



CHALLENGE
02

NOW CLOSED

**MERCEDES AMG PETRONAS FORMULA ONE™ TEAM
VIRTUAL OPERATIONS SOLUTION**

ENTRY GUIDELINES

Thank you for registering for the F1 Connectivity Innovation Prize and downloading the entry guidelines for Challenge 2: The MERCEDES AMG PETRONAS Formula One™ Team Virtual Operations Solution.

Please read these guidelines carefully before submitting your entry. In the interests of impartiality, no additional guidance can be offered beyond the outline offered in this guidelines document and no correspondence will be entered into concerning the entry requirements.

DEADLINE:
09:00 BST Wednesday 27th July 2016

INTRODUCTION

Virtual Reality (VR) & Augmented Reality (AR) are exciting new technologies which are fast becoming mainstream. Formula 1 racing offers great opportunities to explore the application of these technologies to improve the fan experience, and to enable faster and more efficient ways of working for teams.

The F1 Connectivity Innovation Prize (F1 CIP) is a unique global platform set up by Tata Communications in partnership with Formula One Management and the MERCEDES AMG PETRONAS Formula One™ Team. Since its introduction in 2014 the F1 CIP has used crowdsourcing to invite Formula 1 fans and followers from 18 countries to present solutions to technical challenges in areas of interest to both Formula One Management and the MERCEDES AMG PETRONAS Formula One™ Team.

In the second challenge of its 2016 edition, F1 CIP will provide the platform to help unlock ideas and insights which will explore the use and activation of VR & AR inside the MERCEDES AMG PETRONAS Formula One™ Team.

Every time the MERCEDES AMG PETRONAS Formula One™ Team cars are on track, whether it be mid-season tests, practice, qualifying or race day, a group of engineers based at the Team's Headquarters in Brackley, UK work together with their trackside counterparts as a single integrated team. No matter where the race is around the globe, they work the same hours as the team at the track and are stationed in the 'Race Support Room' (RSR), where they use live TV feeds, audio and data communications to support the team on track for all live sessions.

Seamless communication and engagement between the remote and trackside engineering teams are extremely critical to extract the maximum benefit from the Race Support Operation. This kind of integration is a vital requirement in running a fast paced, competitive organization today.

Currently, these teams operate multiple daily meetings via audio communications, supported by two-way video feeds between the pit garage and the factory. The two-way camera feeds allow people on each side to view each other's environment remotely. The team discusses strategy, reviews component changes and resolves problems that occur at the track.

THE CHALLENGE

For the 2016 F1 Connectivity Innovation Prize, the MERCEDES AMG PETRONAS Formula One™ Team wants you to design a Virtual Reality (VR) / Augmented Reality (AR) solution to further enhance the efficiency of its engineering operations by enabling the team in the garage and the team at the Race Support Room in Brackley to work better as an integrated virtual unit, with a holistic view of the components being discussed or the problems needing resolution.

Your challenge is to design a solution that enables the following:

- Enable both teams to work as an integrated unit
- Enhance the remote, factory-based team's ability to understand trackside challenges and analyse car data to provide better reports and setup suggestions
- Improve the trackside team's ability to leverage the intelligence of the remote team to observe and address trackside challenges and incidents

The challenge requires you to think about the application of VR/AR rather than designing the intricacies of the VR/AR technology.

THE SOLUTION REQUIRED

Your solution should include the following components:

Overall concept to improve communications and problem solving efficiency

- Describe how the solution will change the way teams on both sides interact with each other and work in respective areas
- Describe what engineers on both sides will see and experience
- Describe the near live and recorded elements which will form the part of your VR/AR solution

