of all of the Teams, ranked numerically in order of best performance in the Slalom-and-Sprint Event, best time shown first. This "Seeding" List determines the first round of Team vs. Team match-up's in the Baja competition. Standard pre-printed Brackets show where to write the name of each Team, based on 'seed.' Seeding has the intent that the really highly-ranked teams will probably not "meet" each until near the end of the Tournament. Teams seeded relatively lower will face tougher opponents earlier in the Tournament. It is advantageous to be "seeded high."

Brackets: “Double-elimination Brackets” determine the sequence of match-up’s and give each Team at least two racing opportunities. The Baja competition calls for at least two Drivers from each Team. Teams continue to compete by advancing in the Brackets. Bracket competitions determine one Racing Events Champion, one Finalist (“Second Place”), and one Semi-Finalist (“Third Place”).

Rules [Section 3.2.2](#) gives the URL Web locations for standard and printable Brackets for any number of Entering Teams.

A simple ‘finish-line’ tape or equivalent indicates the Winner of each Baja match-up. First vehicle to cross the Finish Line tape without violation “advances” on the Bracket as the winner of that match-up.

Vehicle finishing second or “DNF / did not finish” continues in “Lower Bracket” match-up’s as shown on the Bracket Sheet.

If a vehicle is inoperable when called-upon for a match-up, and feasible and prompt repairs seem possible: that match-up may be delayed while other allowable match-up’s are run, and the delayed match-up shall be conducted when absolutely required by the Brackets sequence. A vehicle still not able to compete against an operative vehicle, despite having had delay-time for repair, shall be deemed ‘did not finish’ and shall be logged on the Brackets accordingly.

Entrants with no competitor available shall be logged as match-up ‘winner’ and offered the opportunity to run the track, for experience, solo and at own risk.

If both vehicles, by their own performance and durability, become inoperative during a match-up and neither one finishes the race, the victor shall be determined by farthest own-lane centerline distance travelled on the course, including final coasting distance within the obvious territory of the course. Distances might need to be paced-off for accuracy.

If neither vehicle in a match-up is able to compete when ultimately called upon: “No Result” notations shall be entered on the Brackets Sheet, and the Competition shall continue accordingly. A subsequently-revived vehicle from this kind of match-up may compete again in the Lower Bracket, first-repaired and so-reported to Judges taking precedence, only if a properly sequenced match-up is available.

As the Brackets require a proper conclusion and Winner determination, the Judges may simply award a victory to a still truly-inoperable “victim” vehicle in a subsequent match-up against the same “at-fault” vehicle.

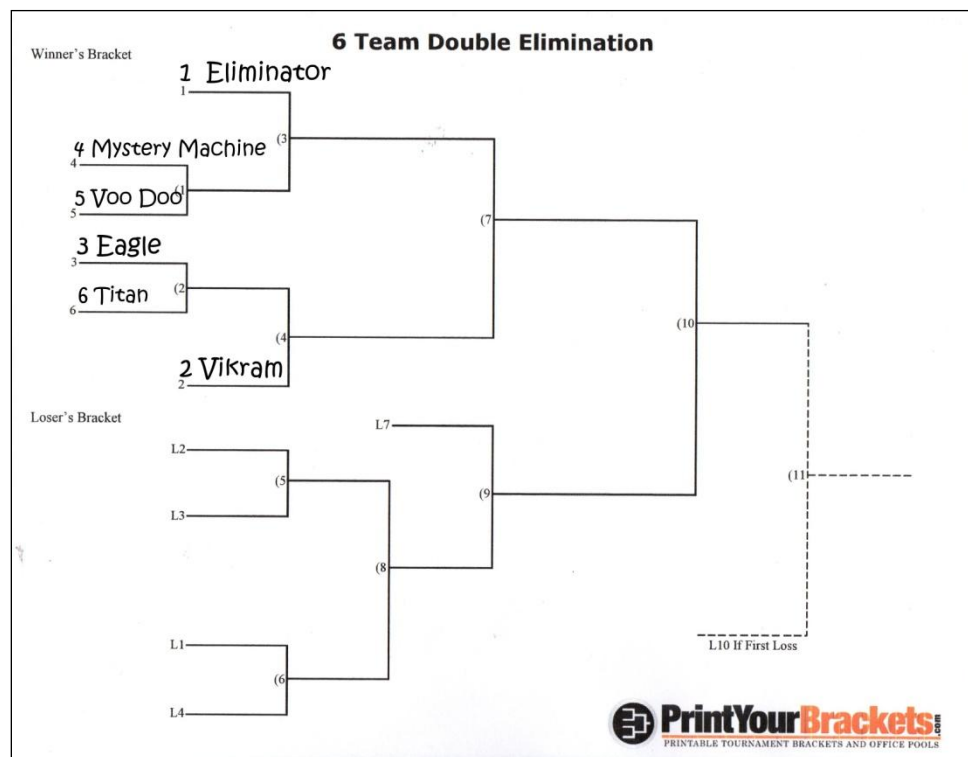
6.2.3 Making proper Bracket entries (with examples)

