Australia's only official F1 magazine
20TH ANNIVERSARY SPECIAL ISSUE
August 2016

F1 RACING



F1 RACING 20 YEARS

20 YEARS OF STAR CARS: FROM 7 TITLE-WINNING TEAMS

Ricciardo... on Max, Tatts and Kyvat



EXCLUSIVE: INSIDE ALONSO'S PRIVATE WORLD

Fernando takes us on a personal tour of his museum and racetrack

Australia's only official F1 magazine

F1 RACING



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How much smaller, more intimate, F1 felt in 1996. Just 16 races, and a grid made up largely of privateers. The 'grand European tour' that characterised the spring-into-summer sweep of the season was still present and correct, from the European Grand Prix at the Nürburgring in April, through to Portugal and Estoril in September. Only the mid-season foray to Canada could trouble the logisticians – the fly-aways to Australia, Brazil, Argentina and Japan were handily tucked away at either end of the season.

Stewart, Jaguar, Red Bull, Toro Rosso, BAR, Brawn, Force India *et al* were all still in some future-imagined space-time; in their stead we had Minardi, Jordan, Tyrrell, Benetton, Ligier and Footwork. We didn't yet have a track designed by Hermann Tilke; the likes of Silverstone, Hockenheim and the Circuit de Catalunya were largely open, unfettered and *fast*. The press gang claret club – Messrs Roebuck, Hamilton and Henry – were in their pomp, as big beasts including Ron Dennis, Sir Frank Williams, Flavio Briatore, Ken Tyrrell, Eddie Jordan and Max Mosley roamed the paddock.

And into this cosier, less forbidding, but still furiously competitive world, *F1 Racing* was born. It was a smart move, for Formula 1 had never been more popular in the UK. Nigel Mansell had surfed to the '92 title, leaving a trail of public goodwill in his wake. Then Damon Hill was thrust centre-stage to take on Michael Schumacher. What better storyline could there have been to sustain a UK-based F1 magazine in its launch season?

As you'll find out in this celebratory issue of *F1R*, we rode that wave of adulation to become a multi-edition title, with a global reach and an audited readership of more than a million. Our growth chimed with that of the sport itself, for it was at this time that the big bucks started flooding in. Whether it was British American Tobacco buying Tyrrell to become a self-marketing F1 team (a model adopted with vigour by Red Bull a few years later); or Ford (via Jaguar), Toyota, BMW, Renault, Honda and Mercedes each deciding at various moments that F1's giddying cocktail of speed, technical aspiration and glamour made it too enticing an arena to ignore, the sport boomed through the early noughties – the era, of course, of Michael Schumacher's domination.

We were there to chart his rise, retirement, return and, sadly, terrible injury; we were there, too, trackside, in the paddock, in boardrooms and even in the private jets of the sport's protagonists, for every second of the past 20 F1 years. What a very fine thing that a magazine dedicated solely to the world's greatest sport should exist. What a joy to record the exploits of Damon Hill, Jacques Villeneuve, Mika Häkkinen, Fernando Alonso, Kimi Räikkönen, Lewis Hamilton, Jenson Button and Sebastian Vettel, champions, all, in our lifetime.

We're not given to self-indulgence – *F1 Racing* prefers to celebrate the sport rather than itself. But on this rather special occasion allow us this: Happy birthday, *F1 Racing*. Happy birthday, to us.

Contributors



Peter Windsor
F1 Racing's longest-serving columnist

This month, PW reflects on the past 20 years by looking at what made a corner great in 1996 and comparing that with the mega turns found in the sport today (p74)



James Mann
Lensman who captures the art of the F1 race car

Since our inception, the constructors' title has been won by seven different teams. James Mann has photographed a title winner from each of them (p33)



Stuart Codling
Our executive ed has been busy filing copy from afar

'Codders' penned his first story for *F1R* in 2001, but few trips have been as good as a guided tour of Fernando Alonso's museum from the man himself (see page 54)



Steven Tee
Our photographer pictured with two of his minions

For 20 years, Steven's images have graced the pages of *F1R*. This month, see them in our Damon Hill interview (p24) and the Alonso museum tour (p54)

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HAYMARKET CONSUMER MEDIA, TEDDINGTON STUDIOS, BROOM ROAD, TEDDINGTON, MIDDLESEX, TW11 9BE, UK

THE TEAM
Group Editor
Anthony Rowlinson
Group Managing Editor
Stewart Williams
Associate Editor
James Roberts
Executive Editor
Stuart Codling
Chief Sub-Editor
Vanessa Longworth
Art Editor
Frank Foster
Designer
Jack Woolrich

CONTRIBUTORS
Columnists
Peter Windsor
Dieter Rencken
Damon Hill
Murray Walker
Technical Consultant
Pat Symonds
Principal Photographer
Steven Tee
Photo Agency
LAT Photographic

Editorial director Mark Payton
Strategy and planning director Bob McDowell
Managing director David Prasher
Chairman and managing director Kevin Costello
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Australian Editor
Steve Normoyle
Art Director
Chris Currie
Production Manager
Peter Ryman
Circulation Director
Carole Jones

NATIONAL ADVERTISING MANAGER
Cameron Davis
T (02) 9901 6177 M 0401 547 112
E cdavis@nextmedia.com.au

Ray Berghouse
M 0427 416 868
E rberghouse@chevron.com.au

HEAD OF SPORT
Hamish Bayliss

Subscriptions Enquiries
Email subscribe@mymagazines.com.au
Customer hotline 1300 361 146

nextmedia

Level 6, Building A, 207 Pacific Highway,
St Leonards NSW 2065
Locked Bag 5555 St Leonards NSW 1590

Chief Executive Officer David Gardiner
Commercial Director Bruce Duncan

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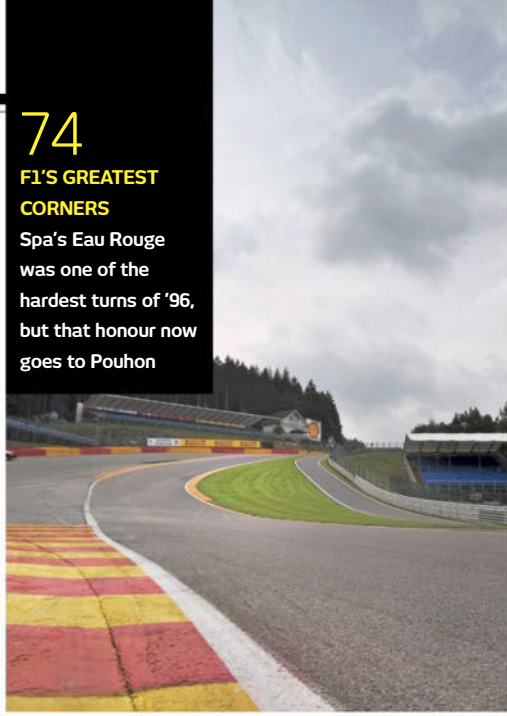
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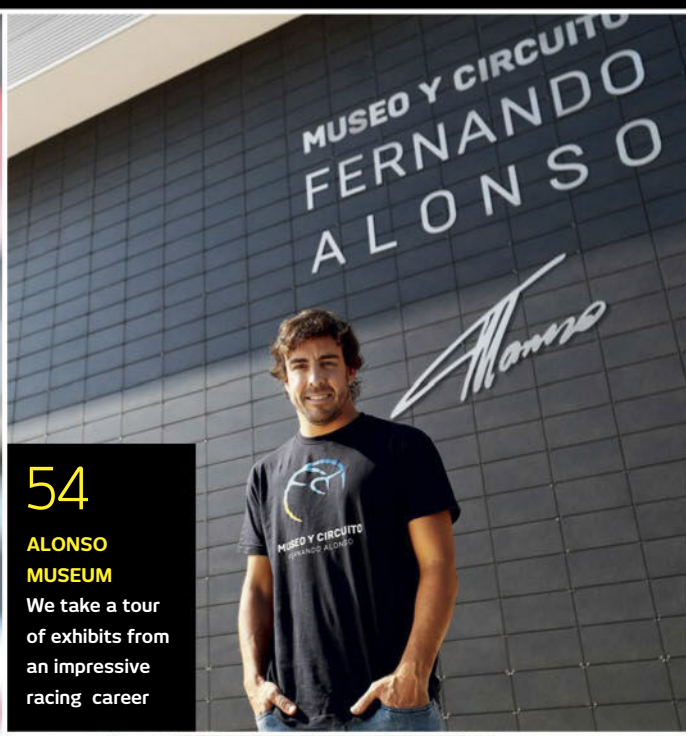


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The 2009 Brawn BGP 001 so very nearly didn't race – yet it went on to take the title



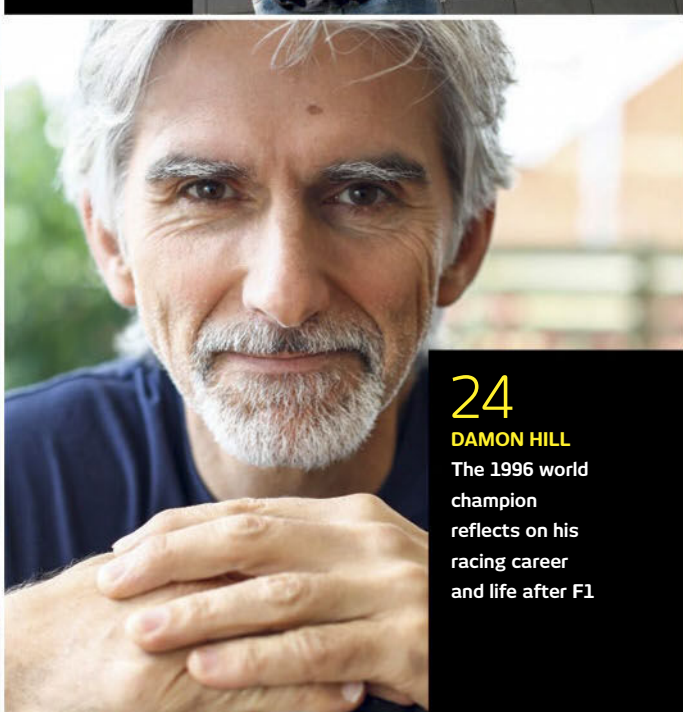


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The 1996 world champion reflects on his racing career and life after F1


AMG
PETRONAS
2016



Parade

Surf's up Lewis Hamilton joyfully celebrates with his fans after his third consecutive British GP win. There was double delight for Lewis when his Mercedes team-mate Nico Rosberg hit trouble, leaving the British ace just one point in arrears in the drivers' championship standings
Where Silverstone, UK
When 2.53pm, Sunday 10 July 2016
Photographer Glenn Dunbar/LAT
Details Canon EOS-1DX MkII, 400mm lens, 1/1000th at F4



Parade

Bogged down Fernando Alonso ploughs his McLaren-Honda through the gravel trap at Abbey after his mid-race spin during the British Grand Prix. Alonso was running in tenth place at the time of his 'off', but recovered to finish 13th at the chequered flag
Where Silverstone, UK
When 1.48pm, Sunday 10 July 2016
Photographer Peter J Fox
Details Canon EOS-1DX, 600mm lens, 1/500th at F5.6


JOHNNIE WALKER
RICHARD MILLE



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F1 INSIDER
NEWS ■ OPINION ■ ANALYSIS

NEWS

Merc drivers could face team-imposed race ban

In the aftermath of Austria, Toto Wolff warns Nico Rosberg and Lewis Hamilton that any further on-track collisions will be met with severe penalties



Mercedes drivers Lewis Hamilton and Nico Rosberg face heavy fines or even race bans if they crash again this season.

Team boss Toto Wolff has told the drivers he is not prepared to accept them colliding on track again (see race report, p88), after a certain one-two turned into a one-four when they hit each other on the final lap of the Austrian Grand Prix.

Rosberg was held responsible for the incident by race stewards, who said he had not given Hamilton 'racing room' when he failed to turn in to Turn 2 and held Hamilton out wide. Rosberg's car was damaged when Hamilton finally attempted to make the corner and Rosberg dropped down to fourth place while his team-mate went on to win the race.

Wolff has said he does not want to spend any more time debating who was to blame in the various incidents they have had. Now that the two have collided three times in five races, he simply wants to put a stop to it.

In addition to Austria, the incidents in question were their high-speed collision on the first lap of the Spanish Grand Prix, where Rosberg defended against an attack from





Toto Wolff (left) is unhappy after various incidents, including the collision in Barcelona (above), which took both drivers out of the race

Hamilton between Turns 3 and Four 4, and Canada where they banged wheels at the first corner and Rosberg ended up off track after Hamilton ran him wide.

"We didn't like the manoeuvre in Austria because it could have ended up in a double DNF. Such a manoeuvre cannot happen again," said Wolff. "I don't want to overmanage it and try to extinguish the whole thing, but equally there is the responsibility to the brand in the background, and if every Monday after the race there are headlines that there is animosity and controversy, that is not good either.



Rosberg and Hamilton have been involved in three collisions with each other in five races as they continue their battle for the championship

"We don't want to have them go around like puppets, but equally let us please not have three shunts in five races. Let's get a ratio in a place that is acceptable for the team.

"We have had an accumulation of accidents that has led to a situation that needs to be contained. It is tricky because if you have a yellow card, will it change your way of tackling or not because you know what happens with a second yellow card?"

Wolff made it clear this was a 'final warning' and that action would be taken if the pair collided again. Mercedes said that the drivers had been issued with revised 'rules of engagement', but refused to specify what these are.

F1 Racing has learned that, fundamentally, it means the drivers must give each other space when they are racing on track. In theory, that could mean moves such as those made by Hamilton on Rosberg in Suzuka and Austin last year, when he legitimately ran his team-mate off track on the exit of corners, might be considered unacceptable by Mercedes.

However, Hamilton said after his meeting with Wolff: "It depends how you interpret what is said. When I sit in the meeting, the first thing I say is: 'I am not going to stop being the racing driver. It is what you hired me to do, what I have grown to be, and like Ayrton [Senna] said: "If you are not going for a gap you are no longer a racing driver."'

"They always say: 'We don't want you to change that.' However, there are rules of engagement and the team, all these people, over a thousand people, rely on us to navigate through whatever personal goals we have in the right way so both cars finish."

The relationship between the drivers remains fragile, as evidenced by the way in which they ignored each other in the pre-podium room after the British Grand Prix.

Some are sceptical as to whether Mercedes would actually follow through on their threat to take one of the drivers out of the car for a race, but *F1 Racing* understands that Wolff is entirely serious. Mercedes have such an advantage in both the drivers' and constructors' championship that they know they will win both titles, no matter what. This means it is of no concern to them whether one of the drivers is not in the car for one race and is replaced by a stand-in – presumably either Pascal Wehrlein or Esteban Ocon, their two most senior young drivers. The only impact such a decision would have would be on the racing driver affected, which Mercedes see as a suitable deterrent to prevent any more unfortunate incidents.

Some insiders claim that a similar situation is brewing at Red Bull, due to Max Verstappen's strong showing since joining the team.

Daniel Ricciardo admitted over the British GP weekend, which was the first time Verstappen outqualified him, that he felt a little overlooked in some ways and that Verstappen joining 'has created a bit more of an atmosphere'.

NEWS DIGEST

The month's big stories at a glance

13.06.16 FIA states all cars must pass tougher flexi tests on rear wings **18.06.16** Bernie Ecclestone says he will accept Imola as venue for Italian GP if that is what national authorities decide **21.06.16** McLaren announce Jost Capito will join them as CEO in time for Belgian GP

23.06.16 Jean Todt reveals that the FIA will have to approve Bernie Ecclestone's successor



24.06.16 The World Motor Sports Council agrees that drivers who avoid penalties in eligible FIA series will be awarded two F1 superlicence bonus points **01.07.16** Plans revealed to re-open western loop of Österreichring **05.07.16** Herbie Blash will step down as deputy race director at the end of the season **08.07.16** **'Halo 2'** safety device is tested at the British GP

PHOTOS: ZAK MAUGER/LAT; ANDY HONE/LAT; GLENN DUNBAR/LAT; STEVE ETHERINGTON/LAT; SUTTON IMAGES; XPB.CC



Ecclestone is known to favour the old-style 2.4-litre V8 naturally aspirated F1 engines

NEWS

Ecclestone could still reverse engine decision

If there are fewer than 19 races in 2017, the F1 boss could invoke a special clause to undo his agreement with manufacturers

Bernie Ecclestone could yet mount another assault on Formula 1's turbo hybrid engines, despite the conclusion of a deal that was aimed at addressing his concerns.

F1 Racing has learned that the engine deal thrashed out over the spring between Ecclestone, the manufacturers and the FIA includes a *force majeure* clause that enables the agreement to be revisited if the calendar drops below 19 races.

Ecclestone has recently remarked that F1 could lose as many as three races next season. The German Grand Prix does not have a contract for 2017, as Hockenheim has a deal only for alternate even-numbered years. In addition, a deal has yet to be concluded for the continuation of the Italian Grand Prix beyond 2016, even though sources claim Monza will ultimately be retained. And there are question marks over the US Grand Prix in the context of a reduction in funding for the event from the state of Texas.

The engine agreement struck at the end of April addressed issues concerning price and the availability of customer engines, performance convergence and noise. It allowed for a price reduction of €1m ($1.5m) on customer engine deals in 2017 and a further €3m in 2018. Ways of making the engines sound louder and more dramatic are also being worked on, while performance convergence is happening naturally.

The Mercedes is still F1's best engine, with a power output of more than 700kW, but insiders say the 2016 Ferrari engine is now only 6kW down on it, while the revamped Renault is just 10kW adrift. Only Honda are lagging significantly behind– they believe their engine is 45kW off the Mercedes, but Fernando Alonso told Spanish journalists after the British GP that it was in the region of 60-70kW down.

Ecclestone has long maintained that he would have preferred Formula 1 to retain the old 2.4-litre naturally aspirated V8s, but these are of no appeal to manufacturers, who want to promote and advance hybrid technology.

Senior figures say that even if Ecclestone does try to invoke the *force majeure* clause and put the old engines back on the table, he would lose because the proposal would still have to go through the decision-making process and the vote would go the same way as before – in favour of the manufacturers.

QUIZ



F1 Mastermind

Your chosen specialised subject: the world's greatest sport

GUESS WHO Can you identify these drivers on the 2016 grid from their 1996 photographs?



1 Carlos Sainz **2** Lewis Hamilton **3** Fernando Alonso **4** Esteban Gutiérrez **5** Daniil Kvyat **6** Jenson Button **7** Sergio Pérez **8** Daniel Ricciardo **9** Nico Hülkenberg

PHOTOS: GLENN DUNBAR/LAT; SAM BLOXHAM/LAT

‘Halo 2’ protection device is still dividing opinion

The latest iteration of the system has brought criticism from both Ferrari’s Sebastian Vettel and Red Bull’s Christian Horner

Ferrari racer Sebastian Vettel and Red Bull team boss Christian Horner have raised questions about the readiness of the halo head-protection system for introduction in 2017.

Vettel ran the latest version of the halo – dubbed ‘Halo 2’ – in practice at the British Grand Prix and judged it “not great”. He said: “Forward visibility was fine but it was quite a bit on top of you. You are not looking at the sky all the time. It needs some further running. I know the decision is up soon. We need to make sure we introduce something safer in all circumstances and we don’t have any compromises. There are always certain scenarios you cannot cover but you try to cover as much as possible.”

Horner, whose team ceased development of the alternative ‘aeroscreen’ system after it failed FIA tests, said: “I am not a big fan of the halo and the limitations it has. It is an inelegant solution. I would prefer more research time taken to do the job properly rather than rushing something through that may have other consequences. I certainly wouldn’t vote in favour of it.”

The FIA plans to introduce the halo in 2017 and teams are designing their cars so it can be fitted. The Grand Prix Drivers’ Association are also keen on additional head protection. However the halo still needs to go through the regulatory process of the Strategy Group, F1 Commission and FIA World Council.



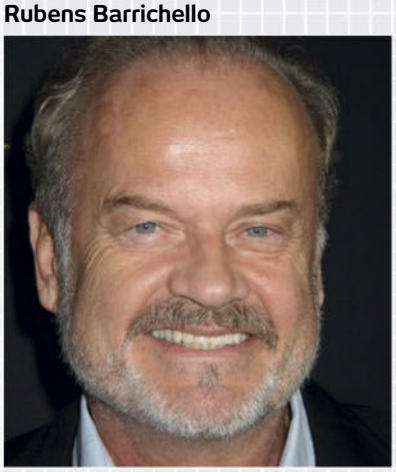
Red Bull’s Chrisitan Horner is not a fan of the halo device calling it an “inelegant solution”

Bernie Ecclestone, Mercedes F1 boss Toto Wolff and Williams deputy team principal Claire Williams are known to have reservations about the halo in its current form, but vetoing the device carries enormous risks: if the halo is not introduced next year and a driver is subsequently injured or killed by a flying wheel, there would be major insurance implications for the FIA, F1 and anyone involved in its veto.

MIRTH

SEPARATED AT BIRTH...

Rubens Barrichello



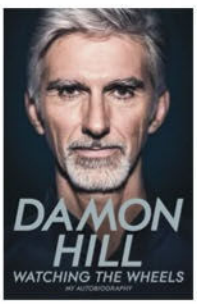
Ex-Ferrari, Brawn GP and Williams racer

Kelsey Grammer



Star of American sitcoms *Frasier* and *Cheers*

NEWS IN BRIEF



DAMON TELLS ALL

World champion and *F1 Racing* columnist Damon Hill will release his autobiography, *Watching the Wheels*, this September. From the pain and chaos of his father’s death in a plane crash in 1975, to his sizzling rivalry with Michael Schumacher, this is a riveting read in Damon’s ineffable style, which goes on sale on 8 September. Read our long interview with Hill on page 36.

SAUBER BUYOUT

Sauber are understood to have struck a deal with investors that will stabilise their finances after a period of difficulty. An announcement was expected as *F1 Racing* went to press.

FERRARI SUFFER GEARBOX PROBLEMS

Scuderia Ferrari are urgently looking into the causes of three separate gearbox issues in recent races, two of which required Sebastian Vettel to change gearboxes and incur five-place grid penalties at Silverstone and the Red Bull Ring in Austria. The problems are believed to have been different, but are not necessarily unrelated. “It’s something we need to solve as soon as possible,” said team principal Maurizio Arrivabene. “It’s too early to give any specific news, but I suspect that it is related to the material.”



CARL HAAS: 1929-2016

Former racer and legendary NASCAR, IndyCar and sometime F1 team boss Carl Haas has died at the age of 87. Haas ran an IndyCar team with actor Paul Newman that dominated in the 1990s and included a championship win with Nigel Mansell. In the 1980s he entered F1 with support from Ford and US food company Beatrice, but the team folded after just two seasons when Beatrice pulled out. Many of his engineers – including Neil Oatley, Ross Brawn and Adrian Newey – went on to shape the course of F1 later in their careers.

PHOTOS: LAT ARCHIVE; SUTTON IMAGES; BUZZ FOTO/REX/SHUTTERSTOCK



Kimi Räikkönen's seat at Ferrari is certain, while Jenson Button's McLaren drive is not

PHOTOS: ANDY HONE/LAT; GLENN DUNBAR/LAT

NEWS

Teams consider their 2017 driver line-ups

F1 stalwart Kimi Räikkönen will stay on at Ferrari, while Jenson Button's future is undecided. And is it all change at Renault?

Kimi Räikkönen, 36, has been re-signed by Ferrari for another season, but the F1 future of fellow veteran Jenson Button, also 36, is unlikely to be resolved for at least another few months.

Ferrari announced they would retain Räikkönen at the British GP in a move that reflected their lack of alternatives. They had shown interest in both Red Bull drivers, Max Verstappen and Daniel Ricciardo, but both are under contract until the end of 2019 and 2018 respectively. Ferrari also considered Sergio Pérez, Carlos Sainz and Valtteri Bottas, but all came with contractual complications requiring them to be bought out of their current teams. There is doubt as to whether any of them would be an improvement over 2007 champion Räikkönen.

Meanwhile, McLaren have indicated that they are in no rush to make a decision on their 2017 driver line-up. McLaren chief executive Ron Dennis said he would not begin to consider whether to pick Button or reserve driver Stoffel Vandoorne as team-mate to Fernando Alonso next season until the Italian GP in September.

McLaren are thought likely to pick Vandoorne, 24, a logical choice given the ages of their current drivers (Alonso turns 35 on 29 July). Alonso's contract runs out at the end of 2017 and Vandoorne is considered the hottest prospect not yet driving full-time in F1. But the decision could swing in Button's favour, due to his marketing appeal, experience and proven quality.

Renault are likely to drop their current line-up of Jolyon Palmer (left) and Kevin Magnussen (right)



His manager, Richard Goddard, said Button had not yet decided what he wanted to do in 2017, but he is known to be of interest to Williams, who are poised to drop Felipe Massa, and who have an option on Valtteri Bottas.

Force India are likely to retain Sergio Pérez and Nico Hülkenberg, both of whom they insist are under contract. But Pérez has had talks with Renault, and disputes this. Renault are at this stage leaning towards dropping both Kevin Magnussen and Jolyon Palmer. Magnussen had impressed the team early in the year, but there is mounting concern over a number of on-track incidents, along with his relaxed approach, which has been interpreted as a lack of commitment. Palmer, meanwhile, was only ever likely to be at the team for one season, having been signed against Renault's will by former owners Genii Capital before the Lotus team was taken over.

Renault want Vandoorne, who will probably be available only on a lease deal from McLaren, and are believed more likely to promote Esteban Ocon, their reserve driver. Ocon, is a Mercedes young driver but is on loan to Renault, where he has appeal due to his French nationality.

Red Bull have announced that Carlos Sainz will stay on at Toro Rosso. Daniil Kvyat has been unimpressive since his demotion from Red Bull but could be retained into next season, unless Red Bull promote reserve driver Pierre Gasly.

Silverlake and IMG look to buy F1 shareholding

High price tag has put off previous potential investors, but the consortium are already in discussion with majority owner CVC



American technology investment group Silverlake and sports marketing giant IMG are together looking to buy a major shareholding in Formula 1. Senior sources say the consortium is in talks with controlling shareholder CVC about an F1 involvement, but that an agreement has yet to be reached.

The two are the latest in a long list of potential investors in the sport's commercial rights, and it remains to be seen whether their interest becomes more concrete than other bidders whose interest has come to nothing.

The stumbling block in any deal has typically been the valuation of the sport, which CVC puts at $8bn. There is also uncertainty over F1's future, notably about the fact that the teams' contracts run out at the end of 2020, with the exception of Renault's, which runs until 2024.

Sources say CVC chairman Donald Mackenzie is keen to stay involved in F1 no matter what happens to shareholdings. And F1 boss Bernie Ecclestone is said to be 'looking very strong in the saddle', according to one senior insider.

Bernie Ecclestone (left) and Donald Mackenzie (right) are both keen to remain involved in F1

That is not a reflection of the power he has to make changes to sporting and technical regulations – where Mercedes and Ferrari currently have a stranglehold on decision-making, as evidenced by Ecclestone's inability to kill off hybrid engines. It is rather a statement of the security of his position as CEO of the F1 Group, which has been strengthened by financial performance.

Ecclestone has in recent months concluded a lucrative new tyre-supply deal with Pirelli, a huge new corporate sponsorship deal with Heineken, plus a new TV deal with Sky in the UK worth some $2bn over six years. And his latest addition to the calendar, the race in Azerbaijan, is said to be worth $70m a year.

PASSNOTES

Your essential F1 briefing
#29 Halo



Name Halo
Age First described by Homer in the *Iliad*
Appearance A circular glow around the head or body

Halo, good evening and welcome!
You've been waiting to deploy that, haven't you?
It's been a while since the word sprang to mind. I seem to recall that the last level was a bit of a swine, but my Xbox is so old that I have to poke an unfolded paper clip into a hole under the disc drawer to get it to open these days.
What tangent has your brain taken this time?
Do you not refer to the first-person shoot-'em-up video game of the early 2000s, and umpteen sequels that I'm far too old to play?
For sure not. And there I was expecting you to pick up the Beyoncé ball and run with it.
If the singist to whom you refer wasn't active before 31 December 1989, I'm not interested.
What a curious cove you are. Anyhow, the halo: a cockpit-protection system for F1 cars, proposed by Mercedes, lambasted by almost everyone else for being fugly, but one which is likely to become mandatory at some time or other.
Ah yes, that carbon-fibre thingy.
That indeed. It gained favour with the FIA over Red Bull's aeroscreen because it was in a more advanced state of development, but Sebastian Vettel tried it in practice at Silverstone and didn't like it. Then Red Bull ran one, with Pierre Gasly driving and wearing a pair of spectacles with a camera mounted on the frame so people could see how it obstructs the view from the cockpit.
Must have been a Gasly business – geddit?
I'm not sure you're taking this seriously.
Did they call him a speccy four-eyes? Hey – I'm talking to *you* McFly!
Are you involved in the Strategy Group, perchance? It would explain why they never come up with anything remotely sensible.
I apologise, but it looks like something you'd use to strap in your kiddies on a fairground ride.
A fairground attraction, eh? Perhaps this is the first of a million disses...
I do the '80s music gags around here.

Do say Safety first
Don't say Aesthetics last

PHOTOS: CHARLES COATES/LAT; UNIVERSAL/REX/SHUTTERSTOCK



NEWS

Ferrari just can't close the gap to Mercedes

A lack of downforce means that despite performance gains in other areas, the Scuderia can't make the progress they'd intended

Pressure is mounting at Ferrari as it becomes increasingly clear that they have made no progress towards their goal of catching Mercedes this season.

They started the year hoping to close the gap to the point where they could compete with Mercedes for wins. But a pattern has emerged that proves the car has the same problem that it has had since 2008 – it is lacking downforce. This explains why the Ferrari can be relatively close to Mercedes on tracks such as Bahrain and Montréal, where the predominantly short, slow corners do not expose its major weakness, but uncompetitive at more demanding tracks, such as Silverstone.

Ferrari were further behind Mercedes at the British Grand Prix this year than they were at the same race in 2015: Kimi Räikkönen was the fastest Ferrari driver both years, and qualified 1.6 seconds slower than polesitter Lewis Hamilton, whereas he was only 1.1s off in 2015. The same trend was evident at Barcelona, the other track considered as the best all-round test of an F1 car. At this year's Spanish GP, Ferrari were 1.1s off the pace; last year that figure was 0.8s. And all this comes despite Ferrari's engine being only about 6kW down on Mercedes in terms of absolute power.

Sebastian Vettel has been supportive of Ferrari so far, but even he admitted to being concerned about both reliability and performance after the British Grand Prix. "It has been a weak race for us," he said, "but we don't need to turn the world upside down. It is not the most competitive weekend for us. There are a lot of things we need to learn this weekend. We failed two gearboxes, one on Friday one on Saturday – both on my car. We recovered in qualifying, but lost a lot of performance in the race in these conditions so there is a lot to understand.

"We want to win. I am very confident things will look different again in two weeks, but that is not an excuse. We had a bad weekend and we need to make sure we address this and take actions and move forward and understand why we struggled more than other people."

Sources close to the team claim that a lack of engineering creativity is their fundamental problem. Former Ferrari technical director Ross Brawn said in an interview before the British Grand Prix that Ferrari needed 'a quiet approach' and backed their technical director, James Allison, as the man who could turn things around for the team.

In the interview, Brawn remarked: "It's important that Ferrari still respect what they have to do, but that they do it progressively and quietly because I think that was a great success in our period, that Jean Todt and Luca di Montezemolo kept a lid over everything and enabled us to work on the engineering side and the racing side.

"So I think it's a quiet approach with the necessary planning and resource.

"They've got some very good people there – James Allison is excellent.

"If they give him the resources and give him the time and put the infrastructure around him, with great drivers they'll get results."

PHOTO: SUTTON IMAGES

Rosberg penalty raises concern over radio ban

Teams are worried by the ten-second penalty handed to the Mercedes driver for radio communications at the British GP

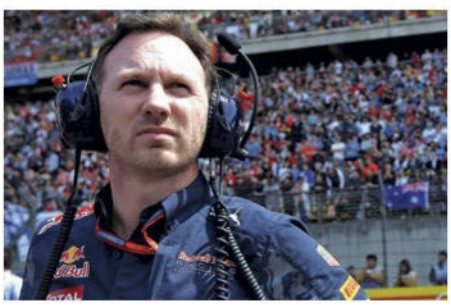
Senior figures in F1 have questioned the heavy restrictions on radio communication between teams and drivers in the wake of Nico Rosberg's penalty at the British Grand Prix.