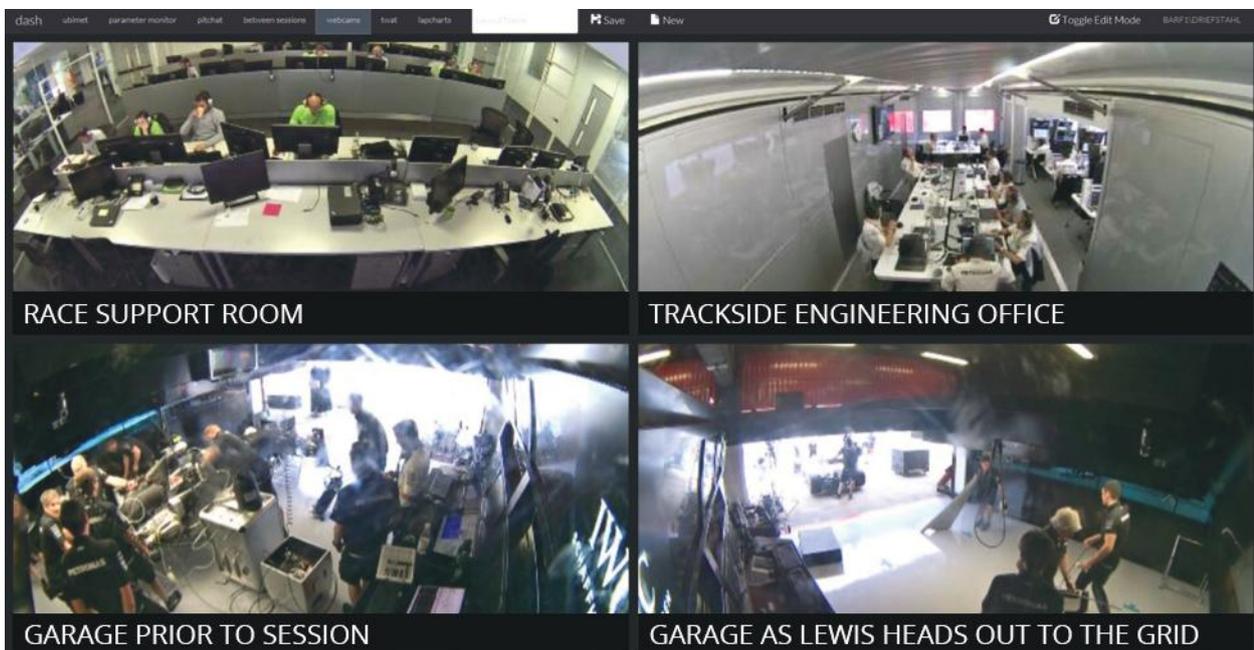
Description of the end to end technology platform to enable the solution

- Cameras and other equipment at the trackside and the Team HQ
- Interfaces and devices
- Connectivity requirements
- Any other platforms required for the solution

DATA SET

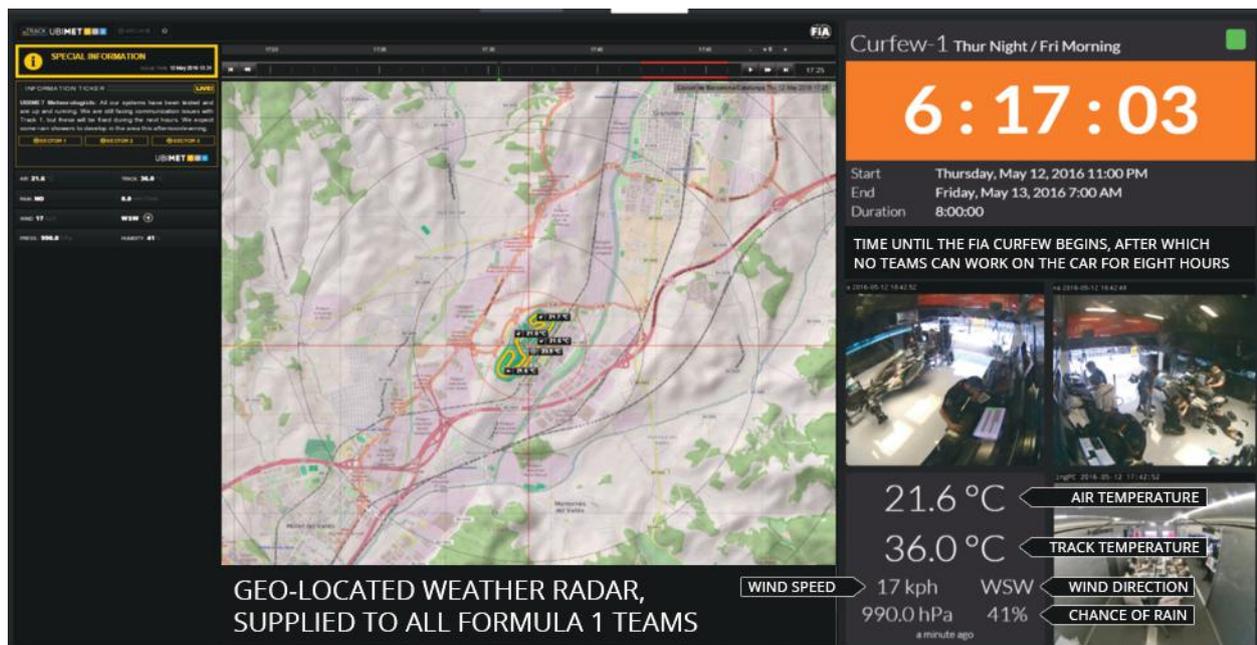
The following data is provided to assist the solution design:

Images of the remote operations room set up at the Race Support Room (RSR), trackside office and garages



Sample data exchange between the trackside and the remote teams

Weather Survey, Timing and Webcams



GEO-LOCATED WEATHER RADAR, SUPPLIED TO ALL FORMULA 1 TEAMS

P3 Runplan

5T/L High Fuel	<ul style="list-style-type: none"> • Double Start • Aero Cruise
5T/L High Fuel	<ul style="list-style-type: none"> • 5th Gear Ramp T3-4
3T/L Low Fuel	<ul style="list-style-type: none"> • DRS • Live Pitstop

Acronyms:

5T/L

Five times laps for the current run

5th gear ramp

accelerating from low rpm to max rpm in 5th gear

Radio Communications

Brake wear on cars

- [Race Support Room Engineer] Dom for Simon on meeting (on meeting refers to the channel Dom is speaking on)
- [Trackside Engineer] Go ahead Dom
- [Race Support Room Engineer] Brake wear is high on both cars
- [Trackside Engineer] Ok thank you

Tyre Abrasion:

- [Race Support Room Engineer] Dom for Loic on tyres
- [Trackside Engineer] Yes Dom
- [Race Support Room Engineer] You can see some rear abrasion
- [Trackside Engineer] Copy

SUBMISSION

Your submission should be made as a single document uploaded to the F1 Connectivity Innovation Prize website in either PDF or Word format.

The document must contain the following elements:

a) A written proposal of no more than 1,000 words broken down into three sections:

1. Overview of your solution (up to 700 words)
2. Summary of the key features of your solution (up to 200 words)
3. The technology behind your solution (up to 300 words)

b) The text can be supported with up to three visuals outlining the proposed interface design (only the first three visuals in each application will be considered as a part of an entry)

Entries will close at 09:00 BST on Wednesday 27th July 2016 and the F1 Connectivity Innovation Prize website will no longer accept uploads after this time. The Finalists of Challenge 2 will be announced on or around Wednesday 31st August 2016.

EVALUATION CRITERIA

Proposals should address the following six key criteria that will provide the basis for the judges' decision-making:

1. Innovation & creativity

Judges will give clear preference to submissions that clearly show unique propositions with innovative thought and creative application.

2. Technical content

The technical dimension of your submission should demonstrate a clear understanding of the technical architecture required to deliver the proposed solution. While only high-level detail is required, applications should reference any proprietary technologies used and outline the function and specification of any bespoke development.

3. Quality of material and input

Due regard will be given to the quality of each submission, the clarity and presentation of concepts and the degree to which objectives are clearly stated and met in both written and visual materials. In addition, evidence of underlying research to validate concepts will also be rewarded.

4. Originality of solution

One of the key criteria for the F1 Connectivity Innovation Prize is to demonstrate original thought that has the potential to deliver a transformative impact on the end-users of your proposals. This is the single most important criterion in the evaluation of your submission and an explicit statement of originality is strongly encouraged.

5. Feasibility of solution

Judges will make a viability assessment of each submission and applicants are encouraged to clearly outline the feasibility case from a technical perspective for their concept (no statement of financial viability is required).

6. Understanding of the challenge and proposed solution

Conformity to the brief is essential and applicants are reminded that any content that falls outside of the stipulated challenge requirements cannot be rewarded.

BACKGROUND

The proposed virtual reality solution can be used before, during and after track sessions by a core group of engineers that are responsible for car performance during practice, qualifying and the race – operating at both the Grand Prix location, as well as the team's HQ in Brackley.