Baja “Seeding” List is made on the basis of best Slalom-and-Sprint Times. The Team with the best (lowest) Slalom-and-Sprint Time is listed as “first Seed.” Team with second-best Time is listed as “second Seed,” and so on. Every Team gets a Seeding number:

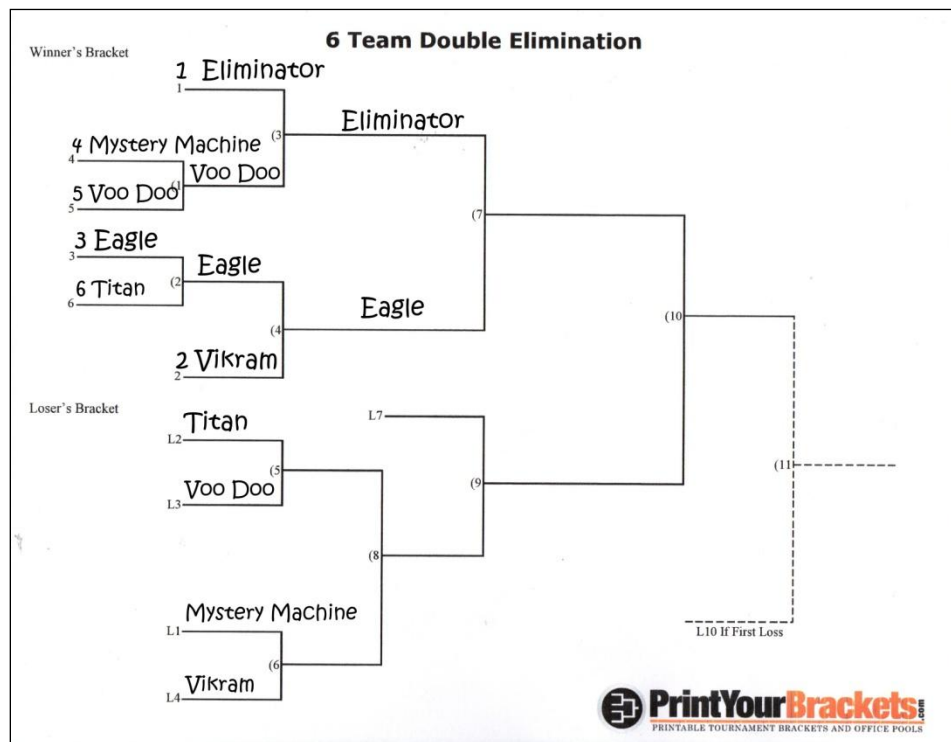
- 1 **Eliminator** (best time in Slalom-and-Sprint)
- 2 **Vikram** (second best in Slalom-and-Sprint)
- 3 **Eagle** (third)
- 4 **Mystery Machine** (fourth)
- 5 **Voo Doo** (fifth)
- 6 **Titan** (sixth)

The “Bracket” chart has pre-printed ‘Seed’ numbers which show where to place the Teams for the First Round of Baja match-up’s. Team names are written on the Bracket per Slalom-and-Sprint results “Seed” number. Here’s a proper example of ‘First Round’ placements and first matches. Notation “1” indicates First Seed, and so on.

