



We had a fantastic World Finals in Singapore this year with 47 teams competing, our biggest World Finals to date.
Union Racing International, breaking the world record, not once but five times was impressive enough, but having a collaboration team take the title makes it even more special.

The standard of work achieved by every team has been outstanding and it blows me away with the depth of engineering knowledge, the innovations developed by the students and their passion for F1 in Schools.

We introduced LERS (Launch Energy Recovery System) this year which added a new dimension to the challenge at the World Finals and it also links closely with similar technological advances that are seen in F1. It certainly spiced up the racing being used by 39 of the teams.

We must congratulate all the teams for showing such ingenuity and dedication to their involvement in the Challenge!

I'm already looking forward to the 2016 World Finals being held in Austin Texas.

Andrew Denford
Founder and Chairman
The F1 in Schools Technology Challenge





### Gary Anderson

Yet again it was a pleasure to take on the role of Chair of Judges. The talent of the students at the World Finals is exceptional and this year was no disappointment. The level of entrepreneurism and engineering excellence exceeded all expectations and I have learnt to always expect the unexpected from these students.

New technologies and innovations have really pushed the competition to its limits. Alongside the intense competition, the camaraderie and sportsmanship between teams is something that can be truly admired.

This year the World Champions were made up of students from both the U.S.A and Germany. I think F1 could learn a few things from our judging process and our teams!

Well done to all the students who made it to the World Finals and congratulations to our new World Champions, Union Racing International on their incredible achievement.

#### Gary Anderson

Chair of Judges



#### David Croft

It is always a pleasure to host this event and every year I am astounded by the levels of engineering, professionalism, creativity and innovation the students present and this year the level was raised yet again.

As always the competing teams were a credit to the competition and certainly great fun to work with. The standard just keeps on improving year on year and with so much support from the F1 community I'm looking forward to seeing some of these young people in the Formula One Paddock Club in the not so distant future.

I congratulate all the students on their hard work to win a place at the World Finals and I hope each and everyone one of them enjoyed the experience in Singapore.

#### David Croft

Sky Sports F1 HD Commentator



### Noel Hawkes

F1 in Schools came back after 5 years outside of Singapore and we were delighted that they chose RWS to hold the event. We went all out to give the attendees and their families a great experience to compliment the 2015 FORMULA 1 SINGAPORE AIRLINES SINGAPORE GRAND PRIX weekend offering delegates a truly unique experience with our integrated facility including unique venues like USS, SEA and ACW. Attendees were also particularly impressed by the judges' night at Tangerine where they were wowed with the tranquility, food quality and service of one of our unique dinning concept at Tangerine.

#### Noel Hawkes

Vice President
Resorts World Sentosa

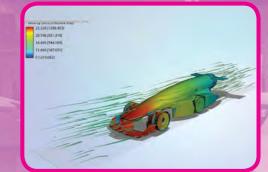


## the competition - what's it all about?



#### 1 - FORM AN F1 IN SCHOOLS™ TEAM

Form a team of three - six students, think of a name, decide job roles; Team Manager, Manufacturing Engineer, Design Engineer, Graphic Designer and Resource Manager......Now register for regional finals.



#### 4 - ANALYSE

YSE AUTODESK

Aerodynamics are **analysed** for drag coefficiency in a Virtual Reality Wind Tunnel using Computational Fluid Dynamics software (CFD).



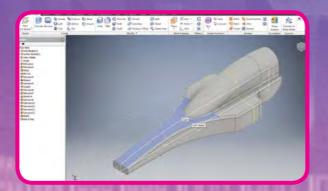
#### 2 - BUSINESS AND SPONSORSHIP PLAN

Prepare a business plan, develop a budget and raise sponsorship. Teams are encouraged to collaborate with industry and create business links.



### 5 - MAKE

Using 3D CAM (Computer Aided Manufacture) software, the team evaluates the most efficient machining strategy to **make** the car.



#### 3 - DESIGN

AUTODESK.

Using 3D CAD (Computer Aided Design) software, the team **designs** an F1 car of the future to the specification set by the International Rules Committee, just like in Formula 1.