This core team typically numbers around twenty personnel, led by Paddy Lowe, the Executive Director (Technical) for the MERCEDES AMG PETRONAS Formula One™ Team. Paddy's lead responsibility is to set the overall competitive ambition for the team over the season and ensure these targets are met in the context of the varying circumstances that the team may encounter during each race meeting.

The **Chief Race Engineer** is responsible for the set-up of the cars through the pre-race sessions to optimise their performance in the race. During the race itself, the **Chief Race Engineer** maintains observations on competitor car speeds, stint gaps and other key variables that provide an indication to rival strategies.

Working in tandem is the **Chief Engineer (Trackside)**, whose focus is on the reliability of the cars. It is the responsibility of the **Chief Engineer (Trackside)** to determine how systems can be managed to secure a race finish for each car. With a complex management structure that connects the car on track to the pit wall, the array of engineers in the garage and in turn, remote support from team headquarters and the multiplicity of scenarios that must be planned for, the slick and precise provision of unambiguous information is an essential element of a successful team.

The Chief Engineers are supported from the garage by a dedicated Race Engineer for each car. The Race Engineer in normal operating circumstances is the solitary person that manages radio communication with the driver and takes responsibility for managing his car's fuel consumption, tyre and brake wear and navigating traffic. The Race Engineer for each car is in turn supported by a Performance Engineer who connects with a range of analysts from within the garage and the **Race Support Room** who maintain a watching brief on the operating parameters of the key systems in the car – from engine and gearbox to hydraulics.

The Sporting Director is the repository of knowledge about the rules and regulations of the sport and aside from maintaining real-time dialogue with FIA Race Control, will also keep a watching brief on the pit lane and the position and status of competitor cars on track. He is supported by personnel within the ***Race Support Room*** in the event of needing to review track action in real time.

The Chief Strategist, backed by a support team of three Race Strategists in the ***Race Support Room***, is responsible for planning the team's race strategy, building contingency plans and adapting these to fit unfolding circumstances during the race to respond to weather, safety cars and other eventualities. Quick decision making is required in live time to counteract any internal or external factors that may change the outcome of the race.

Clarity of information between the circuit and ***Race Support Room*** is essential given the pressurized operating environment that includes high ambient noise, verbal communication by radio and intercom and multiple sources of information.

Within the ***Race Support Room*** each engineer is assigned to a role in view of offering assistance to on-track performance. Communication is provided via radio and video formats – where the induction of Virtual/Augmented Reality would provide the team with intrinsic further depth within the garage.

The ***Race Support Room*** acts as the ideal learning ground for engineers, who are able to operate trackside at any moment if called upon due to the seamless transfer of data and communications between the two points of operation.

OFFICIAL RULES FOR THE F1[®] CONNECTIVITY INNOVATION PRIZE

1. Overview

- a** Individuals who meet the eligibility criteria below will be invited to apply their creativity and problem-solving skills to at least one (1) of two (2) separate challenges (the “Challenges”). Individuals may compete on their own or as part of a team of up to four (4) people. There is no purchase necessary to participate.
- b** The terms “we,” “us,” or “our” in these Official Rules refer to Tata Communications, and the term “you” refers to you, the entrant, both as an individual and as part of your team, as applicable.

2. Eligibility

- a** This skill-based Contest is open to legal residents of the following countries who are at least 18 years old, or the age of majority in the jurisdiction where they reside, whichever is older, at the time of entry: Australia, Brazil, Canada (excluding Quebec), Denmark, Finland, Germany, Hong Kong, India, Ireland, Netherlands, Norway, Russia, Singapore, Spain, South Africa, Sweden, the United Kingdom, and the United States. Employees of Tata Communications, MERCEDES AMG PETRONAS Formula One™ Team, the Formula One group, Sidhu & Simon Communications, or Hill & Knowlton Strategies, McCann Enterprise as well as the immediate family (spouse, parents, siblings, and children) and household members of those employees, are not eligible to enter.
- b** If you are an employee of a corporation, government agency, or an academic institution, you are responsible for ensuring that your participation in the Contest complies with any policies your corporation, agency, or institution may have regarding participation in contests of this type. If we have reason to believe that you violate any of those policies, we reserve the right to prohibit you from participating in the Contest or receiving a prize at any time. We are not responsible for any disputes arising between you and your employer.
- c** By entering the Contest, you confirm that you have not breached any laws in your country of residence regarding the legality of entering the Contest. We will not be responsible for any person entering the Contest unlawfully or otherwise in breach of local laws.