Rosberg was penalised ten seconds, dropping him from second to third, after Mercedes were found to have broken the rules on permitted messages, when they instructed him on how to solve a gearbox problem late in the race.

They were held to be at fault for telling Rosberg what he needed to do in terms of driving the car after the problem had been solved by a setting change on the steering wheel – not for the instruction on the change itself.

After being told the correct procedure to adjust on the steering wheel, Rosberg was told to "avoid seventh gear."

He asked: "What does that mean, I have to shift through it?" And was told: "Affirm Nico, you need to shift through it."



Red Bull's Christian Horner: "The question going forward is: 'Are these rules right for F1?'"

This communication was considered to have broken article 27.1 of the sporting regulations, which dictates that "the driver must drive the car alone and unaided", as well as specific clauses of the restrictions on radio messages that were outlined in a technical directive to all teams at the start of the season.

But the issue has re-ignited concerns about the wisdom of the ban itself, which has been the subject of complaints from teams and drivers throughout the season.

Mercedes F1 boss Toto Wolff said he thought senior figures should take another look at the radio ban. "Those rules maybe need a re-think between the FIA and the teams to go more into detail on what is allowed or not," he said, "because by not communicating at all, you might as well unplug the radio and throw it out of the car. It is part of driving since a long time, but it needs to be discussed."

Red Bull team principal Christian Horner went even further, describing the radio ban as 'rubbish', and saying: "It doesn't make a great deal of sense.

"The cars are technically very complex and you can understand why Mercedes would want to give that message to keep their driver running," he said. "It's a team sport at the end of the day and the cars are a lot more complicated than they were even four years ago for the drivers to work out what they should and shouldn't be doing. The question going forward is: 'Are these rules right for F1?'"

However, there seems little chance of anything changing. The radio ban is a pet project of FIA president Jean Todt, and he has so far shown no inclination to back down.



Rosberg's penalty dropped him from second to third place, after he was told by his team over the radio to avoid seventh gear

PHOTOS: SAM BLOXHAM/LAT



Pat Symonds explains

THE SCIENCE BEHIND...

Suspension



F1 TECH

There seems to be much more rake on F1 cars these days. Why is this, and does it cause any problems for the designers?

'Rake' is the term we use to describe the difference between the front and rear ground clearance – more commonly known as front and rear ride height. In recent years aerodynamicists have found increased performance from running the rear of the car ever higher to increase the load generated by the diffuser. The requirement to keep the front ride height low has not changed, and consequently the rake has increased dramatically over the past few seasons. Providing the range is known at the outset, it provides no real problems for the designer.

What is the ideal ride height for an F1 car?

There is no ideal that applies to all cars. You must remember that a Formula 1 car generates enormous vertical aerodynamic loads on the suspension, which means that the springs, and indeed the tyres, get severely compressed at speed, so the ride height decreases as the car goes faster. This is why you see sparks from the titanium skid plates as the cars near maximum speed. At the front we tend to set the static ride height and the rates of the various springing mediums so that the front of the plank will just be touching the ground at maximum speed. At the rear of the car, there will be an optimum ride height for generating downforce and we will tend to set the static ride height such that, allowing for spring and tyre deflection. It will be near optimum ride height in the most important corners of the circuit.

Does a change of ride height affect the aerodynamics?

We often speak of a vehicle having a particular coefficient of downforce (normally abbreviated as Cl) but in reality this number is a simple descriptor of a much more complex aerodynamic map. At any particular attitude of the car, which is a combination of pitch, roll and yaw, the aerodynamic forces will be different to any other position. In the windtunnel all these forces are captured and then by using a simple mathematical technique known as a weighted average, these different forces are expressed as a single number.

In a real corner trajectory, the car will experience varying attitudes in response to the forces exerted and the reactions to those forces produced by the suspension. This, in turn, will alter the aerodynamic forces and balance through the corner, which means the suspension settings do indeed have a fundamental effect on the aerodynamics.

It seems commonplace to use pushrods at the front and pullrods at the rear. Why is this?

Both pushrods and pullrods are kinematically similar devices. What this means is that both are simple mechanisms for transferring motion from the hub to the spring damper units. The use of the two devices has changed over the years as bodywork regulations have forced designers to look at different packaging options. Today's regulations are reasonably neutral in terms of favouring one or the other at the front, but, at the rear, the desire to keep the top and sides of the gearbox aerodynamically clean has led to the springs and dampers being placed in the bellhousing, thereby favouring a pullrod to operate them.

Do Formula 1 cars tend to use conventional springs and dampers?

There are various types of spring used on F1 cars. Torsion bars may be used on the corners while the centre spring may be a coil spring, disc spring or a rubber element. Gas springs have also been used. There is probably a reasonable combination of all of these in use today.

While conventional hydraulic dampers are used, they are supplemented by a device known as an inerter. Unlike a conventional hydraulic damper, which produces a force proportional to the velocity across the two ends of the device, an inerter produces an opposing force that is proportional to the acceleration seen between the two ends of the unit.

In addition to these relatively conventional elements, there are several other devices to be found in an F1 car's suspension. While front-to-rear interconnection is no longer allowed, there are still a number of hydraulic elements to be found in suspension systems to alter the balance of the car through the corners, or to reduce drag on the straights.

What are the determining factors when deciding on suspension geometry?

There are probably as many different theories as to the ideal suspension geometry as there are cars on the grid, and these days much of the

PHOTOS: GLENN DUNBAR/LAT; LAT ARCHIVE



Rake is key to getting suspension right. In recent years, having the ground clearance (or ride height) lower at the front than at the rear (as seen on this current Red Bull) has proved optimal

geometry is driven by the search for improved aerodynamics. For example, it is common at the rear for the lower wishbone to be mounted parallel to the driveshaft. While this is not something anyone would wish to do for either kinematic or structural reasons, it is still commonplace because the advantages gained aerodynamically from such an arrangement outweigh the problems that are caused.

Why does the suspension on an F1 car seem so stiff? Does this increase grip?

In terms of tyre forces, the stiff suspensions that tend to be used on F1 cars actually reduce grip on anything other than a perfectly smooth surface but as the aerodynamic characteristics are dominant, advantage is found by using the very stiff suspension to maintain a constant aerodynamic platform.



Active suspension was run on various cars in the early 1990s, including the Williams FW14B (left) but was swiftly banned. These days, passive systems do the same job

Some years ago, F1 cars had very sophisticated active suspension systems Do you think we will ever see these systems return?

We probably will not see them in racing. Although they were sophisticated, the systems were in reality no more complex than the intricate passive systems in use today. Indeed, recently, there was some debate among the teams as to whether it would actually be cheaper to produce an active suspension rather than the systems currently in use.

But that is not to say the systems are completely dead, as with the limited track time available to teams these days active ride is sometimes used in private testing to verify aero maps while using minimum track time.

NEXT MONTH YOUR QUESTIONS ANSWERED



PETER WINDSOR

RACER'S EDGE

Authority, wit and intelligence from the voice of *F1 Racing*

Turn a page to turn back time

The recent revelation by Dominika Cibulkova that, blindfolded, she can distinguish between tennis balls used at different tournaments, really impressed me. She does it purely by smell.

I get that, and I guess it's time for me to admit that I'm of similar bent. Blindfold me and open in front of me various racing books and magazines from the past 30 years and I'll be able to tell you the year, if not the month, of publication. And probably the title, too.

It started when I was 11, with my Christmas present that year. The 1962, Volume 10 edition of *Automobile Year*. It lay wrapped at the base of the tree, spattered with pine-scented flakes of 'Santa Snow'. I opened the glossy pages and luxuriated in the smell of fresh print. Jim Clark, reclining in his new Lotus 25, stared up. Suddenly I was at Spa, behind the pits, right next to Jim, examining the seat padding, the stubby gearshift, the red steering wheel.

And so it goes: pine and print. I open that book today and still I am transported, even if all traces of Santa Snow have long since evaporated. *Automobile Year*, Volume 11, by contrast, was very different. The pages were less glossy, the smell slightly muted. Even though this was Jim Clark's year, 1963, volume 11 never possessed the same magic.

Jim's autobiography, *Jim Clark at the Wheel*, by contrast, offered a very different, more musky, printing fragrance, best savoured under blue skies at Warwick Farm against the scent of beer, car-park grass, high-octane fuel, Castrol R racing oil, and brake fluid. The images, in technicolour, are vivid today; the scent, as I open the pristine pages, still remains.

It wasn't just the books. When I was 12 we camped, my Dad and I, near the paddock entrance to the Catalina Park circuit in the Blue Mountains west of Sydney. It was late autumn; mist shrouded the early morning. The smell of bacon and eggs, frying on open stoves, mixed with the scent of an early-rising Lotus 23. It was the first time I associated eggs and bacon with racing fuel. I was intoxicated – but then there were the railway sleeper fences of the track nearby; and there was the quick left-hander. Danger was in the air; all of it mingled into one.

Then there were the Warwick Farm programmes, newsletters and posters, all glossy, seemingly straight from the press and very *Automobile Year*-ish. My grandfather began sea-mailing me *Motoring News* from England in the late 1960s. They arrived in Australia sporadically – sometimes three at a time – all rolled up in brown wrappers. I devoured them faster than I could think.

The scent was delicious. I'd open the creased pages, some stuck together after the long journey, and suddenly I'd be at Rouen, at an F1 race with MGD (Mike Doodson) or ARM (Andrew Marriott) or with Don Grey at the Ste Jovite CanAm. The red *MN* logo was different again – a stronger smell, peculiar to *Motoring News* at exactly that time.

Then I began to work in motor racing – first in Australia, then in Europe. Ulf Norinder used to empty a cloying bottle of Fabergé Brut over his overalls before climbing into his Lola T190; I think he drank the remainder. Bernie Ecclestone, in his Brabham-ownership days, was a walking ad for Aramis; Bernard Cahier was all Cuban cigars; and Gérard Ducarouge blended the smell of Gitanes cigarettes with Brut in a typically French, typically Ligier, Manou Zurini kind of way. Patrick Depailler and François Cevert always smelled of Gauloises – but efficiently so – and John Frankenheimer, when he was over in Europe planning *Grand Prix*, introduced me to an aftershave called Polo. Whenever I watch Pete Aron I always think of Ralph Lauren, just as *Eau Sauvage* inevitably conjures the image of Carlos Reutemann in a Brabham BT44B and, later, Ayrton Senna in a black-and-gold Lotus-Renault.

Yardley first entered F1 with their classic fragrance (quite sweet but clean, very McLaren M19-ish) before introducing Black Label, which was spicier and, for me, synonymous with Kyalami, South Africa, on a golden summer's day.

Williams were sponsored by Denim when I was there, which means that Denim Musk, still available today, for me instantly projects the image of a Williams-Honda FW11A in Piquet form.

Not all motor-racing fragrances are wondrous. The Elf fuel used in 1991-92 reeked of old socks and did nothing for the complexion of 'Jimmy Jock' Walter, our fuel-man/truckie. And I'm not a fan of the odourless print used for most of the motor-racing books today – nor of the smell of a hybrid F1 car. There's virtually no scent and the texture is muffled. Obvious exceptions in the publishing world are the glossy *FIA* and *BRDC Bulletins*, the Goodwood FoS and Revival programmes, and the recently killed-off McLaren magazine. And *F1 Racing*, of course. Among the cars? No stand-outs.



"I'm not a fan of the odourless print used for most of the motor-racing books today"

Peter's still-pristine 1962 *Automobile Year*, Volume 10, still evokes strong memories for him, through smell alone: "I opened the glossy pages and luxuriated in the smell of fresh print. Jim Clark, reclining in his new Lotus 25, stared up. Suddenly I was at Spa, behind the pits, right next to Jim"



PHOTOS: LAT ARCHIVE; SHUTTERSTOCK

They're all bland. A bit like the digital media that runs alongside pages and print.

The scents of Warwick Farm programmes and Catalina bacon/Castrol R will never return. I've captured them and bottled them but we'll never see them again – not in the real world... not now. You can come close at Goodwood but somehow it isn't the same. It's a bit like a Leo DiCaprio movie set in the 1930s always looking *slightly* different from Jimmy Cagney in real time. You can't explain why... It just *is*. Nor have I ever found a book that smelled like *Automobile Year* volume 10, nor *Jim Clark at the Wheel*. I can read them blindfolded.

And, yes, I, too, enjoy the smell of a freshly opened tin of tennis balls. I can't say I can do the Roland-Garros/Flushing Meadows trick, though, but I can most certainly tell the difference between Penns and Wilsons, *F1 Racing* and *Autosport*.

It's all in the mind.



DAMON HILL

KING OF THE HILL

Cockpit savvy from the 1996 world champ, exclusively in *F1R*

If you hadn't noticed... it's all about me!

There is a word for it: solipsism; basically the idea that it is 'all about ME'. George Harrison even wrote a song about it: *I Me Mine* – a much better song title than 'Solipsism' you'll have to agree.

No doubt you will be thoroughly sick of ME by the end of this issue – but I beat you to it, because I'm already sick of ME, myself. In fact I have new word for a very similar condition I call 'autobiogrification'. This is the state of having lost all interest in anything to do with your own history. Try writing about your entire life solidly for four months or more, trying to dredge up all the 'interesting bits'.

Picture a tray of orange slices after half time. You are so stripped of juice that you can only conclude your entire life was like space; 99.9999 per cent dark matter, peppered with a few tiny, brilliant, shiny bits and the occasional black hole. There is a hell of a lot of 'nothing much happening', that's for sure. You're asleep for about a third of it for a start, so that bit, literally, is darkness. The rest is mostly putting out the bins and taking the children to school.

So, on the subject of myself, I have nothing more to add. But I shall be opening this edition of *F1 Racing* with an extra dose of trepidation. For I have been scrutinised by the editor himself! All I can do is hope he has found something I've missed and pray that 'something' is going to be worth cultivating in my post-F1 driving career allotment (see 'Long Interview', page 24).

But whatever this edition contains, in these days of rapid change, it's quite an achievement still to be printing a magazine in the twenty-teens at all. I can remember when it all started (collective groans and mutterings of 'Oh, no. Here he goes again...'). But, sadly or not, it is true. I was there at the beginning, at the dawn of *F1 Racing* time, back in the days when what we now proudly call The Internet, was just a weird nonsense term used by techno geeks in California. How could anyone have #known that we were about to enter a new era of communiTwittercation @F1Racing_mag and that cameramen would charge up their Nikons with electricity before posting their digitised images on something called 'Instamaticgram'?

But the more it changes, the more it's the same. Images of F1 cars are still as evocative as ever, and the day that 140 characters can convey the complete viscerality (another new word) of standing next to, or of actually being *in* an F1 racing car at full honk, is the day we will have died as truly feeling beings; just my view, as a nearly mature adult.

A few months ago I caved in to the power of the smartphone. After years of telling my son not to play with computer games for 48 hours at a time, and castigating my daughter for clinging onto her iPhone like it was a holy relic, I am now no better than the worst of them. The urge to tweet my thoughts to all and sundry has overwhelmed me. I'm like the hermit in *Life of Brian* (showing my age again) who howls out after 18 years of silence. Now I can bark out any thought that comes to mind as fast as I can move my fat thumbs, radiating the worthless bauble across the globe to be returned like a ping pong ball by anyone engrossed in their own urgency to communicate. Because tweets are like tears in the rain, lost in the puddle of human drivel forever – unless you happen to be unlucky enough to step on a sociopolitical landmine. Then better turn off the phone for a few weeks. They will have found some other poor hapless twit to intimidate by then. You hope.

There are two kinds of communication: call and response. After that, it's a dialogue. But we never get into the dialogue bit because we are into the next calling-out bit before we have time to think about what we are thinking about. By the time you've posted your photos on whatever platform you are on this week, you have slipped so far behind the curve that you'll be on Wikipedia before you know it. So it's reassuring that a magazine like *F1 Racing* can make things stick for a whole month.

When the printing press arrived they said we'd have unemployed monks. When photographs arrived they said it was the end of painting. When the movies arrived they said it would kill photography. When TV appeared, they said that it would kill the movies. When the internet arrived, they said it was the end of TV, the newspapers *and* the movies. But we've still got all these things. Even monks. So here's to the 30th anniversary of *F1 Racing* magazine. Only ten more years to go, guys and gals!



How much Damon Hill can even Damon Hill take? Who knows – there's plenty more of him still to come in this issue...

"I'm like the hermit in *Life of Brian* who howls out after 18 years of silence"

PORTRAIT: BENJAMIN WACHENJE; PHOTO: ZAK MAUGER/LAT



DIETER RENCKEN

POWER PLAY

The stories F1's bigwigs would rather you didn't know...

Is too much tech a turn-off?

Consider the complexity of current F1 cars: Up to 1,500 highly qualified personnel collectively design, develop, and construct two grand prix cars, then field them on 21 Sundays per year for superstar drivers, who are then unable to extract the best from their machines unless instructed by their engineer which modes to select at any given time.

FIA critics blamed the Baku woes suffered by Lewis Hamilton, who was all at sea after his engineers dialled in the incorrect engine settings for the circuit, on the sport's regulator, which had clamped down on pit-to-car radio transmissions during grands prix (except for safety messages), but such criticism leaves FIA president Jean Todt cold.

"But [the clampdown] was requested unanimously. We were asked to reduce all aids, all assistance given to drivers for the race, and this is part of that approach," he replied when asked to clarify the issue during the FIA's recent annual Sport Conference.

There, in a nutshell, is F1's biggest existential threat: where once the sport blazed technical trails that were then adopted by the automotive industry on a 'win on Sunday, sell on Monday' basis, Todt's words neatly encapsulate the divergent philosophies now at play, with the FIA sat between two stools – on one side charged with promoting road safety via electronic systems, and, on the other, promoting motorsport, without them.

As the motor makers progressively adopt autonomous technologies, so drivers increasingly lose touch with the art of driving, and, by extension, their admiration for courageous racers who achieve the seemingly impossible in 700kW machines teetering on the outer edges of control. After all, how could drivers of vehicles that deftly eliminate wheel spin readily appreciate the skills required to compete in teeming rain?

ASC (stability control) and ABS (anti-lock braking) are simply the start of a burgeoning trend, and already autonomous cars have lapped race circuits, setting times comparable to those of the best drivers, while Formula E is currently toying with RoboRace as a support category. As the name suggests, this is a series for driverless cars. The danger, of course, is that racing will improve this particular breed, as it did so effectively for road cars...

Lucas di Grassi, one of the most cerebral F1 drivers, who now has pivotal development roles in WEC and Formula E, recently observed: "You now see technology being more important than the driver," adding, "no racer wants that. Racing drivers and motorsport is about who is the best driver on the racetrack, not who has the best technology."

A tech failure was Lewis's downfall in Baku, when he was not allowed to seek help from his engineers



"As motor makers adopt autonomous technology, so drivers lose touch with the art of driving"

The conundrum, though, is that Future Kids are technophiles raised on hard drives and megawatts rather than country drives and kilowatts. They thus have no affinity for wheeled machines, whether two or four, save for funky Teslas or shared rides.

Ban driver aids and autonomous systems, and F1 becomes irrelevant as a technology-transfer platform for the industry, further diminishing manufacturer interest in F1.

The net effect will be that F1 would gradually return to being the minority interest sport it was in the Eighties, before the arrival of tobacco money, big corporate bucks and Bernie Ecclestone. It would be followed once again only by those whose noses twitch at the whiff of high-octane fuel. Already the sport has largely been driven off mainstream TV channels and the front pages of the world's newspapers.

One possible alternative would be for the FIA to embrace emerging technologies by encouraging their development in motorsport in an FIA Driver Aid World Championship. But any such move would rapidly destroy any notion of 'sport'. Surely not even the most ardent geeks would shell out good money – via Apple Pay, of course – to follow that series, whether live or virtually.

F1, then, stands on the threshold of major existential decisions: does it stick rigidly to its sporting ideals by thwarting the inevitable onslaught of technologies? Or does it surrender to driver aids and electronic wizardry, in the process promoting mobile laboratories for autonomous vehicles, whose only resemblance to race cars lie in their sealed black boxes?

Alas, F1 does not know where it currently stands, let alone in which direction it intends to head. Further dithering will likely see it fall prey to the sort of disruptive technologies and/or creative destruction that redefined the travel, literary and music industries; in the hi-tech stakes it was long ago overhauled by Google despite employing armies of bright engineers to make its machines.

Formula 1 must redefine itself as either a sporting spectacle or a technical platform, without forgetting that simply framing its 2017 regulations took two years and numerous legal threats. Time is of the essence...

PORTRAIT: BENJAMIN WACHENJE; PHOTO: SUTTON IMAGES

DAMON HILL

THE LONG INTERVIEW



One driver who has been central to *F1 Racing*'s pages over its 20 years in print is Damon Hill. The 1996 champion won his title in our first year of publication; now he's our star columnist. Two decades on, we met him to chat about racing, surfing and battling Michael Schumacher – all subjects this fascinating man finds, well, fascinating

WORDS ANTHONY ROWLINSON
PORTRAITS STEVEN TEE/LAT

Damon Hill is not like other racing drivers. He's fame-shy, yet media-friendly. He's recognised in the street, yet unstarry. He's exceptionally bright and full of thought-through opinions on a huge range of topics, yet he didn't really 'get' school. He's the man who took on and beat the world's most uncompromising racing driver, Michael Schumacher, while keeping things together as a husband and father throughout his F1 career.

A bundle of contradictions then? Not at all. Just a man with a passion for driving racing cars as fast as they would go and who just so happened to win a Formula 1 world title along the way. That epic 1996 battle seems as good a place as any to start our conversation...

***F1 Racing*:** You know, in 1996, your title win, after three years of fighting Michael wheel-to-wheel, made sales of our sister title *Autosport* hit an all-time high. It sold nearly 100,000 copies the week after you won. That's astonishing for a weekly specialist motorsport title. It had become obvious that there was a real hunger for a dedicated F1 magazine, so it's fair to say that you were one of the main reasons *F1 Racing* was launched.

Damon Hill: I think that era was a peak for the sport's popularity as a whole, wasn't it? We'd had the whole drama of the Ayrton Senna and Michael Schumacher rivalry and of course Nigel pumped it up just before that with his title in 1992. There was that dreadful thing at Imola [Damon is of course referring to the 1994 San Marino Grand Prix weekend, during which Roland Ratzenberger and Senna were killed in fatal accidents] and it piqued interest in the sport. It's a horrible fact of life, but it's true.

***F1R*:** What was it like being right at the centre of that? What was the sport like in 1996? Was your championship actually relatively straightforward after two pretty turbulent preceding seasons?

DH: It was very straightforward, yeah. I was experienced by then. That was my fourth full season in F1 and I was properly settled into Williams. It was the first time I had a car that was properly adapted for me – including my size 11 feet! Adrian [Newey, then co-architect with Patrick Head of Williams' standard-setting chassis] made a very nice car for me.

***F1R*:** Is it true that Williams re-made the monocoque for you?

DH: Yes, because of my size 11s! Racing drivers are mostly below six feet tall and their feet are tiny. So nearly all footwells are cramped. With the three pedals we had then they're even more cramped. You very rarely have enough space between the clutch pedal and the throttle to brake cleanly, or even to rest a foot. So it was a luxury to get this car. Adrian made an effort to make it fit – it was a peach. So, '96... Williams were the best team, with the best car and the best engine [a Renault V10]. What's not to like about that? Jacques Villeneuve was a good team-mate. We could enjoy ourselves. We'd had so much stress for the previous few years that '96 was actually the enjoyable one out of all of them.

Damon's battles against Michael Schumacher et al *raged from 1993-96, his Williams years. In 1993 he took three wins; in '94 he was part of a title showdown; '95 was a tough fight against an uncompromising foe, after which '96 was a slam-dunk, with eight wins and nine poles in the brilliant FW18.*

***F1R*:** Did Williams feel like a comfortable place to be?
DH: Yes, it did mostly. It felt pretty good. They knew I was more experienced than Jacques [who made his F1 debut with Williams that year], and that I'd be the person they could rely on. There were circuits we went to that were new to Jacques. I was the old hand by that time – 11 years older than Jacques. The mature driver in the team.

***F1R*:** Just to talk more about Michael, who remains gravely ill, what do you remember of the intensity of that rivalry?
DH: I think it was all created by the press. It was no more intense than my own intensity or anyone's intensity when they compete. There was this added dimension to Michael, which was his own body language, attitude and the fact that he was with a team [Benetton] who seemed to be constantly attempting new tricks. That set me up as a kind of 'nice boy' who wouldn't dare to dream of doing anything naughty.

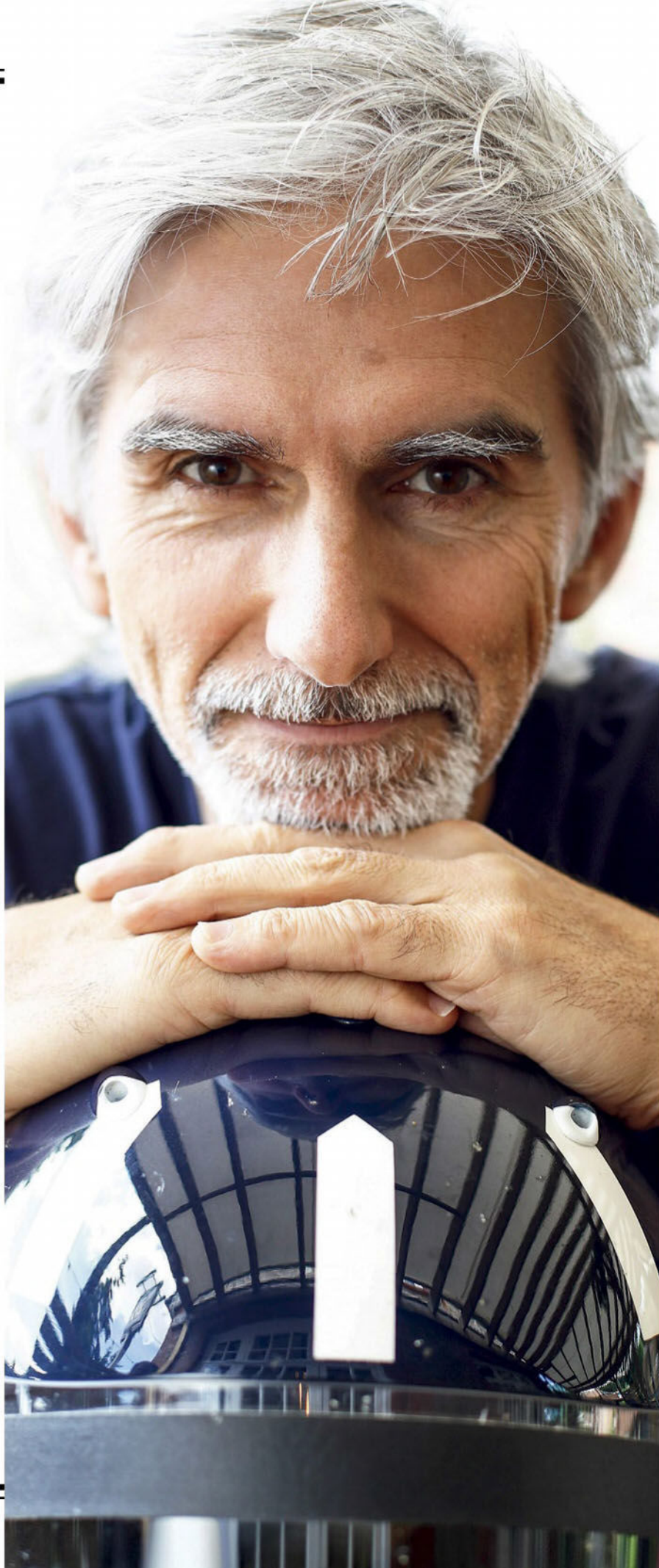
Much is left unsaid here. Throughout 1994-95, paddock rumour was rife that the Benetton team were using a variety of hidden electronic systems to enhance their performance.

***F1R*:** Did you and Michael have any personal relationship beyond the racetrack?
DH: No. I went once with him to the Barrier Reef, in Cairns, Australia, in '93. We went scuba diving and I just couldn't get to know the guy. He seemed impenetrable. I think maybe he took his approach to the sport too professionally.

***F1R*:** When he was younger, he sometimes seemed timid about expressing himself in English…
DH: His English was amazing – better than my German! He was very bright, but in my opinion he bought into all the wrong things. I'd look at him and think if I had his talents I wouldn't be doing what he was doing. You didn't need to!

***F1R*:** You mean some of his dubious on-track ethics?
DH: No, his whole approach to racing. You always want to win and I didn't like getting beaten by him, but it was more than just not wanting to lose. It was wanting to prevail against what I considered to be a rather cynical attitude to the competition. I thought it was spoiling the competition.
***F1R*:** Did the Schumacher era come to dictate how F1 operated?
DH: People will always try to win and they'll try things on. That culminated in 'Crashgate' in Singapore [an instruction given at the 2008 Singapore GP for Renault number-two driver Nelson Piquet to crash deliberately, triggering a Safety Car and helping team-mate Fernando Alonso win the race]. That led to us having driver stewards. They would have thought very differently about a lot of the things that happened in Michael's era. I was a driver steward in Monaco for one Michael 'moment'. Not when he parked during qualifying at Rascasse in 2006, but in 2010 when he was going through the field and passed Alonso on the last lap, just after the Safety Car.

***F1R*:** Some people admired what he did there, even if he was subsequently given a 20-second time penalty.
DH: He was quite clever, but there was the sense that there was a gang of them who were able to get away with whatever they →



wanted. There was a period in the noughties where people lost faith in the sport. They couldn't believe what they were seeing. Kind of: 'It can't be that easy to win everything, what's going on?' There was some bad history there, I think.

***F1R*:** Your battles with Michael gave us one of the great F1 rivalries. What did that feel like from the hot seat?
DH: It felt very uncomfortable!

***F1R*:** He was a pretty tidy driver, it must be said.
DH: He was, so I picked a bad one there didn't I? I picked a fight with the wrong bloke. Michael was incredibly talented, incredibly quick and incredibly smart in the way he went about his competition. You could say I was his first victim. Actually, you could say Senna was his first victim. But he blew our minds, didn't he? Seven world championships? No one would even *think* about seven. Not even Prost. I'm sure Prost thought 'four world titles – no one's going to beat that'. But Michael looked at things so differently to the rest of us.

***F1R*:** You mention Senna. You were team-mates for a tragically short time. How well did you know him?
DH: I knew him like everybody else did. He was a famous person who was very charismatic. He was a proper star in the sense that what he did cultivated this aura. That was just what he did – not because he sought celebrity somewhere else. He expressed himself entirely through his will to win and that's what people saw in him. I just saw that intensity in the team. He was there to win. But he was troubled about what he saw. He could be wrong about some things – he wasn't cunning, you know. He wanted to fight for the principle of something being fair. Make it fair and then we can see who's the best.

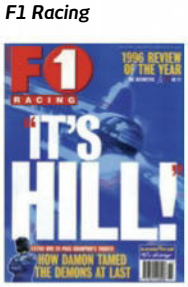
***F1R*:** Do you think that attitude contributed to what happened at Imola in 1994? [Senna crashed fatally from the lead of the 1994 San Marino GP, struggling to stay ahead of a chasing Schumacher.] Was he being driven by a sense of injustice?
DH: There were a lot of factors that weekend. Emotions were running high. There was a lot of stuff in the mix. And that's the tripwire. Get as passionate as you like, but it's dangerous and you have to keep your emotions under control. Have the passion to win, but don't let it get ahead of you. This is the challenge. Someone like Jackie Stewart talks about 'mind management'. And then you look at, say, Max Verstappen: if he had a weekend like he did in Monaco this year... if he'd been racing in Jackie's day, he might not be around any more.

Occasionally Ayrton showed his anger on the track towards his fellow competitors using his car. We saw it with Michael, too. What he did with Rubens at Hungary [in 2010, squeezing Barrichello within millimetres of the wall at full speed on the start-finish straight] was absolutely unjustified. You've got to keep a cool head. That can be difficult because passions run high when you're a racing driver: 'don't come near me when I've had a bad race.' It's hard to come down from the emotions.



***F1 Racing* editor Anthony Rowlinson sits down to catch up with Damon Hill over lunch**

The success of Hill kindled huge interest in F1 in the UK, and contributed to the creation of *F1 Racing*





***F1R*:** Did the Imola weekend make you question your involvement in F1?
DH: It wasn't the first time. Everybody questioned their involvement. I've lost team-mates before. My dad [Graham Hill, world champion in 1962 and '68] lost rivals in racing. You go through a loop of emotion. But I enjoy it; what else would I do? Would I have been able to walk down the street and feel fulfilled? Maybe it's a lack of imagination. You look at life and things happen anyway.