#### 6 - TEST

Aerodynamics are **tested** in wind and smoke tunnels. Aerodynamics is a major focus for all teams involved in the world of Formula 1 and can make the difference to a winning team. Students can fine tune designs to optimise speed and drag co-efficiency.



#### 7 - PIT BOOTH

Put together an informative display showing your work through all stages of the project. Think about your team identity.



#### 10 - VERBAL PRESENTATION

Prepare a presentation to perform to a panel of judges covering all aspects of the challenge. This will be completed within a set time limit. (10 mins)

COMPETE REGIONALLY, NATIONALLY AND INTERNATIONALLY AT THE WORLD

FINALS FOR THE BERNIE ECCLESTONE WORLD CHAMPIONS TROPHY.



#### 8 - SCRUTINEERING

Cars are submitted to parc fermé where the judges scrutinize every dimension to check they comply with the Rules and Regulations.



#### 11 - PORTFOLIO JUDGING

Put together two 10 page A3 portfolio documenting your project.



Judges question teams on how their car has been manufactured and why particular designs were chosen.



#### 12 - RACE

Teams are judged on car speed, as well as supporting evidence of their design, verbal presentation and marketing display stand in "the pits".

Teams put the cars to their ultimate test by racing them over a measured distance with the F1 in Schools 20m elevated track and F1 in Schools race system.





## competing teams

	TEAM NAME	COUNTRY	SCHOOL
-	Laminar Racing	Canada	Rocky View Schools
	Noctis Racing	USA	Brentwood Borough School District
	Blood Elites New Generation	Czech Republic	Secondary Technical School Kolín & Business Academy Kolín
	Veloc Racing	Greece	Psychico College High School (Haef)
*	Hyperdrive Performance	Australia	Trinity Grammar School
***	AXLR8	Portugal	CLIP - The Oporto International School
*)	Cyclopentane	China	Beijing Yucai School
<b>(</b> ::	The Abwin Ulteamate	Singapore	Raffles Girls' School (Secondary)
()	Lyteed	China	The Experimental High School Attached to Bejing Normal University
	Vast Velocity	Germany	Marie-Therese Gymnasium
	Evolution F1	United Kingdom	Robert May's School
<u> </u>	Velox	Cyprus	Archangelos Lyceum Apostolos Markos
+	Cyclone Racing	England	Wilmington Grammar School For Boys & Invicta Grammar School
*	Team HeliosT	Vietnam	British International School Vietnam
	Nova F1 Racing Team	Malaysia	Sekolah Sultan Alam Shah
	TEAM RESET	Greece	Anatolia College Of Thessaloniki
	Horizon	United Kingdom	St. Cuthbert's High School
•	Mustangs	Portugal	Didáxis - Cooperativa de Ensino de Riba de Ave
€	Zero Gravity Team	Cyprus	Periferiako Lykeio Livadion
	Team AIB Racing	Ireland	St. Muredach's College
*}	Triumph	China	Shanghai Shixi High School
<b>(</b> :	Team equiNOX	Singapore	Raffles Girls' School (Secondary)
	Automotive Engineers - Racing Bulls Austria	Austria	HTBLA Steyr - Higher Technical School for Automotive Engineering
<b>(</b> :	AeroPhoenix 2.0	Singapore	Henderson Secondary School
	rev up	Germany	Gymnasium Unterrieden Sindelfingen & Lessing Gymnasium Winnenden
	Tachyon	Wales	Denbigh High School