3. Entry Schedule

- a** The Challenges will be announced on the Contest site at approximately 08:00 British Summer Time (BST) on the Start Dates listed below. Entries for Challenge 1 and Challenge 2 must be received by 09:00 BST on the applicable End Dates listed below. Dates and times are subject to change. Keep checking the site for updates. Entries received after these periods will not be eligible. Our computer is the official time-keeping device for the Contest.

	Start Date	End Date
Challenge 1	27th May 2016	16th June 2016
Challenge 2	7th July 2016	27th July 2016

4. Entry Requirements

- a** You will be required to submit a technical abstract of no more than 1,000 words. You must submit also at least one (1), but no more than three (3), supporting documents (in JPG, JPEG, PNG, PDF, or other format as may be specified at the time of the Challenge) each consisting of no more than one (1) file and up to 5 MB. All materials must be in English. Everything you submit constitutes part of your Entry.
- b** Please make sure your Entry does not:
 - (i) violate the rights — including, but not limited to, copyrights, trademark rights, patent rights, or privacy rights— of any third party;

- (ii) prominently feature any trademarks or logos;
- (iii) portray us, MERCEDES AMG PETRONAS, any Formula One™ Team, or the Formula One group in a negative light; or
- (iv) contain content that is defamatory or in violation of any law, irrelevant to the Challenge, or otherwise inappropriate, as determined by us, in our sole discretion.

We reserve the right to reject any Entry that does not comply with these Official Rules.

c Please see Section 10 for information about how we may use your Entry.

5. How to Enter

- a** Once you have completed your Entry, visit www.tatacommunications.com/f1prize and follow the instructions to submit the Entry. Entries cannot be changed after submission, so please make sure you are happy with what you submit. There is a limit of one (1) Entry per person per Challenge, regardless of whether you enter as an individual or as part of a team.
- b** If you enter as part of a team, you will be required to include contact information for each team member. Each team member must meet the eligibility criteria set forth above. You will also be required to designate a team leader. If we need to communicate with your team, all communications will be sent to the team leader. We are not responsible for, and will not assist in resolving, any disputes between teammates.
- c** By entering, you indicate your full agreement to, and acceptance of, these Official Rules, and you agree to be legally bound by them. You also agree and acknowledge that our decisions regarding the Contest are final and binding. Winning a prize is contingent upon fulfilling all requirements in these Official Rules.
- d** By entering, you represent and warrant that:
 - (i) your Entry is your original work created solely for the purpose of this Contest, and you are the owner of all the rights, including, but not limited to, all intellectual property rights in the Entry;
 - (ii) your Entry does not violate the rights — including, but not limited to, copyrights, trademark rights, patent rights, or privacy rights — of any third party; and
 - (iii) you have complied with these Official Rules.

6. Selection of Winners

- a** Within two (2) months of the End Date of each Challenge, a panel of judges (including at least one (1) independent judge) will evaluate and score all Entries according to the following Judging Criteria:
 - (i) ability to solve the Challenge in a logical, clear, and concise manner;
 - (ii) creativity in problem solving;
 - (iii) technical knowledge of the subject matter and the ability to apply this technical knowledge to the Challenge.
- b** The three (3) Entries (whether individuals or teams) with the highest scores in each Challenge will be deemed Challenge Winners (subject to their compliance with these Official Rules). Challenge Winner will be notified via e-mail approximately seven (7) business days after selection. Each Challenge Winner (whether an individual or a team) wins one Challenge Prize.
- c** After both Challenges have been completed, a panel of judges will evaluate each of the Challenge Winners according to the Judging Criteria. The Challenge Winner (whether an individual or team) with the highest score will be deemed the Grand Prize winner, and will be notified in person at the 2016 FORMULA 1 UNITED STATES GRAND PRIX on or before Sunday 23rd October 2016. The names of the Challenge Winners and the Grand Prize Winner will be announced on the Contest site on or around 26th October 2016.