***F1R*:** When you were racing you were married and had children. Did that affect your approach? Did it prevent you from being as uncompromising as some of your opponents?
DH: I don't think it's ideal. I had a very, very strong wish to be around for my kids. My dad and mum were away a lot when I was as kid. We had Oliver in '89 and Josh in '91. I was just coming into F1 and had two kids. That was tough on Georgie [Damon's wife], having to care for them, plus all the emotions and fears and the anxieties of my racing. *And* having a bear with a sore head around the house after a bad race. It's not ideal to have a large family when you're a racing driver.

***F1R*:** Your memories of that time are obviously pretty vivid. What does it feel like looking at the sport now? You're closely involved as a commentator for Sky – where do you see differences between then and now?
DH: Well, you have to remember, our Williams team then was about 150 people. All sorts of surveys have been done by anthropologists who'll tell you that the optimum number for a group of people, in which individuals still feel like 'someone', is 150. Now the bigger teams are 600 people or more, and it's not possible to have that 'optimum'. It's gone beyond that feeling that you're in a happy band of fellows and girls who are racing. It's such a big organisation now. The stakes are not necessarily higher, in terms of wanting to win, but higher from the point of view of the investment that companies have made.

The driver is now a diminished part of that equation. Mercedes can't afford for the team to get bad PR, and this is the biggest difference. Technology is also very different. Drivers love tech. They love the buttons and knobs. It's impressive technically and it's a big attraction of F1 – interest in what engineers are up to and how they compete to produce highly technical pieces of equipment that perform better than everybody else's. They're under such pressure, too, and that's a draw of the sport that's not publicised enough.

The financial side of F1 is another level of interest. The difference now is that the commercial side of it is far bigger than the pure sporting element, which is to do with people. In my day, the rivalries were the bigger part – seeing how somebody would fare when pitted against somebody else.

***F1R*:** Have we lost a bit of that?
DH: What I'm saying is, when it brews up into a rivalry, it's quickly damped down because it can't be allowed to dominate. Nobody wants to see animosity, but rivalries are crucial. It's



"Michael was incredibly talented, incredibly quick and incredibly smart in the way he went about his competition. But he blew our minds, didn't he? Seven world championships? No one would even *think* about seven"

the essence of it. Seeing two people desperately wanting to beat the other, if they're evenly matched, whether it's tennis, golf or boxing or athletics, it's what people want to see.

Ours is a funny sport, isn't it? It's always been difficult to define and identify the strengths and the weaknesses. I look at certain individuals who might have been good for the sport, like Montoya, and they can't survive.

***F1R*:** Do you think that was more about not being comfortable at McLaren than because he'd had enough of F1?
DH: I think it's to do with the requirement that teams have to be corporate, to present a nice face – you know, corporations don't tend to like controversy. They like things to go well. If they seem to be going well, they're promoting harmony. That is a contradiction in F1. It's not what people sit down to see.

***F1R*:** Let's return to your career. It had an unconventional trajectory: the acceleration from being a test driver to a front-runner in less then two seasons. Did that feel like 'woah!!'?
DH: Of course! It accelerated ridiculously – and you'll be able to read about that in detail in my book soon [Damon will release his autobiography in September]. But you would not say to an aspiring racing driver: 'Look what Damon Hill did, that's the way to do it!' I was sucked into the vacuum left by Mansell [who quit Williams after winning his title in 1992] and Frank was left without an experienced driver. But I'd done the graft as a test driver and impressed them enough.

***F1R*:** What does that do to you as a competitor, or as a human being? Is there a lot of introspection?
DH: It was a bit of a shock, yes. I'm not somebody who necessarily wants to be put on a pedestal and treated like a superstar or something. I just don't get that. If people want to be nice to me and give me money, that's fine! But I don't want to play that 'fame game'. When you become an F1 driver you're on the front of magazines and people want to know your story. It can be flattering, it can be head-turning and intoxicating. We're all vulnerable to our ego: it does us good if we are thought to be good in our particular profession. So PR is important, but it's not something I'd ever set out to acquire. I just wanted to get my hands on a bloody good racing car and win races.





Hill finally gets the better of Michael Schumacher, snatching the championship at Suzuka in 1996

***F1R*:** Having the Hill family name, did you feel like you were part of a generational thing? Did the name help – or hinder?
DH: It's impossible to answer. I have no way of knowing who or what I might have been if my father had not been Graham Hill. And so in many ways I learned quite a lot. I went into the same profession as him, but he'd carved it out for himself. There was no history of racing in our family. So, I would say it had to have helped, having Graham Hill as my dad.

***F1R*:** Did you feel a need for speed early in life?
DH: Definitely. I was very lucky. I went skiing when I was younger, and that experience of whizzing along was amazing – something I'll never forget. I don't know where it came from or how it started. Like when you get on the slide for the first time: 'Faster, Daddy, faster!' – you know.

***F1R*:** Racing must have been in the genes if nothing else?
DH: Whatever I did, I was always going to be up against my dad, whereas Schumacher, Senna, Prost... who do you compare them to? You compare them only to the people they raced against. I was always compared to my dad. Now we do it retrospectively: was Moss better than Clark? We don't know.

But something I'd like to emphasise – and I think there's not enough emphasis on this in Formula 1 – is the pleasure I got from racing cars. I loved racing bikes as well.

I didn't like it at first, but I got into it. I liked racing. I liked driving fast, the competition, getting your hands on a steering wheel and pressing the accelerator and going round corners fast. We don't talk about that enough. We talk about politics, money, deals, whether somebody's knocked someone off. The driver's voice is not heard. It's unlike any other sport.

I like surfing – and that's all about the experience. It's all about the incredible buzz you get from surfing a wave. Now, I got an incredible buzz out of driving. But we don't talk about it. The problem is, who can relate to what we do? Anybody can get on a bicycle, hit a golf ball, play tennis. I suppose the counter to my argument is the success of a show like *Top Gear*, which is about hooning around in a car.

***F1R*:** Should we do more to talk about the thrill of driving?
DH: Prost or Jackie Stewart would talk about the poetry of driving. You'd hear a lot of that. People used to be really into it. Someone like [*F1 Racing* columnist] Peter Windsor still is.

But it's become really difficult to see it, now. You can see it in MotoGP – you can see what they're doing. In the '60s you could see cars drifting. I was watching the 1964 Indy 500 →

INSETS: LAT ARCHIVE

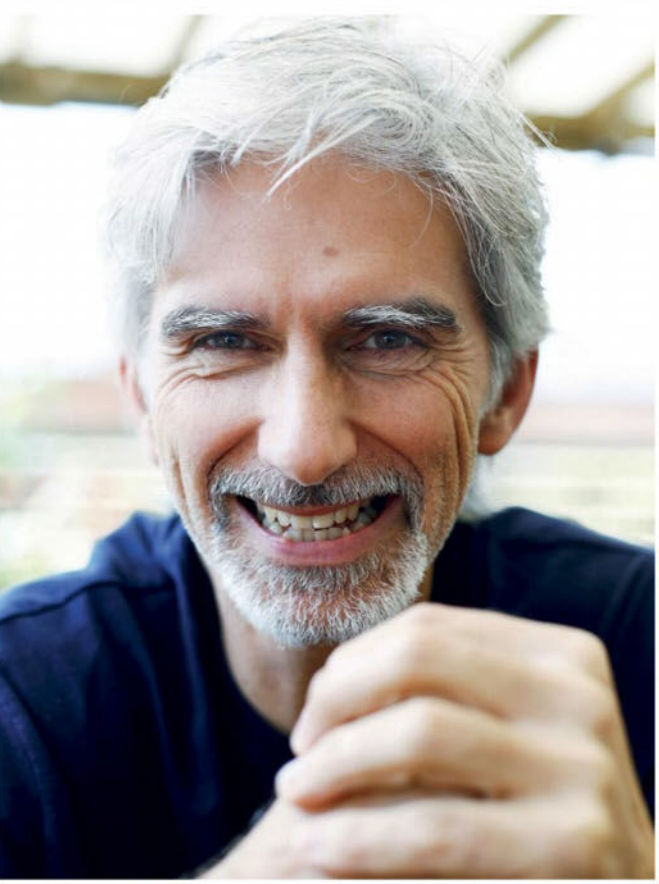
recently on YouTube: Jim Clark was going round the banking sideways – drifting around! Not fast as they are now, but they look exciting. So, the point is, we don't talk about the driving because you can't see it. You can't see what they're doing.

***F1R*:** How would we fix that without turning back the clock?
DH: Since we got wings, you're not going to see drifting in the same way. There are a few circuits where they do some good camera angles that show it – coming out of the fast corners in Russia, when they have to turn and brake. But a lot of those circuits that we built after Imola had certain stipulations: no banking, no increasing-radius corners and stuff. You can't go round redesigning circuits. Some of it is the design and some of it is simply slip angle. The cars next year may be different, but they are so long now with such a tiny contact patch, that the amount of slip angle you can tolerate is tiny. The moment they go out of line they're off. You could make it a squarer car that you could turn almost 360°, like a kart. That'd be good, but I'm not an engineer – it's my imagination.

***F1R*:** After your championship win, you had an abortive season at Arrows, but then you went to Jordan for 1998 and won their first grand prix. That must have been a special experience?
DH: It was brilliant to win Jordan's first GP, yes. I'm almost as proud of that as I am of winning the championship. The question had always been asked: how good was I? Did I have better equipment? Jordan didn't have the best equipment.
We were good at Spa that year and there was a bit of luck, but... I nearly won with an Arrows in 1997!



Hill, aged three, with his father, double world champion Graham Hill: "You compare drivers only to the people they raced against. I was always compared to my dad"



Below: Damon with wife Georgie, on the cover of our January 1999 issue – he admits juggling a racing career with a family is not ideal. Below: with Jenson Button in January 2001. Button is now in his 17th season, whereas Hill had a relatively compressed career of seven seasons





***F1R*:** That whole Jordan era when Eddie was in his prime looked like a lot of fun.
DH: Eddie goes about his life trying to have as much fun as possible and trying to make as much money as possible. I brought them the focus they needed to forget all the other shit and realise that they were there to win. I can put my hand up and say: 'I showed them how to win.' They had the ingredients, but they didn't know how to use them. It's just knowing why you're there. We're weren't there to take pictures with Page 3 girls. That was part of it – it brings in the money so we can win. By then, I was on my last lap, so it was good to get that win.

***F1R*:** In hindsight, your F1 career was compressed – just seven seasons – which is very short compared to, say, Jenson Button who's currently in his 17th season in F1.
DH: At one time I had one of the highest winning averages in F1 – maybe I should have stopped then. During the '80s I was trying to get somewhere by racing. Jenson was in F1 when he was 21. Rubens, Michael, Kimi... they were in their early twenties when they got in, so they grew up in F1. They are 100 per cent F1 drivers. They haven't got another life, they've never had another life. I'd had another life before F1 and I'd almost given up and gone somewhere else by the time I started. It wasn't a career you'd put out as a model to follow.

***F1R*:** Is it true that you lived in a caravan for a while, while you were working your way up the racing ladder?
DH: No! I had a caravan when I raced bikes, but didn't live in one. Although I used to live in a basement flat with slugs in Clapham [south-west London] which was probably worse than a caravan. I never dropped out of civilisation, but I did a few jobs that required my physical labour when I left school. I didn't buy into the school thing at all. Didn't grab me.

***F1R*:** That's interesting, because, if we may say so, you're uncommonly smart for a racing driver.
DH: There have been some very smart racing drivers. I think it's because my mind comes from a different angle. I never had the Lewis Hamilton attitude of: 'I want to be a racing driver when I grow up.' I came at it from different angles. All I want to do if I get an opportunity, is to do the best I can with it. Whether it's bike racing or anything else. There's a competitive streak in me which is impossible to deny. I try to fight it because it can be destructive. You'll never win them all, but it's quite strong. Cycling is good for me now, because it burns a lot of energy and it always wins in the end.

***F1R*:** Do you still have that competitive streak?
DH: No. The growing-up process means drifting away from always wanting to compete, because you realise that it's better



Above: Hill cites one of his greatest achievements as taking Jordan's first-ever win, at Spa in 1998

if we cooperate. Competition is good if you want it to produce a result. But if it's constantly about downgrading other people you're working with because you want other people to remind you about how good you are, I find that rather sad. The attitude of: 'I have to prove I'm quicker than you or richer than you' – I don't want to be caught in that trap.

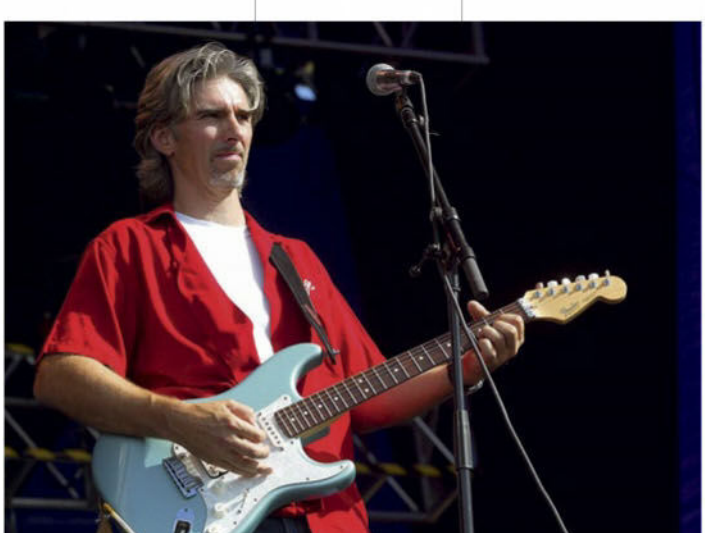
***F1R*:** So how does that square with winning the Formula 1 world drivers' championship?
DH: It's a quandary!

***F1R*:** You must have felt some of those emotions as you were winning? You must have thought you were the best?
DH: No! Because how do you measure it? I won the title that year. So there were two guys with the same car and I did a better job than the other guy. That's the cream on the top. But there were many years trying to get there. So '96 was my reward for the other stuff, trying to get there. The race wasn't 1996 alone – the race included every fucking day up until that point. You don't think you're the best.

***F1R*:** When did it sink in that you'd become world champion?
DH: The reason you're talking to me now is because I won the championship. It lasts a long time, but you only realise it when you stop racing. You reach a period when you want to get away from it. Sky constantly remind me that I won a race here or there. I reply 'I know, that's me, I was there!' It gets better.

***F1R*:** Given all that you've said, what does winning feel like? Is winning the title a different feeling from winning a race?
DH: It does feel different, yes. When you win a race you know you're the cat that got the cream. You look around at Mika Häkkinen, Michael, Prost, and everybody wants to win it. You know they can beat you and they know they can beat you – but they didn't. It was kind of a sneaky feeling. There are days when you drive brilliantly and you just know you were the best that day and they can't complain. [After the wet 1996 Brazilian GP, no lesser a personage than Niki Lauda said that Hill 'drove like a god'.] Those were little pockets in a way. There are so many factors for being in the right place at the right time. There's definitely luck involved.





Above: at the 2003 British GP with his band, The Conrods – an improvement on the name of his first band... Sex Hitler and the Hormones

***F1R*:** When you stopped racing, you weren't one of those guys who hung around. What's it like when you stop F1 and quit racing completely?
DH: My experience was that my dad stopped racing and then he died [in a private plane crash]. I had a family and I didn't want that to happen to them. I didn't want to be doing stupid things. It was really a conscious decision to live as long as I could. I've been very lucky. I made it through racing, so it was a conscious decision to stay away.
I sort of went cold turkey. I didn't do too many crazy things, although I think you become used to a certain level of adrenaline and it can be quite difficult to live without that.

***F1R*:** How did you scratch that itch?
DH: Exercise was good. Biking and staying fit. Then I got a desk job at the BRDC [he was President of the British Racing Drivers' Club, 2006-11] and everything turned to shit. Going up and down the motorway. Sending emails. Desk job!

***F1R*:** You never fancied the 'live in Monaco as a tax exile' thing?
DH: I would love to live in Monaco, it's sunny. No tax... but, I don't know. I'm not sure what the quality of life is like in Monaco. Everybody I know is here. I'm sure you make new friends, but we've got a lot going on in this country which is quite a rich place culturally. Also, I've got a son with learning difficulties and it wouldn't be too easy to go to a place like that with another language. So, *que sera, sera*. I don't regret anything like that. Have you been there outside a grand prix?
***F1R*:** It's very quiet...
DH: Nice climate.

***F1R*:** Do you still play guitar?
DH: I still play guitar in the kitchen. I have a beaten-up old Gretsch, a semi-acoustic. That keeps my fingers going. Every now and then I get inspired to bash one out, but I'm not a guitarist. Like all these things, people who are good at it are good because they're good. I'm not. I just do it for pleasure.

***F1R*:** For the record, what was the name of the first band you played in?
DH: It was called... my friend came up with this name which I repeated rather stupidly and then it stuck. We were called Sex Hitler and the Hormones. Irony doesn't always travel that well.

***F1R*:** You were a punk band, right?
DH: Yep. It was 1977 or '78. I was a bass player. I was about 17.

***F1R*:** 20 years on from your title you seem a contented man. But do you miss racing?
DH: No. What happens is, you think 'let's have a go at that'. Then you remember it's uncomfortable, dangerous, hot and sweaty. The other day I did some karting at Sandown Park for charity. Our team won. I didn't – but I had a fantastic first lap going from 17th to 4th. These days, that's fine for me.

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Involved right from *F1 Racing*'s inception, **Steve Cropley**, recalls the excitement of launching a magazine dedicated solely to the world's greatest sport

It was the simplest idea in the world, and everyone in our Haymarket publishing business knew it. F1 was the most spectacular, most watched and most international sport of the age – an age in which glossy monthlies like *GQ* and *FHM* were thriving. And we were already doing well with our weeklies *Autosport* and *Motorsport News*. So why on earth was there was no proper F1-based monthly magazine in our line-up?

The question became even more urgent when we considered that on the racetracks of the world, F1 was riding a wave. Best of all for a UK-based magazine, there were prominent British stars – Damon Hill and Nigel Mansell, for two – to provide exploits that kept interest strong. What better time to launch a feature-based magazine that would get under the skin of the sport? And what better moment to publish the huge, emotive pictures no one else had time or space for?

Haymarket was involved in motorsport to the extent that it employed a couple of dozen expert hacks who had the contacts and knew just how to get a pitpass. And it had a terrific editor in Mike Herd, who had won his spurs on *Autosport*, to build a staff and pull the thing together.

The sticking point was the business case. If this were to be a glossy monthly, it would need investment – meaning loyal and well-heeled advertisers. But where car magazines have car companies and dealers as commercial supporters, glossy racing mags do not. How could this be overcome? Discussions raged on.

Hacks tend to shy away from filthy commercial arrangements, but two ways were found to make *F1 Racing* wash its face, financially speaking. One was to strike annual deals with advertisers, as race teams do with sponsors – and sponsors were financially healthy at the time.

The second was to publish a German edition. Michael Schumacher and Ferrari were F1's biggest names, and there had been a huge upsurge in the sport's popularity in Germany as a result. If we could tap into that, we could make the glossy mag idea fly. If the international model worked, we could try it elsewhere.

Work began in 1995 to give commercial types time to do deals with advertisers for '96. We produced a 132-page dummy 'issue zero' (pictured above) so people could see what they were signing up to. It was dated November 1995. The first issue was given the go-ahead to be launched at the start of the 1996 season.

Issue zero was brave. We debated whether there ought to be a car on the cover as well as a person (which was our experience with other motoring magazines) but, in the event, the cover featured only a smiling close-up of Schumacher with the big cover line 'Mr Bloody Perfect', which we editorial types thought perfectly advertised the magazine's purpose. Other titles would never have done such a thing at the time.

There were other challenging cover lines: a Martin Brundle story: 'How to do a balls-out lap', and a Gerhard Berger piece: 'Hill has no hope', which sort of went to show how easy it was writing cover lines for dummy issues.

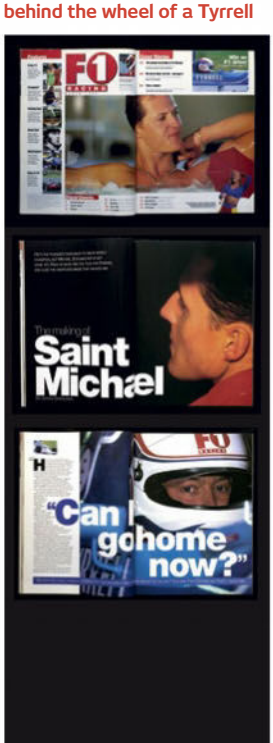
The first *real* issue, dated March 1996, had a somewhat tamer cover. Schumacher was there, but this time we used a side-on helmeted shot, with his eyes barely visible. I don't recall why (I suspect our concerned bosses might have felt it was more obviously 'about racing'), but it seems a poor decision now. We made up for it on the contents page, though, with a head-and-shoulders picture of Schumi in a bubble-bath.

There was a furore in Germany over the UK coverlines. We ran 'Ferrari & Me, by Michael Schumacher', but when we tried the same in German, our German counterparts, Katja Heim and Matthias Penzel, protested, insisting that such wording wouldn't be permitted in Germany because Schumi hadn't physically sat down and written the story (that job had been done by F1 expert, Gerald Donaldson). This was the start of our realisation that international editions can never be slavish translations of the home version.

Still, things went well. The magazine gained traction with its audience and among the F1 people who were the source of the stories. We began to notice an enhanced willingness to cooperate on projects – something teams are hardly famed for. Mike proved adept at attracting the best authors, and commissioning imaginative stories. Art editor Tim Scott designed pages that got people's attention, while Jed Leicester (now a top-class sports photographer) found and chose the images that distinguished them. We even got our F1 reporter Tony Dodgins into an actual Tyrrell F1 car, and printed a piece of telemetry interpreted by legendary technical director Harvey Postlethwaite.

F1 Racing has grown up. It knows more about the sport than we did. More than ever, you read it for inside stories others miss, gloss over or don't have space for. And those of us who helped create it admire the way it continues to promote and explain F1, while staying close to its roots. We're a little bit proud as well.

Our first 'proper' issue featured Schumi in the bath, and reporter Tony Dodgins behind the wheel of a Tyrrell



THE CHAMPION CARS



Just seven constructors have won the world championship during *F1 Racing's* 20 years in print. Here we take a close-up look at some of their finest creations

WORDS
STUART CODLING
PICTURES
JAMES MANN

Over the past 20 years F1 has rolled with the times. V10s have given way to V8s and then V6s, and yet the same handful of names sit at the epicentre of success every time: Renault. Ferrari. Mercedes. Adrian Newey. Ross Brawn. Paddy Lowe.

And yet no individual is bigger than their team. As we spin through the years we see McLaren underachieving consistently in spite of Newey's presence, and Brawn struggling to return his team to winning form under Mercedes ownership.

The cars on these pages, one from every constructors' championship-winning team in *F1 Racing's* lifetime, demonstrate that ingenuity must be tempered with consistency, rigour and hard graft. All of these cars are the products of evolutionary thinking, even if some of them represented a big leap forward at the time... →


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1996 WILLIAMS FW18

In the 1990s, Adrian Newey was all about continuity as he established himself as F1's premier technician. Some saw him simply as an ingenious aerodynamicist, but what set him apart from his peers was his ability to see both the big picture *and* the fine detail of a car, maximising performance outside and in.

As car design grew ever more sophisticated in the 1990s, and required ever larger groups of people working on it, most advances came from seeking out margin gains rather than finding 'magic bullet' solutions that delivered big lap-time improvements. The main exception to this rule was when designers found clever ways of circumventing the rules, as with the FW18.

When regulations were stable, Newey favoured careful evolution over clean-sheet designs. In 1992 and 1993, Williams had swept all before them, but the next two seasons were tough. The '94 car was tetchy at first as the team adapted to the ban on active suspension, yet Damon Hill still came within a whisker of winning the title. Rule changes ushered in to slow down the cars after Ayrton Senna's death moved Newey to adopt the raised-nose design philosophy for '95, but while the FW17 was quick, errors and bad luck meant that it was Benetton and Michael Schumacher who snatched the title double. Hill won an attritional season-closing Australian GP by two laps, but by then it was too late.

The next year, 1996, was about consolidating pace and eliminating errors. Patrick Head, Williams' technical director, made that plain: "The '96 car was only a subtle development on the previous model. The FW17 had an upgrade towards the end of 1995, which was the 17B, and that was already a pretty good car. The higher cockpit sides were the main visual difference on the FW18, but it was very much an evolution.

"The cockpit sides were a key change; along with Jordan, Williams produced a very sleek, low design that met the new safety rules. Other teams were frustrated when their shapes proved less aerodynamically efficient."

Rivals missed another clever interpretation that was used on the FW17B, through which Newey was able to extend the rear diffuser to more powerful effect. Considering the rear aspect of the Williams was the view most of these other teams had through '96, as Hill and team-mate Jacques Villeneuve battled for the title, you'd have expected them to cotton on sooner.



TECH SPEC

Chassis	Carbon-fibre monocoque
Suspension	Double wishbones, pushrod-actuated torsion bar (front) and coil (rear) springs and dampers
Engine	Renault RS8 V10
Engine capacity	3,000cc
Power output	560kW
Gearbox	Williams 6-speed semi-automatic
Weight	595kg
Wheelbase	2,890mm
Tyres	Goodyear
Drivers	Damon Hill, Jacques Villeneuve
Designers	Patrick Head, Adrian Newey





1998 MCLAREN MP4/13

Adrian Newey had a contract with Williams through to 1999, but his ambition was to become a technical director in his own right. This wasn't going to happen with Patrick Head *in situ* at Williams, so in late 1996 Newey negotiated a new job at McLaren. An ugly legal dispute between the two teams followed, and he spent late 1996 and the first half of '97 on 'gardening leave'.

Once-dominant McLaren slumped in the mid-1990s after the withdrawal of engine partner Honda. Following interim seasons as customers of Ford and Peugeot, McLaren forged a new partnership with Mercedes in 1995, but the team had lost their way; engines with more bite improved the situation, but not enough to satisfy super-competitive McLaren boss Ron Dennis.

That changed with the arrival of Newey, whom Dennis would go on to describe as: "The most competitive man I've ever met."

McLaren were already on an upswing, having bookended 1997 with one-two finishes for Mika Häkkinen and David Coulthard, and there could have been more, but for a number of engine blow-ups. Newey's combination of big-picture thinking and forensic attention to detail added much-needed rigour to a design office that was often throwing innovations (such as the clever but quickly banned 'brake-steer' system) at the car in the hope of finding an edge.

Getting his feet under the desk mid-season, Newey focused on development of the 1998 chassis with a view to exploiting the latest rule changes. Again, the FIA planned to shake up the format to control speeds and (theoretically) encourage overtaking by imposing strict limits on brake performance, making the wheels and the cars themselves narrower, and by bringing in the soon-to-be-hated grooved tyres.

"I joined on 1 August," said Newey. "You look to start on the following season's car in June. The team had already analysed several solutions, including the long sidepods, and I worked on the remaining elements. One of the distinguishing features of this car was its low nosecone."

The car was a clean-sheet design, as was its lighter, narrower Mercedes FO 110G engine, with the vee-angle squeezed from 75° to 72°. With better power and reliability, Häkkinen won eight GPs, and Coulthard added another in San Marino, to secure both championships by season's end. Amazingly, McLaren have yet to win another constructors' title. →



TECH SPEC

Chassis	Carbon-fibre composite monocoque
Suspension	Double wishbones, pushrod-actuated torsion bar (front) and coil (rear) springs and dampers
Engine	Mercedes-Benz FO 110G V10
Engine capacity	2,998cc
Power output	570kW
Gearbox	McLaren 6-speed semi-automatic
Weight	600kg
Wheelbase	2,895mm
Tyres	Bridgestone
Drivers	Mika Häkkinen, David Coulthard
Designers	Neil Oatley, Adrian Newey



2000 FERRARI F1-2000

Ever since Enzo Ferrari's death in 1988, the team he founded had been in a state of chaos. Luca di Montezemolo's decision to hire Jean Todt to run the team in 1993 took six years to pay dividends, such was the magnitude of the task, but pay off it did, with the constructors' title in 1999 and the double in 2000.

Backed by di Montezemolo, Todt overcame resistance as he transformed the team, one day coming home to find burglars had deposited a broken pair of scissors on his pillow. When he joined Ferrari, chassis designs were faxed over a page at a time from John Barnard's office near Guildford in the UK. By 1997 Todt had poached the star driver and the chief technical architects of Benetton's mid-1990s success – Michael Schumacher, Ross Brawn and Rory Byrne – but there was still work to be done. Ferrari didn't even have a windtunnel on site, and tumbleweed was blowing through the design office.

With Byrne installed as chief designer and Brawn as technical director, Ferrari's form improved to the extent that Schumacher could have challenged for the drivers' title in 1999 had he not broken his leg at Silverstone. In different circumstances, the technical team would have chosen to evolve their already competitive offering for the next season, but with the recently completed Maranello windtunnel commissioned and ready, they went for a clean sheet.

As Brawn said: "With the aerodynamics I think we have a very good facility here and a very good group of people, so normally when they say something is better, it *is* better. We don't get any surprises these days from the windtunnel."

The F1-2000 was brand new, as was its V10 engine, a wider unit than before to promote a lower centre of gravity. The outer skin followed some design philosophies of 1999, but inside it was very different. The chassis benefitted from a closer tie-up with parent company Fiat's vehicle dynamics research centre in Turin.

Schumacher and his new team-mate, Rubens Barrichello, could now take the fight to McLaren more regularly, and Schumacher won the first three races of the season. McLaren, for their part, suffered poor reliability. The F1-2000 had its flaws – the rear suspension was too flexible, stressing the tyres, and the engine sometimes ran too hot – but Brawn and Schumacher could stitch up their rivals strategically even when racing on the proverbial back foot.



TECH SPEC

Chassis	Carbon-fibre composite monocoque
Suspension	Double wishbones, pushrod-activated torsion arms, front and rear
Engine	Ferrari Type 049 V10
Engine capacity	2,997cc
Power output	575kW
Gearbox	Ferrari 7-speed semi-automatic
Weight	600kg
Wheelbase	3,010mm
Tyres	Bridgestone
Drivers	Michael Schumacher, Rubens Barrichello
Designer	Rory Byrne

2005 RENAULT R25

Having quit F1 as an engine supplier at the end of 1997, Renault soon wanted back in, but in a way that would deliver much greater marketing collateral. That chance arose with an option to buy the fading Benetton team in 2000, but success didn't come as quickly as expected, partly due to the dominance of Michael Schumacher and Ferrari, and partly through Renault's own follies, such as the flawed ultra-wide-angle V10 engine concept they persisted with until 2003.

Under the bravura technical leadership of Mike Gascoyne, they produced interesting cars under a then-unusual methodology: two separate design teams operated in parallel, sharing experience and data during the racing season, and producing cars in alternate years.

Even before the wraps had been taken off 2004's R24, designed by a team led by ex-Jordan man Mark Smith, another team under the auspices of Tim Densham had begun work on the R25 for 2005. By the time it was ready to run, Renault were already part of the chasing pack behind Ferrari – sometimes poaching wins.

The secret of Renault's success was the ongoing tyre war between Bridgestone and Michelin, and the lessons learned during a failed experiment with the wide-angle-vee engine. Where Bridgestone were hand-in-glove with Ferrari, so too were Michelin and Renault. And while the wide-angle-vee engine was a flop due to unreliability and poor balance, Renault's engine department learned a lot about maximising usable torque and fuel efficiency with a low-rev ceiling – useful since the FIA demanded engines should last for two race weekends in 2005. Similarly, designers found that the pain of adapting to the ever-growing weight of the wide-angle engine (as Viry tried to make it more reliable) brought gains further down the line.

The R25 had a more rearward weight balance than many rivals, which gave better traction and negated some problems caused by the latest aero restrictions from the FIA. It took the undercut-sidepod philosophy first seen on the R24 (and still *de rigueur i*n F1 now) to greater extremes, slant-mounting the radiators to maximise surface area in a space with a smaller profile.

For 2005 the FIA banned tyre changes and Bridgestone adapted poorly, leaving Ferrari in the doldrums. Renault and McLaren won eight races each, but Renault's better reliability handed them drivers' and constructors' titles. →



TECH SPEC

Chassis	Carbon-fibre composite monocoque
Suspension	Double wishbones, pushrod actuated torsion bars and damper, front and rear
Engine	Renault RS25 V10
Engine capacity	3,000cc
Power output	600kW
Gearbox	Renault 6-speed semi-automatic
Weight	605kg
Wheelbase	3,100mm
Tyres	Michelin
Drivers	Fernando Alonso, Giancarlo Fisichella
Designers	Bob Bell, Tim Densham



2009 BRAWN BGP 001

Don't believe the hype. F1's recession-era underdog, run by a team born from the ashes of the works Honda team and run on a shoestring, was one of the most expensive F1 cars of all time.

