

The Freescale Cup

2013 Worldwide Championship Rules

Version 05, Last Updated: May 20, 2013

-Updated legal section

Version 04 April 26th, 2013

-Clarified “boosting” in electrical section

Note: The Worldwide Rules are ONLY for the worldwide challenge. Your local Country/Regional Rules are to be used for your respective country/regional challenge.

The spirit of the game is that students demonstrate excellent hardware integration and superior programming.

Section 1: Who may enter and registration

1. Entrants into the global challenge are by invitation only. One invitation is extended to each regional champion team.
2. Teams must register for global challenge, within two weeks of regional event completion at: <https://getregisterednow.com/FreescaleCup/Registration/Register.aspx?li=41>

Section 2: Team Rules and Requirements

1. A team can either consist of all undergraduate students (minimum of 2; maximum of 4) or can include 1 graduate student but must contain at least 2 undergraduate students on the team.
2. Cars will be designed and constructed by students ONLY.
3. Participants are expected to exhibit good sportsmanship. Any inappropriate behavior or cheating may result in disqualification.

Section 3: Equipment Requirements

Each team shall use the same basic kit of parts as described below. The following requirements are in place to keep the playing field level.

Mechanical

1. The original and unaltered equipment must be used as the entry.
 - a. Tires
 - b. Drive - DC motors (See "The Freescale Cup Knowledge Center" for detailed description---<https://community.freescale.com/docs/DOC-1284>)
 - c. Transmission Ratio of Drive Motor
 - d. Servo Motor-Futaba S3010 (See The Freescale Cup Knowledge Center for detailed description---<https://community.freescale.com/docs/DOC-1284>)
 - e. Battery (provided by participants)
 - i. 7.2V, $\leq 3000\text{mAh}$, rechargeable NiCd or NiMH
 - ii. Only one (1) battery at a time may be used to power the vehicle and any attached hardware
 - f. If any standard component of the car model is damaged, then a replacement part of the same model should be used.
2. The chassis can be modified, with some restrictions:
 - a. The footprint of the frame may not be altered
 - b. You may not change the distance between wheels
 - c. No part of the car shall exceed dimensions of 250mm/9.85in (W) x 400mm/15.75in (L)x 305mm/12in.(H)



- d. You may drill holes and mount auxiliary pieces on the chassis assuming it is contained within the above dimensions.

Electrical

1. You may create custom boards and are not required to use the provided Freescale development board(s). Must follow the same rules as stated in number 2 below.
2. The electronics can be modified, with some restrictions:
 - a. A Freescale 32-bit MCU must be used.
 - b. One processor - No auxiliary processor or other programmable device is allowed.
 - c. The car must use a optical sensor to navigate
 - d. DC-DC boost circuit may not be used to power drive or steering motors.
 - e. DC-DC boost circuit is allowed for auxiliary circuits, eg. camera, pre-drivers if needed. The boosted voltage MAY not influence motors.
 - f. Total capacity of all capacitors should not exceed 2000 uF
3. Sensor Limits
 - a. Maximum of sixteen (16) sensors, which includes cameras
 - i. Transmitter/Receiver pair is 1 sensor
 - ii. A CCD sensor is 1 sensor
 - iii. The provided Line Scan Camera is 1 sensor

Section 4: Event Personnel

Organizing committee – A committee comprised of judges (defined below) and Freescale employees who will coordinate event day activities and mediate and resolve any disputes.

Referees - Responsible for on-track activities which includes race track management such as starting and stopping vehicles, as well as timing and scorekeeping. They are comprised of faculty, students, and/or Freescale and industry employees.

Judges - Interpret and enforce rule compliance. This will be comprised of Freescale employees and members of contributing industry sponsors.

Event Personnel shall not aid any one specific team. Communication shall be open to all teams and shall not disclose any information that might compromise the fairness of the event.

Section 5: Vehicle Inspection

1. Before the race, the judges will perform a technical inspection of all entries. This includes vehicle specifications, dimensions, and equipment requirements listed in section
2. After the technical inspection, teams may not alter any part of the vehicle.
3. In the event of any violations, the organizing committee is entitled to disqualify



the corresponding team.