	TEAM NAME	COUNTRY	SCH00L
*	Infinite Racing	Australia	Redcliffe State High School
	Road Runners	Greece	Ellinogermaniki Agogi (Greek- German School of Athens)
	21m/s	United Arab Emirates	Our Own High School
	Insperact	Qatar	Doha British School
	HdG Racing	Netherlands	Osg Hugo de Groot
	Xenith Racing	United Arab Emirates	The Indian High School
	Torque Racing	United Arab Emirates	Rawafed Private School
	Verus Racing	Ireland	St. Attracta's Community School
	Affinity F1	USA	Granbury High School
	Tsuiso	Bahrain	St Christopher's School
$\mathbf{X}$	Team Apex	Scotland	Deans Community High School
€	Squarevolution	Cyprus	Yiannaki Talioti Lyceum
	Electro	Malaysia	Sekolah Menengah Kebangsaan Seksyen 9 Shah Alam
<b>&gt;</b>	Green Streak	South Africa	Grantleigh Schools
Ж	Precision Racing	Australia	Brighton Secondary School
	Silver Bullets	Bahrain	St Christopher's School

## international collaboration teams

	TEAM NAME	COUNTRY	SCHOOL
	Endeavour F1	Australia & United Kingdom	Ulverstone High School & Emmanuel College
*>	Maxele Racing	China & Malaysia	Sekolah Menengah Sains Hulu Selangor & TBC
	Pact Racing	Germany & Ireland	Gymnasium Grootmoor & HEX CNC
	Project Driven	United Arab Emirates & Qatar	Repton School Dubai & Qatar Academy
	Union Racing International	Germany & USA	Lexington High School & Alexander-von-Humboldt Gymnasium





## day i - networking ¢ cultural day in singapore

For most of the 47 competing teams this was their first chance to meet each other, as well as getting their first glimpse of the incredible city of Singapore.

The teams all took to the sky to get a bird's eye view of Singapore from one of Asia's most iconic architectural and engineering marvels, the Singapore Flyer. The Singapore Flyer is Asia's largest observation wheel, taking you 165 meters above ground level. During Resorts World Sentosa where it was the 30 minute flight the teams were able to take in all of Singapore's eyecatching landmarks.

Once back on the ground the teams were transported to the magnificent Gardens by the Bay, where they set aside their rivalries to take part in a networking lunch. The lunch was an informal way for the students to meet their fellow competitors ahead of the World Finals competition.

The teams swapped business cards and began to form friendships which will last a lifetime. Over lunch the students exchanged stories about their journeys to Singapore before being entertained by a fantastic Beatbox performer.

The room was full of energy and excitement as the teams began their World Finals experience.

After a fun filled day in Singapore, the teams were transported back to time for the competition to begin with the teams pit display build. Teams were given a two hour time frame to construct their fantastic pit displays ahead of three intensive days of competition.



















The 11th F1 in Schools World Finals were officially opened by Scott Wightman, British High Commissioner, Singapore.



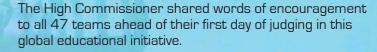












The day brought different challenges for each of the 47 teams, with verbal presentations, pit display and portfolio assessments, engineering judging, media sessions and plenty of on-track action as the teams completed their time trial racing. Each team also took part in the timetrial racing where the outright speed of the car is judged on the 20 metre track.

Resorts World Sentosa was a fitting venue to host the event and provided the students with a huge amount of onsite attractions and restaurants to explore between their judging sessions.







## union racing international - meet the world record breaking champions

Union Racing International, Germany/USA collaboration team, made F1 in Schools history at the F1 in Schools World Finals 2015, when they smashed the track record and broke the one second barrier for the first time ever, sprinting down the 20 metre F1 in Schools race track in a time of 0.997 seconds. The following day they again broke this record with a stunning time of 0.977 seconds.

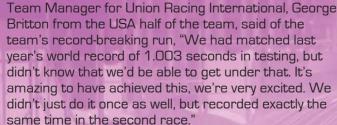


The record-breaking run, set in the time trials, was the first record set with the new Launch Energy Recovery System (LERS) regulations. A sophisticated device gave Union Racing International an acceleration boost off the line. producing the sub one-second time.

The Germany/USA collaboration team had been working together over the last few months, communicating through technologies, but not meeting each other until their arrival in Singapore. Despite being seven thousand kilometres apart, the six boys developed their record-beating car and innovative LERS device, bringing together the various elements needed for the competition on site at the event.