The story begins with Ross Brawn's arrival as Honda team principal in late 2007. Having helped drag Ferrari out of the doldrums in the '90s, he knew a bad car when he saw one – and Honda's 2007 car was awful; the 2008 one not much better. Preparing for a rough ride over the coming months, Brawn mentally wrote off 2008 entirely and turned everyone's attention to the forthcoming package of rule changes for 2009.

"There was some disagreement between the chassis group and the engine group over their contribution to the poor performance that had gone on before," Brawn explained in a recent interview. "And there was a belief from Japan that there was a sort of silver bullet I could apply to bring about a step change in the performance. That's not the case. F1 is a complex business..."

Brawn's record did bring respect as he steered the various groups in the right direction, and he was able to divert an incredible amount of resource to the 2009 project. Designers from Honda's defunct satellite team Super Aguri ran a windtunnel programme evaluating one concept while the team at Honda's Brackley HQ ran another, both with input from the mothership's Tochigi R&D facility.

The results of this work were nearly scuppered when the global economic meltdown prompted Honda to depart the sport in December '08 and offer the team for sale. Inevitably, shysters began to circle. Brawn finally negotiated a deal to take over the team himself, armed with a parachute payment from Honda and a helping hand from F1 ringmaster Bernie Ecclestone.

The Brawn BGP 001, hastily adapted to run a Mercedes engine, was instantly quick; it wasn't the only car whose designers had spotted a loophole in the new diffuser regulations, which allowed another 'deck' to be installed, but it was faster out of the box. All that work in the windtunnel meant the front wing, which influences the all-important aero map of the entire car, was better developed than any rival's.

Those rivals caught up as development stalled for lack of cash but, by then, Jenson Button had done enough to establish himself as the world champion in waiting. Not bad for someone who was nearly out of a job just months earlier.



TECH SPEC

Chassis	Carbon-fibre composite monocoque
Suspension	Double wishbones, pushrod actuated torsion bars and damper, front and rear
Engine	Mercedes FO108W V8
Engine capacity	2,400cc
Power output	N/A
Gearbox	Brawn 7-speed semi-automatic
Weight	605kg
Wheelbase	N/A
Tyres	Bridgestone
Drivers	Jenson Button, Rubens Barrichello
Designers	Jorg Zander, Loïc Bigois





2011 RED BULL RB7

Adrian Newey joined Red Bull during a period of stability in the technical regulations, and spent his first three seasons there trying to engineer a change in working culture as much as improving the cars themselves. It was the major step change in 2009 – with new rules mandating wider, lower front wings and higher, narrower rear wings, with simplified aero in between – that let him establish a new template for success.

"The timing of the regulation change was very opportune," Newey explained. "We'd got to the point where everything was working better and we could say: 'Here's the design challenge for this new set of regulations. Let's get on with it.'"

A defining characteristic of Newey's genius is his ability to respond creatively to a seemingly insurmountable challenge. The first Red Bull chassis for the new era lacked the double-deck diffuser run by Brawn, Williams and Toyota that delivered a useful dose of extra downforce. To this day Newey believes these designs were illegal, and were permitted only as part of a wider political play by then FIA president Max Mosley. But even as the fight over their legality was in full swing, Newey was quietly working out how best to retro-fit one to his car.

Another challenge was the fact that the Renault engine wasn't the most powerful. For 2010's RB6 and its successor, the RB7, Newey's team found a cunning way to exploit the exhaust gas to boost downforce. Routing the exhaust exits via the diffuser to accelerate the flow of air through it had been done before in F1, but the effect was never consistent because the flow tailed off when the driver got off the throttle.

Renault found a way to map the engine so that when the driver lifted off the throttle, the V8 continued to pump air through the exhaust. They called this 'cold blowing'. They made the effect more powerful by letting a small amount of fuel pass through as well, igniting in the exhaust itself (known as 'hot blowing'). This enabled Red Bull to run their cars with an advantageous nose-down rake that rivals struggled to emulate.

Red Bull took both championships in 2010 as controversy raged over their car's legality. The rancour continued into 2011 as Sebastian Vettel won 11 of the 19 races in his RB7 – now equipped with KERS – and the FIA tried to close the blown-diffuser box, much to Newey's frustration.

"Regulation changes I enjoy; regulation restrictions I rather lament," he said. →



TECH SPEC

Chassis	Carbon-fibre composite monocoque
Suspension	Double wishbones, pushrod actuated torsion bar springs (front) and pullrod actuated torsion bar springs (rear)
Engine	Renault RS27 V8
Engine capacity	2,400cc
Power output	N/A
Gearbox	Red Bull 7-speed semi-automatic
Weight	640kg
Wheelbase	N/A
Tyres	Pirelli
Drivers	Sebastian Vettel, Mark Webber
Designer	Adrian Newey



2015 MERCEDES F1 W06 HYBRID

Major regulation changes almost inevitably shake up the competitive order in Formula 1, but you can usually expect a design team led by Adrian Newey to deliver a front-running car in short order. Not this time around.

A lack of results in the seasons following the buy-out of Brawn GP made the Mercedes board twitchy. Even as team principal Ross Brawn set in place the systems that would yield future success, he found himself being elbowed out. After co-existing uneasily for a season with the men being groomed to succeed him, Toto Wolff and Paddy Lowe, Brawn left in 2013.

The era of teams being led by a single person was coming to an end. Mercedes declared the role of team principal obsolete: Wolff would take care of business, Lowe would direct the technical and sporting side. Lowe's arrival galvanised an engineering line-up packed with heavyweight former technical directors, including Aldo Costa (ex-Ferrari), Geoff Willis (ex-Williams and Red Bull) and Bob Bell (ex-Renault).

No wonder Brawn had struggled to manage the board's expectations. But the Mercedes project was about to come good. A tight focus on the new-for-2014 regulations was set to deliver an unbeatable package. One of the key figures involved in shaping the next-generation of cars was Andy Cowell, head of Mercedes-Benz High Performance Powertrains, who delivered the new hybrid 1.6-litre V6 turbo power unit.

Cowell's team had not only invested more time and money than their rivals, they could call on resource from Mercedes' road car division. And, by playing a role in the design of the car, they could ensure that all decisions and compromises were made with the aim of maximising the overall performance of the complete package.

This is why, at the time of writing, no other Mercedes-powered car has won a grand prix. Mercedes indubitably have the best engine, but they continue to have the best car as well. The W05 Hybrid won all but three races in 2014 and the W06 Hybrid was similarly dominant, netting the championship double.

"With the hybrid era still in its infancy, there is plenty of scope for innovation," said Lowe at the W06 launch. "The challenge is to find the key areas for performance gain based not just on what we have learned a year down the line, but also on where there is room to explore new and innovative sources of competitive advantage."



TECH SPEC

Chassis	Carbon-fibre composite and aluminium monocoque
Suspension	Double wishbones, pushrod actuated springs and dampers (front) and pullrod actuated springs and dampers (rear)
Engine	Mercedes PU106B V6 Hybrid
Engine capacity	1,600cc
Power output	560-600kW
Gearbox	Mercedes 8-speed semi-automatic
Weight	702kg
Wheelbase	N/A
Tyres	Pirelli
Drivers	Lewis Hamilton, Nico Rosberg
Designers	Aldo Costa, Geoff Willis, Paddy Lowe

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How far has F1 come



In this special celebratory issue marking 20 years since the birth of *F1 Racing*, we felt it appropriate to gather some of the sport's great and good to discuss how far and in what ways Formula 1 has progressed over the past 20 years. Reflecting on these weighty matters, we assembled an estimable cadre of F1 movers and shakers: **Toto Wolff**, Mercedes F1 team principal; **Zak Brown**, the sport's pre-eminent marketeer; **Otmar Szafnauer**, COO of Force India; former-F1-racer-turned pundit, **Karun Chandhok**; Williams development driver **Alex Lynn**; **Jonathan Palmer**, ex-F1-racer-turned-motorsport entrepreneur; and *F1 Racing*'s resident sage, **Peter Windsor**. In the comfortable ambience of the Pirelli paddock motorhome and with the occasional prompt from *F1R*'s **Anthony Rowlinson** and **Stuart Codling**, we begin...

F1 ROUND TABLE

PORTRAITS STEVEN TEE/ LAT **PHOTOS** LAT ARCHIVE

in the past 20 years?

F1 RACING: How far has Formula 1 come over the past 20 years?

TOTO WOLFF: How far – or the opposite? *[Wolff immediately sets the tone for what will be a vigorous debate, held in notably high spirits.]*

F1R: Has it progressed, has it regressed... is it better or worse?

PETER WINDSOR It's interesting to look back at 1996 because 20 years is either a long time or a short time, depending on how old you are. The Senna era had finished and then Michael Schumacher was starting to create the Michael Schumacher era. And I think Michael, more than any other individual, changed a lot of the ways we operate in Formula 1. Whether it was how he represented F1, or his Technogym fitness suite at testing, the way he dealt with the media, or the way he ran the team. A lot changed with Michael. And that continued right through into the 2000s.

F1R: Do you think we are in a post-Michael era now? Are we in a new era?



PW: I think we are still in his era, in terms of the way the teams handle the media – the Michael ethos of 'the less everybody knows about what I do, the better', and 'the shorter the interview, the greater the victory for me'. That has permeated the sport and everyone kind of embraces that. And Michael's ethos, the work ethic, the fitness... His imprint is still very much there.

F1R: And what do our two young drivers think about that?

KARUN CHANDHOK: A couple of things: I actually drove the car that won the 1996 world championship – and the one that won in 1997. What struck me was that they are not actually bad-looking cars. And they sounded fantastic. The 3.0-litre V10 was amazing. But the racing was a totally different thing. People today are often very critical about races. But then the top six were often a lap ahead of everybody else. If that happened today, the whole social media world would go mad!

ALEX LYNN: Michael was obviously my hero when I was growing up. I watched him in Formula 1 and I fell in love with F1 because of all the personalities. The thing I loved about it then – and still do – is that people just want to win. You see the best drivers doing everything they can purely to win – sometimes for right, sometimes for wrong. For me, that's what it's all about. It's about the sport, and the competition and that's never changed.

KC: Michael at that stage had become such a massive sports star like Senna and Prost →

– they were global sports stars. I remember 2010 when Michael made his comeback with Mercedes; you could go to the autograph session and more fans would still be there to see Michael than are there for Lewis or Fernando today.

F1R: Toto, you manage our biggest modern-day star, Lewis Hamilton. Is he as big as Michael Schumacher was? Is he different? Has he taken the sport in a different direction? Is he actually bigger than Michael?

TW: First of all we have to split the discussion into two parts: one is the sporting side. And I think most of the protagonists around this table are part of the sporting side in some way. We are almost a cast of actors. Then there is a big business side, which overshadows almost everything. The hundred or so yards out there *[Toto sweeps an arm to indicate the F1 paddock beyond the motorhome doors]* is a platform for the players to present themselves. A platform on which to play a role. And, fundamentally, this is driven by the economic side of things.

But on the sporting side, I think that, as Karun said, there is much more competition out there today. Twenty years ago, Sunday afternoon was Formula 1 time and it was an exciting event to watch and we would follow the drivers.

I can remember that if I'd met even drivers who weren't at the very front – Jacques Lafitte for example – I would ask for an autograph at the airport. Today that doesn't happen any more. You have three or four major players, who get all the sun. The reason for it is that with all the digital platforms that have been created, there is much more content being generated. Everybody who puts a video on YouTube is a competitor to Formula 1. You can see things that look much more exciting, much more courageous than F1 might seem to be – although the truth is that they are not. But still every BASE jumper who leaps into a hole looks more hip and more courageous than any Formula 1 driver.

So we need to accept that there is much more competition out there. And we need to come up with a product that draws audiences to the sport.

F1R: Zak, let's bring you in. You're heavily involved in the commercial side of F1. Do you feel it's attractive to commercial partners?

ZAK BROWN: I think that from a commercial point of view not much has changed in 20 years, but the world has changed significantly in 20 years. The great thing is that all the content is there. I think the racing product is outstanding. Yes there are elements that need to be addressed, but you come to a Formula 1 race and you love it.

What we haven't done – and there are a variety of reasons for this, as we all know – we're not engaging with the fans today in the way that other sports and entertainment properties are. And we need to catch up. Because there is a lot of competition out there for Formula 1 that isn't motorsport and if we don't talk to the new generation in the way that they like to consume sport and entertainment, we are going to fall behind. The good news is that when we get there, the thirst and the appetite from the fans are there – but we need to hurry up.

F1R: Something you and Otmar might care to talk about is the kind of sponsors we have today. Twenty years ago there was cigarette money, but that isn't present today. Back then, there was only one manufacturer team, Ferrari, but now we have several and a company like Red Bull who invest at car-manufacturer spending levels. Otmar, you're COO of an 'independent' team – how do you see your creative appeal to sponsors? What's your collateral?

OTMAR SZAFNAUER: We have to understand why they are coming into the sport and what they want to achieve with their involvement. And that's different for every sponsor. I think the fundamental thing for us is that if the sport appeals to a greater audience, then sponsors want to be in it. And if the audience is even bigger, then you can charge a bit more. To me that's what it's about. When I started in F1, in 1998, I remember title sponsors coming in at $50m for a mid-grid team. I was at BAR and that's what we were charging.

PW: You were mid-grid?
[Hearty laughter all round.]

OS: Let's go back and remember... Second year at BAR, we finished fifth out of ten teams. Now, I'm no mathematical genius but where would that put us? *[More laughter.]*

OS: So my point is, for us to get a $50million title sponsor as a mid-grid team is much more difficult today than it was back then. Not for all of us, though. Some of us can get those numbers, but you've got to ask yourself: 'Why is that?'

One reason is the popularity of the sport. First and foremost you have got to get that right. You were talking about that, Toto. In the 1990s, in Japan, there was a lottery for grand prix tickets: four or five million people would apply through the lottery for 120,000 tickets. Now, they can't fill Suzuka. But it's the same circuit. So I think that, fundamentally, if we get that right, then the sponsors will come.

ZB: F1 being the pinnacle of motor racing, it has so much more opportunity it can afford a sponsor beyond, say, a TV ad. F1 offers the chance to meet the players as they're putting their helmets on; you can shake their hand on the grid; you can go onto the grid with a team principal. If you're UBS and you want to meet a lot of wealthy potential customers walking up and down the pitlane, they're here. The list goes on and on in terms of the ways a sponsor can leverage motorsport that I don't think is afforded by other sports. When you go to a football match you are not going to meet the football players, you are not going to sit on the bench. We just need to do a better job of leveraging that, telling that story and giving access.

JONATHAN PALMER: For me, there are two dimensions. The main thing that's crucial about F1, as with any top sport, is that it has →

F1 ROUND TABLE

"I think Michael, more than any other individual, changed a lot of the ways we operate in Formula 1. Whether it was how he represented F1, or his Technogym fitness suite at testing, the way he dealt with the media, or the way he ran the team... A lot of things changed with Michael"



Peter Windsor



Every era of Formula 1 has its figurehead. Michael Schumacher came, saw and conquered, ushering in a culture of ultra-serious competitiveness, which is still the blueprint for the sport to this very day

to generate an audience and a following who ultimately somehow want to pay for it, whether that's pay-per-view or watching adverts.

One aspect of that, which F1 does very well, is building up the stars into being big global public figures. People love to see big headline figures competing against each other. Whether that's Damon Hill against Michael Schumacher in 1996, or Lewis against Nico now, people have an image of these personalities and they want to see who comes out on top.

The dimension in which I think it *doesn't* do well is in providing the visual experience that *in itself* looks exciting. If you watch a MotoGP race on its own, for example, you get a much greater sense of: 'Bloody hell, this is impressive – I couldn't do that.' And you can see the guys who are really good just by watching the technique and watching the machine on track. If the thing is writhing around as they're trying to put down 250hp on a small contact patch, people can see that and it looks exciting. That's the bit I think Formula 1 is still missing.

F1R: Alex, you're the most active racing driver here, and on the very fringes of F1 right now. Do you feel there's enough challenge in the sport?

AL: One hundred per cent.

F1R: So you don't feel there are any problems with the machinery?

AL: The cars are certainly complicated enough and difficult to drive. And I think people who go on about this generation of Formula 1 cars being 'easy'... Well, I can guarantee you they are extremely difficult to operate and extremely difficult to drive very fast because of what it takes to make them go quickly.

JP: I think you've got to distinguish between how difficult it is inside a cockpit – and clearly it is very, very difficult to get those sort of times out of these cars – and how obvious is it that great skill is being exhibited?

KC: Paddy Lowe said to me recently that he had watched a video of Senna's 1990 Monaco pole lap – manual gearbox and all the rest of it. And now when you watch, say, Nico, it's a totally different skillset to when you watch the old days.

F1R: So have we made the sport too complicated?

PW: I would love to see manual gearshifts again. I don't know why they're never on the table...

TW: You cannot go back in time...

F1 ROUND TABLE

"If you were to produce a grand prix like a movie, without any financial or commercial boundaries, you could make it much more spectacular. But then you wouldn't see any trackside advertising"



Toto Wolff

F1R: Why not?

JP: You would be running wooden wheels if you had that approach.

TW: Yes, wooden wheels, then we would have cars sliding again! The way technology is going, the way mobility is going, the way connectivity is going, the way the digital world is going, you cannot stop this. Engineers are always going to try to find ways to improve the car and that's just the way it is.

If you say to a Formula 1 driver now: 'The cars are not difficult to drive,' they would say 'What are you talking about?' It's nonsense. And it's not only about doing the right stuff on the steering wheel. It's about having car control and still being able to do a balls-out lap in qualifying. In races, maybe, yes, we are having to conserve the tyres too much.

AL: These cars have something like 950bhp (700kW) or whatever, instant torque...

OS: You've got more than we do? *[Szafnauer's sharp-witted reference is to the relative power outputs of the nominally identical Mercedes PUs supplied to both Williams and Force India]*

F1R: How much have you got Otmar?

OS: We've got 920!

JP: I still feel strongly that the level of skill is not obvious for the amateur on the outside to see...

OS: Jonathan, you're right. The first Formula 1 race I went to was in 1982. I had never seen one and I came to Detroit. I remember being on the front straight where you don't see much apart from the cars going past at high speed. And what got me the first time I saw them – there was a hairpin at the end – was 'they're not going to make that'. I was convinced they were going through there and into the river. And every one of them made it. It was the braking where, as a fan, I thought: 'I can't believe this. I can't do that'. You had that real sense of 'I can't do that in my road car'.

But the road cars are getting closer now. I have 550bhp in my Mercedes estate; back then, the delta between F1 and what we are driving was huge. I don't think that delta is there today.



TW: Live racing is an audio-visual experience. I'm having this discussion with Andy Cowell [Head of Mercedes High Performance Powertrains] regularly. In F1, the size of the engine has shrunk, and this is the way the technology goes and it's unstoppable – but the audio experience is a different thing.

And I don't think we can make the cars slide because it makes them slow. You can maybe tweak the regulations, though. In Mexico last year, there was new Tarmac with a lot of grease and that made the cars slide and it made them look spectacular.

The visual experience that matters is brought by TV and if you look at the Senna on-board camera from the 1990 Monaco pole lap that Karun referred to earlier, it's not only the gearshift: the camera bounces. That doesn't happen any more because the camera technology has improved. We did an exercise last year with FOM where we altered the camera position – we put it down so you could see the drivers' shoulders and hands. But it still wasn't perfect. So we said: can you dampen it less?

If you were to produce a grand prix like a movie, and you could be without any financial or commercial boundaries, you could make it much more spectacular. But then you wouldn't see any trackside advertising. There are many conflicting agendas and everybody has relevance. You have to understand Bernie's position. He has so many customers. If he didn't sell the advertising we would complain, because we would not generate the money to race. It's very difficult to get it right for everybody.

PW: Toto makes a good point about the movie element and it's fitting to make it here at the Monaco GP because this is the 50th anniversary of *Grand Prix*. John Frankenheimer was a serious director and he took Formula 1 and he made it in his own image. The two things that stood out about his approach to me – things I always remember – were footwell action and pedal movement. Today I often find myself thinking: 'If only I could see what this guy was doing in the cockpit.' I would love to semi-experience everything that has been said. I've been pushing for a long time to get a footwell camera. I know it's only two feet but we would get a lot of movement; there's a lot of action, dancing on the pedals. We are really missing out on something.

The other thing is the eyes. I remember the first time the FIA used a camera pointing back at the driver: it was at Magny-Cours and Michael was in the Ferrari. The light was perfect and there was a camera looking right into his eyes. In the middle of his race. That seems to have gone away as well.

All this is about engaging with the fans, and the ultimate expression of that is living the life of a racing driver. The Lewis fans are on board with Lewis. They can see his eyes, they can see his feet, they can see his hands if they want to. They know what he is doing. And all this wonderful technology is out there and none of us can see it.



There's a struggle in F1 to strike a balance between presenting the most exciting show possible and catering to the sponsors – who, after all, provide a great deal of F1's income

TW: But there is a commercial reality. The camera guys in FOM are experts. Camera angles now can show you the eye movement. It's amazing. Then you can have a camera that shows all the action in the cockpit – the paddles and the action on the steering wheel. You can have some of the angles that are used in bike racing, where you see the speed, but none of that will ever make a sponsor happy. We have a live audience of 60-70m and every second is worth millions of dollars and has the potential to be sold to a sponsor. Getting the right balance between making it look like an action sport and reflecting what it really is, is so hard. And then there's the other side: generating the income we need to go racing. There are so many things we have to consider but definitely the sport is in good shape.

Still, there are a number of things we have to consider: firstly, the internet. We have YouTube videos competing for attention – maybe two guys sitting on the edge of a skyscraper in Shanghai. It looks frightening, but they are not generating a single dime of revenue. So Bernie and his group are in a very difficult position because we all tell him you need to do more digitally, but the only guys who are making money from the web are Facebook and Google. They account for 90 per cent of all revenues.

Bernie can't give his exclusive content to digital audiences that are not prepared to pay for it. So it's a very difficult balance to find. Not to lose the next generation audience, because he's not transmitting over their channels... But equally he's generating £1- 1.5bn in profits.

KC: Otmar, from the app [Szafnauer was responsible for launching the original 'F1' app], you obviously get to understand a bit more about the digital side of things... →

OS: We actually launched the app six years ago here in Monaco. It grew at a rate of about 25 per cent a year until it recently plateaued. I think that's because people still aren't aware what the app is and what it does. We need to drive awareness and it could be a big money generator.

The app costs £20, so if you sell a million of them, that's £20 million. That's as much as some of the grands prix spend to host a race, which is revenue on a 'one grand prix' level.

You're right, Toto, you can't give it away, but somehow we need to drive awareness. Three or four years ago, I didn't go to the Chinese Grand Prix and my wife said, 'Let's go to Cornwall.' I still wanted to watch the race on Sunday, so I found a hotel that was showing qualifying, and I said: "Look, tomorrow I'm coming to watch the race." They said: "No problem we'll have that on for you." I got there and there's a bunch of old people watching cricket. I said: "Put the race on!" – they said: "Sorry, you're too late." So then I had to find a pub that was showing the race. I walked into a pub and I heard the race starting in the background and it was some guy who used to work at McLaren, who was retired. He and five friends had a laptop and they were streaming the race. I said: "Do you mind if I watch, too?" and they said: "No, no – come on in!" so I sat with them and I got my iPhone out and I said: "Do you mind if I run the app next to you?" I put it up and they were amazed. Here are fans to the level of taking their laptop to a pub so they can watch a race and not suffer the cricket, and they didn't know about the app. We've got to make people aware of it. I think it's a promotional question.

ZB: I was in Australia recently with the CEO of the AFL – the Aussie Football League. They generate AUS$55 million in digital revenue for one sport, in one country of 22 million people. They have their own in-house studios; they produce 30 shows a week internally, they bring on different athletes and so on. They push it all out and make $55m. You can watch the games live on your phone, but not on an iPad, so that way it doesn't cannibalise TV. And over three million people watch 30 minutes of the games on Android. The shows are sponsored, they're digital, they're apps, so I don't think it's about one app, two apps. It's about an entire digital campaign. And if Aussie Football League can be making $55million a year of digital revenue, given the size of Formula 1, it should be doing something similar.

KC: It's a question of promotion, definitely. I've been in WEC and Formula E recently and they're keen to talk to all the drivers and teams and say: 'Look guys, this is our message this week, can you get our message out? This is the message we want to put out about how wonderful we are.' Do you think that happens in this paddock enough?

ZB: I think you have to look at digital and how that helps you build your fan base without exclusively monetising every digital platform, because what that does, is creates audience. And then you can monetise that through selling merchandise, which I don't think F1 does



While it's important for F1 to explore new territories, such as Azerbaijan (right), it takes a long time to build up a local following. Lowering ticket prices would help fill grandstands and build up a fan base, but this is impossible while hosting fees are so high

particularly well as a sport. You go to a football game and how many people are dressed up in their team's football jerseys?

TW: Merchandise should be centralised with one organisation that does it professionally. Bernie would still own the rights, maybe that's good, but every driver and every team has their cut.

ZB: For the Ryder Cup, they effectively have a big supermarket. There's this player, that player, there's this merchandise... It's all done digitally, you can check out with PayPal if you want and it's a great experience – you know where to go.

JP: And that should be transplanted from race to race in the same way as the broadcasting and everything else. It should just be part of the Formula 1 village, absolutely. It should be the brand... the global exposure of the brand.

F1R: Jonathan, in terms of building up British motorsport, do you see things that Formula 1 could do very easily? Do you think that there are open goals they're just not hitting?



F1 ROUND TABLE

"This is one of the big problems F1 has: you get a country to build a new circuit and spend £200million on it over two to three years. But what you can't build in two to three years is a following. You can't build that culture of an interest in F1"



Jonathan Palmer

JP: No, I couldn't possibly say that. Motorsport in the UK at club level is totally different – it could be bowls. Our main spectator events for motor racing are British Touring Cars and particularly British Superbikes. They're the biggest in the UK; British Touring Cars are second, but Formula 1 is on a whole other scale.

The fundamental thing is a 'natural following'. People know about British Touring Cars, they know about Superbikes, they know about Formula 1 and it's about creating that momentum of following. It's not easy to push it faster or get it to go slower; trying to steer it and expand it as it goes along is a very delicate thing.

TW: Jonathan, I had an interesting conversation recently with probably Germany's most successful football manager. We were sitting in his office looking at the stadium and we were discussing entry prices and how Formula 1 was very expensive – maybe €400-€500 for a ticket. And he said to me: "You know how much I sell the tickets for, for a 20-game ticket?' I guessed €100 a game, making €2,000. But I was wrong: it cost just €150 for 20 games, so €7.50 a game.

I asked him how that was possible and he explained: "I have 11 big players against 11 players, they are part of my cast. And I have 60,000 fans, who are part of my cast. You need the spectators to promote the show to the external world. Of course, traditionally in Formula 1 those fees have been going up and up and up; it is difficult for a promoter, for the owner of the race track, to make money.

JP: Another big challenge F1 has is creating a certain level of interest. If you look at any circuit, and the amount of people who pay to come and watch it, and you look at how much they pay, the actual revenues generated by spectators watching grands prix will vary from across the world. But certainly you will tend to find that it is bigger at Silverstone and Monza, in the traditional tracks that have built up a following over years and years. You need a long time to do this – a decade is not that long to build up this momentum and a following.

This is one of the big problems that F1 has: when you go to new circuits, you get a country to build a new circuit and spend £200million on it over two to three years. But what you can't build in two to three years is a following. You can't build that culture of an interest in Formula 1. You can throw advertising money at it for two or three years, but I suspect a lot of circuits have found that after they've tried it for the fourth or fifth year and they're still struggling to fill the grandstands, then they're wondering why they're doing it. It's easy to underestimate the importance of history and tradition.

TW: I think that a decade is probably not enough, I think it needs five decades. Personally speaking, I don't really understand what's interesting about cricket, but it has a huge following in some countries.

The Americans follow NASCAR and they're crazy about it, but outside the US, not so many people understand it as a sport. They also follow American football; Europe does soccer. Then there are local phenomena: DTM is filling the stadiums and the race tracks in Germany because there's a perception of a sport over the decades: 'let's go and watch DTM because it's a good thing to do.'

And that's where we leave this absorbing round-table debate for this month, but we'll pick it up in the September issue of F1 Racing*, with the same cast predicting what the future will hold for the sport.*

Daniel Ricciardo

Formula 1's honey badger explains the origins of his unusual nickname, and is far from his usual sunny self as he talks about the pain of his defeat at this year's Monaco Grand Prix

WORDS JAMES ROBERTS **PORTRAITS** ANDY HONE/LAT

Daniel Ricciardo is wrapped up. He's wearing a Red Bull overcoat over his warm top and his choice of drink is telling: "Just a cup of hot water, please." He's not the only one who's suffering from the cold. It is chilly in Montréal, and all of Red Bull's guests and assorted media have crammed into the team's tiny hospitality unit, with the door closed against the cold.

Ricciardo arrived in Montréal with a mood to match the climate: downcast. He believes he should have won the previous two grands prix, one of which, the Spanish GP, was snatched by new team-mate Max Verstappen on his Red Bull debut. The other, Monaco, was squandered by the team's pitlane tyre fumble that nullified Dan's hitherto immaculate performance.

There's the hope of better things to come, though, with the recent addition of an upgraded TAG-Renault PU. But on this icy morning, Ricciardo is struggling to see the sunny side.

As *F1 Racing* sits down opposite F1's self-styled 'honey badger', we're hopeful that a few questions from our readers will warm him up.

When did you acquire the nickname 'The Honey Badger', and who gave it to you?
John Slater, New Zealand

It was my trainer at the time, Stuart Smith. He'd shown me a documentary on it, and said: "Dude, this animal's great!" I thought it was awesome. Then he added that he thought I had a lot of honey badger qualities. And I thought, 'yeah, I think I do'. So it started from there and that was it and I think I've done well to keep it going.

For any F1 Racing *readers lacking the requisite knowledge of exotic fauna, the ratel or honey badger is a particularly feisty weasel-like mammal, with great strength for its size, noted ferocity and skin tough enough to resist machete blows. Despite this, it looks deceptively cute and cuddly. You have been warned…*

Do you have pets? If yes, what are they?
Perla Rincon, Spain

No I don't have any pets. I'm not really an animal person, but if someone wants to give me a pet honey badger then I wouldn't say no. Lewis walks into the paddock with his dogs and I'd love to walk in with a honey badger on a leash. That's my vision and my dream!

What is your view of the aeroscreen/halo debate and its arrival in F1 next year?
Duncan Kennedy, UK

It's a tough one. I started racing because I loved it. I loved the speed and I loved the risk. Part of the attraction is the danger and knowing that you are doing something that's a little bit more dangerous than, say, what a football player does, and that makes you feel a little bit cooler. So I do love that aspect. But for me the whole head protection thing is a different side of the debate. It's not us being scared, it's just us eliminating another avoidable thing. If we've got something over our head it's not going to change the way we approach a corner. If we hit a wall it's still going to hurt, just as hard, just as much.

So if the halo is just going to protect us from a flying object then let's go for it. But also, while →


F1
RACING
Daniel Ricciardo

we're talking about safety, what I'm not really keen on is that some circuits are too open and too safe. That's why I love Monaco. But that's a different topic. People shouldn't get confused about this. We're not trying to make the sport too safe, it's just really about eliminating one aspect.

How would you have felt if you had been demoted back to Toro Rosso?
Jason Bird, UK
Ummm... ahhh [long pause]. Like Daniil Kvyat.

Can you become champion this year?
Gilbert Colon, USA
Given the equipment, yes.

How did it feel to lose to Felipinho Massa in that kart race? [Felipe Massa's six-year-old son challenged Ricciardo to a patio Crazy Kart race before the Monaco GP]
Aaron Shapiro, USA
Not as bad as losing Monaco.

Was the Monaco GP the most frustrating moment of your career?
Pedro Eca, Portugal
Absolutely.

What will give you most satisfaction this year – beating Max or beating Seb?
Jonny Popper, UK
Ummm... I don't know. I've already beaten Seb, so let's say beating Max.