Section 6: Race Day Procedure

1. Testing - Prior to final race, a test track will be available. Final calibrations may be made at this time.
2. The race track may be altered after testing, prior to the final race.
3. Vehicle Inspection (see section 4)
4. When the final race begins, a referee will direct each team when to enter the playing field in accordance with the racing order.
5. There shall be only one team member on the track at any given time. (excludes testing times)
6. Upon entering the track, a team has two minutes to set up the car and signal "Ready" to referee.
7. After the referee confirms "Ready", the vehicle should leave the starting area within 30 seconds.
8. Vehicle must complete one lap.
9. Each finalist will have two attempts to complete the track.
10. The vehicle must be reset (steps 6-7) between attempts.
11. After the attempts, the team shall take the vehicle away from the track.
12. Event displays will post the best time for a single lap.
13. Race order will be determined by random drawing.
14. The best time of the two attempts will be recorded.

Section 7: Fouls, Failure and Disqualifications

The rules will be interpreted by Freescale and the organizing committee of the event.

Foul, is a minor infraction, which results in a time penalty.

Failure, results in the current attempt time not being recorded. Subsequent attempts are allowed.

Disqualification is a major infraction which results in all times not being recorded.

1. Referee will determine whether the racing car ran out of the race track and assign time penalties.
2. Any of the following conditions will be considered a **foul** and will result in time penalty added:
 - a. The race car fails to leave the starting area within 30 seconds after beginning of the race [+1 second].
 - b. The race car fails to stop 3 meters/ 9 feet after crossing the finish line [+1 second].
3. Any of the following conditions will be considered a **failure** and no time will be given:



- a. If any part of three or more wheels leave the race surface.
 - b. The racing team fails to enter the playing field and get prepared for the racing in two (2) minutes after being called by the referee.
 - c. The player touches the race car after the technical inspection without consent of the referee.
 - d. The race car fails to finish within 120 seconds after leaving the starting area.
4. Any of the following conditions will be considered a **disqualification**:
- a. Any auxiliary lighting equipment or other auxiliary sensors are used around the race track.
 - b. Modification of the hardware or software after the race has begun (except for changing the battery.)
 - c. More than one team member in the playing field.
 - d. Any behavior that might interfere with the movement of the car.
 - e. Touching the car during an attempt prior to crossing finish line.
 - f. Any cheating during the event.
 - g. Failure to pass the technical inspection.

Section 8: Scoring

1. Equality and fairness will be ensured as much as possible on the condition of actual feasibility. Disputes will be resolved by a vote of Freescale, members of the organizing committee, and judges.
2. Time starts when the racing car crosses the start/finish line.
3. Fouls will result in the time addition to the car's lap time.
4. Disqualifications and Failures will result in no score.
5. Time will be captured using an electronic gate and/or handheld timer.
6. The best overall time, will be crowned the Global Freescale Cup Champion

Section 9: Prizes

1. The team with the fastest lap time is the winner.
2. The winning team, including the faculty advisor, will receive \$1000.00 USD per team member and a trip to FTF Americas 2014 in Fort Worth Texas.
 - a. Trip includes travel, lodging, food vouchers and event admission. Incidental expenses are not included.
3. Only the prize specified above will be awarded. The Prize is non-transferable, with no cash redemption or equivalent. Freescale reserves the right to substitute a prize or prize component of equal or greater value or to provide a cash award of equal value. Except as specifically provided herein, the prize package does not include insurance, personal expense, incidental charges, gratuities, or any other items not specially described in the above Rules. By participating in this Contest, the Contestants agree to release and hold harmless Freescale, its advertising and promotions agencies and each of their respective parent