Britton from the USA half of the team, said of the team's record-breaking run, "We had matched last year's world record of 1.003 seconds in testing, but didn't know that we'd be able to get under that. It's amazing to have achieved this, we're very excited. We didn't just do it once as well, but recorded exactly the

Of the innovative LERS Design, Construction Manager, one of the three German students in the team, Devansh Dhard, said "Our time was two hundredths guicker than yesterday, which has surprised us. We haven't changed the car at all, we haven't touched it, we're just relying on the ceramic bearings." It was our USA team members who had the idea to develop the inner wall of the device and then we came up with the outer surround idea and then they suggested putting the sponsors on the LERS device, it was a real partnership for the development and a real collaborative effort."





## day a - competition day a

For the 47 competing teams this was their second day of judging and also the reaction racing, with each team selecting their best student to launch their car down the track.













Teams participate in a range of judging activities during the World Finals competition. Whilst today some teams faced the Design & Engineering judging panel to explain the engineering, manufacturing and design choices of their car, others presented their verbal presentations to a different judging panel, whilst the Enterprise judges examined each team's 10 page Enterprise Portfolio and pit display.

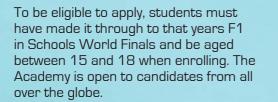






## day 4 - randstad williams engineering academy

2015 saw the launch of the Randstad Williams Engineering Academy, an innovative new scheme that will see Williams and Randstad mentor students from across the world as they bid to secure a career as Formula 1 engineers.



The Randstad Williams Engineering
Academy is as an extra-curricular
e-learning and vocational skills
programme. This is a staged
programme that will see Williams
support the students until the completion

arrandstad WILLIAMS

**ENGINEERING ACADEMY** 

of their university studies. The curriculum includes motorsport engineering themed learning via an e-learning portal. It will also include a variety of work placements at Williams and mentoring opportunities with senior Williams engineers.

Following a series of written submissions today the pool of selected students took part in group exercises that were overseen by a joint Williams and Randstad assessment panel.





Whilst some of the competing students took part in the Randstad Williams Engineering Academy assessment centre, the rest of the teams were treated to a Singapore cultural experience which saw them take part in a variety of activities including Cultural Dance Experience, Batik Painting, Chinese Painting, Henna Style, Stomp it! Percussion, Local Handicraft, Rangoli Sand Art Animation, Local Costume Photography and Dramatisation of Local Tales.

The morning activity gave the teams a true flavour of the Singapore culture within a fun environment giving them a chance to mix with the other teams at the same time. The afternoon brought the 24 fastest teams together to compete in the Knockout Competition, the most competitive stage of the World Finals event. Each team must nominate their team member with the fastest reaction time to launch their car down the 20m F1 in Schools track.

In each round the losing team is eliminated until just two teams are left to go head-to-head in the knockout competition final, which this year, was held during the Awards Celebration Gala Dinner.

















## day s - visit to universal studios, singapore















The teams enjoyed a well-deserved fun day out at Universal Studios Singapore.









## awards celebration gala dinner 🕏 knock-out competition finale







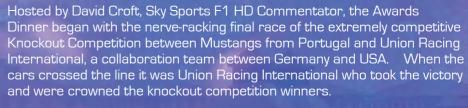












The students were then joined for dinner by VIPs from the worlds of both Formula 1 and education. The Awards Celebration Dinner featured 21 awards, with each award being presented by local, F1 and engineering nstitution personalities.















## world champions, and place \$ ard place



## THIRD PLACE

### Team AIB Racing

St. Muredach's College, Ireland











Didáxis - Cooperativa de Ensino de Riba de Ave,

## WORLD **CHAMPIONS**

Supported by









## **Union Racing International**

Alexander-von-Humboldt Gymnasium, Germany & Lexington High School, USA



Union Racing International, a collaboration team formed by six students from Germany and USA made F1 in Schools history when they were crowned F1 in Schools World Champions 2015, the first time that a collaboration team has achieved the ultimate accolade of this global education initiative.

The team also put their name in the record books when they broke the F1 in Schools track record, taking it under one second for the first time, with their car recording a time of 0.977 seconds in its fastest race.