Do you miss Seb?
Greg Arnold, USA
Whatever... I dunno.
***F1R*:** You must miss him a bit?
DR: I got on with him but does it mean that I miss him... I dunno.
***F1R*:** Do you still see him?
DR: A little bit yeah. Whatever.

Have Red Bull brought Max Verstappen just to put the pressure on you?
Graham Prior, New Zealand
[Max Verstappen has been quietly engaging the media gathered around his table in this small hospitality unit. He calls out in response to this: "That's not a nice question. I don't like that!"]
DR: It's probably for the both of us. To put more pressure on me and to try to accelerate him and see what he's really made of. So, probably.

Can you compare the performance of the 2015 engine to the latest version of the Renault-TAG power unit?
Michael Vosgrove, Canada
Yeah – it's significantly better.

***F1R*:** What do you feel is different?
DR: It's not anywhere in particular, but where it pulls hard, it's all the way through. It has a consistently steeper gradient of power.

Ricciardo is clearly not his usual loquacious self today. We decide to prompt him with one of his favourite topics...

Fantasy match up: who would win in a heavyweight UFC fight between Jon Bones and the Super Samoan and why?
Angus McNeice, UK
[A note for baffled readers: Dan Ricciardo is a huge fan of the Ultimate Fighting Championship]
Jon 'Bones' Jones. Amazing reach; he's more athletic and he's got a whole arsenal. His ground game is great; he's got vicious elbows but he can keep his distance if he wants.
***F1R*:** Didn't you go to a UFC fight in London recently? How was it?
DR: Yes I did and it was amazing. I loved it. I went to one in Las Vegas last year; that was the first UFC event I'd been to and to this day, that Vegas event is the best sporting event I've ever been to in my life. Just amazing.
***F1R*:** The UFC's growing, isn't it?
DR: Once you appreciate it for what it is and block out the violence and the blood, it's amazing. What I love most about it is that it's pure, as pure as sport gets. There are no other variables. You train and you prepare for it. It is what it is.
***F1R*:** Do the hairs on the back of your neck stand up when announcer Bruce Buffer does his thing?
DR: Yup, I'm there like the biggest fan. [Does impression of Buffer shouting down the mic] "Iiiiitttttt'ssssss tiiiiimmmeee!!!!" He makes it; he's just amazing. I love it.
***F1R*:** Right, the next time you go, we're there.
DR: Absolutely, I'll be in America the week before [Irish mixed martial art fighter] Conor 'The Notorious' McGregor's fight in August, but it's cutting it fine for Spa. Logistically I could do it, but I've just got to convince my trainer that I can do it and still get to Spa in good shape.

You've not worked with Max for long, but what are the differences between working with Max and working with Daniil?
Andre Denton, UK

I think they've both got raw speed. Daniil on his day was very quick, but I just feel Max can show that speed more often. Who's quicker? I don't know, probably Max has a bit more. Not taking anything away from Daniil but I would say that Max probably has a bit more speed.



If you had to change the technical regulations of the cars in F1, what would you change and why?
Kamogelo Lekhu, South Africa
I'd make them louder, faster... and that's probably about it. Maybe tyres that you could push on a bit harder, too.

What's your pre-race music selection?
Brock Bolton, Canada
It varies. I went through my whole career listening to punk rock, hardcore... that was pretty much the only genre I was set on. I still go there a lot of the time but I mix it up as well and basically make anything work for me now. I go for stuff that is less heavy now but the lyrics have a bit more meaning. I usually listen to some hip-hop, some pretty heavy trap music, whatever...
***F1R*:** Do you and Lewis share similar taste?
DR: Yeah, pre-race stuff I've probably bowled down his route a few times. I like moving before the race, so anything with a bit of a beat helps. It varies. I've got some guys coming from Alexisonfire this weekend, who are a pretty good melodic post-hardcore band, so that will be on my list this weekend.

With the upcoming 2017 rule changes, do you think Red Bull will be back at the top?
Anesu Mwanyanya, Zimbabwe
I bloody hope so. I think it will help us.

Do you think you would look good in red?
Jed Wallis, Australia
Only if they are willing to dominate a world championship. Otherwise, no.



What cars are you driving in your karaoke videos? How many cars do you own?
Ernie Mikos, Canada
Some of them have just been rental cars – one was an Aston…
***F1R*:** Why don't you do Carpool Karaoke like James Corden does?
DR: I think that would go well. I don't have a voice like him, but I think we'd have a lot of fun.
***F1R*:** And have you been singing on your road trip up to Montréal from New York?
DR: Yes, we did a few little singalongs on the way, but I'm not sure if any of them are worthy of making it onto Instagram.

Dude… What's with your hair?
Daryle Yarab, USA
Hey, Daryle Yarab from the USA… go f*** yourself!

What's your favourite place in Australia?
Andrew Gair, UK
Oooohhh. I love home, I love Perth. I went to Byron Bay [a beachside town south of Brisbane] this year. That was amazing, I loved that. So those are the two places.
***F1R*:** What was so good about Byron Bay?
DR: It was just super cool, super chilled. Amazing beaches. It was really good for training and the people were just so friendly. It was good for surfing as I surfed for the first time ever, so that was cool.

I should answer that hair question properly. [He picks up the pack to start looking for the previous question card] 'What's with the hair?' Well, I've always had the same hair, so I've just been trying to change it up a little. It still looks pretty normal but I've just been having a bit of fun. Why not?

What do your tattoos mean?
Anna Francis, UK
I've got one on my ankle that is basically a compass. I got it last year and it was a period of my life where I was living quite spontaneously, doing a lot of travelling with some good friends. Me and a good mate of mine from Australia decided to get a tattoo that meant something about those few weeks. That was that.

Another says: "No regrets, only memories." There's a few things going on with it but it's basically about me travelling the world and chasing my dream. Obviously a lot of things have happened in my career and it's about not looking back and regretting them and appreciating the good moments and the memories.

There's also a lighthouse with a swallow, and the swallow never roams too far from home. So it's about staying grounded. And another is an old-school racer chick… And why not?
***F1R*:** How big?
DR: Big enough… I just liked the look of it. I was going to get 'Live Fast', or something like that. One of my favourite songs is called *Happiness by the Kilowatt* [another Alexisonfire number] and I was going to get that written below it.

Have you ever read Bill Bryson's book about Oz, *Down Under*? Is it true that the sunny Perth climate produces sunny people, do you think?
Jackie Lupton, UK
I haven't, but the sunny Perth climate definitely produces sunny people. I've been fortunate to travel a lot of the world now and the nicer people are in nicer climates. If I go to a cold place…
***F1R*:** Like Montréal?
DR: [Laughs] No, people are friendly here but if the weather is good it shines through in their personality, 100 per cent. It works with me, too. If I'm cold I'm a lot less happy than when I am warm. Climate does create personality. If you go to hot places, you'll find nice people.

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INSET: ALASTAIR STALEY/LAT

Day at the museum

There are no monsters at Fernando Alonso's own museum in his Spanish home town of Oviedo. Rather, an exquisite collection of cars and memorabilia from the career of a modern great. He gave *F1 Racing* a world-exclusive tour

WORDS STUART CODLING
PICTURES STEVEN TEE/LAT

A warm and sunny but quiet afternoon on the outskirts of Oviedo in northern Spain. During the weekends, the recently opened Fernando Alonso Museum – packed full of memorabilia *and* cars from this local hero's remarkable career – is a massive draw. Less so on a Monday, when most people are at work and the kids should be at school.


Santander
V-Powe
MUSEO Y CIRCUITO
FERNANDO ALONSO





Fernando's first racing licence (left) states that he is aware of the dangers of motorsport and accepts all responsibility. Heavy stuff for a three-year-old













That's worked out well for *F1 Racing*, though. Judging by the reaction of the starstruck visitors who are present when Fernando strolls in – double-takes all round, jaws bouncing off the carpet – we'd need to repel them with a water cannon to get this tour done otherwise.

The museum is a purpose-built facility supported by the local government, including a 1,390m internationally licensed kart track designed by Fernando himself. Children are encouraged to experience racing and learn about road safety at its on-site campus.

What strikes you from the moment you walk in is the logic and sheer completeness of the collection. You start at the beginning of Fernando's career and proceed chronologically to the present day, as if walking through the pages of a sporting autobiography.

Famously, Fernando's father hand-built his first racing karts. They're displayed in order, clean and looking freshly minted under the lights, along with his first gloves and trophy, dated 1985, and a print of his first racing licence. A chubby-cheeked three-year-old Fernando beams from the corner of the page, surrounded by screeds of official text.

"It says that I'm aware of the dangers of motorsport and I take all responsibility," he laughs. "I'm not embarrassed about having all these pictures of me as a kid. How could I be? My life has been very public. Max Verstappen is experiencing a bit of this kind of thing – there are hundreds of pictures of him in karts.

"My old karts were difficult to find. Some of them – especially the early ones – we had sold. We still had the details of the people we'd sold them to, but then we'd find that they'd sold them to someone else. Once we'd tracked them down we just had to repaint them to make them exactly as they were. The later ones, from when I was 14-18 years old and it was getting more professional, they were in Barcelona with my mechanic from that time. He'd kept them because they were important – world championship winners."

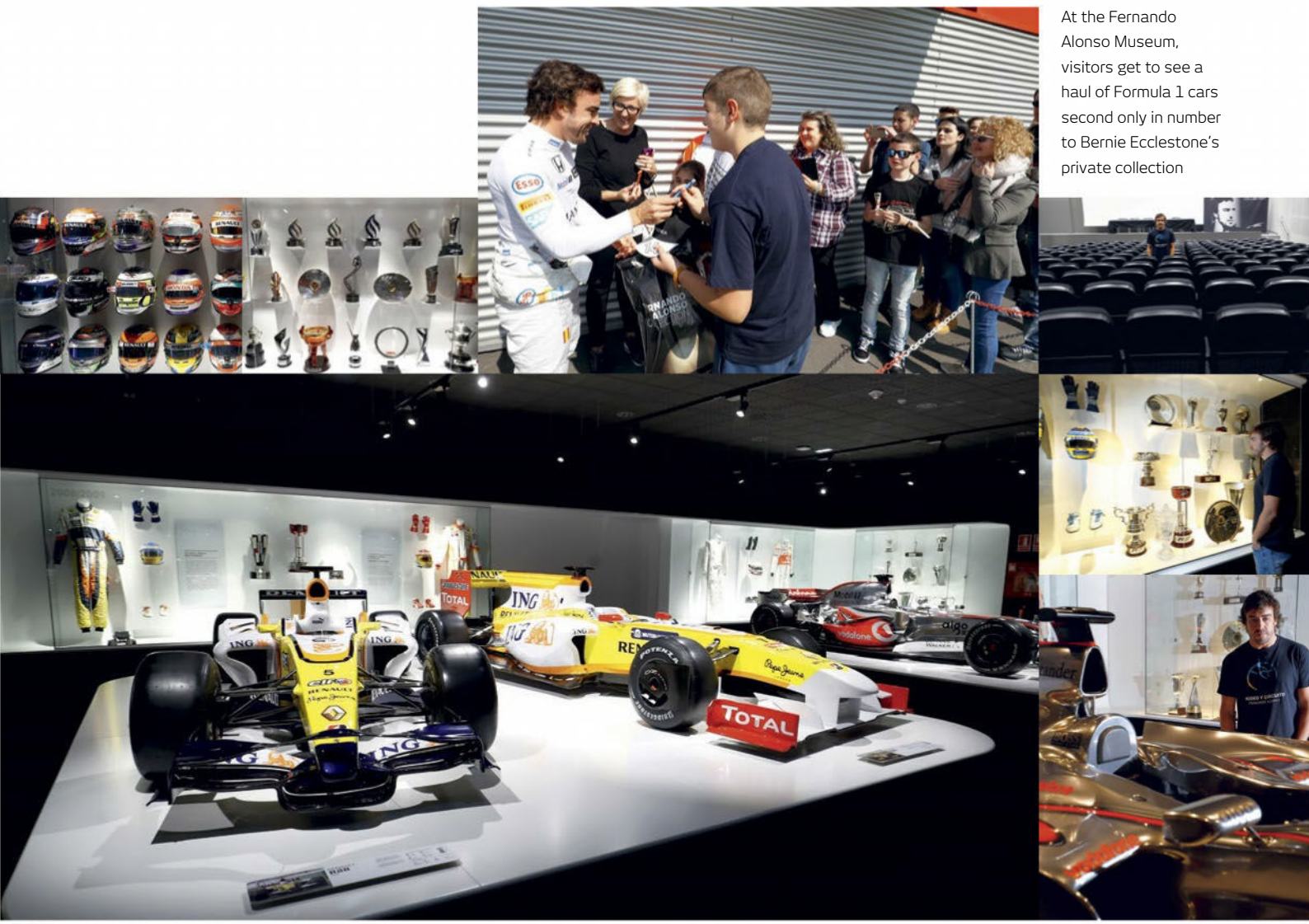
A **great deal of foresight** would have been needed for the family to hold on to the early karts. During Fernando's early karting days, in a country with relatively little interest in four-wheeled motorsports, he probably didn't expect to become F1 world champion, so preserving his own history wasn't a priority.

"Until I got to F1 I didn't have any hopes of that," he says. "When I first jumped in a single-seater, the Formula Nissan, and watched them test, I told my father and my mechanic: 'This is not my world. These guys are too fast, too good.'"

Serendipitously, he was proved wrong, and the evidence is now before us: his 1999 Euro Open by Nissan championship-winning Coloni-Renault, which provided the springboard to the F1 support card, and the Astromega Lola B99/50 in which he finished fourth in F3000.

"I was good in karts," says Fernando. "I was a professional driver, I had a salary, and I thought that was my future. Then when I won in single-seaters I thought, 'Okay, I'm quite good at this, too,' but still F1 was for me too high. Michael Schumacher. Mika Häkkinen. It was impossible

> **"When I first jumped in a single-seater, the Formula Nissan, I told my father and my mechanic: 'This is not my world. These guys are too fast, too good'"**



At the Fernando Alonso Museum, visitors get to see a haul of Formula 1 cars second only in number to Bernie Ecclestone's private collection

for me to arrive at that level, with no money, no sponsors. For our family, it wasn't a target. We were just enjoying ourselves."

It's appropriate, therefore, that as the parade of single seaters comes to an end with the European Minardi PS01 in which Fernando made his Formula 1 debut and the two Renaults in which he took his first wins, you must climb a set of stairs to the next floor to see that next victorious phase of his career. But we aren't heading up there just yet; Fernando pauses between the Renault R23B and R24B, cars that share a colour scheme but which were designed by different teams working in tandem.

"I remember races very clearly," he says. "My first victory in 2003 in Hungary, the first podium – that car changed my life in a way, because F1 wasn't even broadcast on TV in Spain. My first podium seemed to switch on the popularity. I even started making TV commercials. My life changed in a big way. And when people come to the museum, they tell me this car brings memories for them of what they were doing that day when I won in Hungary. That's exciting."

F1 Racing recalls an anecdote in which Mike Gascoyne, then Renault's technical director, described Fernando going over a kerb at Monza and 'utterly rooting' the R23's floor, yet somehow carrying on. "Yes – it went faster," laughs Fernando. "The undertray broke off. We had a big debrief after that race! We wondered if maybe it should accidentally get broken on the way to the grid at the next grand prix…"

If the museum's ground floor impresses through its completeness, the first floor really applies the wow factor. Until Bernie Ecclestone throws open his Biggin Hill stash (and you may be waiting a while for that one…) you're unlikely to find this many recent, cutting-edge F1 cars on public view anywhere in mainland Europe. You certainly won't find five modern Ferraris together outside Maranello itself.

Fernando has an example of each Ferrari he drove during his five seasons with the Scuderia, somewhat unfortunately serving as a visual record of Formula 1's descent into ugliness in recent years with stepped noses and such. But, as Fernando himself says with a shrug: "When you're fighting for the world championship the car is beautiful. But, yes, when you see the evolution of the cars like this, you see things aren't always as pretty as they were."

Unsurprisingly, the 2005-2006 world championship cars, the R25 and R26, get special treatment, rotating gently on twin turntables with the world championship trophy in between.

"My history starts in 2005," says Fernando. "I won the championship and Flavio [Briatore, then his manager and Renault team principal] gave me the car as a present. I called all my friends and family and they came round to take pictures of it. At that point, my father said: 'We can find the karts and the other single-seater cars, and if from now on we put in your contract that at the end of the year you have your car, you will have the whole collection.'" →



"Usually I would get the car one year after the end of the season. The McLaren took three or four years! For sure, there are bad memories as well as good memories here"

The elephant in the room, as it were, is the 2007 McLaren MP4-22. Given the circumstances that year – a gradual worsening of relations with the team and his team-mate, culminating in outright hostility – you wonder how he managed to prise this car out of McLaren's hands at all.

"This was more difficult," he concedes, still smiling. "Usually I would get the car one year after the end of the season. The McLaren took three or four years! For sure, there are bad memories as well as good memories here. But this was not a bad year really – look at that trophy at the bottom," he gestures towards a cabinet heaving with silverware. "That was my second consecutive Monaco win. It was a good year. We lost the championship at the end, and there were difficulties with characters and cultures – me being very Latin and very young and maybe not prepared for many things.

"I'm a different person now, much more open and more mature, and I think McLaren now are much more open and international than they were before. Fans come to the museum and they like to see all the cars and the success. I don't think they remember or really care about the politics from seven, eight, nine years in the past."

Besides the F1 silverware, of which, as you might expect, there is a great deal, the cabinets host a wealth of miscellany: the starting flag he waved at Le Mans in 2014, the keys to the city of Oviedo, the BRDC's Johnny Wakefield trophy and the Premio Principe de Asturias de los Deportes – an award handed to elite sportspeople, a roster that includes international figures such as Sebastian Coe as well as national heroes such as Seve Ballesteros and Miguel Indurain. There's also a cabinet featuring other drivers' helmets; he's been swapping them with team-mates and rivals since David Coulthard set the ball rolling. The one from Daniel Ricciardo has a neatly written personal dedication to Fernando from its former owner on the visor.

"Daniel is a good man," says Fernando. "You have something like this at home and it's cool, but only you, your family and friends get to see it. Here you can share it with everybody."

In the far corner of the top floor is one car he's never raced: a McLaren MP4/4 on loan from Woking. Alongside it, in a jarring break from the otherwise chronological order of the museum, is his first-ever kart, built by his father and painted in colours to match the dominant F1 cars of the time – McLarens. It was actually built for his sister, but when she didn't show much interest their father extended the pedals so Fernando could use it. The rest, as they say, is history, so its presence at the end of the exhibits rather than the beginning lends a powerful sense of a career coming full circle, as if it were always ordained that Fernando should drive for McLaren.

There's also not much room for many more cars, which brings to mind the question of Fernando's future. He has been quite open →

Cabinets display trophies (below right) from Alonso's career, and also fellow drivers' helmets (below left), which he's been swapping over years







A selection of chariots from the adjoining Karting Campus, which has a 1,390m internationally licensed track designed by Alonso himself

Back to school

The Fernando Alonso Museum is the anchor point for a larger public recreation complex, which includes a cycling track, a golf course, the Alonso-designed kart circuit and a road-safety education centre. Support from such a prominent sporting celebrity is seen by the local government as the key to engaging children from all over the region with the road safety message. And there's also the possibility that Spain's next F1 champion might begin their career here at the Karting Campus.

"It's amazing that the feeling and memories are coming back to the start of my career and the beginning of my passion," says Fernando.

"Last year we had 35 kids coming through the Campus; next summer it will be 150. It's interesting to see the approach now. Young drivers are more focused and prepared. Everything they do is very professional.

"We prepare a week-long package and they do more than karting. We train them, they cycle, do golf, learn about road safety, visit museums and take part in other cultural activities. There's a uniform, and it's quite fun. Me, I wanted to go back 30 years and experience that as well. We try to help and give something back to my region and my country – something that was missing when I started.

"Also with the road safety, 6,000 kids at all the schools in our region will go through a road-safety course that we only started last week. Three hundred kids have already passed. It's good to give something back."









"To step back from the car is a big change. It's difficult to switch off completely from something that's been your life. Having the museum and the kart school will be a way to switch off gradually, while bringing the excitement of motorsport to the kids to inspire them"

recently about his time as a driver coming to an end. Is this facility and its adjoining karting school part of his exit strategy?

"The future after F1 is not clear from a driver's point of view," he reflects. "You've always been driving, all your life. To step back from the car is a big change. Some do TV commentary, others go on to be team principals. It's hard to switch off from something that's been your life. Having the museum and the kart school will be a way to switch off gradually, while bringing the excitement of motorsport to inspire the kids."

Outside, in the late afternoon sun, he changes into a crisp new racesuit and whizzes around the track with one of the young karters who has come to essay some practice laps. Alonso Sr superintends the preparation of the karts as closely as he did 30 years ago.

"His school friends won't believe him when he says he got on track with you," suggests *F1 Racing* to Fernando afterwards.

"Oh no – he comes here all the time..."





Fernando Alonso with his father (left), who built his first kart (originally intended for Fernando's sister) and prompted him to start his racing collection

Light up the night sky



2016 FORMULA 1 SINGAPORE AIRLINES SINGAPORE GRAND PRIX

Grand Prix Season Singapore is almost upon us once again, as Singapore welcomes visitors to a non-stop celebration: blockbuster concerts, glitzy parties and a dazzling array of cultural and entertainment options – and not forgetting the Lion City's world-renowned gastronomic delights.

And then there is the race itself. This year marks the ninth running of the FORMULA 1 SINGAPORE AIRLINES SINGAPORE GRAND PRIX. The world's first F1® night race proved a sensation when the inaugural Singapore F1® race was run in 2008, and today it remains a unique and much anticipated highlight on the F1® calendar.

As a street circuit, Singapore presents drivers with a range of difficulties. For one thing, mastering the Marina Bay Street Circuit and keeping off the walls that line almost all of its 5km is no easy achievement – in fact, it's a Monaco-like challenge.

Factor in the added difficulty of the heat and humidity, as well as the glare from the artificial lights that illuminate the track, and you've got a challenging and unique set of circumstances – there's nothing quite like the Singapore track on the entire 21-race World Drivers' Championship calendar.

Not that night-time visibility for the drivers is in fact an issue: while many thought it would simply not be possible to safely hold a race for Formula 1® openwheelers at night, the state-of-the-art lighting technology employed in Singapore has indeed shown itself capable of replicating daylight on the circuit after hours.

Statistically, one driver seems to have adjusted to the set of challenges posed by night racing at Singapore more effectively than the others. That driver is Sebastian Vettel, who has won four of the eight F1® GPs held here so far. Impressively, the Ferrari ace's tally of Singapore wins is twice that of the only other drivers to win here, Lewis Hamilton and Fernando Alonso.

Vettel won in sensational circumstances here last year, leaving the dominant Mercedes duo of Hamilton and Nico Roberg for dead, his only challenge coming from Daniel Ricciardo.

Ricciardo has fond memories of Singapore, and as a circuit that seems to suit his Red Bull machine, he'll be looking to make the most of it. That's especially so given that Singapore is like a second home race for the Australian. Not only is it our closest neighbouring F1® race, but for Dan's home-town fans in Perth, it's actually an easier trip than trekking across Australia to catch the race in Melbourne.

That's another aspect that makes the Singapore experience so special: you'll be far from the only Aussie in the stands cheering on our Dan!

Tickets to the 2016 FORMULA 1 SINGAPORE AIRLINES SINGAPORE GRAND PRIX start from $78 (Friday Zone 4 Walkabout Ticket). Book now at www.singaporegp.sg or contact your local travel agent.



Race times

Fri 16 – Sun 18 Sept 2016

Practice 1	Fri	18:00 – 19:30
Practice 2	Fri	21:30 – 23:00
Practice 3	Sat	18:00 – 19:00
Qualifying	Sat	21:00 – 22:00
Race	Sun	20:00 – 22:00

Source: F1.com (Subject to change)

Grand Prix Season Singapore

Here's a small sample of just some of the things you can see, do and experience off-track during the 2016 Grand Prix Season Singapore.



Amber Lounge: the Original F1® Experience

Singapore, home to Formula 1's ® first-ever night race, is one of Amber Lounge's most glamorous and exotic destinations. A celebrity and F1 ® driver hotspot, Amber Lounge Singapore has proven to be the nightlife destination in the Far East, merging the wild party spirit of the West with the opulence and splendour of the Orient.

Sunday, 17 Sept, 11pm
Start the evening with the Amber Lounge F1® Driver Fashion Show – a haute couture runway presentation from leading international designers. It will be a breathtaking fashion show after-party, with International DJ live performances.

Sunday, 18 Sept, 11pm
The closing party is the most anticipated night of the weekend, where the F1® drivers and teams move straight from the paddock to the party for post-race celebrations. Iconic live acts, DJs and free-flowing champagne.

Temasek Reflection
(Water Wall behind Millenia Tower)
1 Temasek Avenue
Nearest MRT station: Promenade (CC4/ DT15)

www.amber-lounge.com/index.php/singapore/



Clarke Quay presents Zouk Block Party

Zouk launches its first ever Zouk Block Party at the Clarke Quay, as a prelude to the big move to the new venue – and to join in the Grand Prix Season Singapore festivities. This block party will feature the much loved Zouk Flea & Easy pop-up and the popular ZoukIDisco. Start the day at Zouk Flea & Easy; everyone's favourite flea market and afternoon party. It is the ultimate shopping haven for style-meisters and bargain hunters alike, amidst chillax tunes. The young ones can bring on those dance moves with mums and dads at ZouKIDisco. To feed the hunger pangs, tantalise the tastebuds with food fare with an Asian Twist from the freshly opened Red Tail.

The party continues into the night with DJ Jeremy Boon and DJ Zushan and many more. Encapsulating everything local within a social space, the Zouk Block Party is for everyone of all ages.

Clarke Quay – Fountain Square
3 River Valley Road
Singapore River
Nearest MRT station: Clarke Quay (NE5)

www.clarkequay.com.sg; www.zoukclub.com





The Circuit at 1-Altitude

It's an eye on The Circuit all weekend with the highest parties, and featuring the only Day to Night Farmers Market with a view. It's a fete pop-up of gourmet food and wines till late as the best DJs and entertainment electrify at Singapore's highest alfresco bar and club, including the iconic Johnnie Walker Circuit Party.

1-Altitude Circuit
1 Raffles Place
Levels 61, 62 and 63
Marina Bay
Nearest MRT station: Raffles Place (EW14)

www.1-altitude.com



Sky Grandé Prix

Keep your eye on the sky for the only 5-day party line-up in town celebrating the grand prix. Back for the fifth instalment, Sky Grandé Prix takes you 45 levels up in the sky offering revellers stunning 360-degree views of the city as they party atop one of the highest nightspots in town. Sky Grandé Prix revs up for **Grand Prix** action featuring all things indulgent: champagne, diamonds, fast cars, and not forgetting guest DJs.

Level 45, Singapore Land Tower
50 Raffles Place
Marina Bay
Nearest MRT station: Raffles Place (EW14)

www.skygrandeprix.sg



Ultra Music Festival Singapore

Ultra Singapore, the Singapore edition of one of the biggest electronic dance music (EDM) festivals in the world, will be held on September 10-11. This makes Singapore the only country in South-east Asia to host a full-fledged edition of the festival. This much anticipated event from the team behind Miami's Ultra Music Festival will feature three stages, 40 artists, and a world-class stage production with state-of-the-art visuals.

1 Bayfront Avenue
Marina Bay
Nearest MRT station: Bayfront (CE1/ DT16)

www.ultrasingapore.com



Tribal Tempo Flower Field Display

Bringing you the boundless blossoming beauty of the Rainbow Nation, brilliant bursts of proteas present on explosion colours unique to South Africa. In conjunction with Mid-autumn Festival, Gardens by the Bay will also feature elaborately crafted lanterns from 2 - 18 Sept, marrying traditional lantern designs with modern lighting technology.

Gardens by the Bay,
18 Marina Gardens Drive
Marina Bay
Nearest MRT station: Bayfront (CE1/ DT16)

www.gardensbythebay.com.sg



Race Weekend Performances



Kylie Minogue

Kylie Minogue will lead a star-studded array of performers over the weekend of the FORMULA 1 SINGAPORE GRAND PRIX. Since she first topped the UK charts with 'I Should Be So Lucky', Kylie Minogue has achieved massive commercial success and critical acclaim in the entertainment industry. She has released 13 studio albums, six live albums, eight concert DVDs, her Greatest Hits and The Ultimate Kylie double albums, and multiple video packages. This is in addition to 69 international singles. Her 2001 album 'Fever', featuring 'Can't Get You Out of My Head,' went multi-platinum.

Fans can look forward to a headline concert from the Aussie superstar at Padang Stage (Zone 4) on Fri, 16 Sept after the last track activity.

Queen + Adam Lambert



With one of the most enduring song catalogues of all time, including 'We Will Rock You', 'We Are The Champions', 'Don't Stop Me Now' 'Somebody to Love', and of course 'Bohemian Rhapsody, Queen's musical repertoire is second to none and the legacy created by Freddie Mercury, Brian May, Roger Taylor and John Deacon lives on through the ongoing work by May and Taylor, now joined by Adam Lambert.

Queen + Adam Lambert will perform at the Padang Stage (Zone 4) on Saturday, 17 September after the last track activity.

KC and the Sunshine Band

Founded in Florida in 1973 by Harry Wayne Casey, KC and The Sunshine Band has sold 100 million records worldwide. Fans can look forward to a great night with their impressive run of hits including 'That's the Way (I Like It)', '(Shake, Shake, Shake) Shake Your Booty', 'I'm Your Boogie Man', 'Keep It Comin' Love', 'Get Down Tonight', 'Boogie Shoes', 'Please Don't Go' and 'Give It Up'.



KC and The Sunshine Band will perform at the Village Stage (Zone 1) on Fri, 16 Sept before Formula 1® Practice 2 session and the Esplanade Outdoor Theatre (Zone 4) on Saturday 17 Sept before Formula 1® qualifying.

Ticketholders can also enjoy full-length concerts from multi-platinum alternative rockers **Imagine Dragons** and electropop singer-songwriter **Halsey**, as well as **Bastille** and **Pentatonix**.



Singapore Arts Circuit

The 2016 Singapore Arts Circuit is three exhilarating nights (Sept 16-18) of art, luxury cars and non-stop entertainment! It also features a three-day live painting exhibition by the world's foremost contemporary motorsport artists, creating original paintings commemorating the 2016 Formula 1® Singapore night race. These include custom original paintings of Lewis Hamilton, Fernando Alonso, Nico Rosberg and Sebastian Vettel. Proceeds from the auction will go to a charity supporting autism. The Singapore Arts Circuit will attract Formula 1® drivers, celebrities, musicians, models, ambassadors and the Singapore ultra-elite, to create this glamorous F1® party experience over race weekend.

10 Bayfront Avenue
Marina Bay
Nearest MRT station: Bayfront (CE1/ DT16)

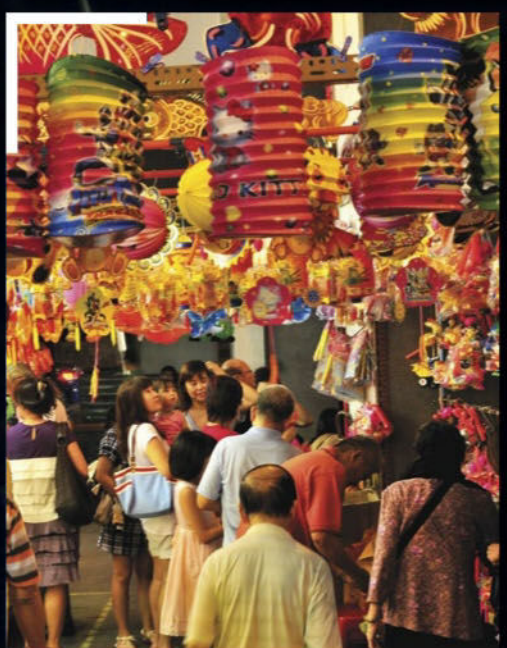
www.ewmevents.com

Dude! Where's my food?

Every year, Artichoke changes up its menu to feed the dudes in town who're here for the F1®. Be prepared for grub like Smoked Balinese duck and Wagyu beef "Kong Bak Pau".