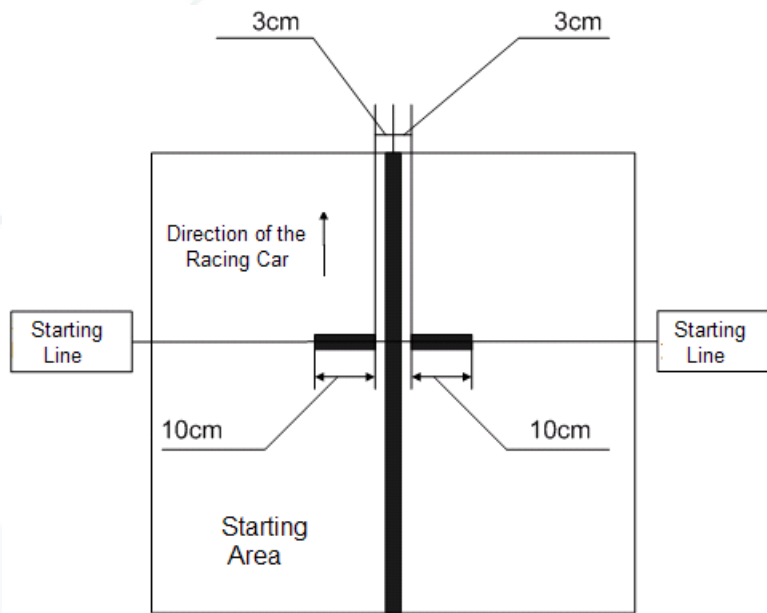


companies, affiliates, subsidiaries, officers, directors, agents, and employees, from any and all liability whatsoever for any injuries, losses or damages of any kind arising from or in connection with the 1) awarding, acceptance, receipt, possession, use and/or misuse of any prize awarded herein; or 2) participation in the Contest or any prize related activities, including but not limited traveling to or from any prize related activity.

Section 10: Parameters of the Racing Track

1. A test track made from the same material as the final track will be made available on the day prior to the final race for calibration and design modifications.
2. The actual layout of the final racing track will be unknown to competitors until day of the event.
3. Width of the racing track shall not be less than 600mm/23.65in.
4. Material specifications regarding the surface of the racing track will be provided on the web site of the event.
5. Surface of the racing track is matte white, with a continuous black line (25mm/1in wide) drawn in the middle as the pilot line.
6. The minimum bending radius of the racing track shall not be less than 500mm/19.7in.
7. The racing track can intersect with a crossing angle of 90°.
8. Any slope in the track will be equal to or less than 15 degrees in a straight section of the racing track, including upgrade and downgrade.
9. Start/Finish line is 1000mm/39.4in long in the racing track, as shown in figure below. In addition, there is a black starting line 100mm/3.9in long at both sides of the starting point. Start time and end time will be determined when the front part of the racing car passes the starting line. The car must be able to automatically stop within three meters of the starting line after finishing the race.





Section 11: Legal

By entering the Worldwide Freescale Cup Contest, the Contestants consent to having judges review his or her Entry and the Contestants further represent and warrant that the Entry is the Contestant's own original work and that the Contestant is the owner or has obtained and currently holds valid and sufficient rights, including rights in third-party intellectual properties, to grant Freescale, their subsidiaries, affiliates, agents, and customers the rights granted herein. The Contestants agree to be solely responsible if they submit another developer's Entry as their own. The Contestants also agree to release, indemnify, defend and hold Freescale harmless from any and all claims, liabilities and damages (including without limitation attorney's fees) related to the Contestant's Entry in the Contest, or usage of the Entry by Freescale. The Contestants agree to immediately notify Freescale in the event he or she discovers that there is any change in the ownership of the Entry as acknowledged and warranted herein.

Each Contestant further agrees to and does hereby grant Freescale, their subsidiaries, affiliates, agents, and customers the non-exclusive, irrevocable, perpetual, royalty-free, worldwide right and license to use, reproduce, create derivative works of, display, publicly perform, demonstrate and distribute all or any portion of the Entry. (In simpler language: We don't own your work, but you give us permission to use and showcase your work.)

Freescale reserves the right to use all or any portion of the winning Entry(s) for any promotional or demonstration purpose, and the right and license granted herein to Freescale by the winning Contestants will be exclusive for a period of six (6) months from the date of the announcement of the winning Contestants. The Contestants agree to execute any document necessary to achieve the



right and license granted herein.