George Britton, Team Manager of Union Racing International said, "it's been a great night for the team. It's amazing and it's been great to bond with our team over the past week and I think our awards show just how much work we've put into this. It's been difficult working together without having met, not being able to see face to face, the main thing we struggled with is agreeing on things, but after we figured that out it was fine."

## announcement of randstad williams engineering academy winners

Following a series of written submissions and group exercises that were overseen by a joint Williams and Randstad assessment panel, the eleven students chosen for the Randstad Williams Engineering Academy demonstrated the passion, commitment and raw skills needed to join this exclusive programme.





no randstad WILLIAMS



Gala Dinner, with Deputy Team Principal Claire Williams, Chief Technical Officer Pat Symonds and Randstad's Managing Director for Asia Pacific, Deb Loveridge, making the announcement. The first cohort of students are based in six different countries. Year one of the Academy officially began on 1st October 2015 and will

The students were informed of their

selection at the Awards Celebration

see the students complete a series of motorsport themed e-learning modules that have been developed by Williams in partnership with Cambridge University Press, one of the world's leading educational publishers. Each student has an experienced Williams engineer as a tutor or "mentor" to guide them through the e-learning activities and provide advice on a motorsport

Academies designed to identify and train future racing drivers have existed in Formula 1 for a number of years, but this is the first scheme of its kind dedicated to identifying and supporting a new generation of Formula 1 engineering stars.



## award winners



WOMEN IN MOTORSPORT

FIA Women in Motorsport Award Supported by FIA Women in Motorsport Commission

### Team equiNOX

Raffles Girls' School (Secondary), Singapore



## FANTASTIC

Team Website Award

Supported by Fantastic Media

### **Zero Gravity Team**

Periferiako Lykeio Livadion, Cyprus





Sutton Images Image of the week award Supported by Sutton Images

#### **Project Driven**

Repton School Dubai & Qatar Academy, United Arab Emirates & Qatar



Knock out Competition Winners

Supported by Resorts World Sentosa

## Union Racing International Lexington High School & Alexander-von-Humboldt

Gymnasium, Germany & USA



## TRELLI

Research and Development Award Supported by Pirelli

### Laminar Racing

Rocky View Schools,

ID



### MASTEREIGN

#### Enterprise Portfolio Award

Supported by Mastereign Enrichment Group

### Mustangs

Didáxis - Cooperativa de Ensino de Riba de Ave,



### WILLIAMSRACING

Verbal Presentation Award

#### Supported by Williams Racing

Vast Velocity Marie-Therese Gymnasium,



## Toro-Rosso

#### Pit Display Award

Supported by Scuderia Toro Rosso

#### Team AIB Racing

St. Muredach's College.

## award winners





#### Outstanding Sportsmanship Award

Supported by Sahara Force India F1 Team

## Nova F1 Racing Team Sekolah Sultan Alam Shah,



#### Team Identity Award

Supported by Scuderia Ferrari

### Pact Racing

Gymnasium Grootmoor & HEX CNC, Germany & Ireland



## PETRONAS FORMULA ONE TEAM

#### Fastest Car Award

Supported by Mercedes AMG PETRONAS Formula One Team

### **Union Racing International**

Lexington High School & Alexander-von-Humboldt Germany & USA



### ON INFINITI

### Red Bull 🦗

### Chair of Judges Recognition of Acheivement

Supported by Infiniti Red Bull Racing

#### Triumph

Shanghai Shixi High School,



Innovative Thinking Award Supported by Lotus F1 Team

## Zero Gravity Team Periferiako Lykeio Livadion,



### MAN.R

Team Sponsorship & Marketing Award Supported by Manor F1 Team

### Tachyon

Denbigh High School,



### McLAREN HONDA

Best Engineered Car Award Supported by Mclaren Honda

### **Laminar Racing**

Rocky View Schools, Canada



## Sauber F1 Team

Best Newcomer Award Supported by Sauber F1 Team

### **Team Helios**

British International School Vietnam,





The Best International Collaboration Team Award Supported by Shell

#### **Union Racing International** Lexington High School & Alexander-von-Humboldt

Gymnasium, Germany & USA





## day s - official after party \$ f1° pit lane walk

To celebrate all their hard work and success the students were given an exclusive official after party sponsored by Singapore Airlines.