161 Middle Rd
Bras Basah. Bugis & Civic District
Nearest MRT station: Bras Basah (C2)

www.artichoke.com.sg



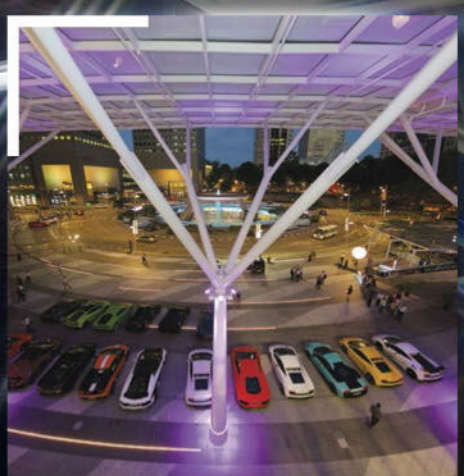
Chinatown Mid-Autumn Festival

Soak in the festive mood of the Mid-Autumn Festival at Chinatown. The official light up and opening ceremony will be followed by more than a month of beautiful Street Light up (Sept 3-30 Sept 2016) along Chinatown. Be enthralled by the traditional decor all around Chinatown. The light-up lanterns was conceptualised by faculty and students of Nanyang Academy of Fine Arts (NAFA).

With a plethora of brightly lit stalls lining up the streets of Chinatown and in front of the People's Park Complex, visitors can enjoy brilliant lights and festive decorations of the Festive Bazaar & Carnival (Sept 2-15) and shop for traditional knick-knacks from mooncakes, decorative items, and festive fruits to potted plants and lanterns.

Eu Tong Sen Street, New Bridge Road and South Bridge Road
Chinatown
Nearest MRT station: Chinatown (DT 19/ NE4)

www.chinatownfestivals.sg;
www.facebook.com/Chinatown.Festival



Oktoberfest at Suntec City

In partnership with German beer house, Erdinger, a name synonymous with Oktoberfest, the Oktoberfest Beer Garden at Suntec City (Sept 9 - 18) promises to be a heady gastronomical experience for foodies, beer fans and fans of Singapore Grand Prix. Expect a delectable line-up of bar bites and restaurant fare complemented with free flow of delicious Erdinger brew. With a pint in hand, relax under the starry skyline at Suntec Plaza.

Suntec City - Suntec Plaza
3 Temasek Boulevard
Marina Bay
Nearest MRT station: Esplanade (CC3)
Promenade(CC4/ DT15)

www.sunteccity.com.sg/events

Grand Prix Season Singapore Pub Crawl

Want to party, get free shots at four bars, free VIP club entry and forge everlasting friendships? All whilst immersing yourself in the true spirit of the Grand Prix™? Then come on down to the Singapore Pub Crawl as we party the night away, Grand Prix™ Singapore style!

Kick off your evening at a themed bar, enjoying the first of your complimentary shots for the night. Chat with your friends and fun-loving crawlers, rub shoulders with the locals, and soak up the lively vibe ready for the night to come. Meet fellow racing enthusiasts – come in your favourite team's colours!

Your professional party local knows the 'in' places and how to help you get the best from your night, so after your first pit stop, you'll head to a string of three bars touted as some of Singapore's best. Down a complimentary shot in each in addition to exclusive drink deals, and feel the tempo crank up as the night progresses and more of the city's chic crowd come out to play.
Ticket Details via Peatix.com

Fat Pigeon Statue is beside UOB Plaza and next to the Singapore River.
80 Raffles Place
Singapore River
Nearest MRT station: Raffles Place (EW14/ NS26)

www.singaporepubcrawl.com.sg



2016 FORMULA 1 SINGAPORE AIRLINES SINGAPORE GRAND PRIX

Grand Prix Season Singapore Highlights



The Spy, The Thug, His Wife & Her Lover

'And So Forth' returns this August with their latest thrilling interactive dining experience: 'The Spy, The Thug, His Wife and Her Lover'. Team up with the Spy and follow him through a series of rooms and situations. Attempt to break out of prison, have a meal with the mafia, extract information, find the hidden truth while escaping a plane crash, and slip away with a worthy spy ending.

'And So Forth' creates series of theatrical feasts immersed around stories, drama and...secrets. The rooms the guests pass through take the form of a series of simulation situations that require wits, self-control and brains. More information of the secret location, dress code and character brief will be given after ticket purchase.

Secret Location
Only revealed 24 hours after event booking

www.andsoforth.com.sg



Building Around The Track

Redpan is a dining collaboration between two local companies: — DP Architects & GRUB. For this year's Grand Prix Season Singapore, Redpan is proud to present 'Building Around the Track' a showcase of DP Architects' role in shaping the Marina Bay skyline which provides the backdrop for this iconic night race.

Redpan, 6 Raffles Boulevard
Marina Square
Bras Basah. Bugis & Civic District
Nearest MRT station: Esplanade (CC3)

www.redpan.sg

Urban Ventures

Experience a reimagining of public space! Watch as Keong Saik Road is transformed into an arts carnival, celebrating the street with street art, street acts and street sports.

The third volume of the Urban Ventures will ignite the freedom of creative spirit and highlight the urban environment and its community. Bringing together graffiti artists, parkour practitioners, street dancers and more, the adrenaline-filled street party will reflect the dynamic spirit of the street.

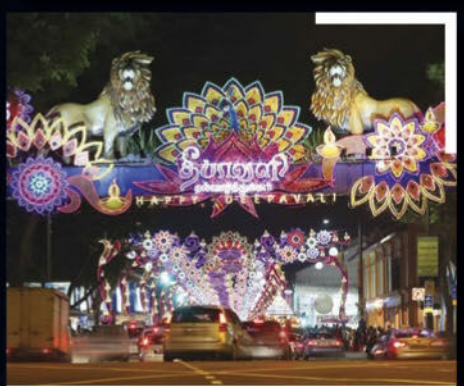
In the evening, join the street party with music, drinks and dancing.

Admission is FREE – bring your friends and family and share the road!

Keong Saik Rd
Chinatown
Nearest MRT station: Chinatown (DT 19/ NE4)



www.lopelab.com/#!urban-ventures/z1vcr www.facebook.com/events/1758996024384622



Deepavali Street Light-Up

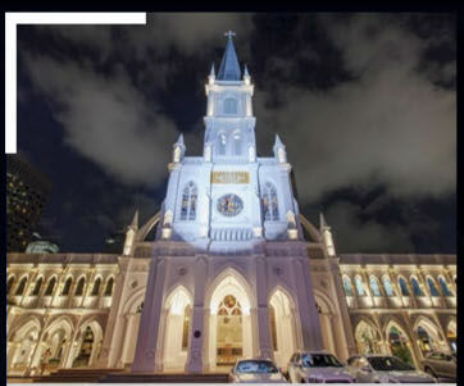
Deepavali Celebrations in Singapore will have a magnificent start with a grand Deepavali Light up Ceremony from Sept 17. Immerse in the festivities and a musical potpourri of cultural performances by local and international artists on the first day of the light up.

Marvel at the spectacular display of the radiant street light up with enchanted lit set pieces adorning Serangoon Road and Race Course.

Sept 17-Nov 12 (7pm to 12am)
Serangoon Road and Race Course Road, Little India
Event Marquee Opposite Serangoon Plaza



www.littleindia.com.sg

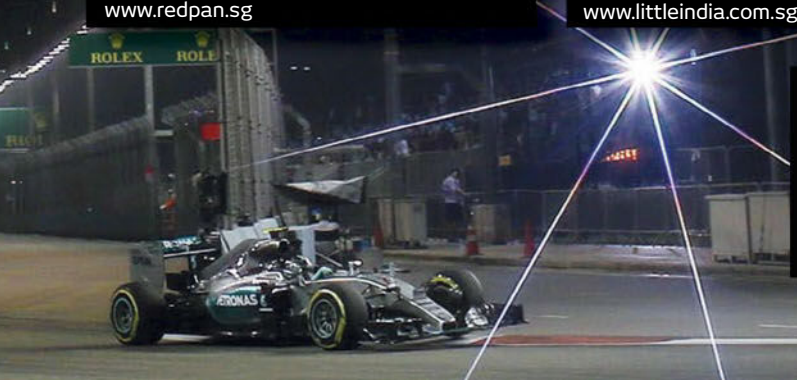


Lap it up at CHIJMES

Rev it up at CHIJMES this race season! Fuel or recharge yourself before or after the race with the suite of exclusive dining privileges at CHIJMES for all F1® ticket holders and crew! Enjoy a free beer* upon presentation of boarding pass and passport for overseas visitors.

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Racing cars do have roofs

Racing cars do not have doors – but it seems they do now have roofs, because chances are that as you read this, the decision to mandate overhead cockpit safety structures in F1 from 2017 will already have been made. It is arguably the most fundamental and most controversial change in the entire history of F1 and openwheeler racing – but is it a necessary and long-overdue development, or is it a misguided and futile attempt to eliminate even the slightest possible risk?

It's hard to find anyone who really likes it. Some are vociferously against it, claiming it is an affront to the very essence of Formula 1 and openwheeler racing. Even for those in favour, it's mostly only a grudging approval, a luke-warm acceptance that the Ferrari-developed, wishbone-shaped F1 cockpit driver safety enclosure, the so-called 'Halo' device, has become a necessary evil.

It also looks like it's an inevitability, because the FIA appears to be prepared to ram through the Halo on the overriding grounds of safety, no matter what the teams or anyone else thinks.

It is a curious situation. On the surface the whole thing seems illogical: the haste with which the FIA is pushing ahead with the Halo is mystifying. After all, Ferrari's first prototype of the concept was unveiled only a matter of months ago. It is yet to be exhaustively evaluated; there are important questions still to be answered.

We are talking here about a very big change. The open cockpit of a racing car is something we've always accepted as a defining essence of openwheeler racing. It's the time-honoured delineation between single-seaters and touring/sports cars: as the cliché goes, racing cars do not have roofs and doors.

Safety concerns aside, a matter of a few months does seem to be an inordinately short consultation process for a decision that represents such a fundamental change to F1.

But the Halo may become a self-fulfilling prophesy. After having campaigned so vigorously for it, having put it out there for public discussion, the FIA now must be surely →

WORDS STEVE NORMOYLE **PICTURES** LAT ARCHIVE; GETTY IMAGES; SPORTSPICS

be concerned at the insurance and legal implications were there to be a serious cockpit driver impact incident next year without Halos being fitted to the cars.

And legal implications are matters that are very much of concern to the governing body at the moment. Remember that all of this is set against the backdrop of the legal action the family of Jules Bianchi took out recently against the FIA. The litigation followed the release of the FIA Panel Inquiry Report which blamed Bianchi for the 2014 crash at Suzuka that ultimately led to his death.

Lawyers claim the Bianchi family was 'surprised and distressed' that the report into the accident came up with numerous recommendations (such as speed limits under yellow flags via the virtual safety car and rules requiring four hours between the start of a grand prix and sunset, if not a twilight/night race) to improve safety in F1 but 'failed to identify where errors had been made which led to Jules' death'. By implication of the FIA's own report and its recommendations, argue the Bianchi lawyers, F1 was less safe than it could have been – notwithstanding the fact that Bianchi lost control of his car in an area of the circuit where there were double waved yellow flags, which under the rules require drivers to slow down and be prepared to stop.

As for the men whom the Halo is intended to protect, opinion is divided. On social media earlier this year, when the device was first unveiled, Lewis Hamilton described it as no less than the 'worst looking modification in Formula 1 history'. "I appreciate the quest for safety but this is formula 1," he posted on Instagram, "and the way it is now is perfectly fine."

Things have changed since then, however. After watching an FIA submission on the Halo, Hamilton is now a believer (*see breakout).*

Nico Hulkenberg is one who doesn't look like coming around to the FIA's way of thinking, however: "I don't like how it looks and for me it feels like trying to eliminate every little bit of risk."

Overall, though, the idea has reasonable support among current drivers – if with some reservations. Sebastian Vettel, who as a Ferrari driver has probably had as much experience driving with the Halo as anyone else, cautions that it needs more testing and research to consider issues such as visibility.

One big concern yet to be addressed is accessibility in a variety of accident situations. For one, it's hard to see how it wouldn't have hindered Fernando Alonso as he extricated himself from his upside McLaren at Albert Park this year. From what we do know about the design, you wouldn't want to be upside down and on fire with a Halo.

Nor is it likely to prevent an errant small component from entering a cockpit, such as the steel spring which smashed Felipe Massa's helmet in 2009. That level of safety certainty can only be achieved with a full cockpit shroud, in the style of LMP1 sports cars.

Surely that would be a bridge too far. In any case, Toyota LMP1 driver Anthony Davidson reckons a full canopy wouldn't offer full protection: in sportscar racing he's seen them break.

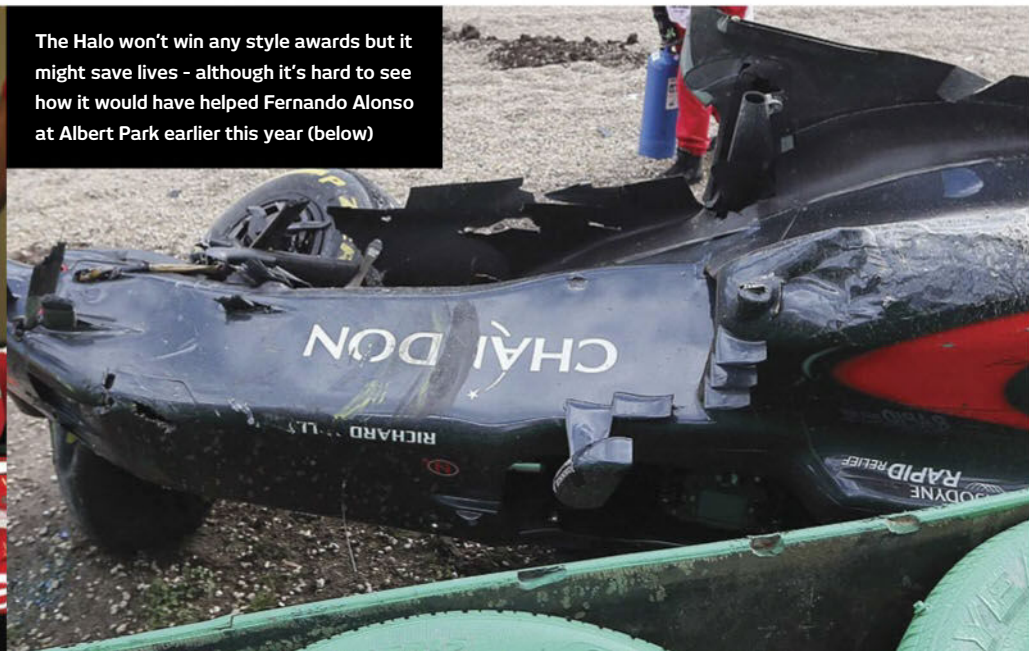
As an ex-F1 driver, Davidson has strong views on the Halo idea. He's a fan: for Davidson, the only point of contention is the extent to which the driver's forward visibility is compromised. The argument about aesthetics, or that it goes against the essential essence of open-style racing cars, just doesn't wash, he told journalist Will Buxton.

"I've really thought long and hard about it, and I think it is the best solution for now... No one person has got an ideal solution to the problem. All I know is that the argument for not having one doesn't hold. 'It doesn't look very good'. 'F1 cars have always been open cockpit'. I'm sorry but that's not enough for me, for things to carry on this way."

When Davidson talks about 'things to carry on this way', he is referring to the recent fatalities involving drivers being struck in the head. Henry Surtees' death in 2010 after being hit by an errant wheel in an F2 race was the catalyst for the Halo concept, but since then in Indycar racing Dan Wheldon and Justin Wilson have each perished in (broadly) similar circumstances.

Whatever anyone thinks about the Halo, what we're discussing here could prove to be a landmark point for safety in the sport. It could be that we have arrived at the logical, inevitable end-point of the long evolution of safety in F1. That's not to say that risk will ever be eliminated, but the cars, the circuits, the driver apparel, the HANS devices, the administrative systems in place such the Safety Car and Virtual Safety Car – in so many areas F1 and motor racing overall is so much safer than it's ever been. Recent history suggests that helmet impacts now represent the





The Halo won't win any style awards but it might save lives - although it's hard to see how it would have helped Fernando Alonso at Albert Park earlier this year (below)

single most dangerous aspect of openwheeler racing – and now it is being addressed.

Over the past half-century there's been enormous progress made in the area of safety. Anyone of the view that motor racing is in danger of sanitising itself should first remind themselves that this sport has a gruesome history.

Consider what used to happen in speedway racing in the 1960s. Speedway at the time was probably more dangerous than anything else in the world of four-wheeled motorsport. Death and serious injury were often week-to-week occurrences. Midget Speedcars did not have proper rollbars (nor did the road racing openwheelers of the day, for that matter), much less rollcages. In NSW, a well-meaning but horrendously misguided act of parliament (the 1957 Speedway Act) allowed speedway racing to be run at showgrounds that used traditional country-style fencing with exposed upright posts with wire cabling running through them. Most of the speedway venues of the era were of this type. Year after year, drivers and riders were routinely skewered on these fencing uprights (this inconceivably sorry state of affairs went on for years and was only rectified after Mike Raymond pressured the government into action through his daily newspaper speedway column).

Yet even then, when it was proposed that the sport mandate full rollcages in an attempt to reduce the carnage, many drivers were vociferous in their disapproval.

The arguments back then have a familiar ring today. Cages would spoil the look of the cars, they said. Midget Speedcars had never been →



Villeneuve: "If they are afraid, they should race touring cars"

During his time in F1, Jacques Villeneuve more than once expressed annoyance over attempts to make motor racing safer by introducing longer runoff areas and other measures.

He famously criticised safety improvements at Spa-Francorchamps, saying that F1 was being sanitised and gradually being stripped of what he saw as an essential part of the sport, the element of danger. It was a stance he maintained consistently throughout his career and beyond, in spite of the fact that his famous father, Gilles, met a violent death at the wheel of an F1 car.

No prizes for guessing what Jacques thinks about the Halo, then.

"If they are afraid, they should go and race touring cars," the 1997 world champion told French newspaper *Le Figaro* earlier this year when quizzed about the Halo concept. "Yes, we must strive for safety, but there are limits we should not exceed. Risk-taking is inherent in F1. It's part of the beauty of the sport...

"I see it that these drivers earn millions and yet they do not want to take any chances. Too bad.

"Do the MotoGP riders ask to ride inside a bubble? This is why they are increasingly respected and admired compared to Formula One drivers."

Remove the element of danger from motor racing, according to the likes of Villeneuve, and you are left with nothing. It's the notion that the challenge of facing up to real danger is fundamental to being a racing driver – to be not merely the fastest and most skilful, but also the *bravest*. It's this aspect that sets motorsport apart from most other sports: the idea that a racing driver is closer in nature to, say, an aircraft fighter pilot than a participant in a sport.

It's a romantic, old-world view of the sport which was given expression by literary giant Ernest Hemmingway in this famous quote: "There are only three sports: bullfighting, motor racing, and mountaineering; all the rest are merely games."

Perhaps the question motor racing needs to ask itself is this: should there be an acceptable level of risk? And if so, what is it? And does it matter whether motor racing today is a sport, according to Hemmingway's definition, or 'merely' a game?





fitted with cages in 50-odd years of speedway, so why start now? Then there was the question of bravery: that to race with a cage was the coward's way.

In the end the pro-cage lobby won. The adoption of cages has proven to be probably the biggest single change in the history of speedway.

It certainly changed the way the cars looked – those who warned cages would spoil the appearance of the cars sadly were proven all-too correct. As the caged era took hold in the 1970s, speedway openwheelers gradually shed their classic svelte roadster lines and morphed into stumpy, box-like structures on wheels.

But the trade-off was a dramatic and immediate fall in the death and injury toll.

As for the 'cowardice' issue, not even the bravest, or most foolhardy of today's drivers would even think of racing a speedway openwheeler without a cage.

One thing that we have learned from history is that, over time, attitudes can shift dramatically. Over the last four or five decades, the level of what's considered acceptable risk in sport – in the eyes of both the public and the participants – has reduced substantially. Any mainstream sport today which incurred the kind of death and injury which motor racing did in the 1960s would be the subject of widespread public outcry – and would be shut down for good.

So, how will the next few decades look? In 10 years' time, when we look back on the era of the Halo in F1, will we shake our heads and wonder how we ever allowed openwheelers to race with drivers dangerously exposed in open cockpits? Or will we rue the day they fitted overhead cockpit safety bars to F1 cars, and yearn for the bygone era of the classic, uncluttered lines of traditional open cockpit racing cars?

Or might we reach the same conclusion that so many fans, commentators and past drivers did when they watched this year's British Grand Prix start behind the Safety Car (and then continued to watch in mounting frustration and incredulity as the cars trundled around behind the Safety Car for so long that the track began to dry and half the field were in the pits for intermediates before the authorities were bold enough to allow the drivers to actually race their cars), that motor racing has lost the plot?

Safety first



On Friday at the Hungaroring on the weekend of the Hungarian GP, one week out from when the top teams were set to vote on the Halo, F1 drivers were given a presentation from the FIA on the Halo concept.

The presentation, given by race director Charlie Whiting, safety director Laurent Mekies and safety consultant Andy Mellor, examined past accidents in F1, GP2 and GP3 and put the case as to how the Halo might have behaved in each situation.

After viewing what were reportedly 'shocking' images, some F1 drivers previously opposed to the Halo concept have changed their views.

For Lewis Hamilton, whose initial responses to the Halo included 'Please no!' and 'if it does come in then I hope that we will be given the option of not using it because I will not be using it on my car', the Hungary presentation has been something akin to a Road to Damascus experience.

"I take safety very seriously and I think the interesting thing," he said, "while it doesn't look great and doesn't look in the racing spirit, you can't ignore the fact that the chances are 17 percent better of saving a driver's life in the incidents that have happened in the past.

"However, we still have to continue to improve and at some stage we would have to close the canopy completely because that would be 100 percent. There were still some examples, like Felipe [Massa]'s accident here in Hungary in 2009, where it wouldn't have stopped him from being injured. I think with Justin [Wilson's Indycar accident], I believe they said it wouldn't have saved him because it was a pointy object from above, but a closed canopy would have perhaps.

"You can't completely ignore it. If there is any way to make it look a little bit better then fine, but if not then it's a safety thing which we have to accept."

Whatever the relevance of the aesthetics argument, this is one area where the Halo seems utterly friendless (outside of perhaps its creator and the FIA).

Aesthetically no one likes it," Carlos Sainz said, "so we need to balance how much is worth it to save a life per five or 10 years against how bad the repercussion against Formula 1 is."

Sainz's Toro Rosso team-mate Daniil Kvyat remained unconvinced after the safety presentation.

"The arguments they gave us regarding safety were strong. They gave us cases of when the wheel comes off, when you do this or do that. Obviously if you really want we can make F1 completely sterile and completely safe – but the question mark is where we need to stop.

"I don't know if it is already a step too far or we have just reached the borderline with the Halo. I might be playing with the devil and I have said many times that when I come to the race track, I know that it might be my last day in the office.

"...I am not trying to be a hero or anything but in the end we are also racing for other people and in the end F1 is a show. But that is why it is so popular."






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Artiste line-up subject to change.



What makes a great corner GREAT?

Eau Rouge, Becketts, 130R... F1's ballsiest turns have written themselves into the sport's lore. Yet changes to the cars' tech specs and to the circuits have altered the nature of the challenge. What, then, are F1's greatest corners in 2016? And what were they when *F1 Racing* launched in 1996, 20 years ago?

WORDS PETER WINDSOR **PICTURES** LORENZO BELLANCA & LAT ARCHIVE

TURN-IN APEX EXIT

What makes a corner great? Firstly, it should be quick. Let's make that *fast*, as in: 'anything over 220km/h'. There are nice, scenic, accident-inducing slower corners in F1. Quick corners, though, reward the elite. You can line-lock a fast corner when grip exceeds the demands of the radius; it's when the entry is blind at 250km/h, or the question is 'to lift or not to lift?' that a great corner earns its status.

Second, it should reward or penalise errors. A great corner should have a long, or longish, straight afterwards, or be followed by a change of direction that demands precise management. There's no point in a fast corner that neutralises errors with an uncomplicated →



heavy braking area 50m down the road. And thirdly, it should transcend the everyday perception of 'a corner'. It should offer, indeed, the ultimate racing driver's challenge: 'If I take this corner flat in seventh, on these tyres, with this fuel load, I may have the big one. Equally, I may end up on pole...'

With these prescriptions in mind, we offer up the corners that present the greatest challenge to the contemporary F1 driver and compare them with those that demanded the utmost respect 20 years ago.



The final corner

PHOTO: SUTTON IMAGES

Turns 2 and 3



BARCELONA

1996: Final corner
2016: Turns 2 & 3

The old last corner at Barcelona was a classic, particularly as it was attacked for the most part by very fast racing cars. Think 3.0-litre, high-revving V10 engines, slick tyres and cars that were always nervous, and you had a truly great corner. Entry speed was in the 220km/h region, plus the approach was downhill, and it was only a second or so from the timing line. The temptation was always to get it in there and worry about the exit later, and, in race conditions, as you thought about towing the car ahead of you down the pit straight, there was always the business of turbulence. The front would go light but you didn't dare back away... as Mika Häkkinen and Michael Schumacher so often demonstrated. It was a great wet-weather corner, with the grip on the outside, but it was line-locked in the dry – in the sense that there was only one tiny hole through which to thread the needle. There were some major accidents there, which is why they killed it with today's preceding piff-paff.

But Barcelona still lives in a more subtle way, particularly in the era of finicky Pirellis and hybrid power curves. Turn 3 is uphill and accelerative. It isn't a patch on the old last corner, but the *preparation* required for T3 makes this a stand-out section: the change of direction out of T1/T2 is exacting and separates the best from the rest. For the demands are twofold: make the entry to T3 as short as possible while accelerating the car as straight as possible out of T2. These dynamics require clever footwork and delicate steering inputs. Get these wrong, and ask too much of the car in T3, and a shunt can result. It isn't graphic in the way of the old last corner, but there is a spectator bank on the inside of T2 from which to watch the dance numbers. You'll see big differences between the drivers – which is what technical 2016 F1 is all about. A trace of the essence is still there. We can't touch the core of it, but we *can* see the result of it if we look closely.

MONACO

1996: Swimming Pool
2016: Massenet/Casino Square

The entry to the Swimming Pool section at Monte Carlo was, in 1996, as raw as it was outrageous. The radius was slightly less than it is today – and there were no kerbs to nurse you away from the apex wall. As you turned-in, in fourth gear, speed in the 200km/h region, you had three possibilities: hit the apex (wall) with the left-front wheel; miss it by a few inches (and lose time); or shave it to perfection (Michael). There was no compromise: you either got it right or you didn't. Today, with a wide, shark's fin kerb at the apex, it's partly a question of getting the kerb right and partly a question of living with the pitch that follows the kerb-strike. This requires great skill, but it's more of an everyday-F1-driver thing than something out there in the indefinable zone of what makes a *racing* driver



tick. Put another way, plenty of F1 drivers can do it: when there was no kerb, only a few were sufficiently precise and skilful. The other great thing was that there was always room in which to move: watch the slow-mos of Michael and you can see the tiny nudge he gives the wheel, mid-corner (by which I mean mid-entry) to tame the rear of the Ferrari. This always set up a flow of load the other way – but, if you were Michael, you harmonised this into the exit. At 200km/h. Within a millisecond. Between the walls.

Today, the entry to the Casino Square section of Monaco is the new Swimming Pool. The hump at the top of the hill is perfectly in sync with today's F1 cars – new track surface and all. Whether to stay flat over the brow in seventh gear and then brake, and whether to approach left-of-centre or centre-road: these were the defining questions of Monaco 2016. Casino (Massenet) was where Lewis Hamilton was all over Nico Rosberg. It is where there are guardrails both sides and where approach speeds towards the blind entry are in the 270km/h region. If the road was flat, Massenet would be just another third-gear corner. It isn't. They accelerate uphill from Ste Dévote and the speed is colossal as the track narrows. The entry to Casino fulfils our third criteria of what makes a corner great.

TURN-IN APEX EXIT

"Today, the entry to the Casino Square section of Monaco is the new Swimming Pool. The hump at the top of the hill is perfectly in sync with today's F1 cars – new track surface and all"



Swimming Pool | Massenet/Casino Square



SILVERSTONE

1996: Bridge
2016: Becketts

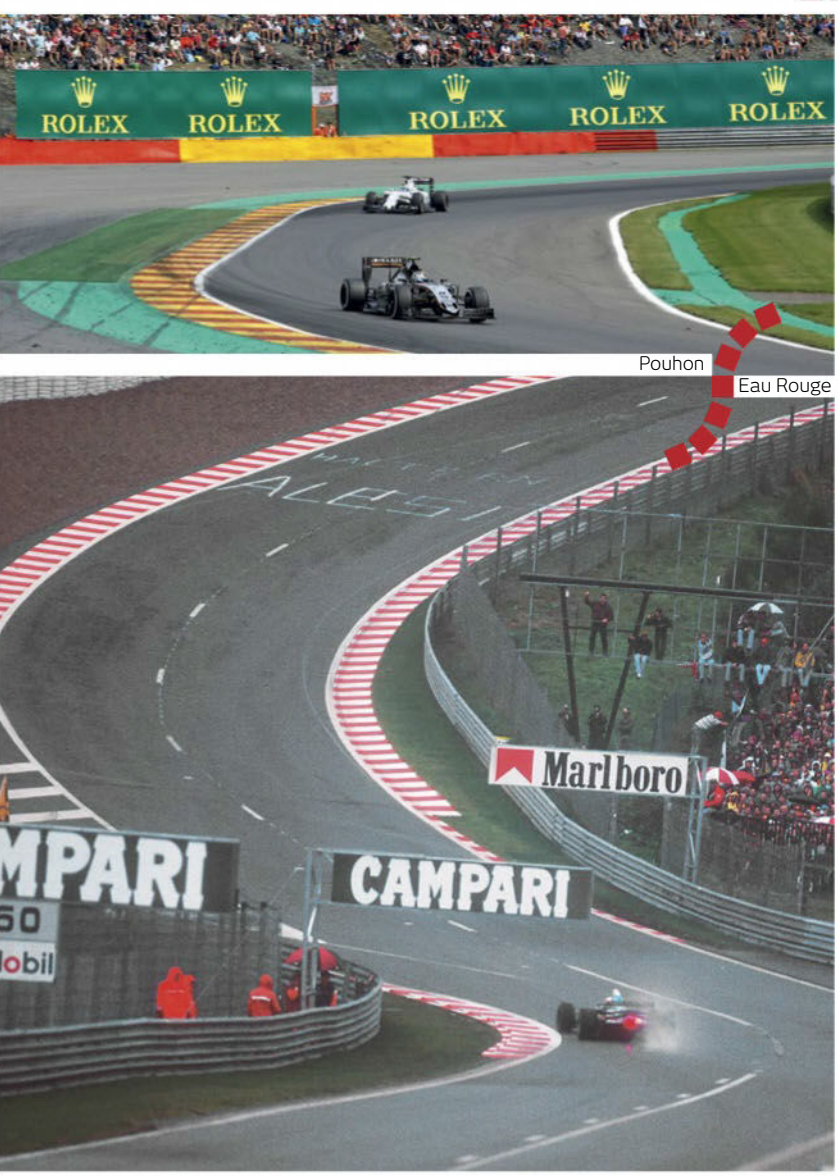
We lost Woodcote and then the heart-stoppingly quick Club Corner, but we gained Bridge. It raised the question 'why?' since Bridge was only slightly less dangerous, in the context of its run-off area, than the corners that had been chicaned. No matter. We embraced it while it lasted, because it was very fast, very downhill and because it demanded so much of both the car and driver on exit. You'd leave the twisty Club complex of the 1996 Silverstone circuit at about 150km/h. Then it was belt-tightening time. Hold your breath. Get set. The cars pounded through the gears up to around 280km/h, and, with just a fraction of a lift if you were Mika Häkkinen or Michael Schumacher or Jean Alesi or Gerhard Berger, you entered Bridge at around 290km/h. The initial steering input was everything. If it was too abrupt, then the car developed too much load too

quickly. You'd usually make it to the exit with deft car control, but there'd be no way of cleanly stopping the car, and placing it for the tight left-hander (Priory) that followed. If you were stable on your entry, and you got the weight transfer exactly right, you'd give the car extra lock mid-corner – at about 160mph now – and position it for a middle-of-the-road exit. But if you delayed that change of direction until the kerb apex – as I believe Jarno Trulli did here in 2004 – then you'd leave a debris field in the sand trap. For me, there was no better corner in the world than Bridge for watching Michael Schumacher multi-tasking. It was as if Bridge had been created specifically with him in mind.