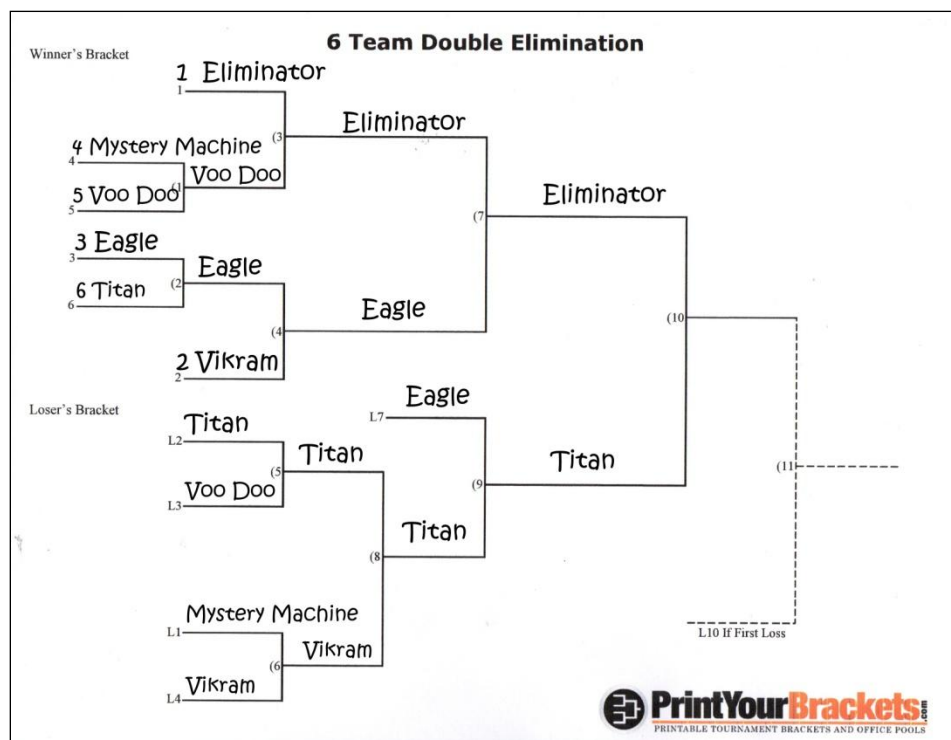
Bracket’s notation “(1” indicates the first race to be run, “(2” indicates second race, and so on.



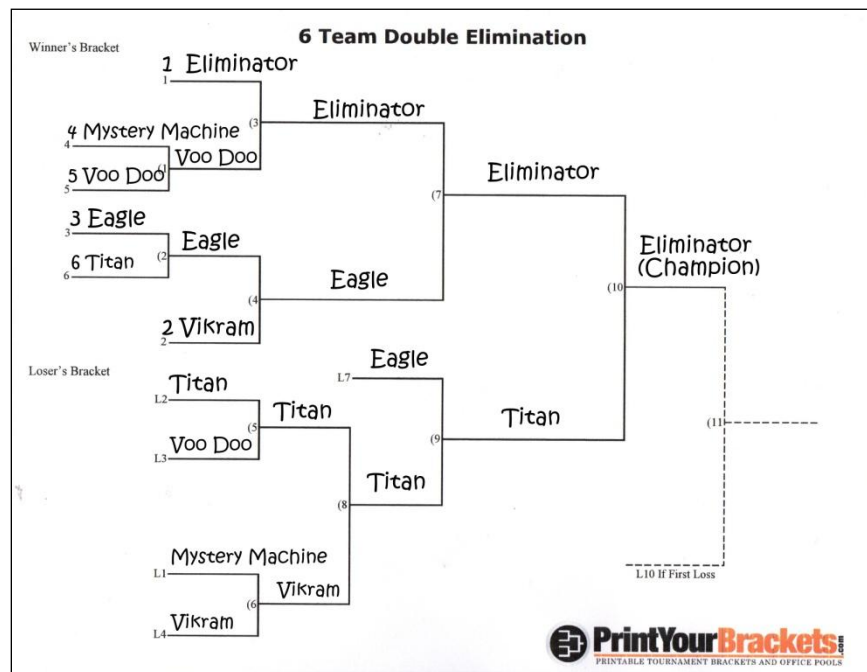
Follow the notations on the Brackets Sheet to “advance” the Vehicles. “Winner” of each match-up moves forward and “Loser” moves to the Lower Bracket for additional match-up’s. Example: notation “L2” indicates next slot for Loser of Race 2; “L3” is the next slot for Loser of Race 3; etc.



