Formula One

Aerodynamics  Wind Beneath the Wings
Business     Auto Giants Set the Pace
Overview    Circuits, Teams, Drivers
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Man Versus Machine  The waiting comes to an end on March 18. Then the checkered flag will fall in Melbourne to start the 58th Formula One season. Motorsport fans around the globe will finally know how the balance of power will change in the wake of Michael Schumacher’s retirement. But when the first award ceremony has passed it will not only cause celebrations. Fans from all over the globe will be thrust into debate about the same old philosophical questions: Did the best car win? Or the best driver? Or was it a combination of the two? These often extremely heated debates usually go round in circles, just like the subject matter itself. But the protagonists never make it to the finish line – otherwise known as reaching a consensus. It doesn’t need to be that way. Imagine if all the drivers were to race in identical cars, with identical chassis, engines, transmissions, steering wheels, traction control devices – after all, identical tires are already a fact of life as of this season. Then we’d finally have a black-and-white answer as to who’s the best. Would that make the world of Formula One more interesting, or even more exciting? I have my doubts. At any rate, I would no longer call myself a fan and probably wouldn’t be the only one. While the incredible driving skills of the 22 drivers are awe inspiring, I’m equally fascinated by the leading-edge technology behind the cars. At the end of the day, it is technology that makes Formula One the most gigantic team sport of all. A sport in which not only 22 drivers fight it out with one another, but 11 teams, each with up to 1,000 employees behind them, including some of the world’s most talented engineers. Despite the cutting-edge technology, Formula One is ultimately about the people involved – be they winners or losers.

Who knows whether I’ll be one of the fans who can celebrate on the winning side one day? I’m optimistic. I’ll be keeping my fingers crossed for the BMW Sauber F1 Team, which is making giant strides. Let me take this chance to wish the racing team in Munich and Hinwil all the best for the coming season – as a fan and in the name of Credit Suisse, the team’s official partner.

Walter Berchtold, Chief Executive Officer Private Banking, Credit Suisse
Credit Suisse is enthusiastic about the start of its seventh Formula One season. After partnering with the Peter Sauber racing team for five years, the bank’s logos have emblazoned the BMW Sauber F1 Team’s cars since last season. Straight away, the newly formed team jumped from eighth to fifth place in the Constructors’ Championship, which has only whetted the fans’ appetite for greater things to come.

**Contents**

<table>
<thead>
<tr>
<th>Formula One</th>
<th>06</th>
<th>Aerodynamics</th>
<th>Key to F1 Glory Lies in the Wind Tunnel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>Team Check</td>
<td>The BMW Sauber F1 Team at a Glance</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Michel Comte</td>
<td>Through the Lens With a Star Photographer</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>Column</td>
<td>The Phenomenon of Brazilian Racing Drivers</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>Website</td>
<td>Credit Suisse Keeps Motor Racing Fans up to Speed</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>Peter Sauber</td>
<td>The Motorsports Pioneer Who Refuses to Retire</td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>Big Business</td>
<td>The Big Works Teams Are Currently Setting the Pace</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>High-Tech</td>
<td>Fast-Paced Partners Ensure the Cars Run at Top Speed</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>Emerging Markets</td>
<td>Formula One Heading for Lucrative Shores</td>
</tr>
</tbody>
</table>

**Overview**

| 23  | Race Calendar | From A for Albert Park, to S for Silverstone |
| 24  | Teams and Drivers | Brief Portrait of All the Formula One Racing Teams |
| 27  | Circuits | Round the Curves With Heidfeld and Kubica |
| 30  | Rules | All You Need to Know About Engines, Fuel Loads and Standardized Tires |
The test section lies at the heart of any wind tunnel – a highly sensitive area that’s guarded like the Holy Grail. The cars are exposed to airstreams that can reach speeds up to 300 km/h. However, the cars are not suspended in the air as pictured above suggests. Instead, they drive on the so-called “rolling road” made of steel.
Wind Beneath the Wings

In 2007, the key to F1 title glory lies in the wind tunnel. The advent of standardized tires and "frozen engines" means two key factors drop out of the equation – leaving aerodynamics as the crucial factor for success.

Could Peter Sauber possibly have realized, back in the late '90s, which way the wind would be blowing in Formula One by 2007? One thing is certain, at any rate: Without the wind tunnel he set up at the headquarters in Hinwil, the blue-and-white cars wouldn’t stand a chance this Grand Prix season. That’s because the new standardized tires from Bridgestone – now the monopoly supplier – and restrictions imposed on engines ensure that aerodynamics are now the winning factor. The winning team in 2007 will be the one that is the most effective at giving its cars wings. These wings provide additional downforce, thus making up for the inadequate grip from the standardized tires. More than ever, the “lords of the air,” as they are known, will have the power to make world champions. In keeping with the aerodynamicists’ motto: Sow the wind and reap the win.

Modern wind tunnels have long been an indispensable tool for the works teams, and are now the epitome of leading-edge technology. The way the wind flows around the car, and the way the car produces as much downforce as possible on the track with as little drag as possible, in all situations, has always been important. But it’s never been so crucial as it is this year. In the past it was the type of tire – with its hard or slightly less hard rubber compound – that could help the driver achieve a time gain of more than one second per lap. With no trick other than a few deft hand movements combined with the right set of tires, a marked improvement in adhesion and lap times could be achieved. What’s more, with Bridgestone and Michelin (formerly a supplier to BMW Sauber) two manufacturers were competing with one another. That’s over now, because this season standard rubber will be introduced.

It's All a Question of the Right Curves

To ensure more egalitarianism among the 11 teams and 22 cars, the new engine rules impose heavy restrictions on development of the V8 power plants. As part of a cost-saving initiative by the FIA, F1’s governing body, the 2.4-liter units will essentially be "frozen" at their level at the end of the 2006 season until the year 2010. Modifications may now be made only in a few clearly specified areas. The speed of the 750 or so hp units has been capped at 19,000 rpm. This mainly leaves aerodynamics as the area where creative...
The axial ventilator with carbon rotor blades weighs in at a hefty 66 tons including its motor and housing. At full load it takes an output of 3,000 kilowatts and enables the production of wind speeds of up to 300 kph.
BMW Motorsport Director Mario Theissen talks about the growing emphasis on aerodynamics, efficiency of wind tunnels, and the need for high-performance computers.

“We’re stepping up aero-simulation”

Aerodynamics will be the winning factor in 2007. But a second wind tunnel is not on the cards for the BMW Sauber F1 Team. How can you cope with just a single tunnel, unlike the other top teams? We don’t plan to develop two wind tunnels. Our aim is to use the existing one optimally – and ours is now operating on a three-shift basis every day. In addition, we’ve got a new super-computer, which we’re using to step up aero-simulation sharply.

So you’re going down a different route than your rival Toyota, for example? We see greater benefits in the cross-fertilization of experimental aerodynamics in the wind tunnel and theoretical simulation on the computer. They can complement each other brilliantly and drive new ideas together, because the computer unlike the wind tunnel doesn’t just provide us with results. What it also gives us is the complete physical background, and therefore an understanding of the processes that lead to this result. That’s why we’re putting a greater focus on computational fluid dynamics, which we also use nowadays in mass auto manufacturing.

How do you like the new BMW Sauber F1.07? I like it a lot. You can see very nice details in terms of the aerodynamics of the vehicle and its exterior. Obviously you don’t see everything that’s hidden underneath, such as the new transmission, which switches gear without any interruption in traction.

Aerodynamic developments gave your cars additional wings back in 2006. We made some major leaps in 2006 in terms of aerodynamics development than had been the case in the past. We developed more variants, tested them, and got faster results. That was one of the reasons why we achieved a significantly faster pace last season than in previous years. Aerodynamics is also the primary reason why we were able to drive to a podium finish in the Italian Grand Prix based on our own capability. That aerodynamic development was specifically made for Monza, where special conditions always prevail due to the high speed. With Robert Kubica’s third placing, things worked out perfectly.

What else is going on behind the scenes? We’re enlarging the team from its original 280 to 430. By the end of the season, we should have everything up and running and have reached our full strength so we can really challenge the big teams in 2008.
room for a full-scale racing car. For cost reasons they usually work with 60 percent models. To ensure the cars can be tested not only from a frontal direction but also by airflows coming from an angle of up to ten degrees, the entire measuring platform can be rotated. This “rolling road” is equipped with a steel runway that simulates the relative movement between car and track, as well as the rotating wheels. Just like a hurricane, the rolling road reaches a speed of up to 300 kph. Weighing cells are located under the rolling road for calculating the wheel loads. Additional sensors on the car deliver data in gigabytes to the control room, which is separated from the test section by a glass screen and is an absolute no-go area. Anyone with access rights must be able to keep a secret.

Windy Spies Create Turbulence

Wind tunnels are always like a high-security zone. Any unauthorized persons are watched at every step – as if the US gold reserves of Fort Knox were housed inside. Indeed there are treasures involved, namely operating secrets surrounding those tenths of a second that can give a Formula One car its vital edge – treasures that require the strictest possible security. That aerodynamics specialists may hold extremely valuable secrets is evident from court proceedings in which the “lords of the air” faced charges of transferring know-how and industrial espionage in relation to their former employer. This consisted of long-running lawsuits worth millions, most of which ended in a settlement.

Many top teams can even afford the luxury of having two wind tunnels. But the case of Toyota has recently shown that this immense expense – involving a two- or even three-shift operation – does not necessarily lead to faster findings and an aerodynamically enhanced car. Wind tunnels are complex, complicated structures. Even the tiniest discrepancy, for instance in terms of calibration, can lead to very mixed results. BMW Sauber is continuing to focus on its sole wind tunnel in Hinwil. There, expansion of the aerodynamics department is the top priority. This has recently involved beefing up the operation step by step: from a single shift to two shifts, and at the end of October 2006 to three shifts. Staff numbers have been adjusted at the same time.

While in the original Sauber-Petronas days there were 35 employees there, BMW has grown the aerodynamics team to 85 people. Since spring 2006 it has been headed by chief aerodynamicist Willem Toet. Born in Amsterdam, raised in Australia, and holding UK-Australia dual citizenship, Toet spent four years in a leading position with Ferrari among others. Via BAR (now Honda), he finally arrived at BMW Sauber. Toet has more than 20 years’ professional experience in this area – and in Hinwil he works with the expert who built the aerodynamics department and led it until the end of 2005: Seamus Mullarkey. When the Singapore-born Brit moved to Sauber in 1999, there were only 10 people working in the aerodynamics department. Soon it will be almost ten times that number. Alongside aerodynamicists there are CAD model designers, model builders and electronics experts, as well as technicians, operators, and CFD engineers.

Supercomputer Gives an Additional Boost

CFD stands for computational fluid dynamics, and enables airflows to be viewed on screen. This allows calculation of the flow properties for any number of CAD models created in gridwork form using the CFD software. It means the wheat can usually be separated
from the chaff on screen – with only the most promising models actually making it through to the wind-tunnel stage. The use of CFD calls for a supercomputer with a capability that is beyond that of the human imagination. The BMW Sauber supercomputer is named “Albert 2,” in honor of physics genius Albert Einstein. “Albert 2” is 10 meters long, 2.3 meters tall, 1.2 meters deep, and weighs 21 tons. He replaced his three tons lighter predecessor on December 14, 2006. “Albert 2” can perform 12,288,000,000,000 floating-point calculations every second. To get the same computing power, all the residents of Munich (1.3 million) would have to multiply two eight-digit numbers every three-and-a-half seconds for a whole year! But no matter how powerful the virtual super brain’s performance, it can’t replace the real, live wind chamber. “Albert 2” and the wind tunnel are more like two teammates who spur each other on to ever greater achievement. In this technological duel, everything ultimately leads to one thing: cars that are as streamlined and stable as possible in the wind – and can score a victory. <

Hinwil’s 85 aerodynamicists ensure that the winds blow through the 141-meter-long tunnel on a 24/7 basis. It’s immensely expensive in terms of the few tenths of a second that can ultimately be saved on the race track.