Following the after party, the teams were given the chance of a lifetime, when they took part in a pit lane walk at the 2015 FORMULA 1 SINGAPORE AIRLINES SINGAPORE GRAND PRIX courtesy of Singapore GP. Getting the chance to see the F1 team pit garages up close was a dream come true for a lot of the students.



























# day 7,0 ¢ 9 - winning teams visit the Formula One Paddock Club™

On Friday 18th September the UK Teams were invited to enjoy High Tea hosted by the British High Commissioner 'Scott Wightman' at his Singapore residency.



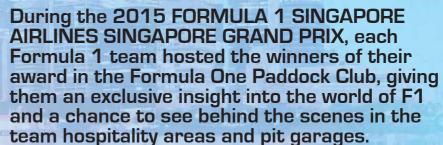


















# day 7,8 ¢ s - winning teams visit the Formula One Paddock Club™















































## women in motorsport







With girls making up 35% of F1 in Schools teams, the initiative expects to introduce a large number of girls to motorsport and a significant percentage of these to enter the engineering industry.

F1 in Schools linking with the FIA Women in Motorsport Commission in recent years has brought a much valued promotion of this aspect to the competition, including the introduction of an award recognising exceptional female talent at the F1 in Schools World Finals.





















## what out visitor's thought...



say a big thank you for the incredible experience of being involved in the F1 in Schools World Finals. I cannot put into words how impressed I was with, not only the unbelievably high level of standards shown by the students, but also by the organisation and professionalism of the whole competition. It was truly inspirational."

I just wanted to take the time to



Joseph Batchelor Formula One Technical Assistant

yable as always. 🕠



Pat Symonds Williams Racing WILLIAMSRACING Chief Technical Officer



ffl can hand on heart say I thoroughly enjoyed the evening. Year on year the the event for the first time came to enthusiastic about the evening.



Graham Watson Scuderia Toro Rosso Team Manager



It was truly inspiring to see the young and aspiring generation working so passionately and motivated.

Thank you again for the invitation and we hope Formula 1 in Schools will keep offering this perfect stage for future F1 colleagues for many years to come. Big congrats also to the organisation team of the finale, which was very well set-up!



Andrea Menth Scuderia Toro Rosso Sponsor Key Account & Brand Manager





Federico Gastaldi Lotus F1 Team Deputy Team Principal



It was a pleasure to attend, I am always so inspired by the students' enthusiasm. The reaction of the guys and girls who were recruited onto our engineering programme was also really pleasing to see - I don't think I was ever that excited by additional work when I was at school!



Claire Williams Williams Racing Deputy Team Principal



fflt was an amazing event, really interesting especially for me because it was my first time to attend it."



Tiziana Mecozzi Scuderia Ferrari Head of Sponsor Accounting





**FIA** 

Paul Monaghan Infiniti Red Bull Racing Chief Engineer, Car Engineering

Many thanks Andrew, count

me in for Austin next year!

FIA Director of Formula 1

Charlie Whiting

Annie Kennedy

Sponsorship Activation Manager



. "

ffF1 in Schools put on an amazir



Matt Morris McLaren Honda Director of Engineering



Jonathan Giacobazzi Scuderia Ferrari F1 Event Marketing Manager



As always, it was a pleasure having been a small part of this amazing event. A big thank you to Andrew and his fantastic team for organizing this wonderful program and finale. The dedication, creativeness, professional team work and passion for F1 shown by all the participants is truly inspiring."



Kristina Fraesdorf Sauber F1 Team On Track Marketing & Event Manager



Many thanks for sending this through. I thoroughly enjoyed the event and am already looking forward to next year's programme in

**C**ongratulations for the perfect

of the schools involved has been

next generations of engineers.

outstanding; let's hope it will inspire



Danielle Reid Williams Racina Talent Acquisition & Development Manager





Official Venue:



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