7. Winner Requirements

- a** Each Challenge Winner (including without limitation, each member of a winning team) may be required to sign a Declaration of Eligibility, Liability and Publicity Release, and W-9 tax form (for U.S. residents) or W-8BEN tax form (for non-U.S. residents) within ten (10) business days of notification in order to receive a Challenge Prize.
- b** If we do not receive the required forms and information from a Challenge Winner in a timely manner, we may disqualify the Challenge Winner (and his/her teammates, as applicable) from receiving any prize.

8. Challenge Prizes

- a** The Challenge Prize is a trip for two (2) to the 2016 FORMULA 1 UNITED STATES GRAND PRIX on 20th – 23rd October 2016. If a Challenge Prize Winner is a team, only two (2) team members will have the opportunity to take the trip, and they will not be able to take any guests. **If a Challenge Prize Winner is an individual, he/she will receive a trip for two (2), the Challenge Prize Winner and one (1) guest. Team leaders are responsible for letting us know which team members will travel.**
- b** The Challenge Prize consists of: (i) round-trip Economy-class airfare from a major airport near the Challenge winner's home to Austin Bergstrom International Airport, United States; (ii) one double-occupancy double or twin hotel room for three (3) nights; (iii) ground transportation between the airport to the hotel and the hotel and the race events; and (iv) two (2) weekend grandstand tickets to the 2016 FORMULA 1 UNITED STATES GRAND PRIX. The approximate retail value of each Challenge Prize is \$16,000 USD (approximately \$20,960 CAD). The actual value of the prize will vary depending on various factors, including the point of departure. **The Challenge Winner is responsible for paying any costs and expenses not listed above.**
- c** Each Challenge Winner and his/her guest (if applicable) are responsible for obtaining passports and any other necessary travel documents, and must have no impediment to entering the United States of America. We will not provide any travel assistance, other than providing the necessary tickets. A Challenge Winner and guest must travel on the same itinerary. Once travel documents are issued, they cannot be changed. The guest must be at least eighteen (18) years old, and must sign and return to us a liability and publicity release prior to the issuance of travel documents. We may determine any Challenge Prize details that are not specified above, in our sole discretion. If a Winner cannot travel on the dates we specify, he/she will forfeit the prize. If the race is cancelled for any reason, our sole responsibility will be to award the remaining elements of the Challenge Prize. The Challenge Prize may not be transferred and must be accepted as awarded. A Winner may not request cash or substitute prize component; however, we reserve the right to substitute the Challenge Prize (or component thereof) with another prize of equal or greater value if the Challenge Prize is not available for any reason. Subject to applicable tax laws, the winner(s) may be responsible for paying taxes and social contributions on the Challenge Prize, which will depend on applicable laws in the winner(s)' country and location of residence, and may require the completion of additional documentation.

9. Grand Prize

- a** One (1) Grand Prize winner will receive \$50,000 USD and a trophy. (If a Grand Prize winner resides in Brazil, the monetary prize will be awarded in gold.) If the Grand Prize winner resides outside of the United States, the actual value of the Grand Prize in the winner's currency will depend on the exchange rate when the prize is paid. If a team wins the Grand Prize, the Grand Prize will be divided evenly among all team members. Subject to applicable tax laws, the winner(s) may be responsible for paying taxes and social contributions on the prize, which will depend on applicable laws in the winner(s)' country and location of residence, and may require the completion of additional documentation.

10. How Your Entry May be Used

- a** You do not transfer ownership of your Entry by entering the Contest. However, by entering, you grant an irrevocable, perpetual (non-exclusive) right and permission to reproduce, encode, store, copy, transmit, publish, post, broadcast, display, publicly perform, adapt, modify, create derivative works of, exhibit, and otherwise use and communicate to the public your Entry as-is or as-edited (with or without using your name) — as well as any footage taken of you participating in Contest-related activities — in any media throughout the world for any purpose, without limitation, and without additional review, compensation, or approval from you or any other party to: (i) in the case of challenges set by the Formula One group, to the Formula One group and its agents, licensees and assigns; and (ii) in the case of all other challenges, to us and our agents, licensees and assigns. By entering the Contest, you unconditionally and irrevocably waive, to the extent permissible under applicable law, any and all copyrights, trademark rights, privacy rights, and other legal or moral rights that may preclude us, our agents, licensees, and/or assigns from any use of the Entry anywhere in the world and you agree not to instigate, support, maintain, or authorize any action,

claim, or lawsuit against us, our agents, licensees, and/or assigns (or those of the Formula One group as applicable) on the grounds that any use of the Entry, or any derivative works, infringes any of your rights as creator of the Entry, including without limitation copyrights, trade mark rights, and moral rights. You agree to sign any necessary documentation that may be required for us or the Formula One group to make use of the rights you granted