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Team Check

2006 saw the BMW Sauber F1 Team leap from eighth to fifth place in the Constructors’ Championship. With duo Nick Heidfeld and Robert Kubica at the wheel of the new car, the aim in 2007 will be to continue the climb to the top.

Text: Robert Höpoltseder

The Car

Work on initial concepts for the F1.07 began back in April 2006. On January 16, 2007, the BMW Sauber F1 Team’s second car rolled out on to the race track at Valencia, Spain. www.bmw-sauber-f1.com

The F1.07 is really the young team’s first race car, and the product of a full-fledged cooperation between the Hinwil and Munich sites. The chassis comes from Hinwil, while the powertrain – engine and transmission – comes from Munich, as do the electronics. In compliance with the new F1 rules, key new features include standardized tires from Bridgestone and a freeze on development of other components of the 2.4-liter V8 engines. Aerodynamics have consequently advanced to become the number-one factor. Compared to the team’s original F1.06 – which mostly evolved from the former Sauber-Petronas team – the new F1.07 is distinguished by a shorter, more elevated nose; larger cooling vents, a slimmer rear with new diffuser, new suspension, more precise steering, a central electronics control unit, and a new seven-speed gearbox with no traction interruption. What’s more, the weight has been reduced whilst retaining the rigidity of the monocoque frame, which in places consists of up to 60 layers of carbon fiber. The new car is designed to achieve another halving of the gap relative to the leading teams, and ensure several podium finishes.
The Drivers
Veteran Heidfeld racing versus rising star Kubica, promises an exciting internal team duel.

Nick Heidfeld _Team Driver_ The man from Mönchengladbach – now a resident of Stäfa on Lake Zurich – was the BMW Sauber team’s biggest scorer in 2006 with 23 points and ninth position in the world championship. With 117 GPs under his belt, the 29-year-old expects a lot from the new F1.07 car, but cautions against over-optimistic expectations: “Things get tighter the higher up you go. We picked up a total of 36 world championship points in 2006, and came fifth in the team contest. But the fourth team got 86 points. That’s a world of difference.”

www.nickheidfeld.de

Robert Kubica _Team Driver_ By coming third in only his third Formula One race, the 22-year-old from Kraków delivered a more than successful debut at 2006’s Monza GP. The taste of success has made the Pole hungrier still for the season ahead: “I want more.” His hunger for success should help inspire the team. That way he’ll continue putting partner Heidfeld under enormous pressure. Nick learned just how that feels in the final third of the 2006 season. And Kubica has continued learning since then.

www.kubica.pl

Sebastian Vettel _Test Driver_ As the youngest participant in a GP weekend, the 19-year-old from Heppenheim made Turkish GP history in 2006. Having barely settled into his seat as Friday driver the German received his first fine: After just nine seconds he was done for exceeding the speed limit in the pit lane. He went on to surprise everyone with the day’s best lap time.

2007 sees him take part in the “World Series by Renault”, on top of which he’ll be piloting the F1.07 on Fridays, ahead of each main GP event, in order to familiarize himself with the car and the team.

www.sebastianvettel.de

Timo Glock _Test Driver_ The 24-year-old from Lindenfels has been signed up as second test driver. Back in 2004 he was the fourth German to be driving in Formula One, alongside Michael and Ralf Schumacher as well as Heidfeld. He entered four races with the then Jordan team, coming seventh and picking up two world championship points in what was only his first GP (Montreal). In 2006 he raced in the GP2 series, which he will also be entering this year. In the meantime he has been assigned individual tests with the F1.07.

www.timoglock.com

The Key Figures
These are the architects whose job will be to build the new team’s future success.

Mario Theissen _BMW Motorsport Director_ Mario Theissen bought his first car at the age of 13: a Fiat 500. “For testing purposes,” as he quickly explains. To this day, Mario Theissen remains a technician with heart and soul. For him, the limits of technical feasibility are a variable. As BMW Motorsport Director he has continually pushed back this variable since 1999. The advent of the BMW Sauber F1 Team in 2006 meant his parameters shifted by another few centimeters. Theissen’s mission: to carve out a winning team from the two sites in Munich and Hinwil.

Willy Rampf _Technical Director_ No one embodies the philosophy of the new racing team better than Bavarian native Willy Rampf. He earned his spurs as an engineer during a 14-year spell at BMW, but it was only after attending the South African Grand Prix in 1993 that he caught the racing bug. A year later, Sauber hired him as racing engineer. Following a repeat guest appearance at BMW, during which he won the Paris-Dakar rally as head of Motorcycles, he returned to Hinwil. There, Rampf has held the reins as technical director since 2000. Under his aegis, eight Formula One cars have been born to date.

Markus Duesman _Transmissions_ Walter Riedl _Project Management_ Jörg Zander _Chief Designer_ Willem Toet _Chief Aerodynamicist_ Beat Zehnder _Team Manager_ Mike Krack _Lead Racing Engineer_ Giampaolo Dall’Ara _Racing Engineer for Heidfeld_ Mehdı Ahmadi _Racing Engineer for Kubica_ Tomas Andor _Lead Engines Engineer_ Urs Kuratle _Racing Team Chief Mechanic_

The Partners

Michel Comte is one of the most sought-after photographers of his generation. His fashion shots and portraits of stars have made him famous around the globe, as has his photo journalism: moving close-ups of people and of children from Iraq, Afghanistan and Bosnia, for example. Michel Comte is also a frequent guest at the race track, where he is currently documenting the early progress of the BMW Sauber F1 Team. Since fall 2005, Michel Comte has gone behind the camera for a major Hollywood movie production – this time as director. Michel Comte is Swiss, was born in Zurich in 1953, and lives in Los Angeles. Through the Michel Comte Water Foundation, he helps develop water-purification projects.
For 15 years, star photographer Michel Comte has provided a tremendously accurate, passionate portrayal of everyday life in Formula One. He’s now taking pictures for the BMW Sauber F1 Team, giving us a privileged behind-the-scenes insight into what goes on there.

Interview: Franziska Vonaesch

Bulletin: How did you get into Formula One?

Michel Comte: Formula One has always fascinated me – more so than cars, even. I wanted to find out about the sort of people who are prepared to take it to the limit, about what they’re like, and about where they come from. I wanted to do something no one’s done before: my personal portrayal of motor racing. On celluloid and in photographs. At one point I then met with Michael Schumacher. Through him, I got to know the drivers and team bosses a little better.

You’ve been following the Ferrari team around with your camera for more than 15 years. Where do you see the parallels with the BMW Sauber F1 Team?

I see parallels between Peter Sauber and Enzo Ferrari. Both pursued the same ideas, had the same motivation and the same dream. At one point Ferrari was looking for a strong partner and surrendered half his shares to the Fiat group. Peter Sauber found his partner in BMW. But the Ferrari legend is unparalleled.

Do you think the BMW Sauber F1 Team has a good chance of success?

Of course. Nick Heidfeld still has plenty of strength in reserve and BMW is in a very strong financial position.

It’s your job to capture the emotions of the BMW Sauber F1 Team through a series of pictures. How do you go about doing that?

I pick up the inner feeling in people’s eyes. Perfectionism, willpower, team spirit: All those things are reflected in their look, their movements and their manner. In some way or other the drivers are always emotional people. Apart from Mika Häkkinen, that is – you could never coax a smile out of him. The mechanics and the technical team are also an incredibly good bunch of people. On the Formula One scene everyone gives their all – from driver through technician to team cook.

In terms of the BMW picture series, is your work based on a predefined concept? No. The ideas and visual implementation come from me. The picture series is divided into three phases: the birth of the car, the team spirit and the race. The birth was rather technical: the first car, the new wind tunnel. In the second part I photograph mainly the drivers, the mechanics and the people. Like in the movie “Le Mans” with Steve McQueen.

And in the third part?

I don’t know as yet. But everyone’s hoping the finish line will feature strongly. (laughs)

BMW Motorsport Director Mario Theissen never considers his high-tech cars to be a finished piece of work at any point. Is that a perception that you recognize from photography?

The perfect photograph is the picture you remember. I remember back to images of Gotthard Schuh and Cartier Bresson – I was five years old then. Those pictures moved me and have stuck in my mind ever since. Sometimes it’s memories of moments of euphoria or grief that deeply affect people. Or it’s a purely technical picture. If it affects someone and makes them pause for a moment, then I’ve done my job.

The perfect picture, in other words?

It’s never perfect. But it’s done what it’s supposed to do. For good or for ill.

Can you plan the right moment to take a shot or is it pure intuition?

In Formula One you always know exactly what’s going on. And what’s going on is always unpredictable. You’ve got to be ready for the right moment. I set up my camera at a specific place and just wait. I then have to wait until the right moment comes.

Do you also create moments?

Never.

As a photographer, you’ve had access to all areas of the circuits. What has changed in F1 as a sport over those years?

(rubs his fingers together) Too much money. Values have changed since the ’60s. In my view there’s simply too much money to play for nowadays. Bernie Ecclestone controls the whole F1 business. He owns all the media rights. Money is the only thing that counts anymore. It’s devoid of emotion.

Are the races still exciting at all?

Much less so. Now that Michael Schumacher is no longer on the scene perhaps that may improve again. But there’s already been much change.

What event has affected you the most?

Obviously the death of Ayrton Senna. And the incident at the Melbourne Grand Prix six years ago. I was standing close to the curve, when two meters in front of me Jacques Villeneuve came a cropper, his car somersaulted and parts of the car flew into the spectator area. A marshal lost his life in the process, and two people were seriously injured. Since then the tracks have seen enormous improvement.

Fashion and motor racing demand the aestheticization of an individual or object. How do things differ in the humanitarian area?

Do nice war pictures make sense?

That’s the problem in photo journalism: Poverty holds a fascination, it’s the tragedy of the whole thing. There is a certain aesthetic within this tragedy. You find a good deal of melancholy in pictures by Sebastiano Salgado or James Nachtwey. And in my pictures too, to some extent. They fascinate. Is that aesthetics? Perhaps of a different kind, but I tend to think it’s despair.

You’re a photographer and since fall 2005 you’ve also been directing a major Hollywood movie. Your first film deals with war. Is the job of a director a logical extension of your career: from classical photography through advertising photography to film? Making movies is a dream for me; I’ve finally got something to say. With movie projects I can do things that aren’t possible with photography. Through my photographs, my wish is to touch lots of people’s hearts. That’s the only thing that counts for me.

So you’re moving away from photography?

Yes.

You’ve done a lot and there’s not much you haven’t turned your hand to. Is there a special commission you’d like to take on?

I’d really like to shoot a documentary about Barack Obama: his road to becoming a Democratic presidential candidate. Obama’s the only ray of hope for America. He’s young, he’s energetic, he’s got charisma, and he speaks from the heart.