Silverstone 2016 is more difficult to detail. A wider-radius Copse is less of a corner than it used to be – and you can now run wide there with no real consequence. Of the great corners, only the Becketts complex remains. It's still demanding on entry, and the slightly slower middle section requires finesse-y weight management. Entry speeds for the first right-hander are around 270km/h, slowing to 240km/h mid-esses, but the job has become easier with the ability of today's cars to take mid-corner downshifts. Conversely, the current breed of Pirelli is at its least fulfilling in areas of high-speed change of direction. Dancing them on the absolute limit of what is physically possible, while wearing boxing gloves, is more about digital repetition and precision than it is natural feel.

PHOTO: FORCE INDIA





SPA-FRANCORCHAMPS

1996: Eau Rouge
2016: Pouhon

It's interesting that in the old days of Spa they never spoke of Eau Rouge as one of the classic corners. Burnenville, yes. Malmedy, yes. The Masta Kink, yes. Stavelot, too – and Blanchimont. Eau Rouge? Just a fast ess-bend. It grew in stature when so many of the other corners were eliminated not only from Spa but from the calendar in general. Paddock Bend at Brands Hatch was up there with it – but then F1 left Brands. Against the odds, Eau Rouge emerged kind of unscathed and stood in 1996 as a test not only of high-speed car placement but also of engine-oil systems. Again, it's important to think back to those screaming V10s and how quick they were down into the dip at a time when Eau Rouge was bumpier and less open at the top of the rise. Having said that, I think Eau Rouge is in many ways the flip-side of Massenet in Monaco. It's the elevation that makes Massenet; and it's the elevation that defines Eau Rouge, by which I mean that the fall and rise of the land tells you where to put the car. Today, Eau Rouge is the downforce baseline of Spa: you run enough wing to take the whole thing flat. Of course, it doesn't always work out that way, particularly if you're Daniel Ricciardo in a Red Bull and you're running the smallest possible rear wing. Then you see car control – good, old high-speed opposite lock – at its very best. For most great drivers, though, Eau Rouge is fun but not truly demanding: 2016 car technology has won the battle.

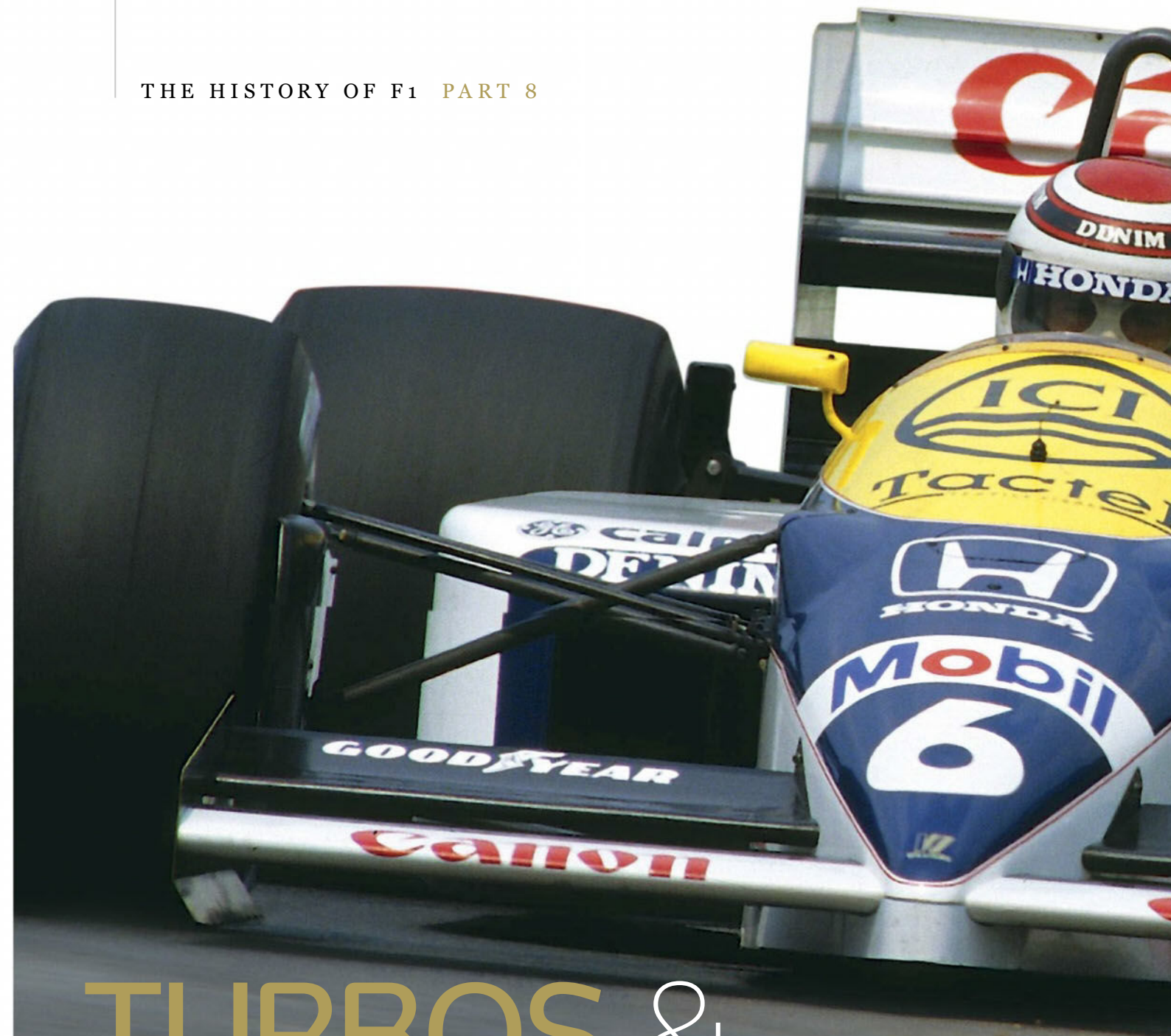
Today it's the long, double-apex left-hander called Pouhon that is Spa's true test of high-speed finesse. The concrete expanse to its right is a safety net more fault-tolerant than catch-fencing or gravel ever was, and it's hard to appreciate the speed from the side of the track because you stand so far from the action. Nonetheless, Pouhon goes beyond the perfunctory boundaries of wing-settings or engine modes or tyre management: if you initiate all the steering inputs perfectly, and create a straight exit before the corner is officially over, you will be quick – as Daniel proved in 2014. The key to Pouhon is, as Carlos Reutemann once said, "to be thinking of the exit before you turn in". A long straight follows Pouhon, penalising a lack of mid-corner manipulation, finesse and/or exit oversteer.



SUZUKA

Special mention should be made of Suzuka. The Japanese circuit stands alone not only as the site of several great corners but also as a track that has changed little since the early 1960s. It has a classic first corner that seems to have been perfectly designed for TV, even though F1's TV coverage was unknown in 1963. It's a brilliant, uphill series of ess-bends from which a clean exit can be executed only if you enter the complex correctly. Then there's an off-camber, understeery double right-hander with little run-off (the Degners); an innocuous-looking but tough kink famous for catching out Eddie Irvine and Daniil Kvyat (the Hairpin); a fast right-hander with little grip on the outside; a long left-hander (Spoon) followed by a critically long straight; 130R, which is not as demanding as it used to be due to a radius change; and the only chicane in the world for which it is easy to brake too early rather than too late. Suzuka has it all and is as great now as it always has been.





TURBOS & TANTRUMS

Having settled their conflict with the governing body in 1981, Formula 1's teams turned on each other once again – and soon even the drivers were getting in on the act...

WORDS STUART CODLING **PICTURES** LAT ARCHIVE


GOODYEAR





"When this is over, I shall seriously reconsider whether or not grand prix racing is still what it purports to be: the pinnacle of sport and technological achievement. Unfortunately this appears to be no longer the case and if it is not cleaned up, Formula 1 will end up in a quagmire of plagiarism, chicanery and petty rule interpretation, manipulated by people for whom the word 'sport' has no meaning." **Colin Chapman, April 1981**

Formula 1's chief stakeholders stepped back from the brink of mutual annihilation when they signed the Concorde Agreement at the beginning of March 1981, but anyone who thought harmony would ensue was rapidly disabused of that notion. Under the settlement, FOCA (the Bernie Ecclestone-led association of teams) had accepted the governing body's ban on sliding skirts, an important enabler of 'ground effect' aerodynamics. When some of those teams found clever ways of circumventing the ban, the illusion of unity was shattered immediately.

By 1981 the sport had reached a technical tipping point; even turbo-averse Enzo Ferrari had recognised that blown engines were the future now that Renault, the turbo pioneers, had solved most of their initial reliability troubles. Those constructors using the naturally aspirated





The innovative twin-chassis Lotus (left), designed by Colin Chapman (below left) and driven by Nigel Mansell and Elio de Angelis, proved effective but controversial and was banned before qualifying at the 1981 Brazilian Grand Prix

V8 Cosworth DFV (strongly FOCA-aligned, including Brabham, Lotus, Williams and Tyrrell) now faced a performance deficit they *had* to claw back with clever aerodynamics – an avenue that had just been shut down. Or had it?

As the season finally got officially under way with the United States West Grand Prix at Long Beach, just days after the signing of the Concorde Agreement, Lotus unveiled their clever twin-chassis Lotus 88: in simple terms, one car (containing driver, transmission and suspension) inside another (a shell for the bodywork, with fixed side skirts), connected via a secondary suspension system that enabled the outer shell to move downwards, independently of the inner chassis, and create a ground-effect system when the car was at speed. Ten of the 16 teams present filed protests against this Russian doll vehicle, and drivers Elio de Angelis and Nigel Mansell were black-flagged during practice. Lotus were forced to race older cars instead, and their founder, Colin Chapman, ejected his toys from the pram in spectacular fashion.

Chapman was no outsider. While holidaying with Bernie Ecclestone in Kitzbühel, it was he, along with FOCA legal advisor Max Mosley, who had come up with the idea of holding the 'pirate' South African Grand Prix that January as a show of strength against the governing body, even though FOCA could barely afford to run it (see 'History of F1: part 7', *F1 Racing*, July 2016). Chapman had likened it to the folk tale of how the garrison of Salzburg's fortress had broken a siege by painting their solitary cow a different colour every day and parading it along the battlements, creating the impression that they had plenty of food left. Ecclestone's initial response had been to retort, "You're both pissed," but the stratagem ultimately worked.

To compound Chapman's ire, Ecclestone's Brabham cars featured a much simpler mechanical dodge. Chief designer Gordon Murray had, like Chapman, recognised that the gap between the cars' bodywork and the ground could be measured only when it was static. He therefore adapted the ground-effect BT49 chassis with fixed skirts and pneumatic struts that held the bodywork at the minimum 60mm above the ground when it was at a standstill. Once the car was moving at speed, the force of air over it pushed it down to its optimal working height.

When Nelson Piquet put his BT49C on pole at his home grand prix in Jacarepaguá two weeks after Long Beach, the rumour mill cranked into gear but no one protested. An ill-advised gamble to start on slicks in damp conditions consigned Piquet to 12th, while his team-mate, pay driver Hector Rebaque, scarcely featured. Other events captured attention instead: Chapman's 88s were barred from competing, and Carlos Reutemann guided his Williams FW07C to victory in spite of clear team orders to move over for his team-mate, the defending world champion Alan Jones.

Number-two status was enshrined in Reutemann's contract – and he was reminded of this in large-point text on his pitboard three laps from the end – but, as he told *Autosport's* Nigel Roebuck later: "I always started every race with the intention of winning, but now I was being asked to give it away. 'If I do that,' I thought to myself, 'I stop the car here and now, and leave immediately for my farm in Argentina. Finish. Not a racing driver any more…'" Williams withheld Reutemann's fee, but this was not punishment enough in the mind of Jones, and the feud continued throughout the year. When Reutemann later suggested that they should bury the hatchet, as it were, Jones replied: "Yeah, right in your fucking back, mate."

The FW07C had been the class of the field in 1980 but its warring drivers would be edged out by Piquet and his BT49C in '81. Jones decided to retire; Reutemann quit abruptly two races into the following season. And since the BT49C complied with all technical checks – it couldn't be measured while out on track – the protests →

against it came to naught and rival teams had to conjure their own equivalent mechanisms. Thus most of the cars racing in 1981 did so while being technically illegal, and, since they had to be stiffly sprung to prevent damage to the fixed skirts, they were difficult and dangerous to drive.

Chapman, meanwhile, having expended so much effort on the Lotus 88, couldn't let it go. The fight to establish its legality sapped his enthusiasm for the sport – prompting the statement with which we opened this chapter – and caused him further stress. Mike Lawrence's 2012 biography of Chapman, disowned by those within Chapman's circle, alleged that the Lotus founder abused barbiturates and amphetamines to work around the clock. He had a fatal heart attack in December 1982, although some cling to a belief that he faked his own death and fled to South America to avoid a jail sentence when his part in the DeLorean fraud was exposed. He had not long passed a medical examination declaring him fit to hold a pilot's licence.

Another game-changing innovation had crept on to the grid in those early races of 1981, but the troubled circumstances of its birth and the tumult of other noise at the time meant its significance went unrecognised until later. Former Cooper and Brabham mechanic Ron Dennis had made a number of unsuccessful attempts to enter F1 during the 1970s, but by the end of that decade his Project Four organisation was riding high in Formula 2. Stepping in when Lamborghini were unable to fulfil a contract to build BMW M1s for the Procar series added to his reputation – and his company's coffers.

When his F2 sponsors, Marlboro, became disenchanted with the poor performance of their F1 team, McLaren, Dennis got another chance. He would rather have started his own team, since he saw McLaren as a loser brand, but Marlboro insisted on a merger and he duly became joint MD of McLaren, recruiting the similarly punctilious John Barnard as chief designer.

The result was the first full carbon-fibre chassis in F1. Lotus had used carbon-fibre panels to lighten the inner chassis of the unraced 88, but Barnard doubled down. This technology was so untested that McLaren had to outsource manufacture of the 'tub' to Hercules, a US aerospace company. The MP4 was barely ready for Long Beach, but McLaren ran it in practice in deference to Hercules before reverting to the older M29s for both Andrea de Cesaris and John Watson. Difficulties adapting to the new Michelin tyres and achieving aerodynamic stability prevented the car from showing its potential fully in the first half of the season, but then Watson nailed McLaren's first win in four years – and did so brilliantly and memorably, on home soil at Silverstone. De Cesaris, for his part, disproved the fears about the resilience of carbon fibre by crashing regularly.

Having raised the technical bar, Dennis and Barnard knew that their weak point was the Cosworth engine. They needed more horsepower – and a more reliable driver wouldn't go amiss, either. The ambitious, energetic Dennis set about securing the necessary finance to fund development of a bespoke V6 turbo engine, and scored a notable coup on the driver front by tempting Niki Lauda out of retirement.

The absurdity in 1981 of the cars only being legal in the pits moved the governing body to backtrack on the unenforceable ride-height rule for '82, but this did not relieve the rancour. All that held the alliance of FOCA teams together now was their dependence on Ecclestone's commercial deal-making skills. But many mistrusted him, believing his increasing closeness with FISA, the sporting committee of the governing body, gave him prior notice of forthcoming rule changes. It is rather more the case that Ecclestone was managing FISA's toweringly arrogant president, Jean-Marie Balestre, as FOCA's growing disunity weakened the teams' collective bargaining position.

That situation came to a head at the San Marino Grand Prix in 1982. For some time the 'edgier' Cosworth-equipped teams had been using ballast in an effort to circumvent the minimum-weight regulations, fitting tanks to their cars supposedly to house water to cool their brakes. Since a loophole in the rules permitted

Ron Dennis at Caesars Palace in 1981, with F1's first full carbon-fibre chassis, the McLaren MP4



"Ron Dennis would rather have started his own team, since he saw McLaren as a loser brand, but Marlboro insisted on a merger and he duly became joint MD of McLaren, recruiting the similarly punctilious John Barnard as chief designer"



Didier Pironi leads Gilles Villeneuve at the 1982 San Marino GP, on his way to a disputed win

these tanks to be topped up after the race, the water was never used for its intended purpose – it was jettisoned on the warm-up lap so the cars could run underweight throughout the race.

Renault's Alain Prost won the season-opener, in South Africa – itself a scene of controversy after the drivers briefly went on strike over new superlicence regulations – but then Piquet won the next. Worries about their new BMW turbo engine's reliability had prompted Brabham to revert to Cosworth power for Brazil, in a BT49D fitted with water tanks. Ferrari and Renault protested the legality of both his car and second-placed Keke Rosberg's Williams. In April, an FIA tribunal upheld the protest, enshrining Prost as the winner, and closed the water-tank loophole. FOCA threatened to boycott the next round, claiming that the rule change had been implemented without proper notice.

The San Marino Grand Prix duly went ahead without any of the FOCA members – apart from Tyrrell, who broke ranks on account of recently having signed up an Italian sponsor, along with Toleman, ATS and Osella. René Arnoux and Alain Prost headed the 14-car field for Renault in qualifying but their engines let go in the race, paving the way for a Ferrari one-two. With time in hand over the third-placed Tyrrell of Michele Alboreto, Ferrari ordered their drivers, Gilles Villeneuve and Didier Pironi, to slow down and preserve their cars to the finish. Villeneuve obeyed, only for Pironi to slice past. They fought over the remaining laps, Villeneuve unsure whether his team-mate was simply entertaining the crowd or playing for keeps. On the last lap he learned which, as Pironi dived through at the Tosa hairpin and 'parked the bus' over the remaining corners to take the chequered flag.

Villeneuve was incandescent, believing Pironi had reneged on a mutual understanding. Pironi claimed he was unaware of team orders. They never spoke again; two weeks later, Villeneuve was killed in qualifying for the Belgian Grand Prix at Zolder.

Events at Imola demonstrated to Ecclestone and Mosley that FOCA was beginning to outlive its usefulness. "It became clear to me that politically, FOCA was a busted flush," Mosley wrote in his autobiography, "an instrument that might break in your hand at the key moment." Mosley briefly took his leave of motor racing in a doomed attempt to enter mainstream politics, while Ecclestone slowly began to distance himself from his role as a team owner.

Balestre would become a useful if somewhat unwitting ally of Ecclestone – Mosley described the relationship as a *modus vivendi* – largely on account of Balestre's burgeoning enmity with Enzo Ferrari, who had obtained a recording of a telephone call in which the FISA president claimed to have the FIA Court of Appeal "in his pocket". Ferrari had also circulated pictures of Balestre in SS uniform ahead of a crucial →



A furious Gilles Villeneuve, believing himself cheated out of the win, watches team-mate Pironi spray the champagne on the San Marino podium

HISTORY TIMELINE

1981

Gilles Villeneuve takes his first of only two poles, in the turbo Ferrari at Imola. Brabham's Nelson Piquet wins the title at the final round, but is so exhausted he has to be lifted from his car.

1982

The number of entrants permitted is raised from 30 to 34 and the number of starters from 24 to 26. Pre-qualifying filters out the slowest. Keke Rosberg is champion, having won just one race.

1983

Michele Alboreto's victory in Detroit for Tyrrell is the last win for a car with a naturally aspirated engine until 1989. Piquet wins the drivers' title and Lotus trial active suspension.

1984

New rules ban refuelling and limit tank capacity to 220 litres. Alain Prost joins McLaren and Ayrton Senna graduates to F1 with Toleman. Tyrrell are stripped of their points at the end of the season due to a technical infringement.

1985

FISA clamp down on additional 'winglets'. Senna moves to Lotus and wins his first GP, at Estoril. Dutch and Australian GPs make their debuts. The Belgian GP is postponed until later in the season after its newly laid surface breaks up.

1986

Naturally aspirated engines are banned and fuel cells reduced to 195 litres. Lotus driver Elio de Angelis is killed in a testing accident . Turbocharged engines are now estimated to be producing well over 1,000bhp in qualifying spec. John Barnard leaves McLaren in August.

1987

Nigel Mansell wins six races to Williams team-mate Nelson Piquet's three, but misses the last two rounds due to injury. Naturally aspirated engines return and turbo boost is cut to 4bar.

1988

The FIA announces turbo engines will be banned for 1989, and introduces lower boost limits and tank capacity (2.5bar and 150 litres) for 1988. Honda makes a new engine for McLaren and they win 15 of the 16 races.



The three main players in 1986 were (left to right) Piquet, Prost and Mansell. The other major battle that year was between Williams' powerful Honda engine (bottom) and McLaren's efficient TAG-Porsche engine (top)



meeting. This could help to explain how the manufacturers got their way in the form of a total ban on ground-effect aerodynamics for 1983.

Realpolitik dictated that Ecclestone bow to this, and the result was that Gordon Murray had to tear up his designs for the '83 Brabham and pull a series of all-nighters designing a car to suit the new flat-bottom regulations. The beautifully elegant arrow-shaped BT52 carried Piquet to the championship, and no driver using a normally aspirated engine would win again until turbos were banned for 1989.

Brabham would never take another world title. Ecclestone eventually sold the team and went full-time on the commercial side, consolidating the race-promotion contracts within a new company, which mutated over the years into the Formula One Group. The mid-1980s were all about Williams and McLaren, Honda and TAG-Porsche, Prost and Lauda, Piquet and Nigel Mansell, and then Prost and Ayrton Senna.

Ron Dennis recruited Prost to join Lauda for 1984, armed with Barnard's new MP4/2 and a V6 turbo custom-developed by Porsche with investment from TAG. Honda also entered the fray, supplying Williams, but while their V6 shared an identical 80-degree vee angle with the TAG-Porsche, that was as far as the similarities went. While the Honda lump eventually became more powerful after its initial reliability gremlins were resolved, its sprawling ancillaries stood in stark contrast to the neatly packaged TAG-Porsche. Barnard had been utterly unbending about the space it could occupy.

Outright power wasn't the TAG-Porsche's strongest suit, but its sophisticated Bosch fuel injection – troublesome at first – yielded fine economy, a race-winning advantage as FISA banned refuelling and imposed ever-shrinking caps on fuel-tank sizes. There was harmony, too, in the garage as Lauda recognised Prost's superior pace and relied on his guile to win the '84 title by half a point from his team-mate. Piquet's Brabham BT53-BMW was usually quicker but his engine blew up too often.

In 1985 Prost's superior speed and results over Lauda moved the Austrian to retire for a second time, and Ferrari's Michele Alboreto proved to be Prost's closest championship challenger. But this, along with Pironi's near miss in '82, would be the nearest Ferrari got to a drivers' title this decade; Keke Rosberg's searing pole position at Silverstone in a Williams-Honda, and three wins for the team in the final races, gave a preview of what the following two seasons would be like.

"Outright power wasn't the TAG-Porsche's strongest suit, but its sophisticated Bosch fuel injection yielded fine economy, a race-winning advantage as FISA banned refuelling and imposed ever-shrinking caps on fuel-tank sizes"

By 1986 Honda power was regularly trumping TAG-Porsche efficiency as a determinant of race outcomes. Prost, now partnered by Rosberg, won four races. The Williams combination of Mansell and Piquet won five and four apiece, but their working relationship unravelled during the season. They despised one another. Mansell believed he was faster, but Piquet was better paid (he was on a £3million a year retainer) and publicly disparaged his team-mate in an interview with *Playboy* as "an uneducated blockhead with a stupid and ugly wife".

With their founder only just starting to adjust to life after the accident that left him quadriplegic, Williams were ill-equipped to deal with dissent. Prost poached the 1986 title at the final round when Mansell's right-rear tyre exploded and Williams brought Piquet in for a precautionary stop. The two Williams drivers continued to take points off one another in '87, but by then the TAG-Porsche was well off the pace and Mansell's accident at Suzuka ruled him out of the final two rounds, leaving the way open for Piquet to bag his final drivers' title.

Honda shifted allegiance to McLaren for the following season, but if Prost thought this would easily usher another championship into his portfolio, he was wrong. The burning competitiveness of Senna, his new team-mate, would spark a rivalry that defined F1 for years to come – and by getting involved, Jean-Marie Balestre was about to blunder into a political trap that would end his reign at the FIA.



NEXT MONTH
DEATH AT IMOLA

RACE DEBRIEF by Anthony Rowlinson

Austrian Grand Prix

03.07.2016 / Red Bull Ring, Spielberg



Oops!... We did it again

What will stop Lewis and Nico driving into each other? Team orders, that's what, says Toto Wolff

Somewhat like Austria itself, the Red Bull Ring is small, intense, resonates to the echo of past grandeur and has an agreeable habit of producing things of exceptional quality. So it was with the 2016 Austrian GP – a gripper with a dramatic climax and a tantalising coda.

The win (his 46th) went to Lewis Hamilton, but only after a last-lap bump-'n'-grind between him and (you guessed it) Nico Rosberg that gave Lewis the lead and relegated Nico to fourth.

Their T2 collision was the latest in a series of 'greatest hits' that includes Belgium 2014, Austin 2015 and Spain 2016. And while Hamilton emerged with bodywork damage insufficient to prevent him scarpering through Turn 3 to the flag, Rosberg lost his front wing, then two places, to Max Verstappen and Kimi Räikkönen, as he nursed his crippled machine over the finish line.

Opinions differed as to whether this was a cruel outcome for Rosberg, who had battled his way to the lead from sixth on the grid, or whether the ever-aggressive, opportunistic Hamilton fully merited the win, having started from pole, overcome a Safety Car interruption and then prevailed in wheel-to-wheel combat when a late passing opportunity arose.

Their clash began with the demise of Rosberg's brake-by-wire system on the penultimate lap. This left him defending against a charging Hamilton and a mistake was inevitable. It happened into Turn 1 on the final lap: Rosberg missed his braking point, compromising his traction on exit and giving Hamilton chance to drag alongside on the steep uphill run to Turn 2.

Rosberg then appeared to brake late into T2 and ran deep into the right-hander, with no chance of making the apex. Trouble was, Hamilton had already edged up on Rosberg's left (the outside line into the right-hander) and was in no mood to help him ease his way around a wide line and emerge still in front. Contact!

Hamilton lost aero bodywork extremities and Rosberg his front wing as both drivers gunned it downhill toward T3. Hamilton was through and away now; Rosberg lucky still to be circulating. Both were very fortunate to be racing on, for even minor contact can mean broken suspension, punctures, or shattered aero parts.

Team boss Toto Wolff was caught on camera fist-pumping in fury as his pair tangled. Post-race, his tone was far more ominous than when confronted with a similar situation in Barcelona this year. "I need to cool down in a bucket of ice," he said, "and then we will make a decision" – that 'decision' being whether or not it was now inevitable that Mercedes impose team orders on their drivers if they're again running one-two. An outcome was expected before Silverstone.

"I don't want to attribute blame this time," Wolff added. "Every time we look at it there's more information. But the bottom line is that there cannot be contact between our two drivers. Any team will take the same position."

Had this race been a re-run of Spain this year, where both Merc drivers ended up in the kitty-litter, the beneficiary would once again have been Max Verstappen, who stormed to second on a bold one-stop strategy (56 laps on a set of softs) that kept him ahead of Räikkönen's notionally faster Ferrari (is any of this sounding familiar?)

Fortune prevailed for Hamilton, although his delight had cooled to contrition when he spoke to the media: "I went very wide and left him plenty of room," he said. "He collided with me, and I didn't see it as controversial, although it was very close between us there. I'm happy that I didn't give up and pushed all the way."

Rosberg was investigated by race stewards for causing an avoidable accident and had ten seconds added to his race time and two penalty points. He was also reprimanded for continuing to race with a damaged car.

While the loss of a victory left Nico only 11 points ahead of Lewis in the title chase, greater woe befell Sebastian Vettel, whose right-rear Pirelli super-soft exploded on the start-finish

straight on lap 27, in a reprise of Nigel Mansell's Adelaide '86 blow-out. He contained the initial burst, but then looped uncontrollably into the pitwall and across the track. Twenty-seven race laps on tyres that had also endured qualifying was asking too much of the fragile rubber and Vettel could only rue an opportunity lost. Team boss Maurizio Arrivabene noted: "Seb, without his tyre failure, was going to finish very high on the podium. I don't know where, but very high."

Another victory shot lost and nine races into a 21-race season Ferrari have yet to win; they left Austria trailing Mercedes by more than 100 points. Räikkönen was the Scuderia's sole podium representative: "I'm disappointed, but it's better than nothing," he noted, underwhelmed.

Elsewhere, there was greater joy for lesser reward. Jenson Button finished sixth, having run respectably in P2 in the race's early stages. This was the most competitive outing yet for McLaren-Honda, much to Button's delight: "Sixth has made me very happy, but more importantly fighting up front was good as well."

More commendable was the competitiveness of Manor's Pascal Wehrlein. A point for tenth after P12 in qualifying was a terrific return for a team whose full annual budget would scarcely cover Lewis Hamilton's jet-fuel bills...

BRAKING IT DOWN

A look at the braking demands at Austria, courtesy of Brembo

4.4g
Average deceleration

144 kWh
Energy dissipated

Turn 2 Statistics

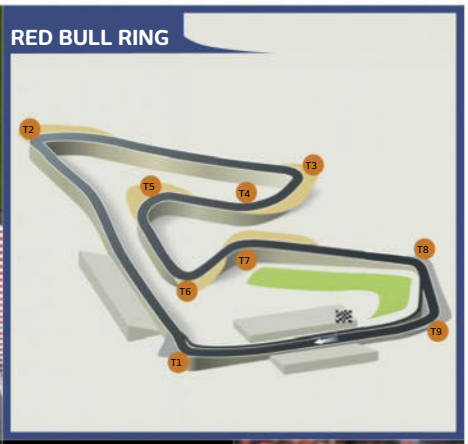
Initial speed	316km/h
Final speed	67km/h
Stopping distance	146m
Braking time	1.72 sec
Maximum deceleration	5.0g
Maximum pedal load	154kg
Braking power	2116kW

> The former A-1 Ring presents a mid-level difficulty for the brakes compared to other tracks. The hardest braking area is at the Remus Curve (Turn 2) where drivers take the turn at 316km/h before slowing abruptly to under 70km/h – in a braking area of just 146m. From the starting line to the chequer, each driver applies a total load of 67 tonnes on the pedal, which is the nearly the total weight of 400 KTM motorcycles.

The story of the race



> It's a British one-two at the start, as Lewis Hamilton leads from the McLaren of Jenson Button



> Having started sixth, Rosberg climbs to P3 before making an early stop to change his tyres on lap 10



> Hamilton does 21 laps on ultrasoft tyres before pitting and Vettel takes the lead when Räikkönen pits

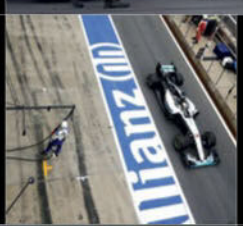


> Vettel suffers a right-rear blow-out on lap 27, prompting an appearance by the Safety Car



< On the restart, Rosberg leads ahead of Hamilton and Verstappen





< Both Mercedes make their final stops on laps 54 and 55, handing the lead to Verstappen

> Within eight laps the Mercedes drivers regain the lead, having passed Verstappen



> On the final lap Hamilton challenges for the lead and the two Mercedes drivers collide at Turn 2





< Force India's Sergio Pérez suffers brake failure and crashes out of the race on the penultimate lap

> Hamilton wins from Verstappen and Räikkönen, with Rosberg in fourth



MAIN PHOTO: SAM BLOXHAM/LAT; ILLUSTRATION: ALAN ELDRIDGE. INSETS: ANDY HONE/LAT; SAM BLOXHAM/LAT; GLENN DUNBAR/LAT; STEVE ETHERINGTON/LAT; ANTHONY ROWLINSON/LAT; SUTTON IMAGES

Austrian Grand Prix stats

The lowdown on everything you need to know from the weekend at the Red Bull Ring...