- b** You acknowledge that we, the Formula One group or other entrants may have developed or commissioned materials similar or identical to your Entry, and you waive any claims you may have resulting from any similarities to your Entry.
- c** You understand that we cannot control the information you disclose to us during the course of participating in the Contest, or what we or our representatives will remember about your Entry. You also understand that we will not restrict work assignments of representatives who have had access to your Entry. By participating in the Contest, you agree that use of information in our representatives' unaided memories in the development or deployment of our products or services does not create liability for us.
- d** You understand that you will not receive any compensation or credit from us for use of your Entry, other than what is described in these Official Rules.

11. General Terms

- a** We reserve the right, in our sole discretion, to disqualify and seek damages from any individual or team who fails or failed to comply with any provision of these Official Rules, cheats, tampers with the operation of the Contest, or otherwise acts in a disruptive or unsportsmanlike manner.
- b** In the event that the operation, security, or administration of the Contest is impaired in any way, we may, in our sole discretion, either: (i) suspend the Contest to address the impairment and then resume the Contest; or (ii) award the prizes according to the Judging Criteria set forth above from among the eligible entries received up to the time of the impairment.
- c** Except where prohibited by law, in cases of death or personal injury caused by our negligence, or fraud or breach by us of these Official Rules, you agree to release and hold harmless Tata Communications, MERCEDES AMG PETRONAS Formula One™ Team, the Formula One group, Sidhu & Simon Communications, Hill & Knowlton Strategies, and McCann Enterprise and each of their respective officers, directors, employees, and agents (the "Released Parties") from and against any claim or cause of action arising out of participation in the Contest, including, but not limited to: (i) unauthorized human intervention in the Contest; (ii) technical errors that may impair your ability to participate in the Contest; (iii) errors in the administration of the Contest arising from circumstances beyond our reasonable control; (iv) any claim or allegation that your Entry infringes any copyright, trademark, or any other intellectual property right; (v) disputes between team members; (vi) disputes between entrants and their employers; and (vii) claims relating to injuries, death, or damage to persons or property relating in any way to your participation in the Contest or use of a prize.
- d** Except where prohibited by law, you agree that any and all disputes, claims, and causes of action arising out of, or connected with, the Contest or any prize awarded shall be resolved individually, without resort to any form of class action, and exclusively by the appropriate court located in New York, NY, USA. All issues and questions concerning the construction, validity, interpretation and enforceability of these Official Rules, your rights and obligations, or our rights and obligations in connection with the Contest, shall be governed by, and construed in accordance with, the laws of New York, without giving effect to any choice of law or conflict of law rules (whether of New York or any other jurisdiction), which would cause the application of the laws of any jurisdiction other than New York. (For residents of Denmark and Finland: Should you be considered a consumer under the applicable mandatory consumer protection legislation, nothing contained herein shall prevent your rights to present claims in the Market Court.)
- e** Our failure to enforce any term of these Official Rules shall not constitute a waiver of that provision. The Contest is subject to federal, state, provincial, and local laws and regulations and is void where prohibited by law.
- f** Any clause of these Official Rules that is prohibited or unenforceable in any jurisdiction is ineffective as to that jurisdiction to the extent of that prohibition or unenforceability. That does not affect the validity or enforceability of that clause in any other jurisdiction nor invalidate the remaining clauses of these Official Rules.

12. Privacy and Publicity

a Any information you submit as part of the Contest will be used for purposes of this Contest and treated in accordance with our Privacy Policy. Except where prohibited, participation in the Contest constitutes your consent to our use of your name, likeness, voice, opinions, biographical information, and jurisdiction of residence for promotional purposes in any media without further payment or consideration, and to the cross-border transfer of such information, consistent with applicable law.

13. Organizer

The Contest is organized by Tata Communications Limited, Vintners Place, 68 Upper Thames Street, London EC4V 3BJ, United Kingdom