Is there anything or anyone you’d never photograph?

I wouldn’t do cigarette ads, as a matter of principle. Or Johnny Hallyday. <
Samba Syndrome

Fittipaldi, Piquet, Senna, Barrichello, Massa – virtually no other country produces as many successful racing drivers as Brazil. We find out why.

‘It must be down to the water they drink,’ was Jackie Stewart’s take on the Brazilian racing driver phenomenon. The words he chose were rather unorthodox, but this was the ‘70s – when a certain Emerson Fittipaldi twice picked up the world championship title. Between then and 1993, the world championship title would go to Brazil six times: three times to Nelson Piquet and three to Ayrton Senna. And in the shape of the talented Felipe Massa (Ferrari) and veteran Rubens Barrichello (Honda), Brazil has at least two more arrows in its quiver for the years ahead.

That still leaves the question of ‘why,’ however. Bear in mind that motor racing is a sport that requires a lot of investment and Brazil – despite its huge reserves of raw materials – is still a relatively poor country. But the country’s footballing tradition is easy to understand:

Buying a ball doesn’t cost much, and there’s also no shortage of space to play in a country with a land area of 8.5 million square kilometers. And yet there are some amazing similarities between football and motor racing – however incredible that might sound.

Should you wish to embarrass a Brazilian, all you need to do is ask him or her to do something that requires a high degree of discipline if it’s to be done successfully. How come, for instance, the Brazilians are not any better at gymnastics? It’s quite simple: This is a sport that leaves no room for improvisation. All movements are the result of precisely planned, scientifically developed exercises, together with a huge amount of discipline. If, on the other hand, you were to invent some sort of game and say: “Guys! There aren’t any rules, you just need to try doing this or that,” the Brazilians would feel completely in their element. One need only think about the carnival and its processions. Each member of the various samba schools obviously has a more or less clearly defined function on this moving stage – I would emphasize “more or less,” because nothing is absolute in Brazil. What really matters to the people on the stages and the jury, however, is their creativity, their spontaneous movements and their gracefulness.

None other than Ayrton Senna showed his mastery of the ability to improvise when he swept along the track at 300 km per hour. A racing driver is exposed to constant challenges and has fractions of seconds to assess a situation and then fractions of seconds in which to react to it correctly. And isn’t that precisely what Brazilians do in their day-to-day lives? Doesn’t their way of life also consist of challenges, assessing these challenges, and responding appropriately to them, thereby obviating the need for meticulous planning?

Planning is an alien concept in football too – well, at least in the Brazilian version of it. Here too, every situation calls for a rapid interpretation and immediate reaction. A football player obviously behaves completely differently than a racing driver, though seen in conceptual terms they are not at all dissimilar. The things a football player does on the pitch, and a racing driver in his racing car, are to a certain degree an extension of what the majority of Brazilians do in their everyday life – at least as far as the strain on their nerves is concerned. So a Brazilian headed for the pitch or racetrack has already got his basic training behind him.

This doesn’t explain everything, of course. But it’s at least a good start, isn’t it? Combine that with the Brazilians’ enthusiasm for cars and speed, and we get fairly close to the heart of the matter. Many Brazilian boys drive karts, which shows that motor racing seems to be in the Brazilians’ blood. Karting certainly costs a lot of money. But those who drive a kart solely with a view to a career in motor racing don’t come from the favelas anyway; instead, they come from Brazil’s middle class at least.

The media are doing their bit. The attention paid by the press to motor racing is much greater than in other countries. The number of viewers of Formula One transmissions on the Globo TV network averages eight million per race. Therefore, some firms are happy to invest in the career of young racing drivers. Because the revenues they can expect from their media presence are in many cases worth the sponsorship. That explains why there’s almost always a Brazilian on the driver lists for the most prestigious categories in Europe, the U.S., Japan and Australia. And in how many golf tournaments is Brazil represented? None that I know of. <

Livio Oricchio was born in São Paulo in 1954. He experienced his first Grand Prix as a reporter in Rio de Janeiro in 1987. Since 1991 he has tirelessly traveled the world’s race circuits, almost always on behalf of daily newspaper O Estado de São Paulo and radio station Globo/CBN. As for the 2007 season, our expert anticipates a very tight battle between Renault, Ferrari, McLaren Mercedes and BMW Sauber. Asked about who he expects to in the title, Oricchio is prepared to put patriotism to one side. Neither Massa nor Barrichello, he says. His tip is Räikkönen.
Circuits, Teams, Drivers

F1-Season 2007

Calendar

March 18  ..................................................................Melbourne, Australia
April 8  ........................................................................Kuala Lumpur, Malaysia
April 15 ........................................................................Manama, Bahrain
May 13 ........................................................................Barcelona, Spain
May 27 ........................................................................Monte Carlo, Monaco
June 10 ........................................................................Montreal, Canada
June 17 ........................................................................Indianapolis, United States
July 1 .............................................................................Magny-Cours, France
July 8 ...........................................................................Silverstone, Great Britain
July 22 ........................................................................Nürburgring, Germany
August 5 .......................................................................Budapest, Hungary
August 26 .....................................................................Istanbul, Turkey
September 9 ..................................................................Monza, Italy
September 16 .....................................................Spa-Francorchamps, Belgium
September 30 ................................................................Fuji, Japan
October 7 .....................................................................Shanghai, China
October 21 ....................................................................São Paulo, Brazil
Teams and Drivers: The Formula One Field at a Glance

Eleven teams will be battling it out in the 2007 season. Among the drivers, Lewis Hamilton, Heikki Kovalainen and Adrian Sutil are newcomers. They will be making their Formula One debut in Australia.

McLaren Mercedes

<table>
<thead>
<tr>
<th>Name</th>
<th>Nationality</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fernando Alonso</td>
<td>Spain</td>
<td>1</td>
</tr>
<tr>
<td>Lewis Hamilton</td>
<td>Great Britain</td>
<td>2</td>
</tr>
</tbody>
</table>

- Born: Fernando Alonso - July 29, 1981
- Born: Lewis Hamilton - January 7, 1985
- F1 debut: Fernando Alonso - 2001
- F1 debut: Lewis Hamilton - 2007
- GP starts: Fernando Alonso - 87
- GP starts: Lewis Hamilton - 0
- GP wins: Fernando Alonso - 15
- GP wins: Lewis Hamilton - 0
- Pole positions: Fernando Alonso - 15
- Pole positions: Lewis Hamilton - 0
- 2006 overall ranking: Fernando Alonso - 1st
- 2006 overall ranking: Lewis Hamilton - –

"You've got to take your hat off to him. In 2006 he got the job done and didn't give up and even with all the technical things that were thrown at Renault, to try and take a bit of pace out of them, it didn't really have an overall effect." Mark Blundell

"Lewis has won the title in every category he's contested so far. I can't see any reason why he shouldn't be just as successful in Formula One, especially as the McLaren Mercedes works driver." Murray Walker

Renault F1 Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Nationality</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giancarlo Fisichella</td>
<td>Italy</td>
<td>3</td>
</tr>
<tr>
<td>Heikki Kovalainen</td>
<td>Finland</td>
<td>4</td>
</tr>
</tbody>
</table>

- Born: Giancarlo Fisichella - January 14, 1973
- Born: Heikki Kovalainen - October 19, 1981
- F1 debut: Giancarlo Fisichella - 1996
- F1 debut: Heikki Kovalainen - 2007
- GP starts: Giancarlo Fisichella - 177
- GP starts: Heikki Kovalainen - 0
- GP wins: Giancarlo Fisichella - 3
- GP wins: Heikki Kovalainen - 0
- Pole positions: Giancarlo Fisichella - 3
- Pole positions: Heikki Kovalainen - 0
- 2006 overall ranking: Giancarlo Fisichella - 4th
- 2006 overall ranking: Heikki Kovalainen - –

"I don't think Giancarlo Fisichella will have enough pace to lead the team the way Fernando Alonso did last season." Stirling Moss

"Heikki Kovalainen will have some fantastic races in 2007, but we'll also see some spectacular mistakes from him. It's simply part of the learning process." Pat Symonds

Scuderia Ferrari

<table>
<thead>
<tr>
<th>Name</th>
<th>Nationality</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felipe Massa</td>
<td>Brazil</td>
<td>5</td>
</tr>
<tr>
<td>Kimi Räikkönen</td>
<td>Finland</td>
<td>6</td>
</tr>
</tbody>
</table>

- Born: Felipe Massa - April 25, 1981
- Born: Kimi Räikkönen - October 17, 1979
- F1 debut: Felipe Massa - 2002
- F1 debut: Kimi Räikkönen - 2001
- GP starts: Felipe Massa - 70
- GP starts: Kimi Räikkönen - 104
- GP wins: Felipe Massa - 2
- GP wins: Kimi Räikkönen - 9
- Pole positions: Felipe Massa - 3
- Pole positions: Kimi Räikkönen - 11
- 2006 overall ranking: Felipe Massa - 3rd
- 2006 overall ranking: Kimi Räikkönen - 5th

"To be quite honest, I never really rated Massa. But give him the right car and he's a terrific driver. In two or three races he produced a really strong performance. Only fools never change their minds. I realize that." Flavio Briatore

"Räikkönen's got to follow in Schumacher's footsteps at Ferrari. That's a tall order, because German precision has helped the team triumph for many years. Kimi has his work cut out there – and he isn't always the hardest worker." Niki Lauda
### Honda Racing F1 Team

<table>
<thead>
<tr>
<th>F1 Debut</th>
<th>1964</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wins</td>
<td>3</td>
</tr>
<tr>
<td>Chassis</td>
<td>Honda RA107</td>
</tr>
<tr>
<td>Engine</td>
<td>Honda RA80TE</td>
</tr>
<tr>
<td>Team boss</td>
<td>Nick Fry</td>
</tr>
<tr>
<td>Test driver(s)</td>
<td>Christian Klien (A), James Rossiter (GB)</td>
</tr>
</tbody>
</table>

- **Jenson Button (Great Britain)**
  - Born: January 19, 1980
  - F1 debut: 2000
  - GP starts: 118
  - GP wins: 1
  - Pole positions: 3
  - 2006 overall ranking: 6th

  "Jenson Button’s Hungarian victory, amid difficult conditions, made an impression on me. He’s matured a lot. Whether it’s already too late for him to be world champion depends on how things go this year."  
  — John Surtees

### BMW Sauber F1 Team

<table>
<thead>
<tr>
<th>F1 Debut</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wins</td>
<td>0</td>
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<tr>
<td>Chassis</td>
<td>BMW P86/7</td>
</tr>
<tr>
<td>Engine</td>
<td>Toyota RVX-07</td>
</tr>
<tr>
<td>Team boss</td>
<td>Mario Theissen</td>
</tr>
<tr>
<td>Test driver(s)</td>
<td>Sebastian Vettel (D), Timo Glock (D)</td>
</tr>
</tbody>
</table>

- **Nick Heidfeld (Germany)**
  - Born: May 10, 1977
  - F1 debut: 2000
  - GP starts: 115
  - GP wins: 0
  - Pole positions: 1
  - 2006 overall ranking: 9th

  "Nick Heidfeld’s a smooth operator, and is often slightly underrated. I don’t think he’s reached the peak of his powers as yet. He can go further still."  
  — Peter Sauber