Continue to make Entries on the Bracket after each match-up:

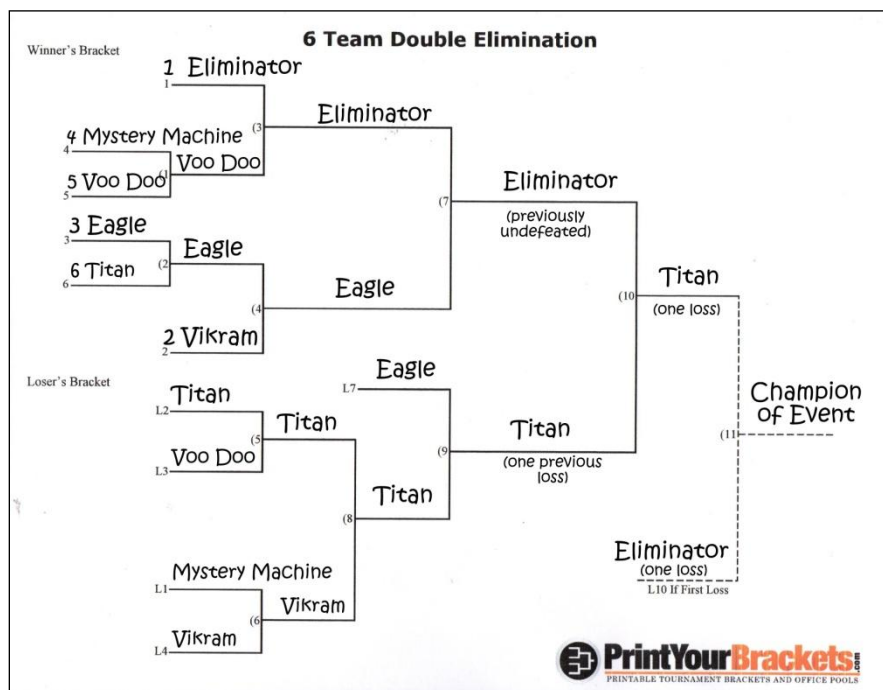


Championship: If a previously undefeated Vehicle (e.g. “Eliminator”) wins Championship Match-up (10, that Vehicle is the Champion of the Event.



For **Awards**: In the above example, ‘Eliminator’ is the Champion, ‘Titan’ is Finalist, and ‘Eagle’ is Semi-Finalist.

If Championship Match-up (10 generates the first loss for an otherwise undefeated Vehicle (in this example “Eliminator,” then “Eliminator” gets a second race against that same competitor (“Titan,” which also has just one loss), to determine the Event Champion. It always takes two losses to be eliminated from a Double Elimination Tournament.



7.0 Baja Driving Rules

7.1 Drivers are expected to become familiar with the lay-out and conditions of the Baja Course, before and during the Races, and to immediately call any apparent Course flaws to the attention of the Judges for possible correction.

7.2 Special agents that increase traction may not be added to the tires or track surface. Tires that would leave marks on the nice venue's nice racing surfaces will not be allowed, and shall be disqualified if not corrected.

7.3 Before the start of each match-up, one of the Drivers, selected at random by coin-toss or 'matching pennies' or anything similar, shall choose one of the lanes, with the other Driver taking the other lane. Keeping in mind, the lanes shall be as identical as we can make them, and if one Driver 'knows' something good or bad about the lanes, that information needs to be disclosed.

Drivers may stand anywhere or move about, during the run.

The Driver (only) may rescue, by hand, a stranded or marooned vehicle. Rescues may not improve track location or velocity of vehicle; except: if the vehicle cannot get over a course obstacle after three good-faith attempts, the Driver can carry or drive around to the other side.