THE GRID



1. HAMILTON
MERCEDES
1min 07.922secs Q3



3. BUTTON
McLAREN
1min 09.900secs Q3



5. RICCIARDO
RED BULL
1min 09.980secs Q3



7. BOTTAS
WILLIAMS
1min 10.440secs Q3



9. VETTEL*
FERRARI
1min 09.781secs Q3



11. GUTIÉRREZ
HAAS
1min 07.578secs Q2



13. GROSJEAN
HAAS
1min 07.850secs Q2



15. SAINZ
TORO ROSSO
NO TIME IN Q2



17. MAGNUSSEN
RENAULT
1min 07.941secs Q1



19. PALMER**
RENAULT
1min 07.965secs Q1



21. NASR**
SAUBER
1min 08.446secs Q1



2. HÜLKENBERG
FORCE INDIA
1min 09.285secs Q3



4. RÄIKKÖNEN
FERRARI
1min 09.901secs Q3



6. ROSBERG*
MERCEDES
1min 08.465secs Q3



8. VERSTAPPEN
RED BULL
1min 11.153secs Q3



10. MASSA
WILLIAMS
1min 11.977secs Q3



12. WEHRLEIN
MANOR
1min 07.700secs Q2



14. ALONSO
McLAREN
1min 08.154secs Q2



16. PÉREZ
FORCE INDIA
NO TIME IN Q2



18. ERICSSON
SAUBER
1min 08.418secs Q1



20. HARYANTO**
MANOR
1min 08.026secs Q1



22. KVYAT***
TORO ROSSO
1min 08.409secs Q1

*Five-place grid penalty for a replacement gearbox **Three-place grid penalty for failing to slow for yellow flags ***Required to start from the pitlane due to change of survival cell

THE RACE



THE RESULTS (71 LAPS)

1st	**Lewis Hamilton** Mercedes	1h 27m 38.3107s
2nd	**Max Verstappen** Red Bull	+5.719s
3rd	**Kimi Räikkönen** Ferrari	+6.024s
4th	**Nico Rosberg** Mercedes	+26.710s*
5th	**Daniel Ricciardo** Red Bull	+30.981s
6th	**Jenson Button** McLaren	+37.706s
7th	**Romain Grosjean** Haas	+44.668s**
8th	**Carlos Sainz** Toro Rosso	+47.400s
9th	**Valtteri Bottas** Williams	+1 lap
10th	**Pascal Wehrlein** Manor	+1 lap
11th	**Esteban Gutiérrez** Haas	+1 lap
12th	**Jolyon Palmer** Renault	+1 lap
13th	**Felipe Nasr** Sauber	+1 lap
14th	**Kevin Magnussen** Renault	+1 lap
15th	**Marcus Ericsson** Sauber	+1 lap
16th	**Rio Haryanto** Manor	+1 lap
17th	**Sergio Pérez** Force India	+2 laps/brakes
18th	**Fernando Alonso** McLaren	+7 laps/battery
19th	**Nico Hülkenberg** Force India	+7 laps/brakes
20th	**Felipe Massa** Williams	+8 laps/brakes

*Includes ten-second time penalty for causing a collision **Includes five-second time penalty for speeding in the pitlane

Retirements

Sebastian Vettel Ferrari	26 laps – tyre
Daniil Kvyat Toro Rosso	2 laps – loss of power

THROUGH SPEED TRAP (QUALIFYING)



Fastest: Pascal Wehrlein, 206.67mph



Slowest: Marcus Ericsson, 198.84mph

TYRE COMPOUNDS USED



Ultrasoft | Supersoft | Soft | Inter | Wet

CLIMATE

Overcast 17°C

TRACK TEMP

28°C

FASTEST LAP



Lewis Hamilton, lap 67, 1min 08.411s

FASTEST PITSTOP



Nico Rosberg, 21.035s (entry to exit)

DRIVERS' STANDINGS

1st	**Nico Rosberg** Mercedes	153pts
2nd	**Lewis Hamilton** Mercedes	142pts
3rd	**Sebastian Vettel** Ferrari	96pts
4th	**Kimi Räikkönen** Ferrari	96pts
5th	**Daniel Ricciardo** Red Bull	88pts
6th	**Max Verstappen** Toro Rosso/Red Bull	54pts
7th	**Valtteri Bottas** Williams	54pts
8th	**Sergio Pérez** Force India	39pts
9th	**Felipe Massa** Williams	38pts
10th	**Romain Grosjean** Haas	28pts
11th	**Daniil Kvyat** Red Bull/Toro Rosso	22pts
12th	**Carlos Sainz** Toro Rosso	22pts
13th	**Nico Hülkenberg** Force India	20pts
14th	**Fernando Alonso** McLaren	18pts
15th	**Jenson Button** McLaren	13pts
16th	**Kevin Magnussen** Renault	6pts
17th	**Pascal Wehrlein** Manor	1pt
18th	**Stoffel Vandoorne** McLaren	1pt
19th	**Esteban Gutiérrez** Haas	0pts
20th	**Jolyon Palmer** Renault	0pts
21st	**Marcus Ericsson** Sauber	0pts
22nd	**Felipe Nasr** Sauber	0pts
23rd	**Rio Haryanto** Manor	0pts

CONSTRUCTORS' STANDINGS

1st	Mercedes	295pts	9th	Renault	6pts
2nd	Ferrari	192pts	10th	Manor	1pt
3rd	Red Bull	168pts	11th	Sauber	0pts
4th	Williams	92pts			
5th	Force India	59pts			
6th	Toro Rosso	36pts			
7th	McLaren	32pts			
8th	Haas	28pts			

FORIX
For comprehensive F1 statistics visit www.forix.com

PHOTOS: GLENN DUNBAR/LAT; STEVE ETHERINGTON/LAT; ANDY HONE/LAT



Image is not of the person quoted.



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RACE DEBRIEF by Stuart Codling

British Grand Prix

10.07.2016 / Silverstone



Silver surfer storms the 'stone

Hamilton's fourth British GP win was as brilliant – and popular – as anything ever seen at Silverstone

The insurance people must surely have winced as Lewis Hamilton went crowdsurfing not once, but twice, after a sensational British Grand Prix victory that brought him to within a point of his world championship-leading team-mate Nico Rosberg. And they would have winced again as he tossed the venerable Royal Automobile Club trophy – awarded to every British Grand Prix winner since 1948 – into the air as he stood atop the podium.

Hamilton set pole position with a new lap record for this Silverstone track configuration and *owned* the race, from Safety Car start through to comfortable finish, conducting his Mercedes W07 Hybrid through changing conditions with barely a slip. A cloudburst as the field assembled on the grid left the track thoroughly drenched, but it had already stopped raining by the time the race had got under way behind Safety Car driver Bernd Mayländer's Mercedes AMG GT-S.

Aquaplaning over the large areas of standing water was less of a problem than keeping up brake and tyre temperatures, and at one point Hamilton came close to colliding with the Safety Car at Copse as he tried to remedy his glazed rear discs. After five slow laps, Hamilton raced away at the green flag, backing the field up early at Stowe and then stepping on the gas, leaving second-placed Rosberg trailing behind.

Nearly half the field – among them Sebastian Vettel, starting outside the top ten after a gearbox-change penalty – pitted for intermediate tyres at the green flag. But the leading group left it for another two laps and that proved the best policy, since Pascal Wehrlein spun his Manor into the wall at Abbey. Race control put the track under Virtual Safety Car conditions, enabling Hamilton, Rosberg and Max Verstappen to pit and emerge with a comfortable margin over the following pack.

Force India's Sergio Pérez also benefitted from stopping at this point to run fourth, having started from tenth, and he would prove an impediment to Daniel Ricciardo's progress in the second Red Bull. Practice and qualifying had validated the growing belief that Red Bull are now very much Formula 1's second-best team, ahead of Ferrari, but Verstappen was the star of their show today.

The Dutch teenager was arguably even more impressive here than in Spain, where he secured his first victory. He ran third initially before mugging Rosberg for second when the Mercedes gave a wayward twitch at Becketts on lap 16, then consolidated his advantage over Rosberg with a mighty final lap on the intermediates when both of the Mercedes pitted for medium-compound slicks shortly afterwards. The only real blunder by Verstappen was made when both he and Hamilton ran wide at Abbey independently of one another on lap 22, allowing Rosberg to cruise into DRS range.

Even so, it took another 15 laps for Rosberg to bully his way past, and it is one of the few disappointing elements in this race that his subsequent charge to get on terms with Hamilton was blunted by a problem with his gearbox. They traded fastest laps blow-for-blow until seven laps from the chequered flag, when Rosberg briefly became stuck in seventh gear. Advice from the team to change the settings and short-shift between sixth and eighth enabled him to hold his position, but the FIA deemed this communication to be a breach of the sporting regulations governing radio messages. He crossed the line ahead of Verstappen, but the FIA's ten-second penalty meant that their finishing positions were subsequently reversed.

Ferrari were nowhere in this race. Kimi Räikkönen started and finished fifth, but to get there required a lengthy wrestle with Pérez in

the later laps, and he was 40s down on fourth-placed Ricciardo. Sebastian Vettel started 11th after picking up another gearbox-change penalty, and although the team gambled on bringing him in early for slicks – he was first in, on lap 15 – he had a scrappy and incident-packed race, and the sight of team principal Maurizio Arrivabene with his head in his hands became a familiar one. A five-second penalty for nerfing Felipe Massa off at Village left him on the margins of the top ten in the final standings.

Hamilton has now crept up to just one point behind Rosberg in the 2016 drivers' standings, but poor reliability earlier in the season may begin to hinder his championship momentum as we move into the closing stages of the year, since he has almost exhausted his allocation of five power units for the year. Any further changes will now bring grid penalties.

"I did everything I could in the race to save this engine, as obviously I'm on my last one," he said. "I'm catching him [Rosberg], so let's keep going.

"I approached the race with an incredibly positive attitude, so I didn't at any point think that the car would fail on me. I could see the crowd beginning to stand up and cheer in the excitement and I felt exactly what they felt. It's just the most amazing feeling, when you come across the line as the winner of the British Grand Prix."

After four Silverstone victories, he knows whereof he speaks.

BRAKING IT DOWN

A look at the braking demands at Silverstone, courtesy of Brembo

4.1g
Average deceleration

86 kWh
Energy dissipated

Turn 16 Statistics

Initial speed	327km/h
Final speed	194km/h
Stopping distance	71m
Braking time	0.87 sec
Maximum deceleration	5.5g
Maximum pedal load	166kg
Braking power	2375kW

> Silverstone is one of the easiest on brakes of all the 21 circuits. Only 10% of the lap is spent braking, but an average 4.1 g average deceleration shows that then they brake, they brake hard. From the start to finish, each driver applies a total load on the pedal of 56.5 tonnes, which is four times the weight of Big Ben.

The story of the race

v A pre-race downpour forces a start behind the Safety Car

SILVERSTONE



v The race gets under way on lap 6 and Hamilton leads Rosberg by nearly 4s by the end of the lap





> Most stop for intermediate rubber on the restart, but the top four stay out on wet tyres





< Wehrlein spins at Abbey on lap 7, resulting in a Virtual Safety Car. The leaders pit for inters

> The field pits from lap 15. Verstappen stays out a lap longer and slots back into second



> Various drivers spin at Abbey, including Pérez and Verstappen





< Vettel dives inside Massa at Village on lap 37, forcing Massa off track to avoid him



< Rosberg regains second place from Verstappen at Stowe on lap 38

> Rosberg reports a gearbox problem on lap 47 and is investigated post race for radio conversation





< Hamilton wins his third successive British Grand Prix by 6.9s from Rosberg

> Rosberg is penalised 10s, switching his position with Verstappen to third



MAIN PHOTO: GLENN DUNBAR/LAT. ILLUSTRATION: ALAN ELDRIDGE. INSETS: ANDY HONE/LAT; SAM BLOXHAM/LAT; GLENN DUNBAR/LAT; ZAK MAUGER/LAT; JAKOB EBREY/LAT; SUTTON IMAGES

British Grand Prix stats

The lowdown on everything you need to know from the weekend at Silverstone...

THE GRID



1. HAMILTON
MERCEDES
1min 29.287secs Q3



2. ROSBERG
MERCEDES
1min 29.606secs Q3



3. VERSTAPPEN
RED BULL
1min 30.313secs Q3



4. RICCIARDO
RED BULL
1min 30.618secs Q3



5. RÄIKKÖNEN
FERRARI
1min 30.881secs Q3



6. BOTTAS
WILLIAMS
1min 31.577secs Q3



7. SAINZ
TORO ROSSO
1min 31.989secs Q3



8. HÜLKENBERG
FORCE INDIA
1min 32.172secs Q3



9. ALONSO
McLAREN
1min 32.343secs Q3



10. PÉREZ
FORCE INDIA
1min 31.875secs Q2



11. VETTEL*
FERRARI
1min 31.490secs Q3



12. MASSA
WILLIAMS
1min 32.002secs Q2



13. GROSJEAN
HAAS
1min 32.050secs Q2



14. GUTIÉRREZ
HAAS
1min 32.241secs Q2



15. KVYAT
TORO ROSSO
1min 32.306secs Q2



16. MAGNUSSEN
RENAULT
1min 37.060secs Q2



17. BUTTON
McLAREN
1min 32.786secs Q1



18. PALMER
RENAULT
1min 32.905secs Q1



19. HARYANTO
MANOR
1min 33.098secs Q1



20. WEHRLEIN
MANOR
1min 33.151secs Q1



21. NASR
SAUBER
1min 33.544secs Q1



22. ERICSSON**
SAUBER
NO TIME IN Q1

*Five-place grid penalty for a replacement gearbox **Required to start from the pitlane – change of survival cell

THE RACE



THE RESULTS (52 LAPS)

1st	**Lewis Hamilton** Mercedes	1h 34m 55.831s
2nd	**Max Verstappen** Red Bull	+8.250s
3rd	**Nico Rosberg** Mercedes	+16.911s*
4th	**Daniel Ricciardo** Red Bull	+26.211s
5th	**Kimi Räikkönen** Ferrari	+69.743s
6th	**Sergio Pérez** Force India	+76.941s
7th	**Nico Hülkenberg** Force India	+77.712s
8th	**Carlos Sainz** Toro Rosso	+85.858s
9th	**Sebastian Vettel** Ferrari	+91.654s**
10th	**Daniil Kvyat** Toro Rosso	+92.600s
11th	**Felipe Massa** Williams	+1 lap
12th	**Jenson Button** McLaren	+1 lap
13th	**Fernando Alonso** McLaren	+1 lap
14th	**Valtteri Bottas** Williams	+1 lap
15th	**Felipe Nasr** Sauber	+1 lap
16th	**Esteban Gutiérrez** Haas	+1 lap
17th	**Kevin Magnussen** Renault	+3 laps/gearbox

*Includes ten-second time penalty for breaching article 27.1 of sporting regulations (radio transmissions) **Includes five-second time penalty for forcing another driver off the track

Retirements

Jolyon Palmer Renault	37 laps – gearbox
Rio Haryanto Manor	24 laps – spin
Romain Grosjean Haas	17 laps – loss of power
Marcus Ericsson Sauber	11 laps – electrics
Pascal Wehrlein Manor	6 laps – spin

THROUGH SPEED TRAP (QUALIFYING)



Fastest: Nico Rosberg, 204.49mph



Slowest: Jenson Button, 195.42mph

TYRE COMPOUNDS USED



Soft | Medium | Hard | Inter | Wet

CLIMATE

Wet/ overcast 21°C

TRACK TEMP

29°C

FASTEST LAP



Nico Rosberg, lap 44, 1min 35.548s

FASTEST PITSTOP



Kevin Magnussen, 28.450s (entry to exit)

DRIVERS' STANDINGS

1st	**Nico Rosberg** Mercedes	168pts
2nd	**Lewis Hamilton** Mercedes	167pts
3rd	**Kimi Räikkönen** Ferrari	106pts
4th	**Daniel Ricciardo** Red Bull	100pts
5th	**Sebastian Vettel** Ferrari	98pts
6th	**Max Verstappen** Toro Rosso/Red Bull	90pts
7th	**Valtteri Bottas** Williams	54pts
8th	**Sergio Pérez** Force India	47pts
9th	**Felipe Massa** Williams	38pts
10th	**Romain Grosjean** Haas	28pts
11th	**Nico Hülkenberg** Force India	26pts
12th	**Carlos Sainz** Toro Rosso	26pts
13th	**Daniil Kvyat** Red Bull/Toro Rosso	23pts
14th	**Fernando Alonso** McLaren	18pts
15th	**Jenson Button** McLaren	13pts
16th	**Kevin Magnussen** Renault	6pts
17th	**Pascal Wehrlein** Manor	1pt
18th	**Stoffel Vandoorne** McLaren	1pt
19th	**Esteban Gutiérrez** Haas	0pts
20th	**Jolyon Palmer** Renault	0pts
21st	**Marcus Ericsson** Sauber	0pts
22nd	**Felipe Nasr** Sauber	0pts
23rd	**Rio Haryanto** Manor	0pts

CONSTRUCTORS' STANDINGS

1st	Mercedes	335pts	9th	Renault	6pts
2nd	Ferrari	204pts	10th	Manor	1pt
3rd	Red Bull	198pts	11th	Sauber	0pts
4th	Williams	92pts			
5th	Force India	73pts			
6th	Toro Rosso	41pts			
7th	McLaren	32pts			
8th	Haas	28pts			

FORIX
For comprehensive F1 statistics visit www.forix.com

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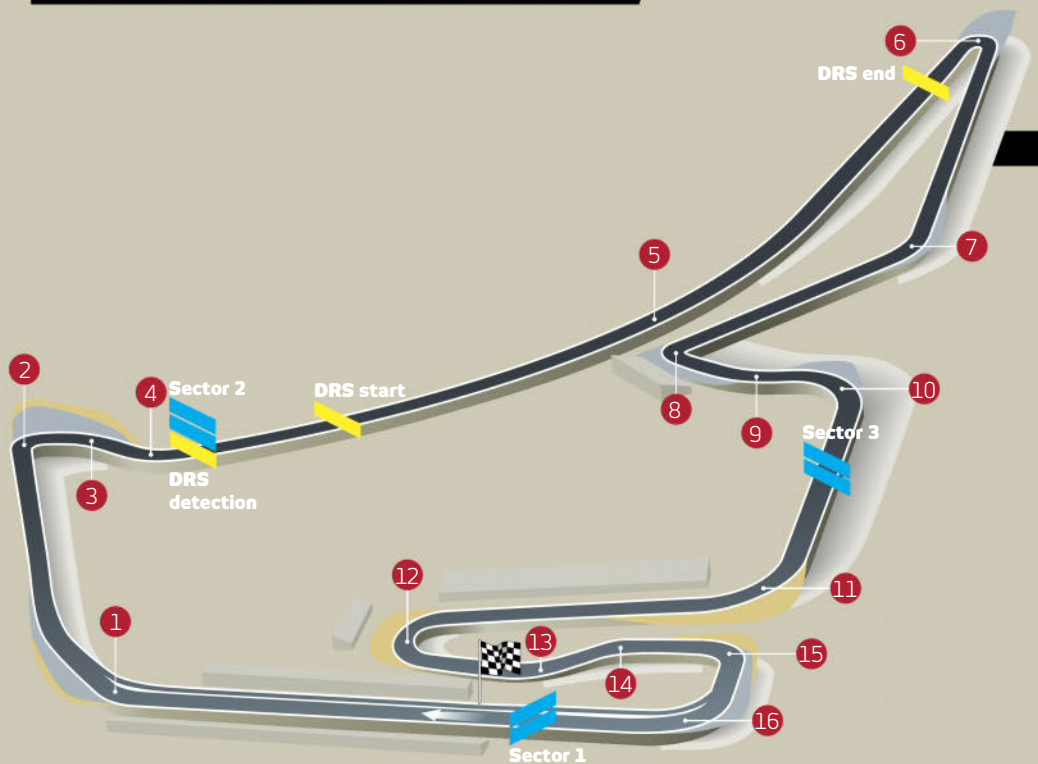
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The German GP preview

Round 12 / 29-31 July 2016 / Hockenheim



GERMAN GP RACE DATA

Circuit name Hockenheimring
First GP 1970
F1 races held 34
Circuit length 4.573km/h
Race distance 67 laps (306.392km/h)
Direction Clockwise
Winners from pole 18

WILL ROSBERG HELP PULL IN A BIG HOME CROWD?

Since 2007, the German GP has alternated between Hockenheim and the Nürburgring. However, last year's trip to the Eifel mountains was cancelled when organisers failed to reach a commercial agreement with Bernie Ecclestone, and for the first time in 60 years, there was no grand prix in Germany on the F1 calendar.

Now, after a two-year break, F1 returns to Hockenheim, with the hope that Nico Rosberg's so-far successful title campaign will boost attendance. Older fans will rue the lost of the long straights, but the new section from Turn 1 to beyond the hairpin guarantees a good mixture of overtaking, incidents and controversy.

If more fans make the trip this year (and there could be a large Dutch contingent supporting Max Verstappen) the final section of the track, through the narrow fan-filled stadium section, will once again be a thrilling sight.



All hopes ride on the continued success of Mercedes' Nico Rosberg this year

WHAT GOES ON TOUR...

Mercedes seem to revel in their home race and ensure there is plenty of goodwill on offer at the German GP weekend. It often begins by giving us the use of a quick and economical C-Class. We punch Speyer into the sat nav, and off we go.

In previous years (at the Nürburgring) former motorsport boss Norbert Haug would offer passenger laps around the Nordschleife in souped-up AMG monsters, while one evening is usually set aside for a barbecue, where media get to mingle with Merc management.

However it was rivals Ferrari who stole the show one year with a dinner at Hockenheim for the British press. The revelry ended in drama when one well-loved member of the press corps was caught trying to pilfer a large ashtray made from the re-fuelling nozzle of a Ferrari F1 car. 'Ashtraygate' is still remembered today.

James Roberts

WHAT HAPPENED IN 2014'S RACE...?

Winner Nico Rosberg
Margin of victory 20.789s
Pole position 1m 16.540s, N Rosberg
Fastest lap 1m 19.908s, L Hamilton
Race leaders 1
Safety Cars 1 (2 laps)
Pitstops 55
Overtakes 65



Hockenheim two years ago was the scene of an easy home win for both Mercedes and Nico Rosberg. Nico led from start to finish, but there was drama: a first corner shunt between Felipe Massa and Kevin Magnussen left Massa's Williams upside down, while Lewis Hamilton superbly fought back from a disastrous 20th on the grid to finish a battling third behind Valtteri Bottas and Rosberg.

ILLUSTRATION: ALAN ELDRIDGE. PHOTOS: SAM BLOXHAM/LAT; CHARLES COATES/LAT

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facebook.com/f1racingmag
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Lewis Hamilton crowd surfs at Silverstone after winning his third consecutive British GP

Hats off to Silverstone!

I've just spent another fabulous weekend at Silverstone, the home of British motor racing. It was made possible by countless staff and volunteers who seek to provide enjoyment for all and do so year in and year out without fail.

Lewis Hamilton crowd surfing above my head will live long in my memory, maybe even on a greater scale than the height of the Mansell Mania days. Lewis deserves all the plaudits he gets: he has humility, respect for tradition and is a true man of the people.

Well done Lewis and Silverstone, your country is proud of you both.

Michael Brierley
Manchester, UK

Cost control is needed

With great excitement, my husband and I decided that this was the year to take our three children to Silverstone. Race day ticket prices were out of our price range, so qualifying it was. And what a wonderful day we had!

Our enjoyment was slightly marred, however, by the exorbitant costs facing us at almost every turn. Excluding fuel, once we had bought tickets, parking, three Mercedes caps (so that the children could show their allegiance to their hero, Lewis) a programme and a couple of snacks (it was certainly no more than that, because we had brought our own food in anticipation), the cost was £305. That's a lot for a day out – especially when the children got in free.

There is an argument that we should either do without live racing or suck it up and pay Mr Murdoch for the privilege of watching F1. Yes, arguably I could (in common with many, I suspect) afford to buy five grandstand tickets for race day and afford to pay for a subscription to Sky. But I choose to use that money towards school shoes, and swimming lessons, and, if we're lucky, one holiday a year.

I in no way resent other people's wealth, but I do resent the lack of appreciation of the effort "normal" people have to put in to be able to afford live sport. I fear that there is so much money sloshing around in the higher echelons of F1 that the bigwigs have no concept of what life is like on the ground and are slowly but surely pricing out the common man. I urge them not to forget about us: what, after all, is Silverstone without the fans?

Kathryn Paisley
By email

F1 should follow its fans

I read Sir Martin Sorrell's comments on F1's future ('Insider', *F1 Racing*, July 2016) and while I agree that it's commendable to have F1 in more countries around the world, the sight of empty grandstands does not sell the sport well. China, the most populated country in the world, can't fill its grandstands. If F1 is going to visit more countries, it needs to consider the existing motorsport fan base and the price of tickets relative to the country's average earnings.

With the future and viability of a number of popular circuits under threat at present, surely this expansion philosophy cannot continue? If it does we will have races in countries with no fan base at empty circuits, is this really what F1 is working towards? I hope not.

Neil Fuller
By email

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SEPTEMBER ISSUE ON SALE: 1 SEPTEMBER

*CONTENTS MAY BE SUBJECT TO CHANGE

PHOTOS: GLENN DUNBAR/LAT; JAKOB EBREY/LAT

MURRAY WALKER



UNLESS I'M VERY MUCH MISTAKEN...

"'Will you do a photoshoot for our front cover, wearing a Union Jack suit?' asked *F1 Racing*..."

I'm a ham at heart, so I said yes. That was in April 2000, four years after *F1 Racing* had launched and gone on to achieve international success, selling in 15 countries in 10 different languages. However, that it would ring the sales bell with enthusiasts all over the world was by no means a foregone conclusion, so hats off to its publisher, Haymarket, for having the courage to enter such a specialised and competitive market with a glossy monthly magazine.

I've been writing this column with its long deadlines for eight years, and I can tell you that in today's world of instant online information, followed up at length by the full story in weekly magazines, I've spent many an hour agonising about finding something to say that won't be old news or incorrect by the time it is being read.

But F1 is never short of excitement and there have been plenty of storylines for me. Number one without a doubt was the brilliant day I had at Silverstone, being driven in the one-off two-seater F1 McLaren by my ITV commentary-box partner Martin Brundle. The unique McLaren had been built to give people an experience of what it is like in an F1 car at genuine racing speeds and, boy, did it do it! When the big day came, I was strapped into a space behind Martin, before undertaking three mind-blowing laps of the great circuit which has been so much a part of my life. Over 190mph (300km/h) down the Hangar Straight, massive G-forces around the corners, and acceleration and braking that were literally gut-wrenching. It was wet and when we came in Martin said: "That wasn't very exciting. If it's dry after lunch we'll go out again." And we did. For another five laps, at the end of which I was completely shattered. Those five laps, during which we were alone on the track, took about seven and a half minutes, whereas an actual race of wheel-to-wheel combat lasts for some 90 minutes. F1 drivers really are supermen.

Not all my *F1 Racing* experiences were as happy, though. I once brashly wrote that Sauber were there to make up the numbers and that I wouldn't know their designer, Willy Rampf, if he rode through my study on a unicycle. It was a silly and unjustified thing to say and to this day I don't know why I did it. It gave great offence to the charming Peter Sauber, who went around the paddock at Sepang collecting as many copies of *F1 Racing* as he could find, and putting them in the bin, and who had a frank and fearless discussion with me about his point of view. I felt about two inches tall and bitterly regretted what I'd said. Can't win them all, I suppose.

But what a roller coaster of a ride it has been for *F1 Racing* readers. You've experienced the dominance of Michael Schumacher and Ferrari, the rise and fall of Renault, the unexpected downfall of McLaren, a private team in the form of Red Bull dominating them all, the amazing Brawn story, the emergence of Fernando Alonso, Lewis Hamilton, Sebastian Vettel and Max Verstappen, and three British champions – Damon Hill, Jenson Button and Lewis Hamilton, plus the crushing superiority of Mercedes.

All this and the cut and thrust, hurly-burly and political shenanigans of Formula 1. You might think that it is difficult to fill over 100 pages 12 times a year, but such is the variety of human and technical activity in Formula 1 that this magazine does it – and I'm proud to be a part of it. So very well done to the *F1 Racing* team, past and present. Happy Birthday!

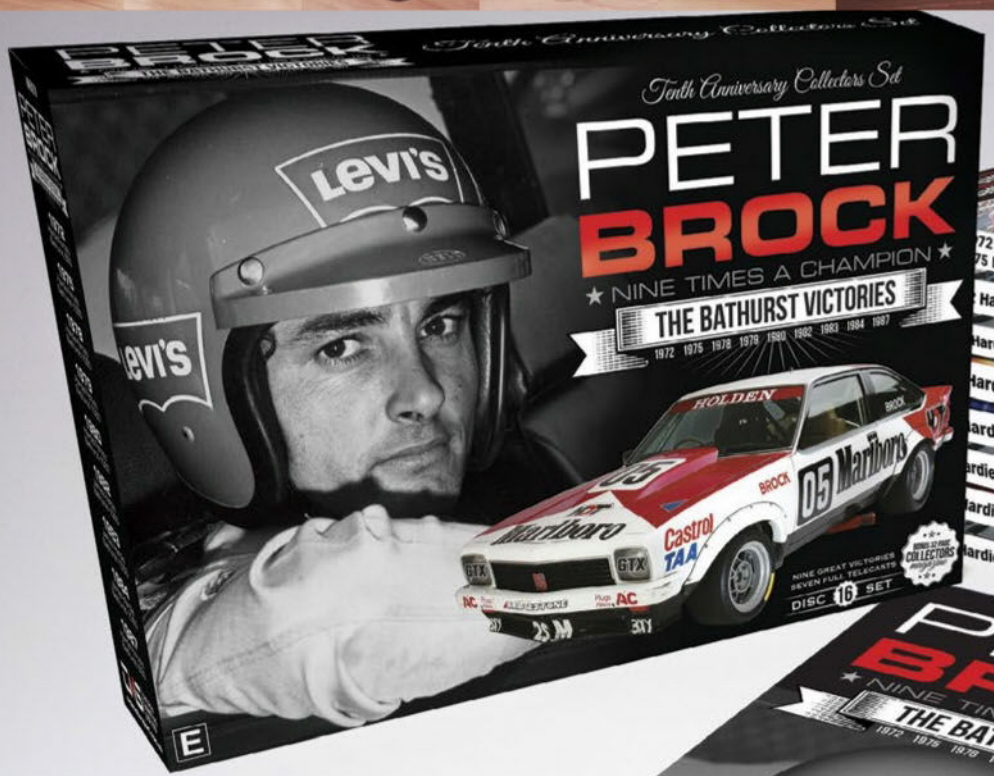


"I've been writing this column for eight years... F1 is never short of excitement and there have been plenty of storylines for me"



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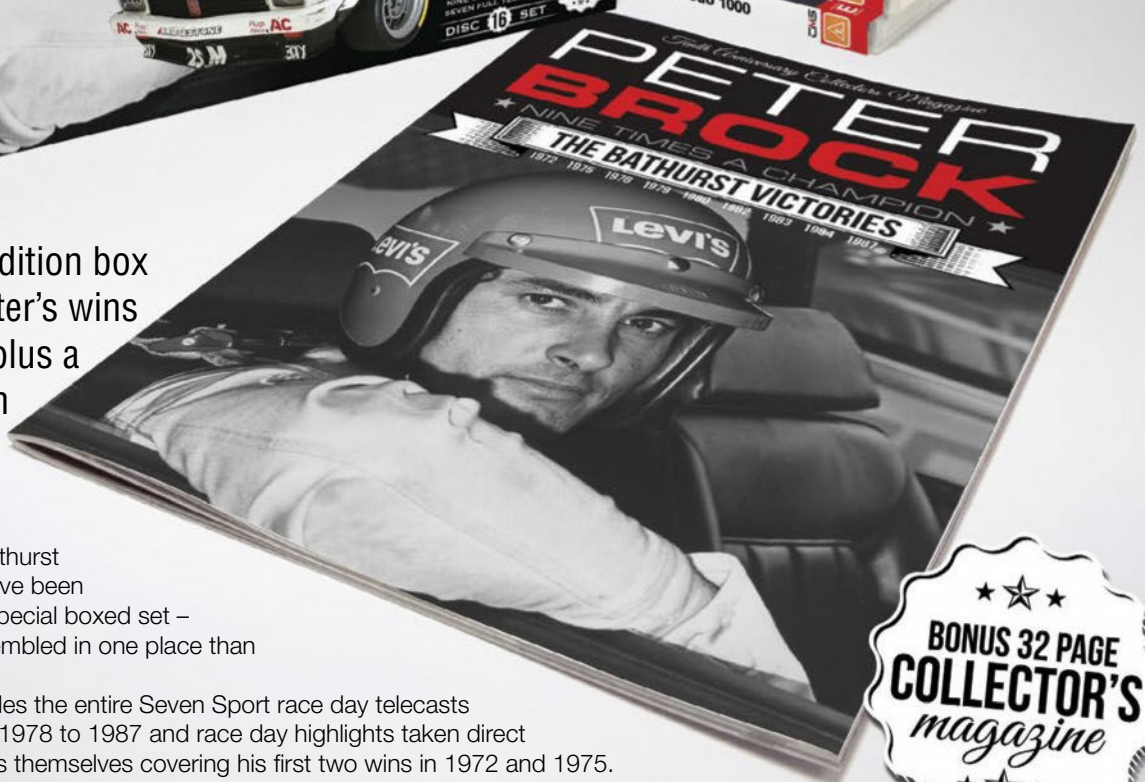




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