- **Robert Kubica (Poland)**
  - Born: December 7, 1984
  - F1 debut: 2000
  - GP starts: 118
  - GP wins: 0
  - Pole positions: 0
  - 2006 overall ranking: 16th

  "Robert Kubica is undoubtedly a huge talent. I think his second year will be crucial for him in terms of what the future has in store."  
  — Peter Sauber

### Panasonic Toyota Racing

<table>
<thead>
<tr>
<th>F1 Debut</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wins</td>
<td>0</td>
</tr>
<tr>
<td>Chassis</td>
<td>Toyota TF107</td>
</tr>
<tr>
<td>Engine</td>
<td>Toyota RVX-07</td>
</tr>
<tr>
<td>Team boss</td>
<td>Tatsuto Tomita</td>
</tr>
<tr>
<td>Test driver</td>
<td>Franck Montagny (F)</td>
</tr>
</tbody>
</table>

- **Ralf Schumacher (Germany)**
  - Born: June 30, 1975
  - F1 debut: 1997
  - GP starts: 163
  - GP wins: 6
  - Pole positions: 6
  - 2006 overall ranking: 10th

  "There’s never been a ‘Rolex Ralf.’ Ralf Schumacher is a highly intelligent, highly sensitive racing driver. He’s anything but straightforward. You’ve just got to accept that."  
  — Hans Mahr

- **Jarno Trulli (Italy)**
  - Born: July 13, 1974
  - F1 debut: 1997
  - GP starts: 165
  - GP wins: 1
  - Pole positions: 3
  - 2006 overall ranking: 12th

  "Trulli is of the same caliber as Ralf Schumacher. I’d rank both of them equally. The only problem is that Trulli needs a car with a completely different setup than Ralf’s."  
  — Hans-Joachim Stuck

### Red Bull Racing

<table>
<thead>
<tr>
<th>F1 Debut</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wins</td>
<td>0</td>
</tr>
<tr>
<td>Chassis</td>
<td>Red Bull RB3</td>
</tr>
<tr>
<td>Engine</td>
<td>Renault RS 27</td>
</tr>
<tr>
<td>Team boss</td>
<td>Christian Horner</td>
</tr>
<tr>
<td>Test driver(s)</td>
<td>Michael Ammermüller (D), Robert Doornbos (NL)</td>
</tr>
</tbody>
</table>

- **David Coulthard (Great Britain)**
  - Born: March 27, 1971
  - F1 debut: 1994
  - GP starts: 211
  - GP wins: 13
  - Pole positions: 12
  - 2006 overall ranking: 13th

  "I don’t think age is a barrier. If you’re fit and committed, and have the will to win, you can do it. And David remains fired up."  
  — Christian Horner

- **Mark Webber (Australia)**
  - Born: August 27, 1976
  - F1 debut: 2002
  - GP starts: 86
  - GP wins: 0
  - Pole positions: 0
  - 2006 overall ranking: 14th

  "Red Bull Racing’s probably a good team for Mark, because the car’s headed in the right direction and the team offers him chances he wouldn’t get elsewhere."  
  — Stirling Moss
### Williams F1 Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Nationality</th>
<th>Birth Date</th>
<th>F1 Debut</th>
<th>GP Starts</th>
<th>GP Wins</th>
<th>Pole Positions</th>
<th>2006 Overall Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nico Rosberg</td>
<td>Germany</td>
<td>June 27, 1985</td>
<td>2006</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>17th</td>
</tr>
<tr>
<td>Alexander Wurz</td>
<td>Austria</td>
<td>February 15, 1974</td>
<td>1997</td>
<td>53</td>
<td>0</td>
<td>0</td>
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</table>

- He dominated the GP2 series and has been competitive from the word ‘go’ since moving into a Formula One car – that’s better than expected.
- Alex has really surprised me with his consistency and self-belief. He’s been working systematically on his career and can now, hopefully, achieve what he wants to achieve.

- Michael Schumacher

### Scuderia Toro Rosso

<table>
<thead>
<tr>
<th>Name</th>
<th>Nationality</th>
<th>Birth Date</th>
<th>F1 Debut</th>
<th>GP Starts</th>
<th>GP Wins</th>
<th>Pole Positions</th>
<th>2006 Overall Ranking</th>
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<tbody>
<tr>
<td>Vitantonio Liuzzi</td>
<td>Italy</td>
<td>August 6, 1981</td>
<td>2005</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>19th</td>
</tr>
<tr>
<td>Scott Speed</td>
<td>USA</td>
<td>January 24, 1983</td>
<td>2006</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>20th</td>
</tr>
</tbody>
</table>

- Vitantonio’s driving was inspiring at times last season and he showed pace, so much so that you thought: ‘That’s the guy we’ve been hearing so much about.
- Formula One could also become a big thing in the States. All that needs to happen is for Scott Speed to win races or the world championship.
- Michael Schumacher

### Spyker F1 Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Nationality</th>
<th>Birth Date</th>
<th>F1 Debut</th>
<th>GP Starts</th>
<th>GP Wins</th>
<th>Pole Positions</th>
<th>2006 Overall Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christijan Albers</td>
<td>Netherlands</td>
<td>April 16, 1979</td>
<td>2005</td>
<td>37</td>
<td>0</td>
<td>0</td>
<td>22nd</td>
</tr>
<tr>
<td>Adrian Sutil</td>
<td>Germany</td>
<td>January 24, 2006</td>
<td>2007</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
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</tbody>
</table>

- I haven’t seen all of Christian’s races, but I think he’s a very good driver. However, he drives for a team that finds it very difficult to pick up points.
- Adrian is one of the fastest young drivers there is in the sport, and he’s very strong mentally. I’m sure he’ll live up to expectations, and show his potential as a future star.

- Jos Verstappen
- Colin Kolles

### Super Aguri F1

<table>
<thead>
<tr>
<th>Name</th>
<th>Nationality</th>
<th>Birth Date</th>
<th>F1 Debut</th>
<th>GP Starts</th>
<th>GP Wins</th>
<th>Pole Positions</th>
<th>2006 Overall Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takuma Sato</td>
<td>Japan</td>
<td>January 28, 1977</td>
<td>2002</td>
<td>69</td>
<td>0</td>
<td>0</td>
<td>23rd</td>
</tr>
<tr>
<td>Anthony Davidson</td>
<td>Great Britain</td>
<td>April 18, 1979</td>
<td>2002</td>
<td>3</td>
<td>0</td>
<td>0</td>
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</table>

- Takuma Sato has had a few very good races, and he’s done everything asked of him. His form has really struck me over the course of the season.
- I expect good qualifying sessions from Davidson right from the start, but his lack of race experience will probably slow him down because no matter how much testing you’ve done, races are a different matter.

- Mark Blundell
- Mark Preston
March 18, 2007

**Australian GP in Melbourne**

Circuit length .............................. 5,303 km
Number of laps ............................. 58
Max. throttle ................................ 58%

"Albert Park is one of my favorite circuits because it’s partly raced on roads. There are also a number of runoff areas, which makes things a bit easier. There isn’t much grip and there are rather a lot of bumps, although conditions improve greatly over the course of the weekend. You have to be able to make changes to the car and understand how it will react. I like the course a lot – it’s a real challenge, with tight corners alternating with full-throttle sections."  

Robert Kubica

April 8, 2007

**Malaysian GP in Kuala Lumpur**

Circuit length .............................. 5,543 km
Number of laps ............................. 57
Max. throttle ................................ 56%

"Heat and high humidity make this a particularly tough Grand Prix. So far I’ve never really had a problem with the conditions though. I don’t object to the odd tropical downpour – I actually enjoy driving on wet circuits. I’m also looking forward to being in the country again. We used to do a lot with Petronas here in the past, and I’ve also spent time on vacation in Malaysia. So I feel I now know a bit about the place."  

Nick Heidfeld

April 15, 2007

**Bahrain GP in Manama**

Circuit length .............................. 5,412 km
Number of laps ............................. 57
Max. throttle ................................ 61%

"The Bahrain race in 2006 was my first outing during a GP weekend. It was a really great feeling. There was little grip on the circuit, especially because of the sand blown in on the desert wind. But the circuit is certainly easier with the V8 engines than it used to be with the V10s. Now you can take two or three of the corners flat out. With new tires and reduced grip, however, the 2007 race promises to bring new challenges. Overall Bahrain is a really nice circuit."  

Robert Kubica

May 13, 2007

**Spanish GP in Barcelona**

Circuit length .............................. 4,627 km
Number of laps ............................. 66
Max. throttle ................................ 60%

"Every driver knows the Barcelona circuit like the back of his hand, as a lot of testing goes on here. It’s fast and has great corners. It has become a more glamorous event since becoming the home Grand Prix for the world champion. Extra grandstands were built for the 2006 GP and they were absolutely packed too. Lining up on the grid against a backdrop like that is an amazing experience for any driver, not just Fernando."  

Nick Heidfeld

May 27, 2007

**Monaco GP in Monte Carlo**

Circuit length .............................. 3,340 km
Number of laps ............................. 78
Max. throttle ................................ 41%

"The sensation of running flat out around the city’s narrow streets with hardly an inch to spare on either side is absolutely unique. The rush is unbelievable. The track is phenomenal and the spectators lining the circuit get a real impression of the speed and noise of the event. The whole city seems to vibrate – even into the night, when the drivers are tucked into bed. I lived in Monaco for a few years and always enjoy coming back."  

Nick Heidfeld

June 10, 2007

**Canadian GP in Montreal**

Circuit length .............................. 4,361 km
Number of laps ............................. 70
Max. throttle ................................ 60%

"Montreal is the sort of road circuit that doesn’t allow even the slightest margin for error. That’s what I like about it! As in Melbourne, the circuit offers little grip at the start of the weekend and it’s a pretty bumpy ride. There are some nice difficult corners, a few stop/start passages and some bouncing around chicanes with a wall waiting to catch you on exit. I’m really looking forward to this year’s race."  