7.4 On a Race Course with side-by-side matching tracks, each Vehicle having its own Lane: A vehicle may go completely outside a non-barrier-type (e.g. masking tape, chalk, or totally absent) track boundary on an outside turn or a straight portion of the track; but if ALL of the vehicle's wheels or tracks go outside a lane or track boundary on an inside turn, thus taking a short-cut not available to the other vehicle, that turn must be repeated from at or behind point of departure.

On a Race Course with a "cross-over" viaduct feature, both Vehicles encountering the same Course features: A vehicle may go completely outside a non-barrier-type (e.g. masking tape, chalk, or totally absent) track boundary on an outside turn or on a straight portion of the track, may take direct short-cuts to the proper side of the next feature of the Course, and may intrude into the other vehicle's lane so long as the intrusion does not influence or impede the other vehicle.

7.5 In the event of detrimental lane violations, vehicle collisions, track defects, or unsportsmanlike driver conduct, a "Foul!" may be shouted-out by either driver or by any Judge.

Both vehicles shall stop and the Judges shall make an at-fault, no-fault, or track-fault determination. Judges may gather information from the drivers and witnesses.

As a general rule, the vehicle determined to have been on the "wrong side" of the centerline shall be presumed to be 'at fault' and the other vehicle shall be declared the winner of the match, but, the Judges may make contrary or cancelling determinations in cases of actions needed for safety, bad conduct or enticement by either driver, or improper Course conditions.

A driver judged to have made an unjustified "Foul!" call loses the match-up.

If an offended driver, voluntarily and after vehicle examination, declares "forgiveness" of a collision or violation, or, after faulty Course conditions are corrected, the Race shall begin again, with both vehicles starting in their own lanes, located as at the start of the incident.

7.6 After each run, in order to save time, Team members shall assist in clearing their car (and remnants) off the track so that another match-up can get started promptly.

Bracket competitions determine one Racing Events Champion, one Finalist ("Second Place"), and one Semi-Finalist ("Third Place").

8.0 Events Summary

Presentations		Slalom and Sprint	Baja
Judged on Presentation Skills, regardless of racing-performance of the vehicle		Individual performances, with 'Times' being recorded	Vehicle vs. vehicle Races on a matched-lanes Baja Course
Presentations First Place, Second Place, Third Place; additional Awards (e.g. additional Places or Best Technical Content) as determined by Host Venue		'Best Times' determine seeding in Baja match up's	One Racing Events Champion, one "Finalist" (second place), one "Semi-Finalist" (third place).

Presentations Judging Form

School _____
Vehicle Name _____
Judge _____

I. PRESENTATION: Was the Presentation well organized and clearly presented?

0	20	40	60	80	100	
inadequate	below par	average	above par	very good	excellent	POINTS 100 max

II. DESIGN and CREATIVITY: Does the vehicle appear to be a nicely-engineered product, with new and unusual features?

0	50	100	150	200	250	
inadequate	below par	average	above par	very good	excellent	POINTS 250 max

Check-list items: Did the team tell the origin of their **differential**? ☐ If not, please ask.

Did the team tell of any components retained from **prior years' entries**? ☐ If not, please ask.

Is the vehicle in **compliance** with the Rules and **eligible** to compete in the Races? Yes / No ☐

III. MANUFACTURING SKILLS: Did the Team show good knowledge of modern manufacturing methods, and make wise decisions about "making vs. buying" individual components?

0	20	40	60	80	100	
inadequate	below par	average	above par	very good	excellent	POINTS 100 max

TOTAL POINTS:

POINTS 450 max

Judge's Notes on this Presentation:

Judging Instructions, after all Presentations:

Promptly, retire to a private location. Compile the Scores from all your sheets onto some sort of chart, for your deliberations. Examine, compare and consult. Be guided by your Scores, but, you are not obligated to follow any "purely mathematical" calculations. Arrive at an agreement on winners of First Place, Second Place, and Third Place etc, and, each Vehicle's Eligibility to compete in the Races.

Write and sign a piece of paper with your agreed-upon decision and provide it to the designated Event MC very promptly. Event MC will need to print Winner Certificates and needs plenty of time for that.

Give your Judging Forms and deliberation-chart to the MC too; those papers are taken away and destroyed.

We thank you for your support.