This Contest is void where prohibited by law. These Rules cannot be modified or superseded except by Sponsor in its sole discretion. By participating as a Contestant you agree to abide by and be bound by this official rules and the decisions of the judges, which shall be final with respect to all issues relating to this contest. It is the Contestant's responsibility to ensure that they have complied with all of the terms and conditions contained in these official rules. Freescale is not responsible for any Entry that is lost, late, misdirected, stolen, illegible or incomplete entries.

Freescale is not responsible for any incorrect or inaccurate information whether caused by a Contestant by a printing error or by any of the equipment or programming associated with or utilized in the Contest or by any technical or human error, which may occur in the processing of Entries in the Contest. Freescale reserves the right to correct any typographical, printing, computer programming or operator errors. Freescale does not assume responsibility for any error, omission, interruption, deletion, defect, delay in operation or transmission, communications line failure, theft or destruction or unauthorized access to, or alteration of, registration forms or Entries. Freescale is not responsible for any problems, failures or technical malfunction of any telephone network or lines, computer online systems, servers, providers, computer equipment, software, email, players or browsers, on account of technical problems or traffic congestion on the Internet, at any website, or on account of any combination of the foregoing. Freescale is not responsible for any injury or damage to a Contestant or to any computer related to or resulting from participating or downloading materials in this Contest. If, for any reason, the Contest is not capable of running as planned, including infection by computer virus, bugs, tampering, unauthorized intervention, fraud, technical failures, or any other causes beyond the control of Freescale which corrupt or affect the administration, security, fairness, integrity or proper conduct of this Contest, Freescale reserves the right at its sole discretion to cancel, terminate, modify or suspend the Contest at any time. The rules, terms and conditions are subject to change by Freescale if necessary. Persons found tampering with or abusing any aspect of this Contest, or whom Freescale believes to be causing malfunction, error, disruption or damage will be disqualified. CAUTION: ANY ATTEMPT BY A CONTESTANT OR ANY OTHER INDIVIDUAL TO DELIBERATELY DAMAGE ANY WEBSITE OR UNDERMINE THE LEGITIMATE OPERATION OF THE CONTEST MAY BE IN VIOLATION OF CRIMINAL AND CIVIL LAWS. SHOULD SUCH AN ATTEMPT BE MADE, FREESCALE RESERVES THE RIGHT TO SEEK DAMAGES FROM ANY SUCH PERSON TO THE FULLEST EXTENT PERMITTED BY LAW.

Dispute Resolution: Except where prohibited by law, as a condition of participating in this Contest, Contestant agrees that (1) any and all disputes and causes of action arising out of or connected in any way with this Contest, or any prizes awarded, shall be resolved individually, without resort to any form of class action; (2) the parties shall use their best efforts to settle the dispute, claim, question, or disagreement, through good faith consultation and negotiation with each other, recognizing their mutual interests and attempting to reach a just and equitable solution satisfactory to both parties; (3) if the parties do not reach such resolution within a period of 60 days, then, upon notice by either party to the other, they may pursue resolution of the dispute through the United States court system; (4) the mandatory jurisdiction and venue for any lawsuit brought to resolve a dispute arising under this agreement will be Travis County, Texas, U.S.A. Under no circumstances will Contestant be permitted to obtain awards for, and Contestant hereby waives all rights to claim, punitive, incidental or consequential damages, or any other damages, including attorneys' fees, other than Contestant's actual out-of-pocket expenses (i.e., costs associated with entering this Contest), and Contestant further waives all rights to have damages multiplied or increased. All issues and questions concerning the construction, validity, interpretation and enforceability of these Official Rules, or the rights and obligations of Contestants and Sponsor in connection with this Contest, shall be governed by, and construed in accordance with, the substantive laws of the State of Texas, USA without regard



to choice of law rules.

For a list of winning Contestants, please send a request via email to John.McLellan@freescale.com with a subject line "Freescale Global Cup Winner's list" before October 1, 2013.

The rules and conditions are subject to change by Freescale if necessary. Freescale reserves the right in their sole discretion to cancel, suspend and/or modify The Freescale Cup race at any time. These official rules are drawn up in the English language. If these official rules are provided in any other language and there is a conflict in the text, the English language text shall prevail.

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