Robert Kubica
June 17, 2007
United States GP in Indianapolis

Indianapolis Motor Speedway
Circuit length ........................................ 4,192 km
Number of laps ........................................ 73
Max. throttle ........................................... 55%

“I drove one of my best races at Indy in 2001. Despite losing first, second and seventh gears, I somehow still managed to finish sixth. In 2006 my race was over after just a few meters. I was involved in a collision that turned the car over and over. For all of us in F1 it’s a special experience to drive the banked corner, even though basically it’s pretty simple – you just put your foot down.” Nick Heidfeld

July 1, 2007
French GP at Magny-Cours

Circuit de Nevers
Circuit length ........................................ 4,411 km
Number of laps ........................................ 70
Max. throttle ........................................... 53%

“I have a fairly ambivalent attitude toward Magny-Cours. It’s not one of my favorite circuits, although I wouldn’t say I dislike it. I don’t have an issue with it. Magny-Cours is much more fun in an F1 car than in the smaller cars I used to drive in other categories. In particular, the chicanes really show off the potential of an F1 car.” Robert Kubica

July 22, 2007
European GP at the Nürburgring

Nürburg Grand Prix Kurs
Circuit length ........................................... 5,148 km
Number of laps ........................................ 70
Max. throttle ........................................... 55%

“I always look forward to the Nürburgring. I learned to ride a bike there as a three-year-old and even went sledding on the Nordschleife. I was eight when I drove a kart there for the first time. These are really happy memories. In 2005 I secured my first pole position in Formula One at the Ring, finishing second in the race itself. It’s also the venue that attracts more of my fans than any other circuit. The support I get here is just fantastic.” Nick Heidfeld

August 5, 2007
Hungarian GP in Budapest

Hungaroring
Circuit length ........................................... 4,381 km
Number of laps ........................................ 70
Max. throttle ........................................... 48%

“I’ve got very fond memories of the Hungaroring. The 2006 GP was fantastic; there was so much going on. I got a rear shunt from Michael Schumacher after I went past him and ended the race with a damaged car. But I still managed a podium finish. I also won my Formula 3000 title in Budapest in 1999. The many corners make it a very physical circuit and overtaking is difficult.” Nick Heidfeld

August 26, 2007
Turkish GP in Istanbul

Istanbul Racing Circuit
Circuit length ........................................... 5,338 km
Number of laps ........................................ 58
Max. throttle ........................................... 60%

“An amazing new circuit – turn eight has already staked its claim to fame. Most drivers find this section quite a challenge. It’s very long and in fact consists of four different bends. It’s great fun as soon as you’ve got your line sorted out. The circuit can also be pretty vicious, because occasionally you bottom out, lose traction and the car becomes unstable. We weren’t particularly fast there in 2006. I hope things will look better in 2007.” Robert Kubica
One of stark contrasts – with amazing ultramodern second gear. Shanghai is a fascinating place, but closes tighter and tighter, forcing you to change to rate the first part of the bend. Then the corner at it flat out and maintain speed even as you initiate the first aero package and special setup. I finished third here in 2006."

Robert Kubica

"The Italian GP is very special to me because I spent a few years living not far from Monza during my karting days and racing in junior series. Until there's a Polish GP I'll always think of Monza as my home circuit. Low downforce, hard braking, extremely high speeds – the cars here have a completely different nature in their handling and braking. I haven't driven Spa that often. We're quite used to g-forces from lateral acceleration, but not to the extent we're used to at Spa-Francorchamps.

Robert Kubica

"For me Spa is one of the great race circuits. Eau Rouge is a really unique curve, and I would recommend people to go and see it for themselves. Although the compression is not a problem in physical terms, it's really unlike anything else. After all, we're quite used to g-forces from lateral acceleration and braking. I haven't driven Spa that often. Races weren't held there during my time in Formula Ford and Formula 3, and I was forced to miss the last GP held there."

Nick Heidfeld

"It's always exciting to come to a new race circuit. None of the Formula One drivers will really know it well. I usually get to find my way around new circuits quickly. Like most drivers I was very fond of Suzuka and would be very pleased to drive there again one day. But I'm very confident that the new course at Fuji will prove to be just as successful."

Robert Kubica

"Even though the course is so new, it certainly has character. The first turn is very unusual. You arrive at it flat out and maintain speed even as you initiate the first part of the bend. Then the corner closes tighter and tighter, forcing you to change to second gear. Shanghai is a fascinating place, but one of stark contrasts – with amazing ultramodern architecture standing side-by-side with abject poverty."

Nick Heidfeld

"With its infamous bumps, Interlagos reminds me of some road circuits. The track surface is the worst of any on the F1 calendar. You need to find the right balance for the car and get adequate downforce in the slow corners. But there is also the long, uphill straight where it's important to reach a good top speed. I have fond memories of Interlagos – I won my first race there in a Formula Renault 2000."

Robert Kubica
The Most Important Points in Brief

Schedule (local times)

**Friday**
- 10:00–11:30.........................First free practice
- 14:00–15:30.........................Second free practice

**Saturday**
- 11:00–12:00.........................Third free practice
- From 14:00............................Qualifying

**Sunday**
- From 14:00............................Race

Qualifying All the cars run laps during the first 15-minute session. At the end of the first 15 minutes, the six slowest cars drop out of the qualifying process. These cars make up the six spots at the back of the starting grid, the driver with the fastest lap time among them occupying 17th spot on the grid, followed by the remaining five cars in order of their qualifying time.

The best times set by the remaining 16 cars are wiped clean for part two of the qualifying procedure. At the end of the second 15-minute session, the process is repeated with the six slowest cars dropping out of further qualifying. This second set of six cars occupies starting positions 11 through 16.

Again, the qualifying times are reset for the 10 cars that remain, and the drivers enter the final qualifying session. The drivers have 15 minutes to decide the top-ten spots among themselves. The fastest qualifier takes pole position.

Fuel can be added at any time during the first two qualifying sessions. Those cars eliminated in the first two qualifying sessions are allowed to refuel, as long as this is done before the pit lane is opened prior to the race on Sunday.

The teams that participate in the final 15 minutes of qualifying must begin the final session with the fuel load on which they plan to start the race. Fuel used in the final qualifying session can be replaced prior to the start of the race.

Safety Car As soon as the safety car moves onto the track, the pit lane is closed. It is only opened again once all the cars have lined up behind the safety car. In addition, lapped drivers then have to overtake any drivers ahead of them who are on the lead lap. They also overtake the safety car, drive an additional lap and rejoin the field at the back. This rule does not apply to drivers who are already at the back of the field with no leading cars ahead of them; they simply remain in their position. The safety car stays out at least until this process is fully completed.

Engines Only V8 engines with a cubic capacity of 2.4 liters will be used in the 2007 season. As before, the engines must have completed two weekends, though in 2007 this applies only on the Saturday and Sunday. Fridays are no longer subject to this rule, with the result that power units can be changed prior to the Saturday training session. These changes promise more action for fans on Fridays. Tight restrictions have been imposed on further development of the engines. The teams have to submit a homologated engine – based on an engine that completed two races in the 2006 season – to the FIA by March 1, 2007. This power unit will serve as a technical basis from 2007 through 2010. Modifications are only permitted to peripheral areas, for example, on the velocity stacks or exhaust piping. The entire crank mechanism and valve train must remain unchanged and in line with the homologated engine. Engine speed is capped at 19,000 rpm.

Tires From 2007, Formula One will be served by a single tire supplier: Bridgestone. The Japanese company will supply two specifications of its Bridgestone Potenza tire at each Grand Prix, from which the teams can choose. Each driver will have 14 sets of dry-weather tires (seven sets per specification) at his disposal. A driver may use a maximum of four sets on the first practice day and the remaining 10 on the Saturday and Sunday. In dry conditions, both specifications must be used during the race. In the wet, the driver has a total of seven sets of wet-weather tires available to him (four sets of wet-weather tires and three sets of extreme-weather tires). Between four and seven gears may be used.
Credit Suisse takes a look behind the scenes in the world of car racing: Our race analyses, audio interviews, an online game, as well as picture galleries and reports on everything relating to the BMW Sauber F1 Team are designed to keep all you car racing fans out there up to speed.

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Peter
For 36 years, Peter Sauber drove his racing team toward success. That was before handing over control to BMW at the end of 2005. But the motorsports pioneer hasn’t quit the scene entirely. Sauber’s “family” – as he calls Formula One – is simply too close to his heart. In this interview, the man from Zurich explains how his advice is still in demand.

Interview: Andreas Thomann

Bulletin: Has your quality of life improved since retiring as team boss?
Peter Sauber: Well, my life’s different now – though it’s certainly not deteriorated in any way.

What do you mean by different?
Every day is still jam-packed, but my working day is shorter and I’m not as efficient as before – I suppose because the pressure’s off to some degree.

Are there any hobbies that you’ve rediscovered?
Not really. I’ve been out and about a bit more often on my motorcycle. In the winter I’ve had a little more time to go skiing.

You’ve still got at least one foot in the Formula One camp.
What exactly do you do?
First and foremost I act as a point of contact for the BMW Sauber F1 team, with which I’ve got a consulting agreement. I’m also responsible for its two partners: Credit Suisse and Petronas.

Does that mean we’ll be seeing you regularly in the paddock this coming season too?
Yes, I’ll be attending about 10 races.

So, you can’t tear yourself away from it all?
That’s not true. If BMW hadn’t offered me this consulting agreement I could well have been able to call it a day. I can easily imagine a life without Formula One. I’d hardly have been sitting around doing nothing, though. Instead I’d very likely have been hunting around for a new challenge.

Is there still much call for your advice at BMW Sauber?
To some extent. It depends on the issue really. On strategy matters my advice can still be valuable – simply because of my many years of experience. But I stay well out of the day-to-day stuff.

That gives you more time to get involved with general questions surrounding Formula One. Is the series headed in the right direction?
Ask three people the same question and you’ll get three totally different answers. But it’s probably the same in any business. Opinions vary. Right now, the direction of Formula One is primarily being determined by FIA President Max Mosley – with the backing of Bernie Ecclestone. Even if I don’t welcome everything they decide, I can happily live with the general thrust of things.

So do you also welcome this season’s switch to standardized tires from Bridgestone?
At the end of the day, I think standardized tires are a good move. We’ve seen in the past how tires can sometimes have a really big effect on the car’s performance – much more so than the aerodynamics or the engine. Often this has seriously distorted the...
Milestones in a Racing Career

1967 Peter Sauber makes his first move into motor racing. The qualified electrician buys a souped-up VW Beetle from Zurich racing driver Arthur Blank and enters his first races.

1970 In the basement of his parents’ home in Zurich, Peter Sauber builds his first race car. In the “C1” he immediately proceeds to win the Swiss Sports Car Championship.

1976 Equipped with a BMW engine, the “C5” is the most successful of the early Sauber cars, helping Switzerland’s Herbert Müller to overall victory in Europe’s Inter serie championship.

1985 After a 30-year absence, Mercedes plans a return to motor racing in partnership with Peter Sauber. The “C8” is the first product to emerge from this successful collaboration.

1989 Sauber becomes the official works team of Mercedes. The silver “C9” takes Sauber to one-two victory in Le Mans and the Constructors’ and Drivers’ Championship titles in the Sportscar World Championship.

Has your old firm changed its identity?
It’s difficult to say. The management here at Hinwil is still the same, and to a large extent there’s still the same spirit. A top executive from Munich arrived and he is at pains to integrate the two sites at a gradual pace, and only in areas where integration makes sense. There’s also a feeling of continuity among the racing team, where the same people who worked under me remain a tight-knit bunch. Yet massive expansion obviously brings change. But it wouldn’t have been any different in my day if I’d suddenly expanded the workforce to 430 people.

The fact that the Sauber name lives on is also emblematic of continuity. Does that give you a certain pride?
It was a decision taken by BMW. One thing shouldn’t be forgotten, and that’s the fact that Sauber has a good name in Germany, stemming from the sports car era with Mercedes but also from Formula One. For many years, readers of the weekly Motorsport aktuell voted us their favorite team. So the Sauber name had a good reputation, and BMW presumably wanted to carry that over to the new team. Obviously I’m happy about that – very happy, in fact. I think it’s a nice gesture as far as long-standing employees are concerned, but also for the media and the fans in Switzerland. And it’s obviously a matter of personal pride to see the name live on.

The fact that we’re now in 2007 and the Sauber name lives on in racing would scarcely have been thought possible when you started out in Formula One 14 years ago. Why is it that Sauber has survived, yet many rivals have disappeared from the scene?
I always tried hard to keep both feet on the ground, keep an eye on the financial and personal boundaries, and work hard. The last of those things applied not only to me, however, but to the whole team. I think the employees were the most important factor of all. Perhaps my strength lay in the fact that I always found good staff who were also prepared to dedicate themselves to the firm.

You also proved that you had a good nose for talent when it came to drivers: Michael Schumacher, Heinz-Harald Frentzen, Kimi Räikkönen, Felipe Massa – many of the stars

results, especially as the tires were highly dependent on weather conditions – whether dry or wet, hot or cold. It might well have been interesting for spectators in one or two instances, but it sure made life difficult for the teams.

The second big change concerns engine development, which has been frozen at the level of December 2006. What’s your view on that?
For the manufacturers it cuts two ways. On the one side, they’re aiming to outshine their rivals through innovative technology; on the other, they’re wanting to save costs. Depending on what you believe is more important, you’re either for or against. But from the viewpoint of an independent, mid-sized team – which has its eyes on costs above all else – this measure should definitely be welcomed in my opinion.

Everyone is talking about costs, but in the end no one really seems to have applied the brakes.
The overriding view in the paddock is that so long as the money’s there it’s going to be spent. I think that sums things up pretty well. For some manufacturers, money hardly plays a roll. These teams will continue shelling out the money they’re given.

No matter what the rules say?
Absolutely. There’s always going to be an opportunity to go on developing and researching somewhere or other.

Right now, Hinwil resembles a giant building site. Has the Hinwil operation, and therefore the economic region as a whole, benefited from BMW’s acquisition of the Sauber team, or is it still too early to say?
No, it certainly has benefited – in a variety of ways. Back in the days of Sauber Petronas we employed up to 300 people, but capacity will now be hiked to 430 people by the end of the season. The suppliers also have considerably more work. Take the PaucoPlast firm in Altendorf, which has been making bodywork parts for us since 1973. They’ve grown their workforce from 25 to 50, and at the same time they’re adapting their infrastructure. We’re experiencing similar things with other suppliers from the region, above all in terms of mechanical assembly.
The fact is, a manager couldn’t approach the likes of McLaren or 1993 The “C12” is you’re reluctant to take on someone like that, even though at a 2001 Sauber takes Credit Suisse on board as its new main sponsor. A mixture of the two. Take Robert Kubica for example: I recom- mended him to Mario Theissen, without him having done a single test for us. I just looked at the results, at his record – so in that case was at the end of his career, wasn’t an alternative either. Putting it was gut instinct, certainly. With Kimi and Massa it was different. three from the German Formula 3 championship – and it worked. Was something you had to weigh up. You can’t compare these three cases. And you can’t compare them to what’s probably the best-known case, either – the trio of Schumacher, Frentzen and Wendlinger. In that instance we were simply lucky. We took the top three from the German Formula 3 championship – and it worked.

Did you rely on gut instinct or ruthless data analysis?
A mixture of the two. Take Robert Kubica for example: I recom- mended him to Mario Theissen, without him having done a single test for us. I just looked at the results, at his record – so in that case it was gut instinct, certainly. With Kimi and Massa it was different. Kimi’s career hadn’t really got off the ground when he came to us. Massa also took a bit longer, but he came a very long way. That was something you had to weigh up. You can’t compare these three cases. And you can’t compare them to what’s probably the best-known case, either – the trio of Schumacher, Frentzen and Wendlinger. In that instance we were simply lucky. We took the top three from the German Formula 3 championship – and it worked.

Not all your driver decisions hit the mark. Probably your most spectacular signing – that of ex-world champion Jacques Villeneuve – didn’t deliver the results you’d hoped for.

Would it be fair to call that a failure?
Failure’s the wrong word. But I probably wouldn’t do it again. With hindsight, obviously, that’s easy to say. At the time, there were no suitable alternatives on the market for that price. David Coulthard also offered his services; he was a driver who’d for years been the number two with McLaren, and that weighed heavily with him. You’re reluctant to take on someone like that, even though at a personal level I’ve always found Coulthard very likeable. Panis, who was at the end of his career, wasn’t an alternative either. Putting a second youngster in the cockpit next to Massa would have been a highly debatable thing to do.

Did you also develop friendships with individual drivers?
I’m very careful about using the word “friendships.” But in the loose sense of the word, I probably did. There’s the special friendship – warm friendship, even – that I still have with Jean Alesi. That’s despite the fact that his hot-tempered nature made him almost impossible to deal with when he was with us (grins). I’m always pleased when I see him.

Is it mutual?
Yes, certainly. Another completely different relationship of mine – but one that’s also based on a lot of rapport – is with Johnny Herbert; though in his active days too there was an element of friction – he would have happily stayed with us longer than three years, but we didn’t want that. I’ve also got a very good relationship with Heinz-Harald Frentzen, Sauber’s most successful driver ever, who also gave us our first and last podium finish.

That slightly dispels the cliché of Formula One being a pool of sharks.
Absolutely. It’s never been like a pool of sharks for me. I’ve never felt uneasy in Formula One. I took a good look at the racing series before I got into it. And it was just the way I’d expected it to be. Whereby probably the most important thing for me was the people. I don’t just mean the team in Hinwil, but also the very close coop- eration with Ferrari, which actually lasted nine years. It was a magnificient collaboration – one that was obviously driven by the very good relationship with Jean Todt. It’s also something that I miss these days to a certain extent: the people. At the end of the day they were my family: I spent more time with them than at home. You got to know lots of people, saw them every two weeks and were thrown together in a very confined space.

You’ve achieved a lot in sporting terms, including six podium places, fourth overall ranking in 2001 – but never a win. Does that bother you?
No, and I’m being totally honest with you. If we’d won a race, it wouldn’t have been a win by our own means. Obviously we’d have been immensely happy, but we’d have known it was due to luck. So there’s nothing to regret.

1993 The “C12” is Sauber’s first Formula One car.
With fifth placing in the South Africa GP, Finland’s J.J. Lehto gives the team a successful debut in the top tier.

1995 Heinz-Harald Frentzen drives to third position at Monza and picks up Sauber’s first podium placing in Formula One. With 42 points in 64 races, Frentzen is Sauber’s most successful driver.

1997 Ferrari replaces Ford as Sauber’s engine supplier. This marks the start of a nine-year partnership. Johnny Herbert provides the highlight of the season by finishing third in Hungary.

2001 Sauber takes Credit Suisse on board as its new main sponsor. And youngsters Nick Heidfeld and Kimi Räikkönen lead Sauber to fourth place in the Constructors’ Cham- pionship.

2006 After 13 years in Formula One, the captain leaves the ship and hands over control to BMW Motorsport Director Mario Theissen. The BMW Sauber F1 Team is born.
For many years, Formula One was the domain of independent, private teams. The exception – Ferrari (Fiat) – confirmed the rule. Today, it’s the big brands which dominate the starting grid. Since 2002, no fewer than four automobile giants have bought a racing team (Renault, Honda and BMW) or created their own (Toyota). Meanwhile DaimlerChrysler got involved back in 1995 through its partnership with McLaren.
Battle of the Giants

In today's Formula One, it's the big players who call the shots. A glance at the rankings shows that last year's six most successful teams are backed by the six biggest automobile manufacturers in the world. Even though just one of these heavyweights will be crowned world champion at the end of the season, they all believe themselves to be winners.

If all the strategy papers, marketing studies, and sales handbooks of the car manufacturers involved in Formula One were to rain from the skies, the race tracks would be covered by a dense layer of white paper in a very short time span. Even today, most of these theories point in the direction of a phrase that was coined in North America in the '50s: “Win Sunday – Sell Monday!” It's so easy – yet at the same time so difficult – to explain the fascination on the part of the major automotive manufacturers toward the top discipline in motor sport. It's about selling cars, and these days a winning smile is the ideal way of doing that. There's just one catch. There are now six big brands fighting it out in the Grand Prix arena to win the favor of spectators and buyers: BMW, Renault, Fiat, DaimlerChrysler, Honda and Toyota. It's in the nature of motor racing that five of them will go home as losers. And that would be a disaster for business. No senior executive would willingly take his company on such a suicide mission. But if it's not just about winning, then, what is it that is beckoning the industry into Formula One on a scale never seen before?

Marketing Jargon Is Everywhere in Motor Racing

For all six, it's primarily about boosting their image and showing their potential audience what they can do. “Look,” they say, "we can do battle with our rivals – and hold our own.” As political correctness more or less precludes companies from staging prestige races against their key rivals on the public highway, the race track is developing into a substitute venue for the world championship in auto marketing. The extent to which the big manufacturers have changed Formula One since the dawning of the new millennium is illustrated by comments made by Frank Williams at the start of this season. Known for his independence and steadfast resistance to takeovers in general, the British team boss announced: “We’re adopting a totally new brand identity in 2007.” Only a few years ago, the angular-faced Brit wouldn’t have wasted any thoughts and certainly not a single penny on his team’s image. Anyone visiting the team's factory at Grove would be offered a couple of sorry-looking cookies. Today, even the smallest race teams adopt the language and ideas of the majors. Profile is no longer just a matter of the right tire selection.

With their Formula One strategies, the big brands attempt to liberate themselves a little from the all-eclipsing drivers’ world championship. In keeping with the motto: “We're right behind the winner.” Ultimately, it is the car producers – together with the main sponsors – who keep the money flowing in. They want something in return, even if it's just increased awareness. The worldwide legend of Formula One produces this on a greater scale than any other championship or series – and a decision to get involved often seems to pay off.

Despite annual investment budgets running into the hundreds of millions, anyone looking for a new image or searching for new brand values would be well advised to walk onto the world stage...
Enthusiasm Is Paying Off

What drives a bank into the world of car racing? There are more parallels than you might think between banking and Formula One. There is a drive for excellence in both — excellence that can only be achieved through the power of innovation, teamwork, precision and efficiency.

These parallels alone do not justify a commitment. Obviously not. The fact is virtually no other sport has a global presence on the scale of Formula One. An average of nearly two billion globally TV viewers follow the live broadcasts of the 17 races, making the Formula One world championship the third-largest sporting event in the world after the Football World Cup and the Summer Olympics.

What’s been the effect of the bank’s involvement since getting on board six years ago? Thanks to Formula One, we’ve strengthened our brand awareness and image throughout the world — especially in important emerging markets like China, Eastern Europe, Southeast Asia and Brazil.

How do your clients respond to Formula One? Very well. We’ve discovered numerous fans among our clients and even attracted a few new ones. We obviously got particularly good feedback from the 4,500 or so guests who since 2001 have been able to experience a live Formula One race thanks to our efforts.

Is this enthusiasm reflected financially in any way? Absolutely. Many of these Grand Prix visitors were really grateful that we made it possible for them to have such an exclusive experience. In quite a few cases, this led to more intensive client relationships. What’s more, our Formula One sponsorship also enabled us to acquire some new clients.

How do your employees feel about the F1 sponsorship? The regular surveys we conduct always show our employees to be very positive about it. That’s important to us, because we also wish to highlight our commitment in-house. For this reason we organize various activities from exclusive visits to the BMW Sauber factory in Hinwil, Switzerland, discounted Grand Prix tickets or marketing merchandise, to a Formula One forecasting game with attractive prizes.

What is Credit Suisse offering its clients and employees in the event of a world championship win? BMW Motorsport Director Mario Theissen doesn’t expect to win the title before 2008. So we’ve still got a little time to give it some thought. ath
racing is still a motivating factor for the car manufacturers’ various departments. Among technicians in particular, the Formula One buzzword helps instill a little corporate identity: a universal team spirit. Given the high degree of specialization that work in the racing departments entails, many engineers are still in a position to indulge themselves. This can produce synergy benefits for series manufacturing, but can equally work in the opposite direction. Hinwil shows how BMW has transferred methods that were tested in series manufacturing across to the building of race cars.

There’s no question that the Japanese companies represent the global yardstick on this score. For flourishing giant Toyota, for instance, the billions invested in building a racing team and factory from the ground up presented no financial problem. At the same time the company is taking account of Formula One’s European roots by building a base in Cologne, Germany. The company is taking longer than expected to get its motor racing outfit into gear – cultural differences no doubt being one contributory factor.

Japanese ambition and the traditional painstaking drive to succeed still need to fit in properly with the unique structures of the motor racing world, which is why many an order or personnel decision from a distant Tokyo is cast aside as unworkable. But this perseverance and the pride of the world’s most profitable auto manufacturer prevents any shelving of its plans. For Toyota, its presence in Formula One is a matter of honor. This is especially true since Honda, its much smaller but more successful competitor in the sport, last year acquired the former BAR racing team as its very own works team, thus getting its first longed-for triumph under its belt. The Asian rivals spur each other on much more than one might suppose at BMW and Mercedes. “We race to sell cars; you guys sell cars to race,” a high-ranking Toyota executive is said to have whispered playfully to his Honda counterpart. This rivalry is encouraging further offensives, and growing corporate interest is also boosting the general interest in Formula One.

Profitability Comes Before Winning the World Championship

The huge concentration of carmakers in the Formula One circuit obviously harbors risks, too. If thousands of workers are laid off at Mercedes, it’s not only the works council that will be asking whether the game’s up for such an expensive marketing tool as motor racing. This may be one of the reasons why the Stuttgart firm did not buy Britain’s McLaren racing team outright (it owns 40 percent of the shares). Here the financial benefits are in competition with the temptation of finally being able to talk about the firm’s own “silver arrows team.” For now, corporate rationale has won the day.

The speed at which involvement can fade is shown by none other than Renault’s world championship team. When “cost killer” Carlos Ghosn took power in the boardroom, it was unclear where the journey would lead – despite the first world championship title. In light of an impending exit, team boss Flavio Briatore hesitated to extend his contract.

Meanwhile, World Champion Fernando Alonso took his leave and signed up at McLaren Mercedes. Though Ghosn has since praised the positive benefits of the involvement in car racing, its continuation was made dependent on the necessary return on investment. The message from the new man in charge sounds somehow familiar: “It’s our job to turn success on the race track into success on the sales floor.”

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Carbon is the magic word for PaucoPlast. Paul Pfenninger (left) and Conrad Rapp got themselves two autoclaves for hardening carbon fiber compounds.

Thomas Walter (left), head of Engines at Kistler Group, and development engineer Stefan Brechbühl produce sensors for measuring the combustion pressure of engines.

Paul Molnar (right) and his operations manager Roger Danner supply BMW Sauber and others with brake rotors – now made from titanium – and ballast, so speed and weight can be got right.
Fast-Paced Partners

Technology is literally taken all the way to the top in Formula One. And racing teams like BMW Sauber also help drive innovation among their numerous partner firms. This is reflected in the network of highly specialized suppliers that has grown up around the Hinwil site. We visited three firms which are typical of all the BMW Sauber F1 Team’s partners – all of them quietly making a material contribution to the team’s sporting success.

Texts: Dorothée Enskog, Andreas Schiendorfer, Michèle Bodmer

Fluid Forms

Are you among those thinking F1 pilots drive the same car throughout the racing season? Then you’re far off the mark. PaucoPlast, a maker of bodywork components for racing cars, supplies the BMW Sauber F1 Team with aerodynamic components in carbon. These parts are constantly modified ahead of races. The company’s co-founders explain why.

A F1 racing car is all about weight and cohesiveness. “The ABC of racing is about driving lightly,” according to Paul Pfenninger. The bodywork components produced by PaucoPlast on behalf of the BMW Sauber’s F1 team are made in carbon fibre, an extremely light and chock-resistant material. The parts are developed and tested in Hinwil, Switzerland, where the team has its base.

Albert 2 Changed the Life of PaucoPlast

Nowadays, the supercomputer “Albert 2” calculates the optimal design of each component with great marksmanship, speeding up the quantity of designs (models) tested. “Earlier on, we had to fiddle on our own,” Pfenninger recalls with some regret. The designs the supercomputer comes up with, make it to the wind tunnel where the aerodynamics of each component is tested. Improved components are produced, the car reassembled and tested during the weekly test ride.

Constant Enhancements

“PaucoPlast lives from the constant enhancements of the cars and not from crashes,” says Conrad Rapp. The BMW Sauber car is different at the end of racing season, compared to the one presented in Valencia mid-January. “The engineers at the wind tunnel always find minor nuances to improve. It’s a compromise between aerodynamics and downforce,” Rapp adds.

A F1 car’s setup is significantly modified ahead of every race to take the aerodynamic requirements of the various racing circuits into account, as well as the ambient air temperature and humidity. The car needs different components on a high-speed circuit like Monza than on a circuit’s like Monte Carlo. “The differences won’t be visible to the naked eye, as the changes made to the various bodywork components can be in the range of a few millimeters. The fact that the car’s silhouette always looks similar also makes it difficult to catch any modifications,” Pfenninger says.

PaucoPlast produces no supporting parts of the BMW Sauber car, like the frame or the nose, but specializes in smaller parts like the rearcase, underbody and brake ventilation. “We are the tailor...”
PaucoPlast in Altendorf has in recent years focused its activities entirely on BMW Sauber. Its specialty is the manufacturing of aerodynamic components made from carbon. This costly material provides an optimum balance between cohesion and weight. With its distinctive, shimmering qualities, carbon is also sometimes referred to as “black gold.” But on the car itself – our picture shows part of the tail from last season – this is obviously no longer visible following the lacquering process. The closest you get to noticing the carbon is through quicker lap time ...

of the case,” Pfenninger underlines. The company and BMW Sauber are mutually dependent, as PaucoPlast owns the group’s largest autoclaves, he adds. Autoclaves are hot air pressure furnaces, where the car’s various components are heated under pressure, in order for the carbon fibre compounds to harden.

Doubled Workforce as BMW Steps Into F1

The Altendorf-based company (canton Schwyz) has doubled its workforce to 50 from 25 since BMW stepped in as the Sauber team’s partner in 2006. PaucoPlast nowadays entirely focuses on supplying the BMW Sauber F1 Team, with its 2007 sales forecast to reach as much as 10 million Swiss francs. “We’re not a supplier of the BMW Sauber F1 Team, but part of the family. We don’t even have a written contract with them,” Pfenninger says.

But it all began in late 1972, when Peter Sauber – the founder of Switzerland’s only Formula One team – held his first meeting with PaucoPlast’s co-founders about the construction of C3 racing cars. It is this type of car that was predominantly used in the Swiss Sports Car Championship.

More Fun Than Business

“Racing was more fun than business for PaucoPlast until the late ’80s. By then, the technology had evolved so much that we decided to solely focus on racing,” Pfenninger adds. “Now, our primary focus is on reaching the third position in the F1 Constructor’s Championships, and that’s realistic,” he concludes. The team finished fifth in 2006.
Crystalline Sensors

Probably only a few firms in Formula One are among the sure winners of each race: Kistler is one of them. All F1 engine manufacturers rely on its sensors to measure combustion pressures, and therefore optimize engine performance.

“At the moment, we’re the number-one supplier of sensors in this market,” explains Thomas Walter, who heads up Kistler’s Engines unit. That may come as a surprise. Not that there could be any doubt about the quality. But the fact that the firm is allowed to sell to other customers in such a vital area – in an industry in which secrecy is taken to almost absurd levels – is something rather unexpected. “Absolute discretion is of supreme importance to us. Industrial espionage wouldn’t make much sense anyway,” explains development engineer Stefan Brechbühl. “Based on the ‘same physics, own mechanics’ principle, the fact is every engine manufacturer employs a different development process. That’s why each team also has its own types of sensors.”

Now a few words about piezoelectricity. Though the term might sound Spanish, Greek speakers will know the answer: “Piezein” means “to press.” In 1880, the Curie brothers used the term to describe the phenomenon they had discovered whereby mechanical pressure could be exerted on the surface of certain crystals to release electric charges. Because this charge is produced in proportion to the pressure applied, it serves as a useful measuring tool. Hans Conrad Sonderegger and Walter Paul Kistler, two former employees of Schweizerische Lokomotiven- und Maschinenfabrik (SLM), put this to good use when they launched the first miniature quartz pressure sensors on the market in the ’50s. These humble beginnings eventually led to the creation of the international Kistler group, with around 800 employees and an annual turnover of some 174 million Swiss francs.

The automotive market has always been an important customer for Kistler sensors, with BMW in Munich also putting its faith in them at an early stage for its Formula One turbo engines. Peter Sauber then came into (indirect) contact with them in 1989. In winning the Le Mans 24-hour race with his Group C silver arrows, he relied on a Mercedes engine which had been developed using the then revolutionary 6051 high-temperature pressure sensor.

“In F1 engines, our sensors are exposed not only to extreme vibrations but also to very high temperatures,” Brechbühl explains. “Quartz crystals have limitations in terms of temperature, however. In 1998, we therefore began cultivating our own high-temperature crystals, which are better at coping with these requirements. But these crystals, too, are constantly being developed.”

Team Spirit and a Passion for the Product

“If there’s something that everyone in Formula One shares, it’s team spirit and a passion for the product. Our development teams can engage in weeks of heated debate about whether a certain edge of the crystal should be a 10th of a millimeter shorter or not,” explains Thomas Walter. Nevertheless, he says the typically hectic pace of Formula One in the months leading up to the start of the season is not something that affects Kistler very much. “Engine development tends to go on constantly.”

The crystals made by Winterthur-based Kistler help ensure the BMW engines can go right to the limit. Cultivation of specific crystals is a prerequisite for the ability of the sensors – which look fairly nondescript, as the picture shows – to be able to measure combustion pressure in the engine with high accuracy, even in extreme conditions, and therefore assist with constant engine development. So piezoelectricity is actually the magic word behind all this.
Of Brake Bells and Ballast

A Formula One racing car is made from hundreds of precision components supplied by various manufacturers. What they all have in common is obsession with exactitude – and rightly so. The price of making mistakes is high in this industry. This is why Paul Molnar, of Molnar Präzisionsmechanik (precision mechanics) Corporation employs only highly skilled workers who personify his standards for delivering quality quickly.

From November to the end of February, Paul Molnar and his eight employees are on standby, prepared to put in the extra hours necessary to deliver – at F1 speeds – precision parts manufactured to the critical tolerances demanded for BMW Sauber racing cars. His company’s focus is on making brake bell and ballast to keep the car balanced and to meet F1’s 600-kilogram weight limit (inclusive driver). "The lead time to the rollout of the new season’s car in January is an extremely busy time for us," explains Molnar. "But we are busy throughout the season."

Paul Molnar’s wife Rita, who handles the company’s back office, is constantly on alert during the season keeping an eye on e-mails. "When we get an e-mail from BMW Sauber with plans for the part, we have to give them a yes or no answer within minutes as to..."
The job of Bülach-based firm Molnar is to add weight to the BMW Sauber Formula One racing car, and therefore reduce its speed. Well, no, that’s not quite true. Molnar does, on the one hand, supply the necessary ballast for the car to meet its required racing weight based on its optimal aerodynamic shape; on the other, the small workshop in Bülach provides high-quality titanium brake rotors (the picture shows a variant from last season). The brakes must function perfectly, so the racing drivers can really put their foot down …

whether we can deliver," she says. The company is not the only supplier of these parts, but it ranks highly among the top 10. “Of course, we never want to turn down an order, but it is our responsibility to think fast and be reasonable.”

With such a small company – I generally like to have no more than 10 employees – our main challenge is capacity,” explains Paul Molnar. His company has been making parts for the medical, aviation and astronautics industries since 1978. F1 came into the mix just seven years ago. “Once I’ve determined that we have the necessary manpower to take on a particular job, I give the go-ahead, and we have 24 to 48 hours to manufacture the part and to create a detailed protocol on the process.” The nature of the F1 game is that things are constantly in a state of change. This means that the company can never prepare an inventory of a particular part. “Every component in an F1 car makes a difference in timing and performance,” says Molnar. “This means that with every test or after every race, some parts might be changed incrementally, but that minor change could provide the competitive advantage. Three seasons ago, for example, there were five brake bell versions.”

Gaining Competitive Advantage Incrementally

The F1 fan began working with Peter Sauber and Sauber-Petronas in 1998. Though the two live only a few homes apart, they’ve met only twice. “Our company was recommended to Peter Sauber by one of our clients. We don’t advertise, because I prefer not to, but our client base continues to grow through this kind of word-of-mouth,” says Molnar. “When he approached us, I did not hesitate to take on his business. Not every company can work for F1. I’m happy to say that we have that honor.”

A lot has changed since that first season with Sauber – from the materials used to create parts, to the number of machines in operation. “Working with Sauber gave me the incentive to expand the company by investing in more high-tech machinery,” explains Molnar. “To make the brake bells, I bought two wire EDM machines at about 220,000 Swiss francs each. I got two because we always need a spare to meet the F1 team’s needs in case one machine breaks down.” Previously, the brake bells were made from aluminum, but for the past three seasons have been made from titanium. The company continues to make cockpit and trim ballast, as well as silly plate ballast, which is the plate located under the car’s nose. “Making the ballast is also a complex process and the specifications are constantly changing,” explains Molnar.

Working with BMW Sauber also brought other changes. “Last season, the volume of work doubled because BMW Sauber has a bigger budget. That has had a positive effect on our company. In fact, last year about 25 percent of our total revenue came from working with BMW Sauber,” says Molnar, who watches every race during the season. He was a Ferrari fan long before he became a supplier for BMW Sauber, but he roots for his client during every race. “It’s very important to me that BMW Sauber does well, and I applaud them when they pull ahead of Ferrari. After all, we are a small part of their success.”
The magnificence of the Shanghai circuit. China spares no expense in providing a fitting welcome to the giants of the race track. It's as if Formula One has always been held here.
Goodbye to the Old World?

Global markets are in a state of transition. The emerging countries of Asia, Eastern Europe and Latin America are demanding an ever more vocal leadership role in the new world order. This shifting balance of power is being reflected slowly but surely in the Formula One calendar.

The day-to-day business of Formula One is to thrill and excite. It’s what F1 lives for, what makes it tick. But the vast bank of little red flags – stretching into the distance opposite the starting and finishing straights – was one remarkable sight, even for a Ferrari squad that is more than accustomed to being showered with spectator love. They couldn’t stop gazing in amazement at the historic spectacle unfolding before them: the one hundred thousand Chinese people who chose to make their pilgrimage to the Shanghai International Circuit – totally of their own free will, and in the absence of any party diktat. Even at the first event held on the former marshlands just outside the Shanghai city limits, the crème de la crème of the car racing fraternity could rest assured that they had opted for the right venue in 2004. “It’s fairly incredible what the people have created here. Europe has become a bit third world by comparison,” noted marketing supremo Bernie Ecclestone in typically dramatic style. The successful example of Formula One’s Shanghai experience shows that car racing – now at saturation point in European terms – seems to be on the right track with its move into the emerging markets first discovered by the financial community a while back. With its potential of 1.3 billion people, China is almost in a league of its own. But countries like Malaysia (which has staged races since 1999), Brazil (which was included on the Grand Prix calendar back in 1973, but has only in recent years been turning a profit in terms of ticket sales alone), and Turkey (which was accepted into the international Formula One community two years ago) are also among them.

But there’s more expansion in the emerging countries ahead. Abu Dhabi – the biggest of the United Arab Emirates – will organize a race during the 2009 season. The racing teams have already been getting into the mood with their February parade through the city streets. Neighbor Bahrain, which had its own race premiere in 2004, will nevertheless remain a host nation into the next decade. Even boomtown Dubai is hoping to get in on the act and is working on a 300-million-euro Formula One theme park in the desert. The
accompanying race track has already been accepted by Formula One’s governing body, the FIA. All the oil-producing countries are trying to tap into the tourism market in this way. The expansion policy continues merrily around the globe, assisted by pocketfuls of cash from aspiring host nations. India – a high-tech country that has long dreamt of being represented in high-tech sport as well – would happily host a Grand Prix in Delhi. Its hopes are nurtured not only by the potential of 500 million residents under 20 years of age and the country’s existing below-average rate of car ownership, but above all by the fact that an Indian businessman and his group has emerged as sponsor of the Toyota team. Abu Dhabi (a shareholder in Ferrari) and Bahrain (30-percent co-owner of McLaren) similarly underscore their association with the industry.

**Kuala Lumpur’s Circuit Sets New Standards**

You need only look at the history of the Sauber team to realize that this is not an entirely new strategy. Petronas is synonymous with Malaysia, and therefore for the way in which image is acquired and cultivated through involvement in sport. Even the devaluation of the Malaysian ringgit is unlikely to be an impediment to the future of Formula One. The administration is continuing to focus on the effects of the country’s largest single event and has held out the prospect of supportive financial measures. Built at the turn of the millennium, the motodrome on the other side of Kuala Lumpur’s vast airport also sets the worldwide standard for architecture. Even the owners of the celebrated Indianapolis Speedway looked at the infrastructure of the Malaysia site before remodeling their circuit for its Formula One premiere in 2000. In Kuala Lumpur, where only the select few can afford a ticket to the Malaysian Grand Prix, the government support for Formula One is appreciated. In economically as well as politically uncertain times, guest performances throughout the land by the racing community and outings by the BMW Sauber – once entirely bedecked in Petronas livery – are also a modern means of giving people a sense of identity and cohesion as a society. Efforts by geographically small but economically big neighbor Singapore to be accepted as a city Grand Prix are therefore eyed with suspicion. On the site of Asia’s stock market, German race circuit designer Hermann Tilke is already toying with a layout that should make an interesting course around the city’s landmarks a possibility. One of the special attractions under consideration is night-time driving by floodlight.

Formula One needs to be (more) creative if it is to retain and improve its attractiveness. This maxim is being adhered to more systematically in the emerging markets than anywhere else. Geography plays no small part in this, as the Turkish example shows. Istanbul’s Otodrom lies on the other side of the metropolis on the Bosphorus, in the Asian part of the country, but this bridging of two continents gives it additional attraction. Turkey’s successful effort to host its first Grand Prix in 2005 was heavily backed by the Istanbul chamber of commerce, with its eyes on presenting the country to investors from all over the world as a modern, attractive destination. And things seem to be working out well. The rapidly growing infrastructure around the course and establishment of many manufacturing firms in the neighborhood is already making the
Malaysian Grand Prix, Sepang  Malaysia marked the start of Formula One’s move into the emerging markets in 1999. Like all new race circuits, the Sepang course was designed by German architect Hermann Tilke.

Moving of 5.5 million cubic meters of soil seem worthwhile, even if it is still too early to talk of a tradition or breakthrough. The day-to-day traffic situation on the roads in particular sometimes spoils things for visitors making their way to the circuit.

Traffic in Shanghai is much slower and more chaotic. But in a metropolis that illuminates its highways in blue from the ground up – so that at night they give the impression of being gigantic arteries charting their course between long lines of towering apartment blocks – mobility is a sacred cow. But it’s not just the buildings that ensure Formula One symbolizes out-and-out futurism and growth. Dong Tao from Fixed Income Research at Credit Suisse in China thinks it’s the interaction with daily life that is especially welcome: “China is now the second biggest automotive market in the world, with a vehicle being sold here every five seconds on average. The country has also moved up into second position in terms of car manufacturing. And what better showcase could there be for the car than Formula One? Getting the Grand Prix for Shanghai was almost a logical consequence of that. Drumming up the necessary enthusiasm didn’t take much effort at all in the way of public or private initiatives.” But it’s also clear that in and around Shanghai nothing happens without the goodwill of the regional administration, especially not a mammoth project that seemed ideal for grabbing back some of the limelight from rival Beijing as it prepares to host next year’s Olympic Games.

Fertile ground for success stories exists wherever there is the likelihood of a win-win situation for both sides – host nation and Formula One. For the visiting race bandwagon right away, and >
for the hosts in the near term. For that reason South Korea has already been on Bernie Ecclestone’s waiting list for years. By 2010 at the latest, the port city of Gwangyang should be ready with a new 5.4-kilometer circuit on the harbor promenade.

US Gradually Drifting Toward the Sidelines

These emerging markets are not least a threat to efforts to establish Formula One in the United States, where sport is organized along very different lines. This is despite the significance of the US market to manufacturers and sponsors alike. “There, no businessman would risk a single dollar without being certain of getting it back. And no one believes the US administration will cough up money for Formula One,” Ecclestone explains. “Why should we race in America for half the money we can get elsewhere?” It’s a rhetorical question. Formula One remains a financial championship. But alongside the entry-fee guarantee (reportedly more than 15 million dollars per race), it increasingly has to address the need for universal coverage in a shifting world order. “The move toward new markets underpins the future of car racing, and it also supports the ambitions of the manufacturers,” is how BMW Motorsport Chief Mario Theissen views the new trend. “Asia, for instance, is the most rapidly growing market in the world. Only the races there make our series a true world championship.”

“Formula One, where are you going?” was the question being asked this winter by a leading European car racing magazine, the Zurich-based Motorsport aktuell. On behalf of the European fan base, it warned against Ecclestone’s future plans to alternate the holding of the Grand Prix in France and Britain, in addition to the German races (starting this season, they will alternate annually between the Nürburgring and Hockenheim). Though the plan may initially sound absurd, it’s a real threat given the alternatives available. Prior to this season, who would have thought that the San Marino Grand Prix would simply be struck off the calendar?

There’s undoubtedly some truth in the argument that an unbridled Formula One cannot get away with cutting off its roots entirely. The prospect of controlled growth is perhaps a more likely scenario. Nevertheless, the motor racing industry is rarely interested in any need for balance. Instead, it is much more likely to be guided by the principle of profitability. That also explains why cars still have to make do with the uneven state of the track and many other impediments at host city São Paulo. Longer term, Ecclestone is surely hoping a South America leg will offer more than just a passionately enthusiastic public. Because at the end of the day, each race is an investment for him. Thus Formula One’s future is ultimately tied up in Bernie’s financial here and now. <
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